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National Transport Plan for Greece

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Final Transport Plan Report

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Abbreviations

3PL	Third-Party Logistics
ATC	Automatic Traffic Counts
B2B	Business to Business
B2G	Business to Government
BCR	Benefit/Cost Rati
BSEC	Black Sea Economic Cooperation
CAPEX	Capital Expenditure
CBA	Cost-Benefit Analysis
CEF	Connecting Europe Facility
CF	Cohesion Fund
DMS	Do-Minimum Scenario (aka Reference Scenario)
DSS	Do-Something Scenario
EFSI	European Fund for Strategic Investment
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EIBAS	Framework agreement to support EIB advisory services
ELSTAT	Hellenic Statistical Authority
ENPV	Economic Net Present Value
EPEC	European PPP Expertise Centre
ERR	Economic (Internal) Rate of Return
ERTMS	European Rail Traffic Management System
ESIF	European Structural and Investment Funds
ETCS	European Train Control System
EU	European Union
EUSAIR	EU Strategy for the Adriatic-Ionian Region
EYDE	Special Service for Public Works
G2G	Government to Government
GDP	Gross Domestic Product
GNI	Gross National Income
GVA	Gross Value Added
HCAA	Hellenic Civil Aviation Authority
HGV	Heavy Goods Vehicle
HLO	High Level Objective
HSC	High-Speed Craft
HSR	High-Speed Rail
I/C	Interchange
I2I	Infrastructure to Infrastructure

IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFI	International Financing Institution
IMF	International Monetary Fund
INSETE	Institute of Greek Tourism Confederation
IT	Information Technology
ITS	Intelligent Transport System
KPI	Key Performance Indicator
KTEL	Intercity Bus Company
LGV	Light Goods Vehicle
LNG	Liquified Natural gas
LRT	Light Rail Transit
MCA	Multi-Criteria Analysis
MENA	Middle East – North Africa region
MGV	Medium Goods Vehicle
MIT	Ministry of Infrastructure and Transport
MoMAIP	Ministry of Maritime Affairs & Insular Policy
MoU	Memorandum of Understanding
MSWS	Maritime Single Window System
NOAK	South Crete Road Axis
NR	National Road
NSWS	National Single Window System
NTM	National Transport Model
NTPG	National Transport Plan for Greece
OASA	Athens Urban Transport Organisation SA
OD	Origin-Destination
OECD	Organisation for Economic Co-operation and Development
OP	Operational Programme
OPEX	Operational Expenditure
OSE	Hellenic Railways Organisation
PA	Partnership Agreement for the Development Framework 2014-2020
PATHE	Patra-Athens-Thessaloniki-Evzonoi (corridor)
PATHE/P	Patra-Athens-Thessaloniki-Idomeni/Promachonas (corridor)
PCS	Port Community System
PD	Presidential Decree
PIP	Public Investments Programme
PMS	Pavement Management System
PPC	Public Power Corporation (DEI)
PPP	Public-Private Partnership
PRM	Persons with Reduced Mobility

PSAP	Public Safety Answering Point
PSO	Public Service Obligations
PT	Public Transport
RAEM	Regulatory Authority for Passenger Transport
RAL	Regulatory Authority for Ports
RAS	Regulatory Authority for Railways
REBIS	Regional Balkans Infrastructure Study
RESA	Runway End Safety Area
RSI	Roadside Interviews
S.A.	Société Anonyme
SDR	Social Discount Rate
SFIT	Strategic Framework for Investment in Transport
SKA	Acharnes Transport Centre
SME	Small and Medium-sized Enterprise
SP	Service Provider
SPU	Strategic Planning Unit
SRSS	Structural Reform Support Service
STASY	Urban Rail Transport SA
SUMP	Sustainable Urban Mobility Plan
TA	Technical Assistance
TAC	Track Access Charges
TEN-T	Trans-European Transport Network
ThPA	Thessaloniki Port Authority
ToR	Terms of Reference
V2I	Vehicle to Infrastructure
V2V	Vehicle to Vehicle
VA	Vertical Axis
VDF	Volume Delay Function
VIPE	Industrial Park
VOAK	North Crete Road Axis
VOC	Vehicle Operating Cost
VoT	Value of Travel Time

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Chapter 1 - Introduction

1.1 Background

In November 2014, the Strategic Framework for Investment in Transport (SFIT) was published by the Ministry of Infrastructure, Transport and Networks. The report set out a framework of capital investment needs over the period from 2014 to 2025 and was developed to meet the requirements of the Ex-Ante Conditionality connected with the preparation and approval of the Operational Programme for EU Funds covering the period 2014-2020. The framework was elaborated based on a benchmarking of the performance of the transport sector and the definition of a series of investment projects based on policy objectives and consultation.

It is evident that the SFIT objectives and scenarios comprised a series of projects and other measures that are envisaged as necessary within the Transport Sector. Nevertheless, the framework did not clearly link investments to a supporting problem analysis or quantifiable objectives that demonstrate the need for each investment. Such an analysis typically considers issues relating to capacity, demand, reliability, socio-economic issues, environmental impacts and spatial issues.

In response to the identified need for a more comprehensive overview of the sector, the Ministry of Infrastructure and Transport commenced in 2015 an operation to develop a National Transport Plan for Greece. The Plan would provide the basis for sustainable transport infrastructure and service development in Greece over the medium (2027) to long-term horizon (2037), aiming at, but not limited to, fostering the competitiveness and sustainability of the transport sector of the country and identifying solutions that would cover also organisational and institutional interventions that would complement the envisaged investment also in transport infrastructure.

It was a requirement of the Ministry that the Transport Plan would be based on solid data collection and analysis of the needs of the whole transport sector, supported by a Strategic Environmental Assessment (SEA). It would include the development of a National Transport Model covering all transport modes and capable of being used as a decision support tool for future policy making, investment planning and project preparation.

In parallel with the preparation of the Transport Plan, it was also an intention of the Ministry to elaborate a management plan for the establishment of a Strategic Planning Unit of the Ministry, identifying activities, staffing, and protocols for future information flows between the Unit and external agencies/ authorities and ministerial departments.

It was intended that the Plan would be developed within the broader framework of the EU 2011 White Paper: Roadmap to a Single European Transport Area, including also more specific guidelines for the development of the TEN-T Network (Regulation No 1315/2013), the Orient/East Med Corridor Work Plan and the Motorways of the Sea (MoS) Detailed Implementation Plan.

The development of the Plan would also ensure that it can reinforce and complement other strategic actions, including the Strategic framework for road safety 2011-2020, the National ITS Strategy 2015-2025 & National ITS Architecture 2016-2025, the OSE Business Plan 2016-2020, the National Port Strategy 2013-2018, as well as the National Logistics Strategy and Action Plan 2017. The Plan would be in line with the recently completed National Development Strategy 2018, while also providing a basis for Sustainable Urban Mobility Plans and other local or regional transport plans that may be developed across the country in the future.

The Ministry decided to develop the National Transport Plan with technical support provided through the Structural Reform Support Service (SRSS) of the European Commission. As part of the "Plan for Technical Cooperation in support of structural reforms", it was agreed that, under the indirect management of the SRSS, EIB can support in the development of a National Transport Plan, following a request for technical support from the Ministry of Transport. For this purpose, EIB issued a tender procedure in early spring 2017 under EIBAS Lot 3, a framework contract managed by EIB. Following the contract award and signing with Egis Consortium in April 2017, the project started on 15.05.2017.

1.2 Purpose of this report

The preparation of the Transport Plan has taken place over a 2-year period and has been informed by an extensive process of data collection, consultation with stakeholders, and the development of proposed interventions supported by a significant effort in analysis and research. The work has been supported by a Steering Committee comprising representatives of the Ministry of Infrastructure and Transport, Ministry of Maritime Affairs and Insular Policy, Ministry of Environment and Energy, Ministry of Economy and Development, Hellenic Civil Aviation Authority, HELLASTRON and Hellenic Railways Organisation. In addition, it has included submissions from more than ten external entities, all of which have supported the development of the final package of interventions set out in this document. In addition, the Plan has invited input through www.nationaltransportplan.gr.

The current document attempts to present this significant assignment into a concise summary of activities that have been undertaken, and the logic that has been applied in order to arrive at the final investment scenario. This report is supported by a number of external technical documents that elaborate in further detail the analytical work that has taken place in order to support the conclusions contained in this report (see Chapter 2).

This policy document presents the National Transport Plan for Greece that covers all transport modes (road, rail, maritime, air and intermodal/logistics sectors) and a long-term time horizon of 20 years (2017-2037), along with an evaluation of the significant impacts of the Plan, and the measures that will be taken to ensure efficient and timely implementation. The aim of this report is to summarise the national strategy to be followed in the next 20-years period, proposing interventions with different maturity status, some of them being at a generic/conceptual level. All proposed interventions shall pass through project preparation procedures (as described in the Programming Report) in order to specify their detailed characteristics (via dedicated option analysis and feasibility studies) and eventually be implemented under the national investments programme and/or the forthcoming programming periods for the European Structural and Investment Funds (ESIF).

1.3 Arrangements for Preparation of the Transport Plan

The development of the National Transport Plan involved a number of internal actions to ensure that the appropriate levels of expertise and project management support were available to the Ministry. These arrangements have included:

- The development of a Department with specific responsibility for the development of a National Transport Plan. The Department of Transport Planning and Development has therefore been established to oversee the day to day elaboration of the Transport Plan, and with further responsibilities for the implementation of the Plan; and
- The awarding of a service contract, acting under the direction of the Department of Transport Planning and Development to support in the preparation of the Plan through a systematic and evidence-based approach.

As mentioned above, the European Commission, through the Structural Reform Support Service (SRSS), has asked the EIB to support Greece in the development of a National Transport Plan, following a request of technical support from the Ministry of Transport. Following a competitive tender procedure, the service contract was signed in April 2017 by EIB with a consortium led by Egis (FR) and including TIEG (BE) and Systema (GR).

Throughout the development of the Plan, the consortium worked under the direction of the Ministry of Infrastructure and Transport, supported by JASPERS who acted as a technical consultant for the Ministry. This was achieved through the definition of two clear work components in the consultancy engagement, which reflected the internal arrangements within the Ministry, as follows:

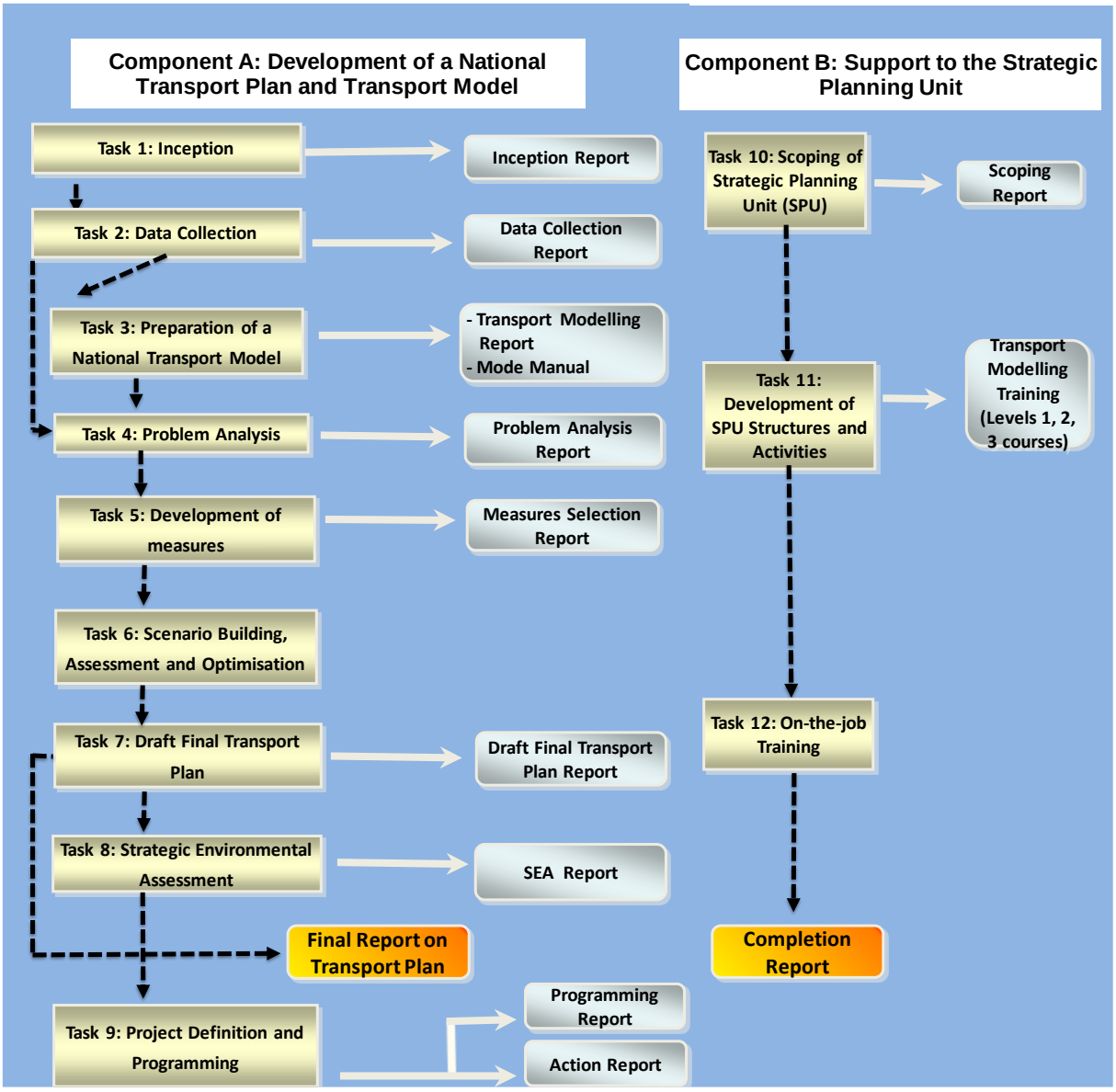
- Component A: Development of a National Transport Plan and Transport Model;
- Component B: Support to the Strategic Planning Unit (SPU).

The project's main outcomes can be summarised as follows:

- A comprehensive National Transport Plan with a horizon year of 2037, and an interim horizon of 2027.
- Supporting planning tools (transport model, CBA model, web-based Data Room).
- A management plan and selected capacity building activities (training, institutional support, protocols, data management, and mechanisms for cooperation with all jointly competent ministries) to support the development of a functioning Strategic Planning Unit in the Ministry and a fully documented set of activities and protocols.

The relevant project activities and outputs, and their sequence followed in the preparation of the Plan and related support actions are presented below.

Figure 1-1: Sequence of Transport Plan activities



1.4 Structure of the report

This document presents the Final Report of the **National Transport Plan** for Greece. It sets out concisely the process leading to the development of the final schedule of measures that are included in the Plan, with the following elements:

- **Chapter 1: Introduction** describing background and purpose of the document and of the overall process. A brief description of the context of the Plan at national and EU level, and the integration with other development and/or local plans is also provided.
- **Chapter 2: Development of Transport Plan** including Data Collection/Consultation, Transport Modelling, Problem Analysis, Measure Selection and Scenario Building. The first part (Section 2.3) describes what data sources have been used, how they have been collated and their relevance and accuracy. The section presents consultations that have been undertaken with stakeholders and the transport industry on key problems and opportunities, as well as the existing situation with regards to infrastructure, organisation and operation of the transport

sector. The section that follows (2.4) outlines the basic objectives, steps and outcomes of the transport model development task including the key components, input/output data and scenarios of the National Transport Model. Then, the problem analysis phase (Section 2.5) is presented in a clear way, with problems summarised for all transport sectors in accordance with the related data and consultation results and the High-Level Objectives (HLO) defined for the project. The section presents the definition of the Operational Objectives (their precise relation with identified problems is given in Annex II: Links between Problems and Operational Objectives) for the Transport Plan, which show how the problem analysis leads to a series of specific needs that the Plan intends to address. Section 2.6 describes the identification of Measures and Scenario Building steps, highlighting any comparative testing of major Measures and how the final list was derived. The methodology for the final selection of soft and infrastructure Measures and their combination into scenarios that reflect defined themes in the Plan is included. This section also describes the steps of assessing the alternative scenarios of NTPG and optimising the results leading to the definition of the preferred scenario. A brief description of the financial envelope available for the implementation of the Plan is included in this analysis.

- **Chapter 3: The Transport Plan** provides a detailed description of the preferred scenario, focusing on the defined investment pillars of the Plan, including also information about the Reference Scenario measures that form the basis of the future transport strategy. A brief summary of each proposed measure and its related actions, the rationale and maturity, and the compatibility with other measures and priorities is given in Annex IV. Correlations between pillars and measures are given in Annex V.
- **Chapter 4: Expected Outcomes** presents the expected impacts of the preferred scenario for the National Transport Plan, including details on the foreseen benefits as evaluated against the High-Level Objectives set. Annex I contains the sub-objectives and the sets of indicators proposed to be adopted for assessing the level of achievement of the HLO.
- **Chapter 5: Implementation of the Plan** outlines the basic components of the programming framework needed for the implementation, monitoring and update of the Plan by the competent MIT services, in coordination with the national and European funding arrangements of the current and future programming periods for European Structural and Investment Funds. The Plan also presents a broad implementation timescale for the next programming periods, up to 2030. It also presents the financial analysis and funding arrangements for the Plan, which include an assessment of financial sources, available funding scenarios, impact on income and expenditure at the level of government, and affordability.

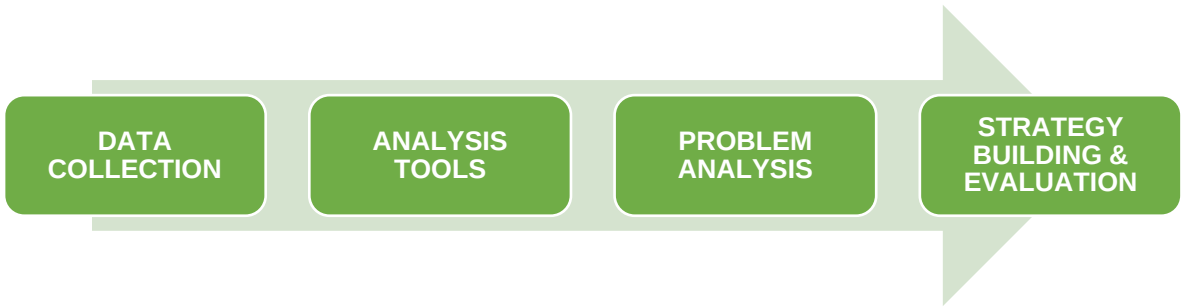
Chapter 2 - Development of Transport Plan

2.1 Introduction

The development of the Transport Plan has taken place over a 2-year period, beginning in May 2017 and progressing through a programme of data collection, analysis of transport needs, strategy building and evaluation, and financial analysis. Each stage in the development of the Plan is summarised through this section of the report and is intended to demonstrate how the final schedule of interventions has been derived on the basis of identified needs in the sector.

The development of the Plan has progressed through a number of distinct activities, as outlined below in Figure 2-1. Each of these activities is described in further detail through this section of the report.

Figure 2-1: Procedure for Plan Development



2.2 Inception Phase

The project started on 15.05.2017 and the kick-off meeting took place in Athens on 19.05.2017 with representatives from the Ministry, EIB, JASPERS and SRSS.

A Project Steering Committee (PSC), appointed by the MIT, and under the direction of Mr Athanasios Vourdas, Secretary General, included representatives from concerned stakeholders and institutions including:

- Ministry of Infrastructure and Transport (MIT);
- Ministry of Maritime Affairs and Insular Policy (MoMAIP);
- Ministry of Environment and Energy;
- Ministry of Economy and Development;
- Hellenic Civil Aviation Authority (HCAA);
- HELLASTRON;
- Hellenic Railways Organisation (OSE S.A.).

The role of the Steering Committee was not only to review and provide input to project development, but also to participate in working meetings, to provide comments and suggestions and to get appropriated with the project.

Regular (monthly) meetings with the presence of the EIB, the Ministry's project management team, JASPERS, SRSS and the Service Provider were held throughout the whole duration of the project to steer the project progress and resolve any outstanding issues.

Considering the limited time between contract starting date and start of peak summer season, it was agreed to postpone the implementation of most surveys to mid-September. Several proposals aiming at optimizing the survey programme, based on collected data and usual best practices, were proposed, approved and implemented.

In addition, a substantial amount of data from TRAINOSE, Hellenic Statistical Authority, MIT/Motorway Directorate, MoMAIP, Egnatia Odos S.A and Intercity Bus Association were provided during this period.

A number of outputs were delivered during this inception phase, being part of the Inception Report (Deliverable of Task 1), including the Project Management Plan, Transport Modelling Plan, Consultation Plan and Document Review Report.

Several key technical notes were also produced in order to present suitable solutions to several issues including survey preparation, trip distribution methodology, field survey locations and web-based data room.

Finally, a project website (www.nationaltransportplan.gr) was developed and put in operation.

2.3 Data Collection

The Plan has required the collation of existing data and collection of new data, all related to the organisation, operations and supply/ demand for all transport modes. This has allowed not only the development of an understanding of existing behaviour through interrogation of the data, but also the development of future transport forecasts through the use of a transport model. The development of the needed dataset has been achieved through a number of sources, described below:

Data made available by third parties

It is noted that significant data already exists within the transport sector, although at the current time there is no system for centrally storing or reporting such data. Through a series of direct agreements, the Ministry collated data from relevant third parties, government agencies and transport operators, based on a scoping exercise with the relevant data providers. The Ministry noted the commercial sensitivity of such datasets in many cases and entered into agreement to protect the raw datasets from use by other parties. Through this procedure, valuable data on existing transport activity was received, for example from TRAINOSE, KTEL or HELLASTRON. It is noted that available transport data were collected by entities primarily for internal management purposes, and in many cases did not exactly match the needs of the Ministry; in such cases additional assumptions or supporting datasets were needed to gain a complete picture.

Data available from public sources

An important element of the Transport Plan is understanding existing demographic, economic and socio-economic data. The following data was sought:

- Population: 2011 census, household number/size, estimated population (2002-16);
- Labour: employed persons per economic activity, unemployment rate, labour force;
- Economy: GDP, GDP per capita, GVA per economic activity, international trade, imports/ exports;

- Mobility: car ownership, road accidents, maritime transport, road freight transport.

Such data provide a comprehensive picture of existing drivers of transport demand, but also in some cases can inform the preparation of future growth forecasts. Typically, this information was available via public sources. The following providers assisted with such information:

- Hellenic Statistical Authority (ELSTAT),
- Eurostat,
- European Commission AMECO,
- World Bank,
- International Monetary Fund (IMF),
- Organisation for Economic Co-operation and Development (OECD),
- Institute of Greek Tourism Confederation (INSETE).

Other public sources used for relevant data were the websites of transport operators and relevant stakeholders, such as OSE, TRAINOSE, KTEL companies, Athens International Airport, port authorities, Hellenic Coast Guard, etc.

Collection of information and data from other sources

Additional data sources were employed to collect specific and more detailed information on main problems and bottlenecks, measures and interventions (past, ongoing and planned), as well as regulatory and other issues. Quantitative and qualitative information was collected from all above-mentioned stakeholders, as well as via consultation with other relevant actors, members of the Steering Committee and transport operators. The data collection process has fed all development phases of the NTPG, as the information requested was related to:

- Transport regulations and trade logistics issues;
- Transport infrastructure capacities;
- Infrastructure projects implemented/under implementation and scheduled;
- Identified physical and regulatory bottlenecks;
- Soft measures implemented/under implementation and scheduled.

During the data collection, it was clear that there became a necessity for the period to be extended to allow for the relevant public sector services and organisations to respond to the requests for a wide range of transport-related data sets and specific information. The processing, consolidation and evaluation of the received data was also an elaborate activity, requiring clarifications and further information from the competent agencies.

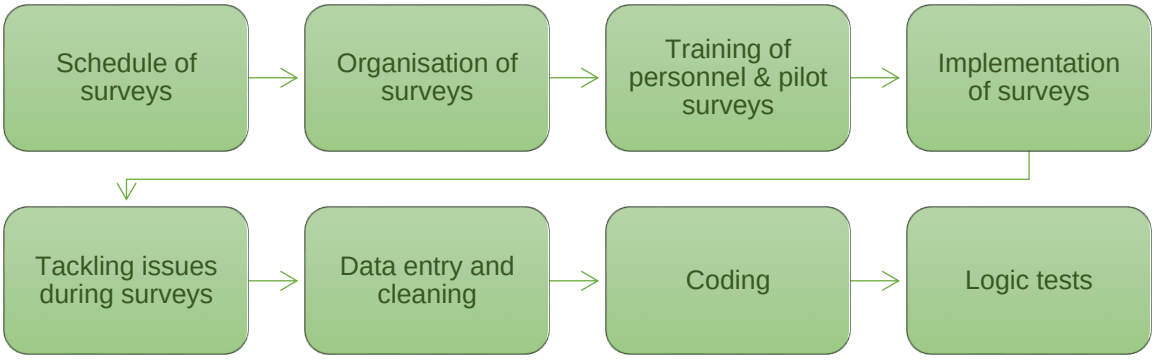
In the data collection phase, most of data and information was made available. It was noted that the largest part of missing information was related to the maritime transport sector, that is, detailed data about Greek ports, their master/ business plans, past, ongoing and future development projects, as well as comprehensive traffic data for passengers, vehicles and goods. Gaps in the resulting analysis, which could result in incomplete problem analysis and measure development, were mostly compensated by the particular knowledge of the team, site visits, additional requests and special meetings for data, as well as extensive consultation with the Steering Committee members and other stakeholders.

Collection of Field Survey Data

The collection of field survey data was undertaken to ensure a complete understanding of the movements of passengers and freight through the national transport network and was designed to complement the data received from existing sources as outlined above.

The collection of field survey data took place over the period from September until October 2017[1], and was organised by a specific management team, covering all methodological steps including survey design, training, permitting, implementation, coding, quality assurance and logic testing (Figure 2-2).

Figure 2-2: Methodology for Field Survey Data



The Field Survey Data comprised a comprehensive schedule of direct observations, as depicted in Figures 2-3 and 2-4. In total, more than 10,000 car drivers and 1,200 truck drivers were interviewed on the interurban road network (20 survey stations on motorways, national and provincial roads). In addition, approximately 4,500 passengers in rail stations, 4,600 passengers in KTEL stations, 3,000 passengers (plus 1,500 truck drivers) in ports, as well as 400 passengers in airports were interviewed. The surveys reflected the typical period to collect reliable data about common travel patterns (trip purposes, trip frequencies, etc.) in Greece, while the interviews were accompanied by an extensive set of traffic counts for vehicles and passengers that helped attain the full picture of current transport demand conditions in the country[2].

[1] Apart from Journey Time Surveys which were carried out in June 2017.
[2] The detailed methodology and survey results can be found in the Data Collection Report, Chapters 3 and 4.

Figure 2-3: Roadside Interview (RSI)/Traffic Counts locations

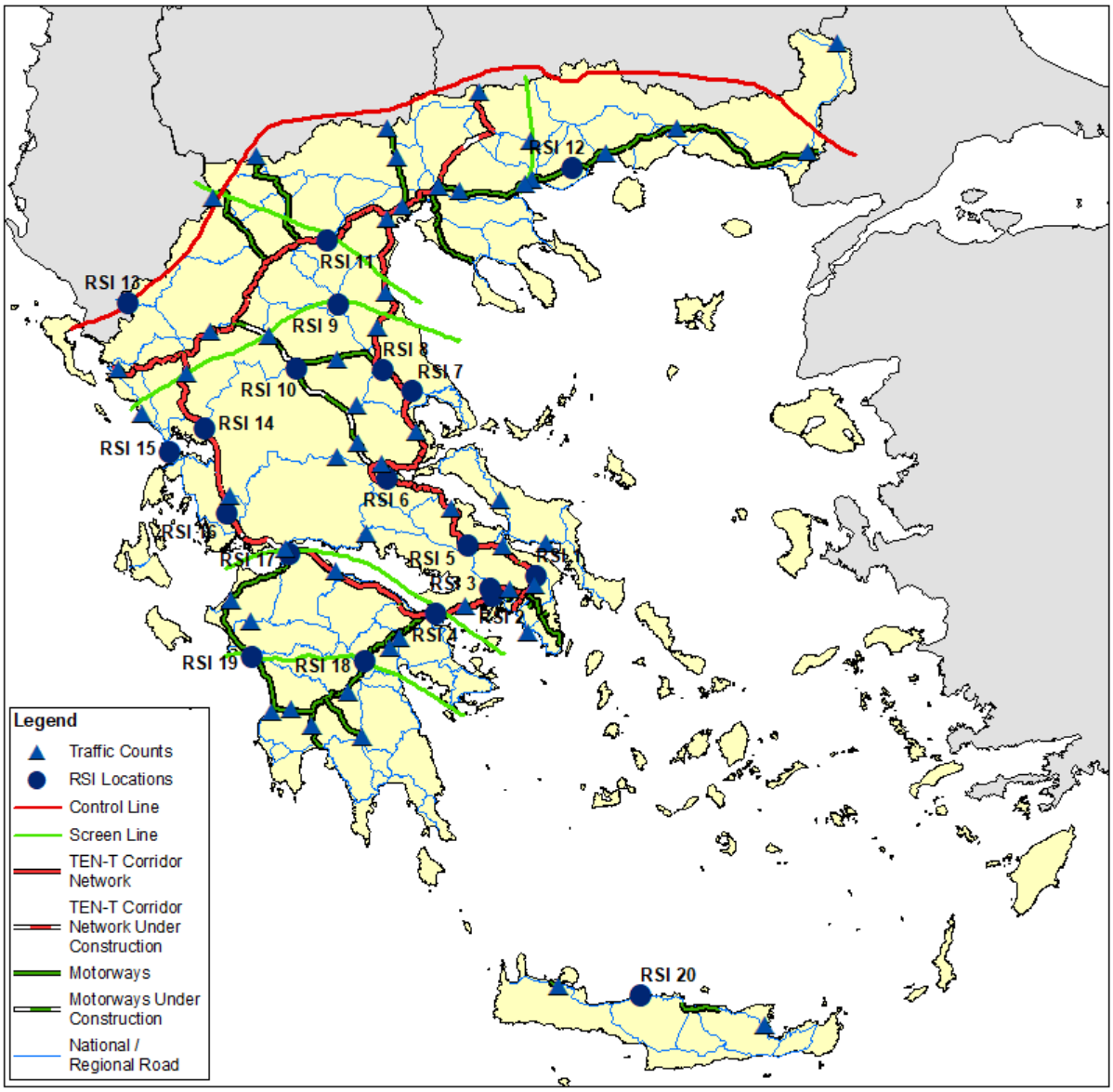
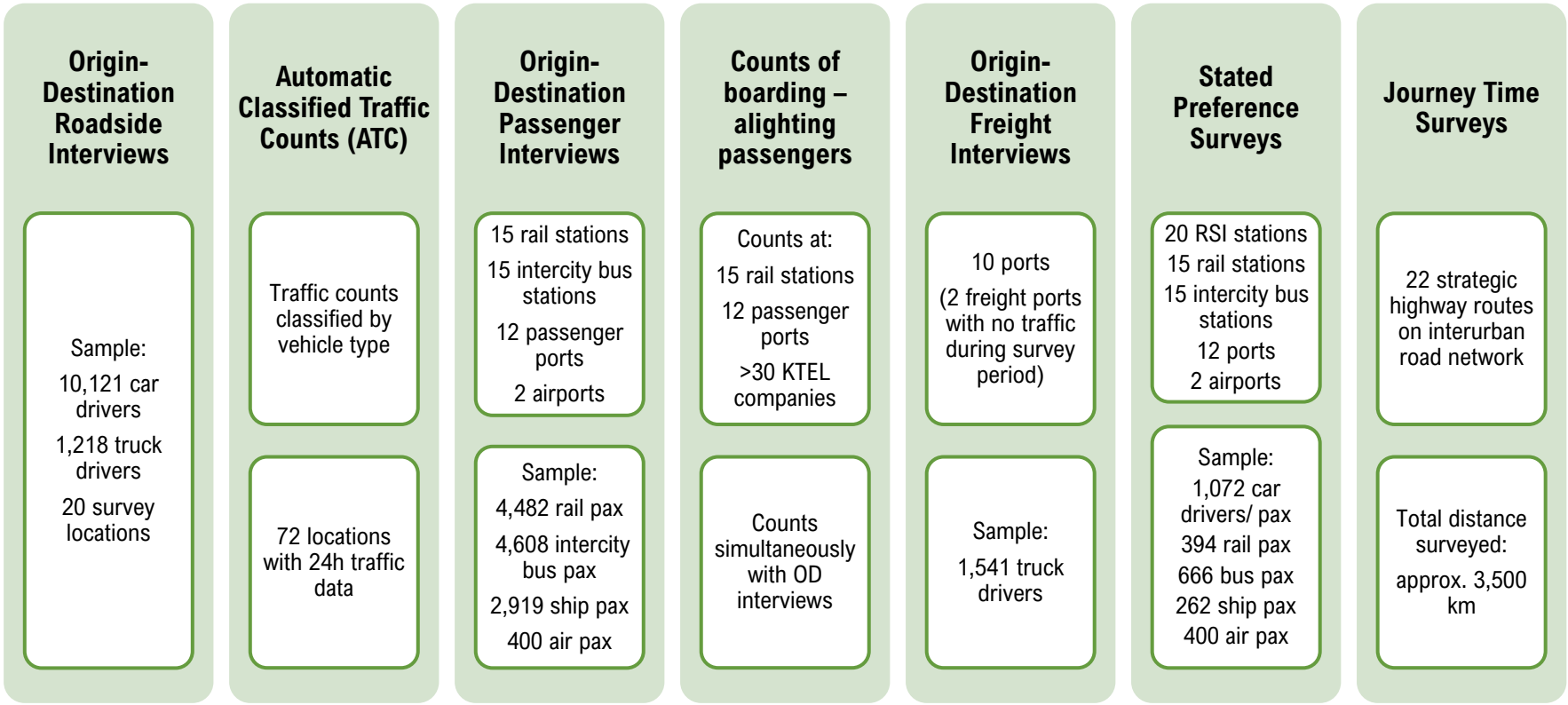


Figure 2-4: Summary of field surveys outcomes



2.4 Analysis Tools (Transport Model)

2.4.1 Objectives of the Transport Modelling

The fundamental objective of this task within the NTPG preparation was to develop a strategic macroscopic transport model covering the whole of Greece (nationwide), including also external zones. The model allows for assessing movements between the major cities being the main traffic generators and attractors, but also traffic entering or leaving the country at key border crossing locations and through the international ports and airports.

The purpose of the National Transport Model (NTM) of Greece is to serve as an effective tool that can support the analysis of existing and future traffic flows of passengers/freight by transport mode, on different networks, in conditions of different infrastructural, economic and charging regimes. The NTM will have an important role in strategic transport planning activities of MIT services, as well as in supporting project preparation actions for external entities. Furthermore, this model is the basis to identify and develop strategies to alleviate the shortcomings of the current transport system and to develop the future transport system in a converging direction of meeting future demand and promoting the economic and social development of the country without compromising its sustainability. The model is also used to identify specific measures for all different transport modes and support their integration into the selected strategies. The model will produce quantitative results allowing determining impacts of the strategy alternatives and of the measures on traffic conditions, as well as social and environmental impacts. Therefore, the model supports the:

- Identification of shortcomings / bottlenecks / needs for improvement;
- Development of strategy alternatives;
- Development of policies, investment strategies, projects and measures;
- Assessment of the impacts of the different alternatives and selection of the most appropriate option.

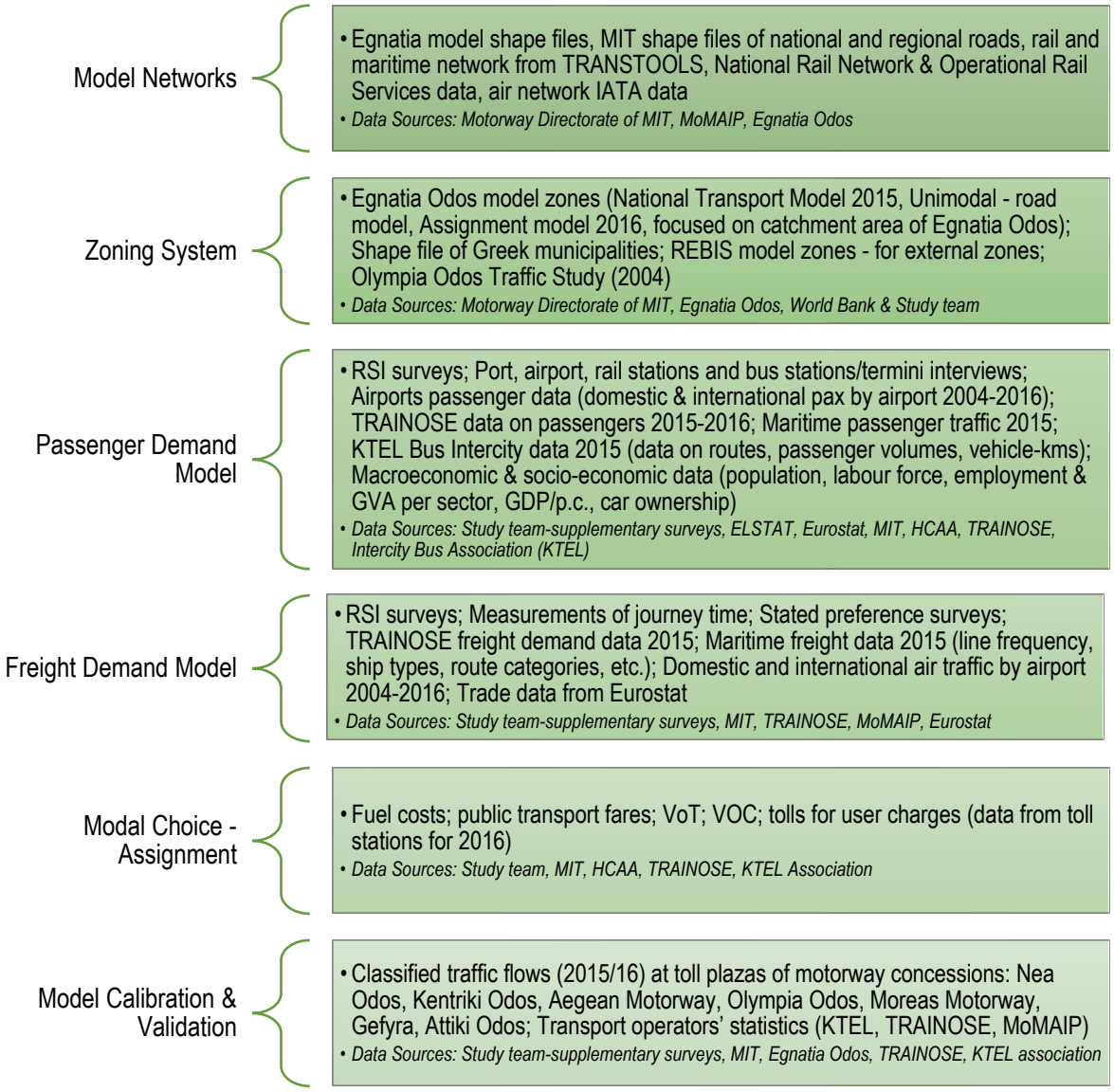
2.4.2 The National Transport Model

It was required that the development of the Transport Model reflected the intended applications of the model both for the preparation of the Transport Plan, and for its subsequent uses as a decision-making support tool. These applications strongly determined the degree of complexity of the model, which is sufficient to allow the impacts of new interventions to be measured but avoids over-complexity which might make such a transport model unstable or difficult to use. Following a detailed scoping exercise involving experts from Egis/Systema and JASPERS, the following are the main features of the Greek National Transport Model:

- Base Year 2017, with future forecast years 2027 and 2037;
- A total of 373 zones, 205 of which are within mainland Greece;
- A total of 34,399km of strategic roads, including major roads beyond the territory of Greece;
- Public roads defined according to four road classes (hierarchies);
- Public transport services covering all routes by interurban bus (KTEL), rail, air and ferry;
- All domestic and international air services from the 39 airports in Greece;
- Rail network comprising 9,500km plus all Greek railway stations;
- All stops and service lines for domestic rail traffic (115) and two international lines to Belgrade and Sofia;

A summary of the input data used for the transport model is presented in the figure below.

Figure 2-5: Data utilised for each step of the model development



2.4.3 Transport Model Horizons

2.4.3.1 The Base Year Model - 2017

The base year for the analysis is year 2017 when the traffic surveys were also conducted. The base year model was developed to represent existing demand and current conditions in the national transport system with a sufficient level of accuracy for nationwide macro analyses. The development of the base year model is crucial in the reliability of a transport model, as only the base year model can be compared to empirical data and can then be used for forecasts and "what-if" analyses, i.e. to determine the impacts of internal and external changes to the transport system, both for base year and the forecasting years.

The base year model enables the analysis of passenger and freight flows and traffic conditions on all links and junctions, on all public transport services, even if the empirical measurements are more limited. It corresponds to an expansion of the conditions observed in certain links/ nodes and hours/ days to the

complete network and the entire time period. Furthermore, the base year model allows the determination of various parameters and the analysis of functional relationships that would be difficult or impossible to determine without a model, e.g. total emission of pollutants, greenhouse gas emissions and noise, access to different transport systems and the accessibility of the territory through the transport services provided.

2.4.3.2 Reference Scenarios – 2027 and 2037

The Reference Scenarios (or Do-Minimum Scenarios - DMS) are those scenarios that will exist in the future without any new investment, and they therefore form the starting point for the development of interventions to be considered in the Transport Plan.

For the Reference Scenario of 2027 and 2037, it was considered that the following project categories will be fully implemented under existing commitments, regardless of the results of the Transport Plan (based on official information covering the period up to 31 December 2017[3]):

- Co-financed infrastructure projects (through ESIF or INTERREG) that are included in current Operational Programmes (already with an MIS code), so they have secured financing and they may be already contracted or not, and/or are included in a Public Investment Programme's (PIP) Collective Decision;
- Nationally funded infrastructure projects that are included in the latest PIP Collective Decisions (i.e. financing sources are committed to these projects).

For the creation of the future Reference Scenarios, the base year model was uplifted based on expected population and employment growth, as well as growth in economic activity and changes to the transport network[4].

2.4.4 Applications of the Transport Model

The model that has been developed forms a decision-making tool not only for the preparation of the Transport Plan, but also for ongoing functions of the Ministry of Transport in the future. Whilst the model has been used to test a set of network strategies for the current Transport Plan, it can be utilised for further testing of other alternate strategies beyond this project. Moreover, the model can be used as a platform for testing a variety of socio-economic scenarios in the future, such as high or low growth rates of the economy and/or population migration rates.

The National Transport Model is suitable for strategic studies, as it has been calibrated and validated at a higher level, and not at a particular local/regional level. Although there are 373 traffic zones in the model, this strategic zoning system can provide accurate and reliable results for all kinds of transport studies. Where there is a need for more localised studies (e.g. municipal bypasses, local public transport, tertiary roads, specific junctions, urban/suburban network etc.), the model can provide a broader starting point for such studies – providing strategic transport movements that are then enhanced through a more locally-focused data collection and model development exercise.

The ongoing application of the transport model is one of the key roles set for the newly established Strategic Planning Unit within the Ministry, i.e. to utilise on an everyday basis, as well as to maintain and update[5] the National Transport Model, so as to be able to attain up-to-date passenger and freight

[3] The exact sources of information on transport projects considered for the Reference Scenarios are detailed in the Technical Note No. 8 (May 2018).
[4] Further information on the development of the transport model, as well as the methodology used on the growth forecasting is available in the Transport Modelling Report.
[5] A recommended model maintenance schedule is provided in the respective Deliverable of Task 3.

transport demand forecasts and test the impact of proposed transport infrastructure projects and/or soft measures. The below maps show examples of model outputs, showing the level of traffic volumes on each section of the network.

Figure 2-6: Interzonal traffic volumes in Attica area

Figure 2-7: Volume capacity ratio on Greek mainland road network for Reference Scenario 2027

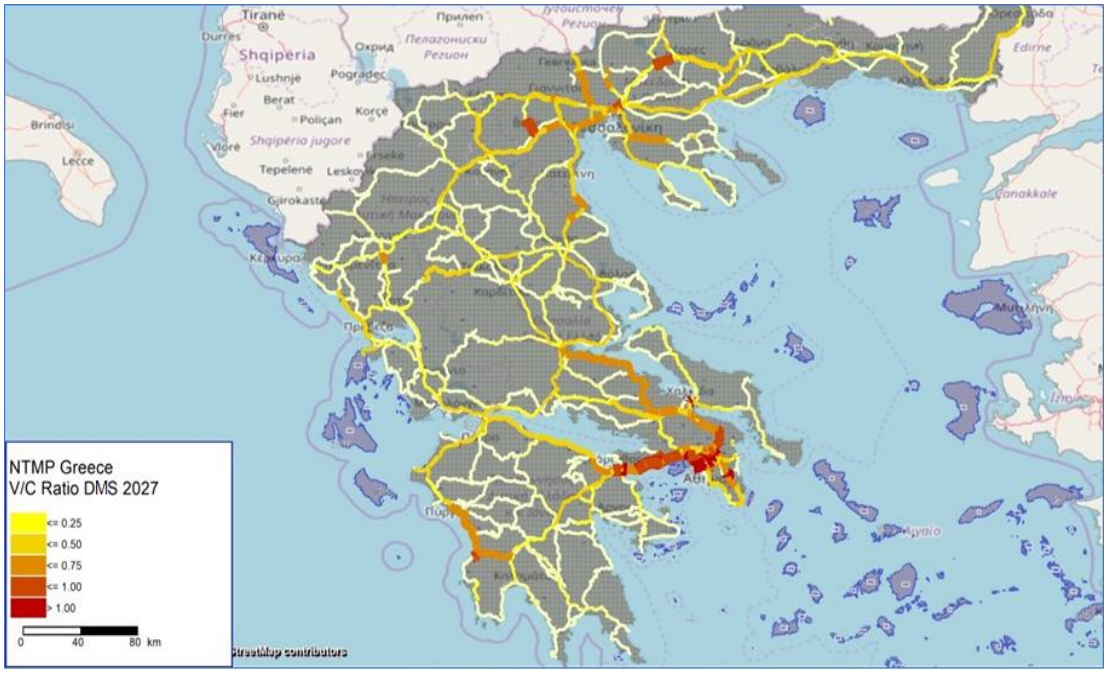


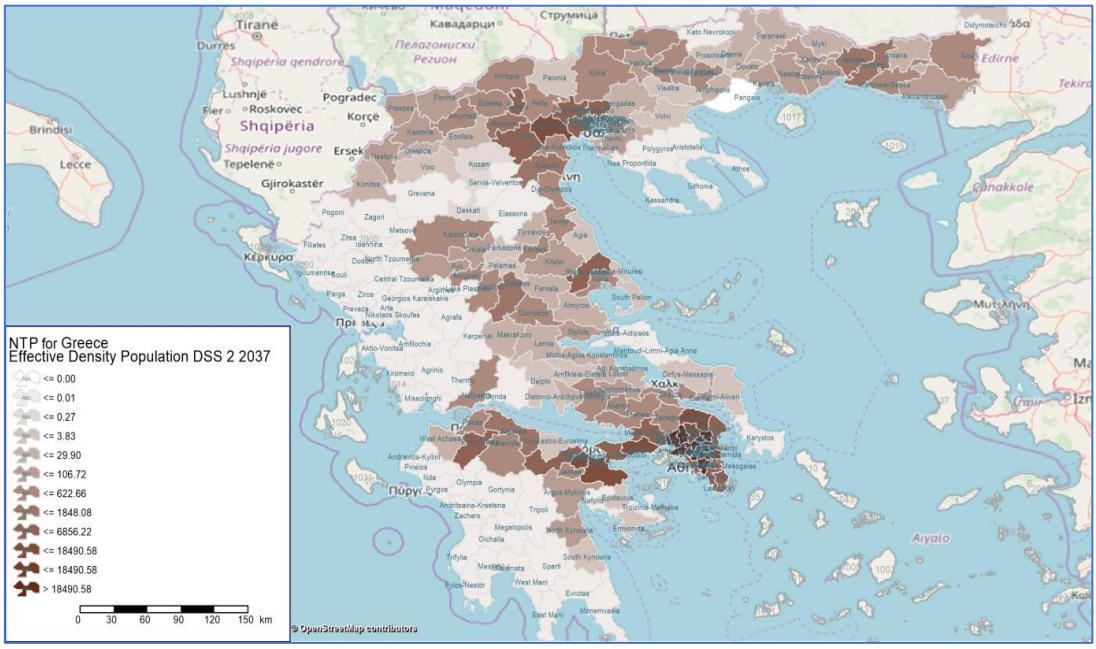
Figure 2-8: Freight movements by road & rail in mainland Greece for Reference Scenario 2037

2.4.4.1 Transport Accessibility Mapping

Further analysis has been undertaken through the use of Accessibility Mapping, with the effective density index for each transport zone being calculated as a function of its connectivity with other zones, measured through not only travel time but also the economic weight of that zone. In this way, each zone can be allocated a quantitative measurement of its effective density, with higher values suggesting that it is well-connected to areas of higher economic activity.

The calculation of effective density has been undertaken also using information from the transport model, with a subsequent analysis used to calculate its values (example in Figure 2-9). This calculation is used to understand the relative marginalisation of specific areas, which can then support the understanding of how these can be better integrated into the socioeconomic fabric of Greece.

Figure 2-9: Indicative rail accessibility map of mainland Greece



2.5 Problem Analysis

It has already been noted that it was a requirement of the Transport Plan to be based on solid data collection and analysis, and with interventions therefore defined based on observed problems in the whole transport sector. Nevertheless, the understanding of weaknesses is not always visible through the reviewing of raw transport data, and a broader programme of research involving both qualitative and quantitative information is needed to understand this.

In order to inform the Transport Plan, an analysis has been undertaken that examines infrastructure, organization/ legal framework and operation of the transport system in full, making also use of the Transport Model outputs to better understand existing and future transport supply and demand patterns that would not be observable only through the direct observation of the network. The analysis has also used the information collected from other surveys and previous reports in order to elaborate, together with the extra data collected during the development of these consultancy works, a comprehensive study of the transport sector.

2.5.1 Defining High Level Objectives

High Level Objectives (HLO) are those major goals which connect the sectorial plan of a country, in this case for transport, with the dimension of its national development strategy. They guide the sectorial policy by integrating in its development the main societal or government outcomes and by trying to find a balance between them. In line with the ToR, the following five HLO were defined for the transport sector in Greece:

- Delivering **Economic Growth and Efficiency** in the development and operation of the transport system, at Regional and National level, measured through travel times, reliability, and cost effectiveness;
- Improving **Transport Connectivity**, comprising connectivity with the islands, connectivity between complementary transport modes, interoperability of systems, territorial cohesion and cross-border connectivity with EU/non-EU countries;
- Ensuring an **Environmentally Sustainable** transport sector;
- Providing **Accessibility and Social Inclusion** with respect to jobs, education and social services for the population; and
- Maintaining a **Safe and Secure** transport system.

The High Level Objectives for the National Transport Plan for Greece, as they are listed above, are so general that their level of achievement cannot be assessed through a unique indicator, but sets of indicators are required for that assessment. Each Objective was broken down into more concrete sub-objectives for which sets of quantitative indicators of their achievement can be more easily identified. For each indicator, a value has been set for the base year along with target values for two time horizons, namely medium term (2027) and long-term (2037), the latest being the time horizon of the National Transport Plan. Values for the targets are proposed considering international experience and best practices. It has to be emphasized that whilst the value assigned to some of the proposed indicators will be calculated based on the results of the Transport Model, others cannot be provided.

For each HLO, the corresponding sub-objectives and the sets of indicators proposed to be adopted for assessing the level of achievement of these HLO are shown in Annex I.

2.5.2 Key Findings of the Problem Analysis

The Problem Analysis begins with the High Level Objectives and then seeks to understand the obstacles that currently prevent those objectives from being fulfilled. It is achieved through the following methods:

- Outputs from the transport model;
- Analysis of raw datasets;
- Feedback during consultation; and
- Direct observations (site visits, etc.).

This section of concluding remarks aims at making a balance of how the current transport system contributes to the achievement of the High Level Objectives or, conversely, fails to do so. The major problems are listed below.

Promote Economic Growth and Efficiency

The current Greek transport system fails to adequately promote economic growth and efficiency. As it has been explained through the relevant Problem Analysis Report (deliverable of Task 4), the inefficiencies particularly for transport operations are numerous with many causes, but they can be summarised to:

- Low level of concentration of companies,
- Low variety and poor level of services, some of them being not adapted to the market and falling behind European standards,
- Old and costly operational assets (buses, rail rolling stock, rail stations, bus stops, airports and ferry terminals),
- Difficult access to funding,
- Limited intermodal coordination,
- High level of tariffs,
- Non-regular updates or lack of passenger information,
- Inappropriate timetables partially due to the limited offer and related demand,
- Delays in implementing infrastructure development, especially in the rail sector affecting its competitiveness and image,
- Deficiencies in transport planning.

All this has a negative impact on the economy that is exacerbated by incoherent legal and institutional set ups and a few infrastructure bottlenecks, especially on networks interconnectivity. The development of logistics services and operators should be a priority to increase the value and the efficiency of freight transport. For passengers, there is potential for cost savings in most transport modes which should result in lower tariffs and hence in more efficient access to employment.

Increase Regional and International Transport Connectivity

Regional transport connectivity by road, air and maritime transport is quite satisfactory even if it should be more efficient; for rail, there is more traffic potential along the main corridor Patra-Athens-Thessaloniki. However intra-regional and interregional connections between modes especially to rail services is to be looked at.

International transport connectivity is more deficient; the road accesses are sub-standard, as so are the respective rail links. Rail connections to Albania and Turkey do not exist. On ports, Piraeus has become more attractive with the arrival of COSCO, but customs procedures are still burdensome, and the lack of Single Windows reduces Greece's trade potential.

Ensure Environmental Sustainability

The Greek transport system could do better on this High Level Objective. First, the share of cleaner modes such as (preferably electrified) railways is very low. Second, road freight transport is not only massive but also very inefficient, undertaken by very old and polluting trucks with low load capacity.

Third, the fleet moving passengers (buses and cars) is also very old with almost no presence of hybrid or electric vehicles. Recent actions of the Government may start changing this but the development of electric charging infrastructure networks together with ambitious strategies on fleet renewal need to be undertaken shortly. Such fleet renewal shall foster the purchase and use of cleaner energy and electric vehicles.

Increase Personal Accessibility and Social Inclusion

The transport system in Greece makes efforts at least to ensure, if not increase, personal accessibility and social inclusion at a minimum acceptable level. This is attained by providing several mobility benefits and with the signing of numerous Public Service Obligation contracts. However, it is a costly solution and it is necessary to revaluate the current organisation of the transport networks and services in order to maintain or improve the accessibility while reducing the expenses (and the tariffs paid by the end user). Schemes for Public Service Obligations need to be improved to make the best possible use of the limited funds available. Also, regions without rail connections are served by bus services which do not provide for significant tariff reduction for low income people.

Separately, at least for rail transport, the current infrastructure very often fails to provide appropriate access for People with Reduced Mobility. Last, but not least, intermodality between intercity public transport (trains, buses and ferries) and urban transport is yet to be significantly improved in terms of facilities, services and tariffs affecting therefore personal accessibility.

Ensure Safety and Security

The current transport system has made great improvements in transport safety. It is worth mentioning the massive improvement in road safety over the last 20 years. Other modes have also made improvements so the trend can be considered positive. Nevertheless, this is not enough, especially for road transport. Despite the improvements of the last years, Greek roads are still among the most dangerous roads in Europe. This is partly due to the fact that Greece is still behind in infrastructure maintenance and removal of safety black spots. In addition, certain cultural habits are taking time to evolve so more active enforcement accompanied by a strong political will is necessary if Greece wants to reach its targets on safety. For rail, the development of ERTMS would be a great step to put the country at the same level as the rest of Europe, while safety level is currently acceptable. Further removal of level crossings is also required.

Through the above activities, the main emerging themes are set out as below[6].

Confusing institutional frameworks in most of the sectors

Road infrastructure and maintenance, railways, ports and maritime transport institutional frameworks are too fragmented and suffer similar problems:

- Too many public stakeholders involved,
- Unclear allocation of responsibilities between public authorities leading to overlaps and to lack of accountability,
- After some reforms delegating duties or creating new authorities, the public staff has not been resized resulting in higher costs.

Moreover, current and future reforms for other sectors, as the restructuration of the Civil Aviation Authority or the creation of the Regulatory Authority for Passenger Services, may end up having similar consequences unless they are carried out bearing in mind the aforementioned problems.

[6] Further information can be found in the Problem Analysis Report.

Fragmented legislation calling for rationalisation and reforms that must be thoughtfully designed

Transport legislation is too fragmented. It is not only an excess of regulation (the case for logistics); it is a problem of appropriate law drafting. Adopting laws that do not replace fully or clearly the precedent laws burdens unnecessarily the activities of both public officials and private operators. In particular, it hinders enforcement application. Cases of laws being too general and requiring several regulations to add or clarify concepts have also been found. In some situations, this was justified by changes in EU legislation governing the scope of the law; in others, it was the result of a law drafted too rashly. Regardless of the reason, this adds even more complexity to the legal framework, and some sectors would benefit of a legal recast.

Another type of issue, this affecting especially the maritime sector, is the way of adoption of EU regulations. Any legal change on a strategic industry, as it is shipping, shall be evaluated in detail, especially all the potential negative effects that could result from its implementation.

General lack of data

A surprisingly negative finding is the lack of data for the transport sector centralised in the Ministries. This greatly affects road passenger transport, motorway operations, ports and maritime transport but deficiencies have been found in most of the sectors. Without appropriate systems to collect data, analyse and consolidate it, it is impossible to implement and monitor successfully any transport strategy. Solving this shortcoming in the short-term should be an urgency for the Authorities.

Relatively low infrastructure needs but connections with the borders need an upgrade

Transport networks, with maybe the exception of railways, are quite developed with a satisfying geographical coverage. Few capacity bottlenecks exist in most of the modes except for the airports sector, for which many airports require an upgrade of the runway or of the passenger terminal. Infrastructure development efforts should be focused on completing the rail core network, improving rail and road accesses to borders and especially enhancing intermodality.

Insufficient and financially unsustainable maintenance

Even if there are no comprehensive inventory and condition data regarding the national and provincial road network, it is clear that road maintenance is underfunded, as in many other countries, which may result in faster deterioration of the road assets and higher road safety risks. For railways, maintenance is greatly covered by State grants as rail charges do not suffice to ensure it, which makes rail maintenance financially unsustainable; it is expected that the rail infrastructure manager should be capable of covering rail maintenance with its own revenue. There are as well procedural delays in ports rehabilitation, especially in cases of emergency. It seems evident that over time infrastructure maintenance has not been receiving enough resources in general, and probably, not enough attention from the Public Authorities. The institutional set up, financial flows and management systems related to maintenance need an overhaul to ensure asset preservation.

Infrastructure networks and services needing rationalisation

Linked to the above, some airports and rail lines do not support enough traffic to generate profit and benefit from a compensation under PSO contracts. However, keeping those infrastructures and services is so costly that raises the issue of their sustainability or their replacing by other services with lower operation and maintenance costs (bus, ferry services).

Inefficient operations in land freight transport suffering the lack of development of logistics

Road and rail freight transport suffers from many inefficiencies. Rail transport bears relatively high costs and poor interconnectivity with other modes in a country with a geographically unsuitable terrain for cost effective rail transport. Road freight transport still drags the consequences of a sector highly protected in the past: individual operators, very old fleets, lack of cooperation, competition based on cost, huge market share of own account fleets, many empty kilometres, poor access to funding, etc. Logistics development should spur the integration of both modes and propose additional services resulting in a higher added value activity. However, this development is hindered by several bottlenecks: inconsistent legal framework, lack of infrastructure for service concentration (Logistic Centres), lack of investment in IT systems or their own fragmentation.

High costs and relatively poor service quality for land passenger transport

Greece bears high costs for land passenger transport. In the case of interurban buses, the costs are from 2 to 5 times higher than in other EU countries and that cost is transferred to the final user. The current monopoly of KTEL presents inefficiencies and the redesign of the bus network and tendering system should pay attention to these in order to achieve a reduction of costs for the final user while maintaining or improving the accessibility of public transport.

For railway, the costs are only partially transferred to the final user as most of them are covered by public subsidies. The cost to the State being too high and the traffic too low, many actions must be taken to increase the attractiveness of rail transport, its quality of service, its income and to optimise operation costs.

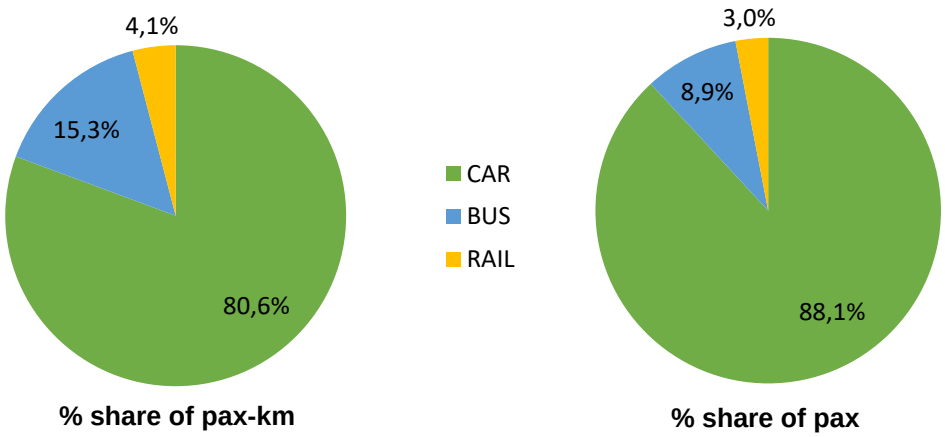
Continuing Poor Record in Road Safety

Though road safety level has improved significantly in the last years, Greece remains amongst the European countries with the highest number of road accidents. Reasons are multiple: poor law enforcement, drivers' habits, vehicle fleet, condition and characteristics of the roads.

Imbalance in Mode Share using Public Transport

Whilst the level of service and prices of bus transport are not satisfactory, the rail utilisation in intercity transport is still very low. There is therefore a clear imbalance between modal split for private vehicles, buses and rail, as also shown in the below graphs:

Figure 2-10: Current Passenger modal share



Moreover, intercity public transport services are not being operated using modern and sustainable technologies, with most of bus and rail rolling stock having past their active life.

Need to further improve urban transport and its connections with interurban public transport

Current urban transport systems are to further continue their improvements in terms of planning, operation, facilities and services provided. Major improvements were carried out in the last 25 years with successful development of metro, LRT and rail services in Athens and (partly) Thessaloniki. However, no comprehensive urban mobility plans have been developed so far, including in Thessaloniki and Athens metropolitan regions, still leading to high use of private car. Urban and regional bus services are still to be improved through an upgrade of the fleet, using greener technologies and improvement of the network. Despite a relatively favourable environment (climate and topography), necessary measures to promote the development of soft modes are to be fostered. Also, there are relatively poor connections between urban transport and long-distance PT, especially to rail stations and to a lesser extent airport, port and bus terminals. Parking facilities at these locations are also limited affecting appropriate accessibility.

Following the completion of the Problem Analysis, a series of Operational Objectives have been defined which specify in additional detail the areas of action that are required to address the Problem Analysis outputs (see Annex II).

2.6 Strategy Building

2.6.1 Defining the 'Investment Pillars'

In parallel with the fulfilment of the five High Level Objectives of this Plan, eight Investment Pillars were defined after extensive consultation with the Beneficiary, aiming to guide the identification of measures, the preparation of the scenarios and eventually of the plan but also focusing on solving the identified problems. The pillars represent the country's vision to transport development, having been agreed on the basis of the Problem Analysis, and they define those specific areas where most attention should be focused on in order to deliver an economically efficient, safe, environmentally sustainable, accessible and connected transport sector.

An additional ninth pillar was necessary to include measures linked also with the subsequent 20-year strategy (either via an intermediate update of the current plan, or the preparation of the next one), forming thus the interface between the current plan and its updates and ensuring the continuity of actions. Therefore, these nine strategic pillars are the identified priority areas for transport investment and development for Greece, aiming at further improving and integrating the national transport system. They are defined as follows:

1. **Enhancing Safety, Sustainability, Efficiency and Competitiveness of Transport**
   This pillar is a fundamental element of the transport strategy as the proposed measures aim at enhancing the efficiency, sustainability and safety of the transport sector mainly through improvements in regulation, funding and data management.

2. **Making PATHE an Efficient Multimodal Corridor**
   The PATHE corridor is the key multimodal corridor for domestic and international transport, connecting the ports of Piraeus, Patras and Thessaloniki with central and south eastern European markets. The high-speed rail corridor is finalised up to Attica, while it is expected soon to reach up to Patras. It carries low volumes of freight and passengers, but the level of service is expected to improve. PATHE motorway is also the main passenger transport corridor between Athens and Thessaloniki, serving close to 75% of Greek population, main Greek ports and is

potentially a competitive gateway to south east Europe: all conditions are now present to make it work efficiently. Additional institutional and organisational measures that foster multimodality in all transport operations, such as rational planning of land passenger transport and associated logistics/ freight transport measures, can considerably support the efficiency and sustainability of this major transport corridor.

3. **Building Stronger International Land Connectivity**
   Greece trades around 4500 million tonnes of freight with EU neighbours on an annual basis, and a further 1800 million tonnes with the Western Balkans[7]. Despite this, routes by road and rail remain weak, with areas of poor infrastructure and with long and unreliable border crossing times. It is necessary to improve this connectivity so as to improve the range of trade routes to, from and through Greece, and to create synergies with neighbouring freight nodes on the European network.

4. **Supporting the Tourism Sector**
   Tourism is one of the main economic sectors of Greece creating a wide number of direct and indirect jobs. It has been growing during the last years, also due to a lower attractiveness of other destinations around the Mediterranean. Though tourism has concentrated mainly in summer season and in the islands, close to saturation, observed trends are showing an increase of the duration of the touristic period, development of other types of destinations together with the development of tourism in mainland Greece. Also, the improvement of the economic situation is favouring an increase of domestic tourism. However, infrastructures, level of service and competitiveness of the transport sector (all modes) are to be improved. It is noted that most of the proposed soft and hard measures that improve regional connectivity and accessibility (land, sea and air) will also have positive impact on the tourism sector.

5. **Enhancing Connectivity to the Greek Islands**
   Greece has more than 150 inhabited islands and providing reasonably good access to them, both for inhabitants as well as for tourists, is a key issue for Greece. State subsidies are being provided so as to provide an acceptable connectivity level, while in summer season, the system, as operated, is facing capacity issues and poor level of service and facilities. The objective here is to rationalise the connection to islands and propose solutions to improve services without increasing State support. This pillar is strongly connected to the previous one, especially with regard to the touristic and economic development of the Greek islands.

6. **Improving the Efficiency of Logistics Sector**
   Despite being a gate to Europe and especially to the Balkans and with a wide number of ports, two of them being of major size, the Greek logistics sector is poorly developed, having relatively few and small logistics centres over the country. Some of the reasons are related to the legal framework. Also limited investments and few business developments in the sector have led to such situation. The proposed measures are closely linked and compliant to the recently completed National Logistics Action Plan.

7. **Developing an efficient Urban and Suburban Public Transport System to support National Transport System**
   Although urban areas cover only 15% of the geography, they account for more than 75% of the total population of Greece. However, accessibility via public transport to several bus terminals,

[7] ELSTAT 2016 data on international trade

ports and rail stations is poor, especially for Persons with Reduced Mobility (PRM). Measures that will facilitate such access will not only increase the use of public transport on short journeys but also for longer distance. In addition, the urban bus fleets are old and continue to use environmentally damaging diesel technology.

8. **Fostering Regional Mobility and Growth**
   Having most of the population living around PATHE corridor, together with a difficult terrain, the rest of the Greek regions are facing low economic development and poor mobility levels. This pillar aims at developing a programme of actions to improve transport infrastructures, and thus enhance the levels of mobility, accessibility and economic growth in more remote mainland regions, especially Peloponnese, north-western, western and north-eastern Greece.

9. **Exploring Further Opportunities**
   This pillar entails additional infrastructure developments that could lead to other unidentified growth opportunities, mostly within the rail sector. They are included in the Plan as future concepts that should be subject to preliminary exploration.

2.6.2 Measures Identification

The identification of measures has required a number of sequential activities that have looked to link the results of the Problem Analysis into a series of interventions, defined within the above nine pillars, which will improve the performance of the transport sector over the horizon of the Transport Plan. It is clear that any identification of potential actions needs to be defined within a number of constraints, namely:

- They need to be relevant to the problems identified;
- They need to have a positive impact on economic, environmental, accessibility, connectivity or safety objectives, as defined by the High Level Objectives;
- They need to be affordable; and
- They need to be delivered within a comprehensive scenario where each intervention will complement the overall package (i.e. there should be no competing or conflicting interventions).

The procedure for the development of the scenarios is outlined in Figure 2-11 and described below.

Figure 2-11: Scenario development process

- **Set Long List of Possible Measures**
  Measures are defined based on the processing information gained from outputs of the Problem Analysis activity, feedback from stakeholder interviews, outputs of the multimodal National Transport Model (indicating infrastructure bottlenecks), analysis of existing plans and programmes (such as the National Development Strategy, the Strategic Transport Investment Framework and the Logistics Action Plan), all supported by the expertise of the technical consultants involved in the development of the Transport Plan. At this stage, all potential measures are defined, on the condition that they are relevant to the Problem

Analysis findings. Such measures may comprise proposals for infrastructure (new road, rail, maritime, air transport or logistics infrastructure), for institutions (organisation of transport activities and changes to methods of delivering infrastructure) or for transport operations (provision or regulation of services), but in all cases they are defined to fit within the Investment Pillars that have been defined, and which are intended to target specific aspects of the transport sector.

Within this exercise, those measures that are not related to infrastructure (i.e. institutional or organisational measures) are defined as 'Soft Measures'.

- **Perform Measure Screening**

  As already mentioned, five High Level Objectives are proposed for this National Transport Plan. It is necessary to ensure that within the long list of measures each of the more significant measures can successfully address these objectives, thereby providing a sufficient justification for continuing with the proposal. The table shown in Annex III indicates the proposed measures to reach each operational objective, organised by each pillar. The screening of measures has been carried out in several steps.

  - For Soft Measures, there was a consultation process with the MIT, EIB, JASPERS and sector stakeholders to collect feedback on the initial proposal. Based on that, these concepts have been refined, considering that the underlying goal behind the soft measures is to prepare an exhaustive list of proposals that, ideally, should be implemented in all scenarios. This leads to the definition of the so-called "Must-Do Measures".
  - For Infrastructure Measures, a more quantitative approach has been undertaken. The more significant infrastructure measures have been taken through a Preliminary Impact Assessment, which looked to understand the impact of each proposal on economic, environmental, accessibility, connectivity and safety objectives, with outputs measured through the use of the analysis tools (transport model) described earlier. A total of 14 significant measures have been taken through this procedure, which has allowed their contribution to the High Level Objectives to be better understood. The results of the Impact Assessment are presented in the Measure Selection Report, which provides information for each measure on the location, proposed phasing period, expected outcome, the lead and other involved stakeholders, the budget whenever quantifiable, etc. Where relevant, recommendations are included about the compulsory and/or complementary actions to be taken for the successful implementation of the Measure.

- **Understand the Financial Envelope**

  The procedure for scenario building is informed by an understanding of the future available funding, which is defined as the budget until the horizon year as well as the funding sources. It is clear that the percentage of foreign funding (EU, EIB, private or other) has significant importance on the available budget for infrastructure developments. However, the level of financing needs would require higher budget allocation to transport so as to deliver the Plan and maintain a sustainable and safe transport system. An estimation of the expected financial envelope can therefore lead to understanding the needs for potentially new budget streams for delivering the Plan.

  The financial envelope considers ongoing government expenditure in transport infrastructure, operation and maintenance, EU grants, loans, private investment and other forms of expenses across all transport sectors. The available financial resources are thus specified, forming the boundary for the investment plan in each scenario and in the final

strategy, so that it is realistic and feasible. For the construction of the scenarios, the assumption adopted is that the levels of Greek expenditure and EU funding remain in the same proportion as during the period 2014-2020. Hence, a total estimated budget of about 19 billion € is expected to be available for investments foreseen by the National Transport Strategy until 2037.

It is noted that part of the financial envelope calculated is already engaged to fund the ongoing projects included in the Reference Scenario. More specifically, the measures included in the Reference Scenario, with secured financing, have an estimated cost of about €7bn. As a result, an estimated amount of €12bn will form the financial cap for the *additional* (soft and infrastructure) measures of the selected investment strategy.

- **Define the Themes**

  The compiling of the measures into scenarios requires some underlying logic that describes the overall theme for each scenario, which will then guide the types of measures that are included within that scenario. Whilst the definition of themes can be quite subjective, it was noted that there were two dominant issues arising out of the Problem Analysis and supporting policy background – namely the need to improve international connectivity to/from the main markets, and also the need to encourage a strong mode shift from roads to other more environmentally sustainable modes. These objectives are not fully complementary, given that international connectivity can be achieved through road construction, but noting that this can do little to support the mode shift objective.

  For this reason, the two themes for the building of scenarios were formed around these objectives. It is noted that for each scenario, the Soft Measures, which have been already defined (and screened), were included in both scenarios, mainly due to their level of benefit and the relatively low cost. As such, the difference between the scenarios relates mainly to the supporting infrastructural measures contained in each.

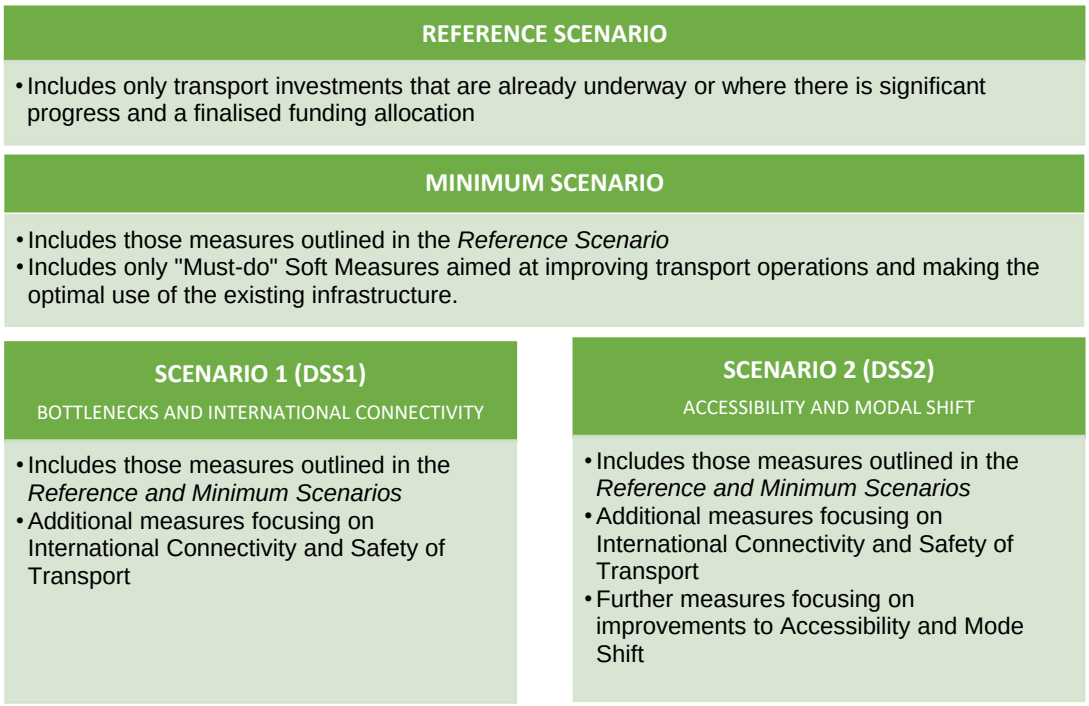
- **Build the Scenarios**

  The two scenarios have been built up following the above themes, also bearing in mind the financial envelope that is available. The building of the scenarios involves the allocation of the various measures into the defined Investment Pillars, thereby leading to a series of final Strategic Investment Pillars populated with specific proposals for action.

  The scenarios are developed taking as foundation the ongoing and programmed interventions of the Reference Scenario. As a first intermediate step in the scenarios development process, a ‘Minimum Scenario’ has been defined including the ‘Must Do’ measures that have emerged from the screening activity, to be included in both scenarios developed regardless of the final set of infrastructural measures, given their low cost and high positive impact of implementation.

  On top of the Reference and Minimum Scenarios, a first alternative scenario has been developed, named “*Bottlenecks and International Connectivity Scenario*”, addressing the identified needs and focusing on three out of the five HLO. The second alternative scenario, named “*Accessibility and Modal Shift Scenario*”, includes interventions fulfilling all defined HLO, adding more measures with positive effects on modal shift from road to rail as well as on accessibility. Detailed description of both scenarios is presented in the Measures Selection Report.

Figure 2-12: Scenario Development Themes



The above scenarios cover the needs identified and the vision set. Additional combinations of measures were examined, but they provided poor added value in this respect, since they brought insignificant changes in the overall national transport system. Therefore, it was agreed that the above two defined scenarios would go through the final evaluation process.

2.6.3 Scenarios Evaluation

The two Do-Something Scenarios have been evaluated through a Multi-Criteria Analysis (MCA) using quantitative and qualitative criteria. Their impact on the whole transport system of the country was assessed assuming full implementation of each scenario. Total figures were extracted by the transport model to quantify the impact of each scenario in terms of travel time and distance. The relevant criteria used for the MCA relate directly to the High Level Objectives, as follows:

- **Objective 1: Promote Economic Growth and Efficiency**

  The analysis is based on a Cost-Benefit Analysis, which uses estimated costs and alignments for the relevant infrastructure proposals. This allows for an indicative result for the rate of return of a specific intervention, pending a more thorough options analysis, preliminary design, demand forecasting and economic appraisal. At this stage, the output is intended to provide only an indication of the likely performance of the measure when it is developed into a final project proposal in the future, and hence the scope for variation remains significant.

  As recommended in the EU CBA Guide, the Economic Net Present Value (ENPV) and the Benefit Cost Ratio were used as indicators for each scenario.

  For the scoring range, a maximum ENPV of €12 billion (at 5% SDR) has been considered for a score of 10. The scores for DSS1 and DSS2 have been calculated proportionally.

- **Objective 2: Increase Regional & International Connectivity**
  The indicator used to measure the increase in regional and international connectivity is the share of investment on international projects (connecting to a border) as part of the total investment volume in each scenario.

  A share of 100% of the total investment cost in each scenario for international/ cross-border projects would correspond to a score of 10.

- **Objective 3: Ensure Environmental Sustainability**
  The impact of the intervention on greenhouse gas emissions has been used as the sole indicator for environmental sustainability, as this provides also an indication of overall fuel consumption in the network.

  The scoring range has been defined so that a 25% reduction in environmental costs scores a 10 in the criterion.

- **Objective 4: Increase Personal Accessibility & Social Inclusion**
  The Effective Density is used to measure accessibility benefits from each scenario. The Accessibility Analysis tool (described in Section 2.4.5) has been used in order to calculate the respective indicator.

  The scores have been calculated considering that 5% of gains would be an excellent result (and unlikely to reach), receiving a score of 10.

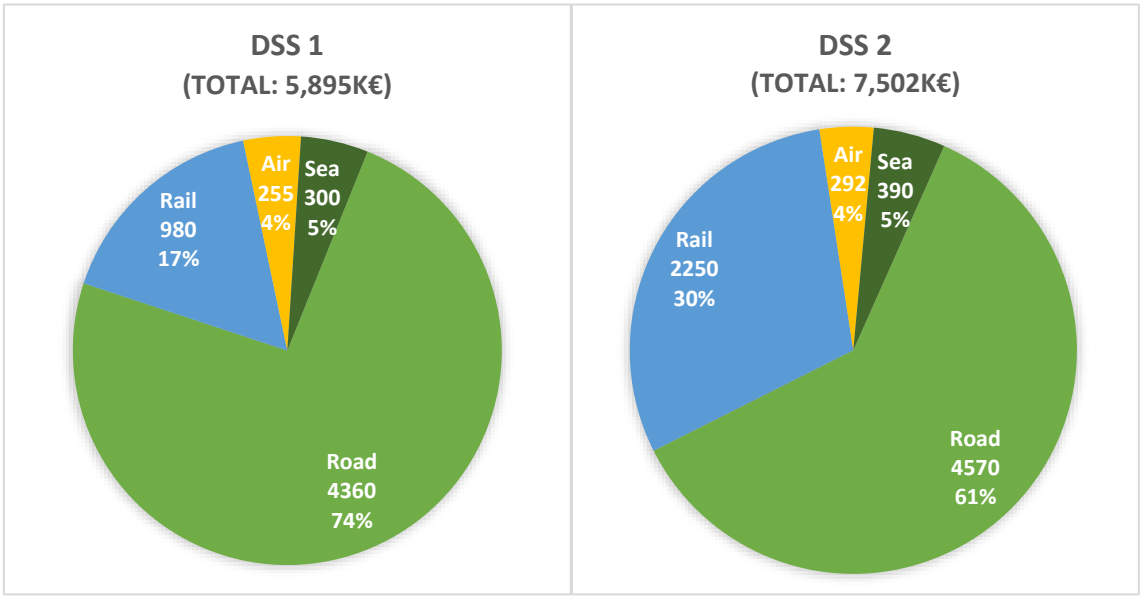
- **Objective 5: Ensure Safety & Security**
  The analysis is undertaken based on network-wide road accident costs for each scenario, with accident costs being a function of vehicle-kilometres travelled and share of road types. The inputs for the road safety calculation are taken from the Transport Model.

  The score is defined by the reduction in road accident costs, with 15% reduction being considered the maximum score possible.

As part of the measure screening process, several of the costliest projects with very limited economic impact were not included in any of the scenarios so as to avoid impacting negatively the economic results for both scenarios. DSS2 adds more measures with positive effects on modal shift from road to rail as well as accessibility; as the cost of these projects seems to be well balanced with their economic, environmental and social benefits, DSS2 ends with a higher total score.

More specifically, the second scenario incorporates measures for upgrading approximately 700 more kilometres of road sections and almost 350 more kms of new or upgraded rail lines compared to the first scenario, which mostly cover regional mobility needs and thus improve the relevant accessibility indicators (effective density, isochrones) for regions with poor accessibility levels in base year, such as Central Greece/Evia, Western Greece and Peloponnese. The estimated expenditure for infrastructure measures per mode of transport for both scenarios is presented in the following graph.

Figure 2-13: Estimated cost of infrastructure measures per transport sector for each alternative scenario (in KEUR)



The extended programme of upgrading road infrastructure across the country also has significant positive impact on the road safety level, in conjunction with the increase of modal share for rail passenger and freight transport (see figures below).

Figure 2-14: Modal split for passenger and freight land transport

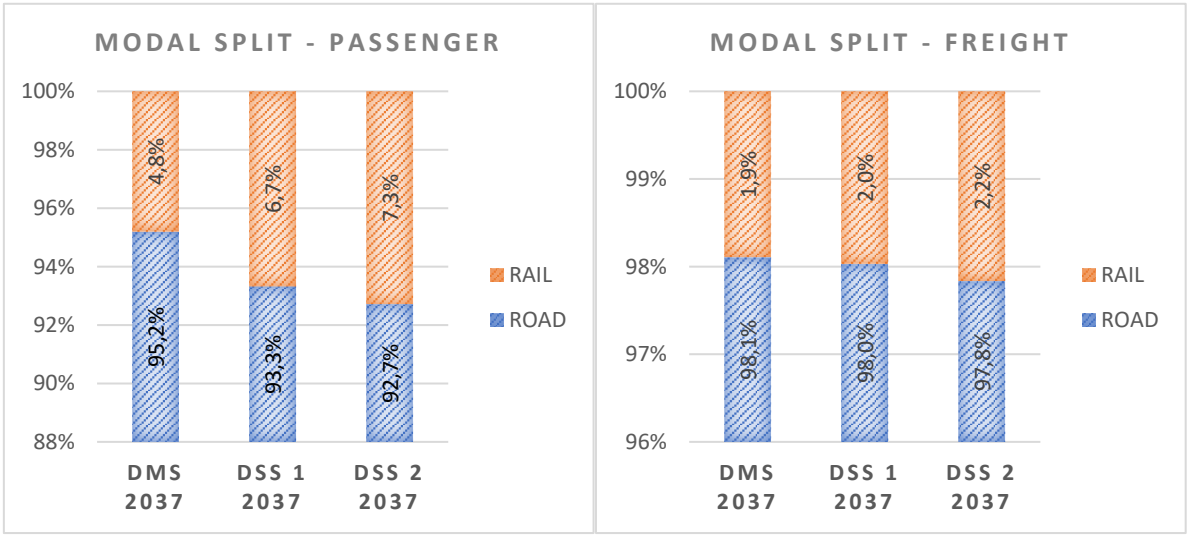


Figure 2-15: Change in land passenger transport (in passenger-kms)

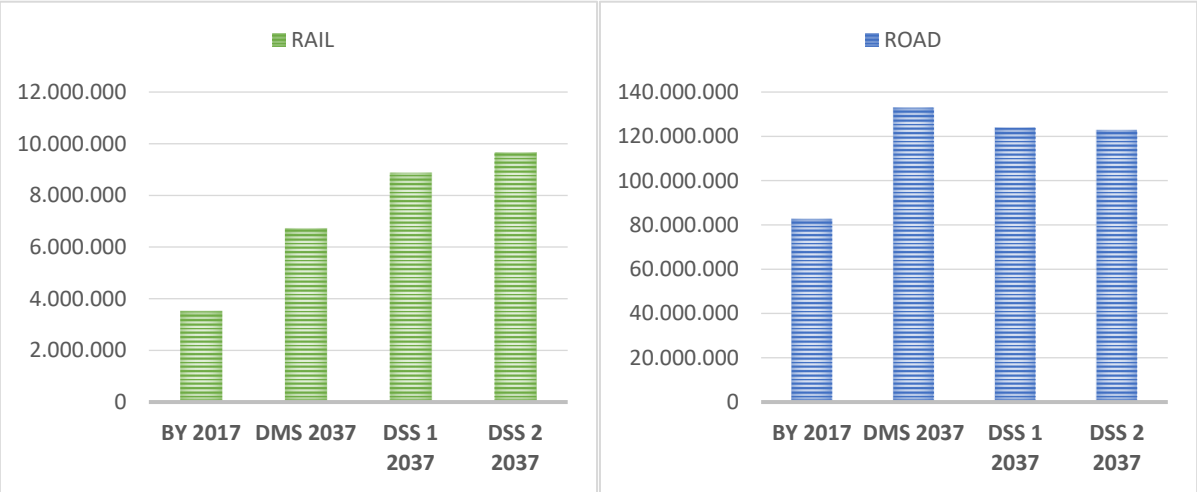
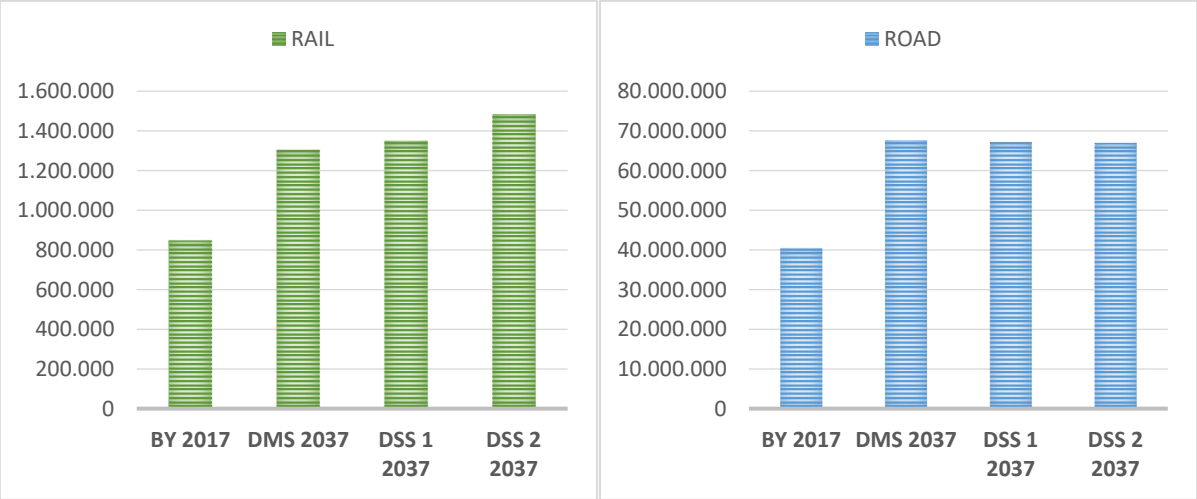


Figure 2-16: Change in land freight transport (in ton-kms)



In line with the above approach, the scoring ranges have been defined for each criterion and the two selected scenarios have been evaluated for each criterion so that their final scores could be compared. The table below summarises the MCA results.

Table 2-1: Results of Multi-Criteria Analysis

Objective	Criterion	Raw Score		Weight	Final Score	
		DSS 1	DSS 2		DSS 1	DSS 2
HLO1	Economic Net Present Value	6.41	8.64	20%	1.28	1.73
HLO2	Investment expenditure on border projects	2.95	2.69	20%	0.59	0.54
HLO3	Environmental benefits	4.29	4.57	20%	0.86	0.91
HLO4	Accessibility benefits (in terms of effective density gains)	4.46	6.89	20%	0.89	1.38
HLO5	Benefits from road accidents reduction	4.79	5.62	20%	0.96	1.12
Total Score					**4.58**	**5.68**

Based on the defined criteria, the second Do-Something Scenario (DSS2) scores higher for most of the indicators.[8] The only indicator where DSS1 performs better is related to the increase in regional and international connectivity (i.e. HLO2): this measures the % share of investments of international projects (connecting to border points) to the total investment profile of each scenario. To this end, the cumulative costs of such projects in both scenarios were compared to the respective total costs. Though DSS1 performs better on HLO2 in relative terms, as the measures associated with it focus mostly on international connectivity (and removal of bottlenecks), in absolute values, DSS2 includes higher investments in cross-border projects than DSS1.

As mentioned before, DSS2 includes more measures with positive effect on modal shift and accessibility, but the cost of these measures is well balanced with their socioeconomic and environmental benefits, yielding a higher total score to the second scenario. DSS2 is thus the preferred scenario that will form the National Transport Plan, and its components are described in detail in the next chapter.

As a final remark: it is noted that throughout the above exercise, the identification of measures and building of scenarios are undertaken at a strategic/conceptual level. At this stage of strategy building, only indicative concepts can be adopted for proposed infrastructure improvements, and the outcome of the Multi-Criteria Analysis is therefore only a high level indicator of future project feasibility. As the implementation of the Plan begins, it is necessary to take selected measures forward for further study of alignments, design standards, location of interchanges/stations, financing proposals (in line with the ESIF programming activities) and connectivity with other transport systems. Only through this exercise can the actual design solution start to emerge, and the technical, environmental and economic feasibility begin to be understood. This procedure is presented in more detail in Chapter 5 that is related to the implementation of the strategy.

[8] The detailed results of the scenario evaluation analyses (CBA and MCA) are presented in the Measures Selection Report.

Chapter 3 - The Transport Plan

The previous chapter has concluded that the scenario titled "*Accessibility/ Modal Shift Scenario*" (DSS2) delivers the best performance against the objectives of the National Transport Plan. The final scenario comprises a number of infrastructure measures across the road, rail, maritime, aviation and logistics sectors, and is supported by a range of Soft Measures that look to address issues related to the organisation and performance of the transport sector.

The final Transport Strategy also incorporates the investments included in the so-called "Reference Scenario", which describes those investments that are already underway or where there is significant progress and a finalised funding allocation.

It is noted that an environmental scoping exercise and Strategic Environmental Assessment (SEA) were elaborated within the framework of the current study. The SEA Report was submitted in February 2019 and after the completion check by the Ministry of Environment, a public consultation, as required by law, followed. Outcomes of this consultation were evaluated and the Decision of Environmental Conditions is attached in Annex VI.

This chapter presents the Transport Plan scenario in further detail, describing the various elements of the Plan and how they complement each other.

3.1 The Reference Scenario

The Reference Scenario describes those investments that are currently under implementation, or where preparation has advanced sufficiently and funding is already allocated (see also Section 2.4.3.2). As such, the Reference Scenario investments are considered to be already advancing and no further support is required by the Transport Plan to underpin their implementation. The timescale for the full implementation of the Reference Scenario projects envisages completion by year 2027. The Reference Scenario investments are as outlined below and shown in a map at the end of this section.

3.1.1 Road Projects

Over 500 km of new roads (highways and bypasses) and significant upgrades and rehabilitations are currently under implementation across Greece, being overseen by the Ministry of Infrastructure and Transport. Investments include elements of the strategic road network, as well as a number of sectional upgrades of regional and local roads. Projects are funded under the Partnership Agreement 2014-2020 between Greece and EU and/or by exclusively national funds, and completion of these investments is anticipated before the year 2027.

- Construction of southern (Xyniada-Lamia) and northern (Grevena-Trikala) sections of A3 (Kentriki Odos) motorway, part of E65, linking A1 and A2 motorways, totalling 94 km;
- Vertical Axes of Egnatia Odos to Greek Borders with neighbouring countries;
- A 75 km new motorway between Patra and Pyrgos including also upgrade of road accesses;
- North Crete Road Axis (A90 motorway): a 200 km four-lane motorway from Chania to Agios Nikolaos through Rethymno and Heraklion, and improvements in vertical axes;
- The 48.5 km 'Amvrakia Odos' motorway linking A5 (Ionia Odos) motorway to Aktio airport, Preveza and Lefkada;
- Road bypasses of main cities (including Thessaloniki Western Internal Ring Road, Katerini Ring road, bypasses of Chalkida, Larissa, Karditsa);

- Other section upgrades/ local improvements, such as: road axis Thessaloniki-Kilkis-Doirani; road section Potidaia-Kassandreia in Chalkidiki; improvement works on Lamia-Karpenissi National Road; upgrade section of Agrinio-Karpenissi National Road; construction of new link from Patra Bypass Road to Patra-Tripoli National Road; new link from Aigio Port to A8 motorway; construction of road Lasteika-Ag. Ioannis bypass-Katakolo; new link from A5 Terovo I/C to Provincial Road Ioannina-Plaka Bridge; construction of Trikala-Arta road (section Pyli Bypass Road-Paleomonastiro) and of road Delta-Palamas; construction of Provincial Road Rizomylos-Koroni (section Tzane Bridge-Kalamaki); improvement of Provincial Road Gytheio-Areopoli-Gerolimenas in sections; completion of road works on Heraklio-Viannos axis.

3.1.2 Rail projects

The ongoing upgrading of the railway network continues with a focus on the Core Corridors of the Trans-European Network (TEN-T). Projects are funded through European Funds (both Regional Development Funds and those allocated through the Connecting Europe Facility).

- Athens – Patras Railway Reconstruction:
  Construction of new double rail line between Kiato and Patra (sections: Diakopto - Rododafni, Rododafni - Psathopirgos, Psathopirgos - Rio, and Rio - New Port of Patra). In addition, new investments include the standardisation and electrification of the railway link Isthmos – Loutraki.
- Athens – Thessaloniki:
  Completion of new double, higher speed, electrified railway line between Tithorea and Domokos.
- Thessaloniki – Idomeni – North Macedonia:
  Upgrade of railway line Thessaloniki – Idomeni and completion of upgrading and electrification works in section Polikastro – Idomeni.
- Thessaloniki – Florina – North Macedonia:
  Rail network reconfiguration on existing Thessaloniki-Platy-Edessa-Florina-Neos Kafkasos line.

3.1.3 Maritime projects

Maritime transport projects continue to be funded through EU Funds, but with a substantial number of investment projects financed through national funds. A number of port improvement projects are under implementation, in addition to several smaller scale projects, the most significant of which are noted below:

- New Port of Patra, Phase A2 (ongoing)
- Port of Pissaetos, Ithaki (ongoing)
- Expansion of Port of Ereikoussa, Kerkyra (practically completed)
- New Port of Igoumenitsa, Phase C1 (secured financing)
- Expansion of Port of Kamares, Sifnos (secured financing)
- New Port of Schinoussa (secured financing)
- Construction of northern pier in Port of Fournoi (secured financing).

Nationally funded projects mainly include restoration of damages caused by earthquakes in several insular ports, studies to address the corrosion phenomena along the coastline and other minor projects. The most significant of these projects is the new Passenger and Freight Port in Sigri, Lesvos. It should also be noted that most Port Authorities implement small-scale projects by own funds. Moreover, ports of international and national importance are obliged to develop Master Plans to plan projects on a long-term basis. Projects included in these Master Plans are not included in the Reference Scenario, since their funding and implementation are generally not secured.

3.1.4 Airport projects

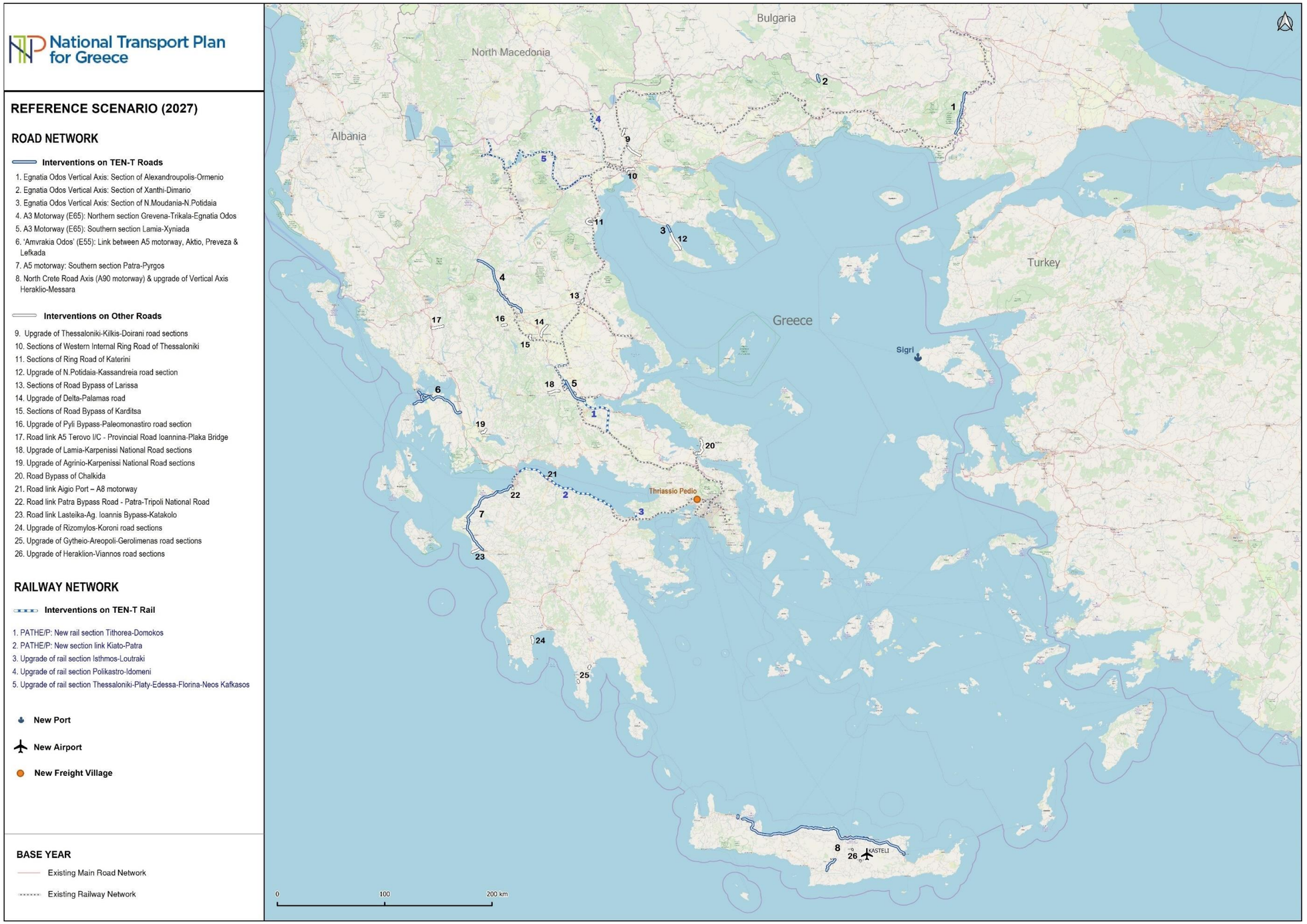
More than 20 aviation projects are currently included in the Reference Scenario. Funding is provided partly through EU Funds (Regional Development Funds and Connecting Europe Facility), mainly relating to air navigation systems, modernisation of navigation, communication and monitoring systems. Other projects, implemented through national funds or private financing are outlined below:

- The new airport in Heraklion/Crete (Kastelli), tendered to be under concession
- The upgrade of 14 regional airports already under the “Fraport concession”, including the airports of Aktio, Zakynthos, Thessaloniki, Kavala, Kerkyra, Kefalonia, Kos, Mykonos, Lesvos, Samos, Santorini, Rodos, and Skiathos
- Chios Airport upgrade
- Paros Airport upgrade and expansion (practically finished and operating)
- Expansion of runway in National Airport of Syros
- Upgrade of National Airport of Thessaloniki "Makedonia" (expansion of runway).

3.1.5 Logistics projects

The Thriassio Pedio Freight Village has been considered in the Reference Scenario for the future years as this major logistics project is already under concession tender. The intermodal hub will serve, inter alia, transit freight volumes from Piraeus port via the Athens-Thessaloniki rail line to the Western Balkans and Central Europe. It is noted that basic rail and building infrastructures have been completed on the adjacent OSE property through national and EU financing.

Figure 3-1: Infrastructure investments (Reference Scenario 2027)



3.2 Investments Proposed under the Transport Plan

Through the analysis and scenario building described earlier, the Ministry of Transport has identified a significant package of new interventions that form part of the final comprehensive Transport Plan for Greece. While the Reference Scenario comprises a package of infrastructure investments, the full suite of interventions will be supported also by a range of actions to improve overall performance of transport sector, addressing institutional and organisational issues that reduce its overall efficiency.

In consistency with the Investment Pillars described in Section 2.6.1, the nine Strategic Investment Pillars are now presented along with the full package of actions that are contained within each of them. Every action has been considered through numerous discussions and has, where appropriate, been the subject of a preliminary impact assessment to understand the contribution of that action to the objectives of the Transport Plan. As a result, it is concluded that each of the proposed interventions is supported by a strong basis for their inclusion in the Plan.

In total, the Transport Plan therefore outlines a schedule of 70 individual interventions: infrastructural, operational and institutional. Detailed Measure Fiches are included in Annex IV. In each case, measures are presented in shorthand, along with a reference.

It is highlighted again that, in the case of **infrastructure measures**, these proposals are **presented** here **as concepts only**, and that the **exact form and performance of such proposals can only be defined through an options analysis and a comprehensive feasibility study**. Such preparation work is critical to any investment project to ensure that the final project is technically, economically and environmentally feasible, addressing the needs of citizens in the most effective way.

During the development of the Transport Plan, several infrastructure proposals were not carried forward as a result of the preliminary impact assessments[9]. These measures were omitted as a result of one or more of the following findings based also on outputs of the model:

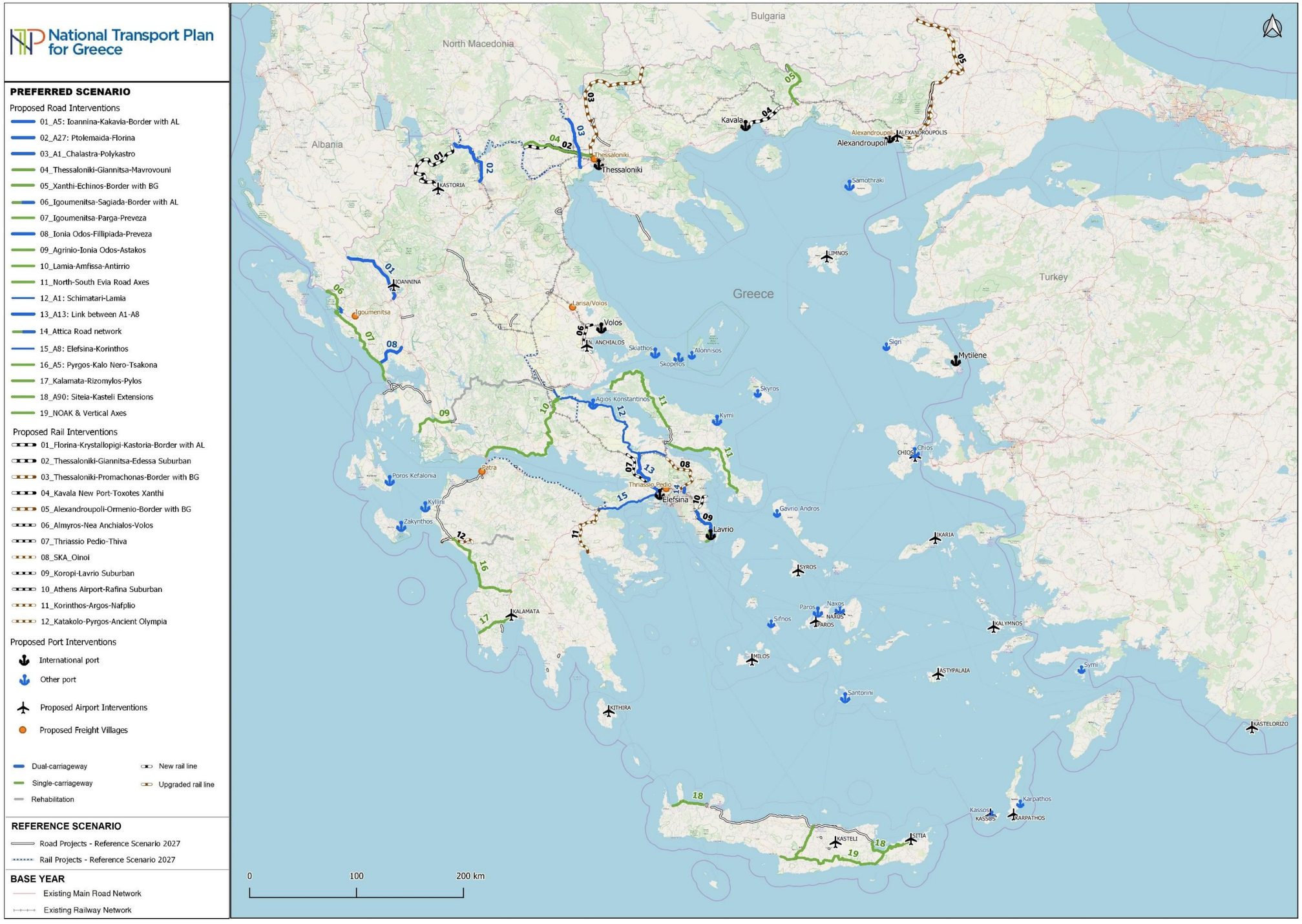
- They do not generate significant benefits to users, in terms of travel time or operating costs for transport;
- They have a very limited potential to attract demand by users, in relation to their costs;
- They are technically difficult or excessively risky to implement; or
- Although they bring some benefits, they have negative environmental, economic or social impacts.

Within those measures that have not been carried forward, it is noted that some do carry a perceived strategic or national significance. For this reason, a number of such proposals is included in Pillar 9. In this case, it is proposed that more investigative studies be elaborated until 2027 to understand how such proposals might be better developed to address a perceived need and/or how they can be combined with other supporting measures to produce a more holistic strategy for a corridor or region. Following such studies, implementation decisions may be taken either to incorporate those projects in the current strategy for the second time horizon (2028-2037), with the official update of the National Transport Plan in the coming years, or to postpone the projects for further consideration in the next 20-year National Transport Strategy.

In relation to infrastructural measures, the following map illustrates the interventions that have been proposed for implementation up to the 2037 horizon for all transport modes. It is noted that the corridors defined are indicative only, pending the outcome of the relevant preparation and option studies for each defined intervention.

[9] More details are provided in the Measure Selection Report.

Figure 3-2: Infrastructure investments for NTPG (2037)



The proposed nine pillars are described hereafter, indicating the associated objective, the total number of proposed measures with a breakdown between infrastructure measures and soft measures, indicating those which are primarily associated with it and those which do contribute, with the following legend:

- IP: Infrastructure measures **primarily** associated with pillar
- IC: Infrastructure measures **contributing** to the pillar
- SP: Soft measures **primarily** associated with pillar
- SC: Soft measures **contributing** to the pillar

The detailed description of each soft and infrastructure measure is provided in the tables of Annex IV. The IP and SP measures of each pillar are presented in the corresponding sections below[10]. The IC and SC measures are listed per each pillar in Annex V.

[10] Key for Measure Codes: RI = Road Infrastructure, RT = Road Transport, RA = Rail, MT = Maritime Transport, P = Ports, AT = Air Transport/Airports, L = Logistics, H = Horizontal

PILLAR 1
Enhancing Safety, Sustainability, Efficiency and Competitiveness of Transport

Objective:	Enhance the efficiency, competitiveness, sustainability and safety of the transport sector through improvements in regulation, funding and data management
Total Measures Proposed:	43 (IP: 1, IC: 23, SP: 9 and SC: 10)

This pillar is a fundamental element of the transport strategy as it brings a focus on the use of “Soft Measures” to improve the overall performance of the sector. The measures target road safety, public transport regulation, data management and specific measures to influence the quality of the national vehicle fleet. A particular proposal is the identified need for consolidation of the railway sector thereby allowing a more streamlined operation of the network and planning for future development. The measures also recognise the central role of the Ministry of Infrastructure and Transport in supporting future development in the transport sector through provision of centralised support services to the implementing bodies.

The following interventions are therefore defined under Pillar 1: Enhancing Safety, Sustainability, Efficiency and Competitiveness of Transport:

- Development of Road Database and Pavement Management System (PMS) at the regional and central levels (RI-Soft 1)
- Development and implementation of a mechanism for securing funds for road maintenance (RI-Soft 2)
- Streamlining and strengthening the organisational structure at the national (MIT) and regional levels (Regions and Regional Units) (RI-Soft 3)
- Establishment of a Comprehensive Data Base at State-level for the Road Transport Industry (RT-Soft 1)
- Revision of the enforcement set up for road transport (RT-Soft 2)
- Rejuvenating the fleet of vehicles (all types) (RT-Soft 5):
  - Restriction on age of imported vehicles (all types)
  - Bonus-malus system of taxes and incentives for new/old vehicles and 'clean'/'polluting' vehicles (all types)
  - Laying down a scale of maximum allowed ages and/or levels of emissions for all road vehicles
- Increase of the visibility for road safety and toughening of penalties for road traffic violations (RT-Soft 7)
- Rehabilitation/ reconstruction of road sections which are so deteriorated that they are not maintainable (RI-Infra-1)
- Consolidating the Rail Sector (review of track access charges, rationalisation of railway network and services, rail node studies for suburban rail systems) (RA-Soft 5)
- Enhancement of Strategic Planning Capacity in MIT and MoMAIP (H-Soft 3).

PILLAR 2
Making PATHE an Efficient Multimodal Corridor

Objective: Further develop the PATHE corridor as the key multimodal corridor for domestic and international transport, connecting the ports of Piraeus, Patras and Thessaloniki with south eastern and Central European markets.

Total Measures Proposed: 17 (IP: 5, IC: 5, SP: 4 and SC: 3)

Being an international transport corridor, the measures defined for the PATHE corridor are mainly infrastructural in nature, looking to develop an efficient and accessible corridor to connect Greece with immediate neighbours, as well as facilitating transit traffic to other Central European markets. Nevertheless, the parallel investment in sometimes competing transport modes (i.e. road and rail) can lead to its own challenges, and hence the proposals include actions to ensure that both modes can work effectively in parallel with each other through targeted regulation of services, through encouraging multimodality in freight, and through supporting information systems.

The following interventions are therefore defined under Pillar 2: Making PATHE an Efficient Multimodal Corridor:

- New high quality road connection between A1 and A8 motorways (RI-Infra 12)
- Developing Attica's metropolitan road network (RI-Infra 16):
  - Extension of Kymis Avenue to A1
- Capacity increase and safety improvements of existing A1 South (Nea Odos), Section: Schimatari (jct A11) – Lamia, through traffic demand management schemes (RI-Infra 18)
- Capacity increase and safety improvements of existing A8 (Olympia Odos), Section: Elefsina-Korinthos (jct A7 Moreas), through traffic demand management schemes (RI-Infra 19)
- Creation of a Land Transport Authority and implementation of the reform of intercity bus transport (RT-Soft 6):
  - M-1 Exploring the institutional issues of merging RAS and RAEM
  - M-2 Revision of Law 4199/2013 on intercity bus transport
  - M-3 Establishment of the Land Transport Authority and capacity building programme
  - M-4 Implementation of the reform of intercity bus transport
  - M-5: Preparation of a time-table and fare web database and an operational intercity bus passenger transport model
  - M-6 Revision of the ownership and operational status of coach terminals after the reform
- Modernisation of Rolling Stock (for passenger rail services) (RA-Soft 2)
- Fostering Multimodality - Programme for upgrade of rail stations at national level (development of multimodal hubs, necessary facilities to PRM and park-and-ride facilities, etc.) (RA-Soft 3 - 2nd part)
- Rail improvements between Athens and Thiva, accommodating long-haul freight flows, interurban and suburban passenger transport (RA-Infra 10)
- Support, development and implementation of ITS solutions in all transport sectors (H-Soft 1) including at international level.

Most of the proposed measures in Pillar 1 and 3 are also significantly contributing to this pillar.

PILLAR 3
Building Stronger International Land Connectivity

Objective: Improve land connectivity so as to improve the range of trade routes to, from and through Greece, and to create synergies with neighbouring freight nodes on the European network.

Total Measures Proposed: 14 (IP: 8, IC: 3, SP: 1 and SC: 2)

Greece shares a significant land border with Albania, North Macedonia and Bulgaria, with two crossings to Turkey at Kastanies and Kipoi. With all borders being non-Schengen borders, and all except the Bulgarian border being external borders of the European Union, this presents significant challenges in relation to cross border trade. Nevertheless, the integration of commercial and social fabric across these borders is also hampered by very weak infrastructure, as well as difficult border crossing procedures. This Pillar therefore comprises mainly infrastructure that seeks to improve interaction across the international borders, making way for future improvements in cooperation and subsequent increases in trade.

The following interventions are therefore defined under Pillar 3: Building Stronger International Land Connectivity:

- New high quality road connection Ioannina - Kakavia - border with Albania (A5 North) (RI-Infra 2)
- Upgrade of road axis Igoumenitsa - Mavromati - border with Albania (RI-Infra 5)
- Upgrade of A27 north to the border with North Macedonia (Section: Ptolemaida-Florina) (RI-Infra 8)
- Upgrade of road axis Xanthi - Echinos - border with Bulgaria (RI-Infra 11)
- Upgrade of A1 North to the border with North Macedonia (Section: Chalastra - Polykastro) (RI-Infra 14)
- Facilitating border crossings with reduced border crossing times by improving the facilities and operations at border-crossing points (RA-Soft 1)
- Improvement of rail line to Bulgaria (Upgrade section Thessaloniki-Promachonas) (RA-Infra 5)
- Upgrade of rail section Alexandroupoli – Ormenio – border with Bulgaria (part of Sea-to-Sea project) (RA-Infra 6)
- New rail line Florina / Kastoria - Krystallopigi - border with Albania and electrification of section Edessa - Florina / Neos Kafkasos - border with North Macedonia (RA-Infra 14 - 2nd & 3rd part).

Moreover, the development of multi-country corridor improvement plans can allow a coordinated improvement of the international road and rail corridors, and a clear prioritisation of corridors within the period of implementation of the relevant Transport Plans.

PILLAR 4
Supporting the Tourism Sector

Objective:	Implement transport sector actions that will broaden and diversify the offer of tourism.
Total Measures Proposed:	23 (IP: 4, IC: 13, SP: 0 and SC: 6)

Tourism is a significant driver of economic activity in Greece. Whilst not directly related to transport, it is noted that all tourism activity does make use of the transport network either as an indirect activity (travel to/from the main destination) or as a direct activity itself (e.g. cruise tourism or touristic railways). Although a large number of soft and infrastructure measures in the Plan improve regional accessibility and development and are thus closely related to the tourism sector, this pillar comprises those measures that primarily focus on the tourism offer.

The following interventions are therefore defined under Pillar 4: Supporting the Tourism Sector:

- Upgrade and potential realignment of Korinthos-Argos-Nafplio single rail line (RA-Infra 2)
- Development of existing rail line Katakolo - Pyrgos - Ancient Olympia as a tourist offering (private project)
- Preparation and progressive implementation of a programme for developing port facilities for cruise ships (P-Infra 4)
- Development of a core network of water airports for the provision of seaplane services from, to and between islands (AT-Infra 2).

In addition to the above, it is proposed that a dedicated Transport-Tourism study should also be developed to ensure that relevant policy actions are efficiently coordinated and specific tourism products related to transport such as developing heritage rail are being proposed. This study shall be elaborated before 2027 and, in case of positive results, implementation decisions may be taken to incorporate the outcomes in the current plan for the second time horizon (2037), with the official update of the plan in the coming years.

PILLAR 5
Enhancing Connectivity to the Greek Islands

Objective: Rationalise the connection to islands and propose solutions to improve services without increasing State support.

Total Measures Proposed: 15 (IP: 5, IC: 6, SP: 4 and SC: 0)

Island connectivity in Greece is provided predominantly by maritime connections, with Piraeus, Lavrio and Rafina being the key mainland ports for passenger traffic. The provision of connectivity supports not only tourism but also general economic development of the islands, ensuring the frictionless flow of people and freight. Such effort requires quality infrastructure both on the islands and at mainland ports, but also a clearly regulated transport system that is affordable and operates to sensible schedules. In some cases, where existing ports are constrained by surrounding development, relocation becomes a necessity in order to mitigate social and environmental impacts of port operations on citizens. Furthermore, consideration is also being given to the further development of additional air transport connectivity.

The following interventions are therefore defined under Pillar 5: Enhancing Connectivity to the Greek Islands:

- Development and operation of comprehensive information systems for the maritime transport and port sectors with the aim of better monitoring port and maritime activities, performances and competitiveness (MT-Soft 1)
- Rationalisation maritime and port network and promotion of fleet renewal/ modernisation (MT-Soft 5)
- Adaptation of schedules of domestic ferry to release congestion during peak periods (P-Soft 2)
- Preparation and progressive implementation of a programme for improving port facilities for domestic ferry passengers (P-Infra 1)
- Preparation and progressive implementation of a programme for upgrading substandard port infrastructure and modernising ship service facilities (P-Infra 2)
- Port relocation – new port developments in island cities where traditional ports are landlocked by urban extension (P-Infra 3)
- Development of Lavrio port as an alternative to Piraeus and Rafina for domestic ferry traffic (P-Infra 8)
- Maintenance and improvement of the Public Service Obligations (PSO) in Greek airport system considering synergies between maritime and air PSO (AT-Soft 1)
- Planned projects of airports operated by HCAA aiming to resolve safety/security and operational problems (AT-Infra 1a).

PILLAR 6
Improving the Efficiency of Logistics Sector

Objective: Improve the operating efficiency of the Logistics Sector through effective regulation, business incentives and consolidation.

Total Measures Proposed: 26 (IP: 7, IC: 4, SP: 9 and SC: 6)

The Transport Plan has identified a desire to use the strategic location of Greece to develop the country further as a logistics hub, but to achieve this in a way that Greece can become an “Added-Value” stop in the logistics chain. Nevertheless, the analysis has identified that the very fragmented nature of the logistics business reduces the overall efficiency of the sector. As such, the measures focusing on the logistics sector include a number of strategic connections to improve overall connectivity, supported by a number of regulatory proposals that will look to improve overall efficiency of operations through consolidation. It is further noted that the Logistics Action Plan, completed in 2017 sets out a detailed framework for addressing the needs of the Logistics Sector, and that strategy has been fully considered in the development of the Transport Plan.

The following interventions are therefore defined under Pillar 6: Improving the Efficiency of Logistics Sector:

- Promoting outsourcing of transport and logistics activities to restructure own-account fleet (RT-Soft 3)
- Promoting cooperation in the Transport & Logistics sectors (RT-Soft 4)
- New rail connection of Kavala port 'Philip II' with main rail network (RA-Infra 8)
- New rail line Volos port & industrial areas – Nea Anchialos airport – Almyros port (private project)
- Planned projects of airports operated by HCAA aiming to improve airport potential (AT-Infra 1b)
- Development of Port Community Systems / Single Window Systems in Greece (MT-Soft 3)
- Promoting initiatives to establish Greece as the South European Logistics Hub (MT-Soft 4)
- Improvement of land access to Thessaloniki port (P-Infra 5)
- Extension of Thessaloniki container terminal (P-Infra 6)
- Development of capacity for dry bulk ports (P-Infra 7)
- Integration and partial revision of the legal framework related to Logistics (L-Soft 1)
- Establishment of a National Logistics Observatory (L-Soft 3)
- Incentives for encouraging mergers and other types of cooperation in the sector (L-Soft 5)
- Revision of the legal framework for the development of Freight Villages / Logistics Centres to endorse private and PPP funding schemes (L-Soft 6)
- Supporting transparency and information flow in the logistics market through digital open platforms and standardization practices (L-Soft 7)
- Completion of a backbone network of Freight Villages (L-Infra 1).

PILLAR 7

Developing an efficient Urban and Suburban Public Transport System to support National Transport System

Objective: Improve the accessibility and quality of urban transport systems to support the integration of strategic transport activity with local transport connections.

Total Measures Proposed: 11 (IP: 4, IC: 3, SP: 2 and SC: 2)

In the consideration of Urban Transport, the areas of most relevance are the Athens and Thessaloniki metropolitan areas. Both are important nodes on the national transport network, and both support overlapping needs of strategic and local transport activity. The measures developed for this pillar focus on the need to provide stronger connections between strategic (e.g. intercity or international) movements and local movements (local passenger transport or last-mile freight transport) in those metropolitan areas. This is achieved through strengthening the connections between the different transport systems, by alternatively ensuring that strategic infrastructure can support movement through these metropolitan areas (e.g. use of railway corridors by suburban transport), and by ensuring that strategic movements are not hampered by excessive use of such strategic infrastructure by local traffic in those most congested parts of the network. The following interventions are therefore defined under Pillar 7: Developing an efficient Urban and Suburban Public Transport System to support National Transport System:

- Developing Attica's metropolitan road network (RI-Infra 16):
  - Markopoulo bypass road
  - Upgrade Markopoulo-Lavrio road
  - Sounio-Lavrio road (incl. Lavrio bypass)
- Fostering Multimodality (development of land transport information platform, introduction of tariff policy with multimodal ticket type, etc.) (RA-Soft 3 - 1st part)
- Suburban rail line Koropi - Markopoulo - Lavrio (RA-Infra 1 – 1st part)
- Suburban rail line Athens Airport - Rafina. (RA-Infra 1 – 2nd part)
- New suburban rail line Thessaloniki - Giannitsa - Edessa (RA-Infra 14 - 1st part)
- Development of a Sustainable Urban Mobility Planning framework (H-Soft 2) for identifying investment pipelines in urban areas including:
  - Development of Railway Node Studies in Athens and Thessaloniki to refine the parallel operation of suburban rail, intercity rail, long distance freight and connecting transport services in those metropolitan areas
  - Renewal of urban bus fleets with low emission, environmentally sustainable technologies
  - Ensuring the role of MIT in coordination between Urban/Regional Planning and National Strategy Making.

PILLAR 8
Fostering Regional Mobility and Growth

Objective:	Develop a programme of actions to improve transport infrastructures and thus enhance the levels of mobility, accessibility and economic growth in more remote regions of mainland Greece, especially Peloponnese, North Western, Western and North Eastern Greece.
Total Measures Proposed:	33 (IP: 10, IC: 14, SP: 0 and SC: 9)

Whilst many of the transport proposals focus on areas of congestion, it is also important to consider those investments that are necessary for reasons of accessibility, safety or environmental impact. Typically, more remote areas tend to suffer exponentially as there may not be a sufficient population to take advantage of such investments. Nevertheless, the need to retain the economic cohesion in more remote regions is accepted.

On the basis of the analysis of needs, the following interventions are therefore defined under Pillar 8: Fostering Regional Mobility and Growth:

- Upgrade of road axis Lamia-Amfissa-Itea-Antirrio (RI-Infra 3)
- Improvement of road accesses of Astakos and Agrinio to A5 Ionia Odos (RI-Infra 4)
- Upgrade of road axis Pyrgos - Kalo Nero – Tsakona (RI-Infra 6)
- New road link Preveza - Ionia Odos (A5) (RI-Infra 9)
- Upgrade of road axis Igoumenitsa-Parga-Preveza (RI-Infra 10)
- Upgrade of VOAK Eastern (Agios Nikolaos-Siteia) and Western (Chania-Kissamos Kastelli) sections (RI-Infra 13)
- Upgrade of North-South Evvia road axes (RI-Infra 15)
- Upgrade of road axis Thessaloniki - Chalkidona - Giannitsa – Mavrovouni (RI-Infra 17)
- Upgrade of South Road Axis of Crete (NOAK) and its Vertical Axes (Heraklio-Agioi Deka and Pachia Ammos-Ierapetra) (RI-Infra 20)
- Upgrade of road axis Kalamata-Rizomylos-Pylos (RI-Infra 21).

In addition to the above, Regional Mobility and Growth will also be supported by a number of Soft Measures that are associated with other Pillars. The key measures of relevance include:

- Creation of a Land Transport Authority and implementation of the reform of intercity bus transport (RT-Soft 6)
- Fostering Multimodality (RA-Soft 3)
- Consolidating the Rail Sector (RA-Soft 5)
- All road infrastructure soft measures (RI-Soft 1 to 4)
- All measures aiming at optimising PSO schemes on bus, rail, maritime and air sectors, etc.

PILLAR 9
Exploring Further Opportunities

During the development of the Transport Plan, a number of infrastructure proposals were subject to a preliminary impact assessment, and on the basis of that assessment it was considered that the proposal did not carry sufficient merit to be taken forward into the Transport Plan at this stage. The proposals were omitted as a result of one or more of the following findings:

- They do not generate significant benefits to users, in terms of travel time or operating costs for transport;
- They have a very limited potential to attract demand by users, in relation to their costs;
- They are technically difficult or excessively risky to implement; or
- Although they bring some benefits, they have negative environmental, economic or social impacts.

It is recognised, however, that in many cases it is the definition of the proposal which has led to it being rejected from the Transport Plan, either because the proposal is presented in a way that it does not directly meet the needs of users, or where the proposal is likely to be incomplete. As such, these proposals are not fully rejected, but instead are proposed to be subject to a further round of exploration and development over the coming period. Through this additional exploration, it is the intention that the relevant measures may be redefined in a way whereby they will provide a more efficient and effective solution for the transport sector, and hence may then be considered for implementation in the second phase of implementation of the plan.

The relevant proposals are mostly identified within the rail sector. These developments include two main transport axes:

- The “Egnatia Railway” Corridor in northern Greece
- The Peloponnese regional railway system.

For both proposals, it is recommended that they are developed instead through a more holistic approach that considers not only the transport infrastructure, but also the economic development and logistics strategy that drives it. A broader study considering also those elements will allow the precise function of these corridors to be better understood, and for subsequent infrastructure requirements to be more closely matched to eventual needs. This can then form the basis for an implementation plan for the relevant transport infrastructure, along with economic policies that are required to achieve the desired outcomes.

It is thus recommended that a working group is established, with the support of the Strategic Planning Unit at the Ministry of Infrastructure and Transport, to further examine economic development strategies for Northern Greece and for the Peloponnese, investigating how strong interregional transport connections, as well as financial incentives and public enterprise, can lead to growth in specialised economic sectors.

Therefore, it is proposed that detailed feasibility and option analysis studies are elaborated, focusing on each specific investment and its potential demand and defining the necessary technical specifications and design standards. Apart from the demand, significant parameters to assess these interventions would be the improvement of international or regional connectivity and/or the synergy with tourism developments.

In addition, the proposed dedicated Transport-Tourism study should also be developed to ensure that relevant policy actions are efficiently coordinated. This study shall be elaborated until 2027 and, in case of positive results, implementation decisions can be taken either to incorporate those projects in the

current plan for the second time horizon (2037), with an official update of the plan in the coming years, or to postpone the projects and include them in the following 20-year national transport strategy.

In addition to the above schedule, there are supplementary measures identified for inclusion in the Transport Plan. It is noted that the measures outlined below are somewhat challenging to implement, and as such further discussions are required to understand political will and available resources, especially in terms of institutional capacity to manage the different actions. The relevant measures are as follows:

- Revision of the organisational framework governing motorway operations with regards to incident management procedures and actions (RI-Soft 4)
- Rejuvenation of the fleet of vehicles (all types) (additional actions) (RT-Soft 5):
  - M-4: Scrappage scheme for old trucks and trailers
  - M-5: Revision of the system of fiscal incentives for greening the fleet of private cars
  - M-6: Development of a plan for the deployment of public electric vehicle charging points. The use of cleaner fuels and electric vehicles is to be further promoted through the development of an inclusive national strategy for electromobility.
- Creation of a Land Transport Authority and implementation of the reform of intercity bus transport (additional action) (RT-Soft 6):
  - M-7: Greening the fleet of vehicles (all types)
- Rationalisation of rail sector organisation and human resources (RA-Soft 4)
- Enhancing the Greek Maritime Cluster (MT-Soft 2)
- Facilitating the implementation of water airports and seaplane services (AT-Soft 2)
- Streamlining port organisation (shift toward the “Landlord” port model & development of port cluster concept) (P-Soft 1)
- Adoption of outsourcing practices by the public sector for Logistics (L-Soft 2)
- Concluding specific agreements with neighbouring European and third countries (aiming at accelerating flows and facilitating freight operations) (L-Soft 4).

Individual detailed Measure Fiches have also been prepared for each one of these soft measures[11].

[11] The fiches are annexed to the Measure Selection Report.

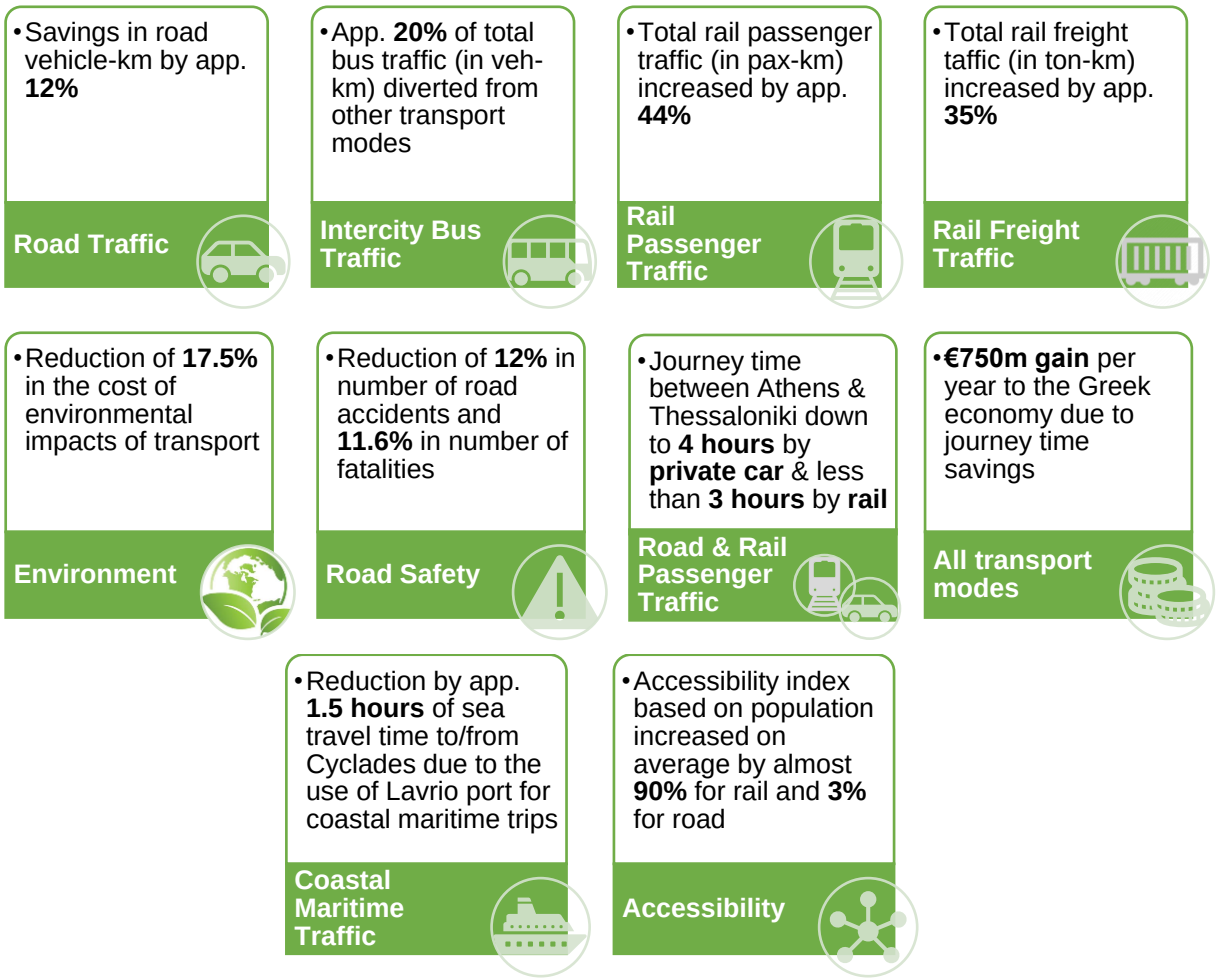
Chapter 4 - Expected Outcomes

4.1 Overview

This chapter provides an overview of the impacts expected from the implementation of the proposed soft and infrastructure measures, mainly focusing on the quantifiable outputs as derived from the scenario evaluation phase. The impact of the Transport Plan has been measured by the Analysis Tools that have been described in Chapter 2 of this report. In particular, the Transport Model has been used to understand how the behaviour or passenger and freight transport will change as a result of the changes in the network and the organisation of transport. Such changes might include shifting routes, changing travel modes (e.g. shifting from car to rail or air to maritime) or simulating future travel patterns following possible regional and/or infrastructural development. All of these effects can be captured and assessed by the transport model.

The Transport Plan investment scenario has therefore been assessed in the Transport Model for the year 2037. The assessment has generated the following indicators for the 2037 horizon year, which assumes delivery of all the proposals included in the Proposed Scenario (DSS2). The data is presented at national level, describing the change in total travel activity for each transport mode.

Figure 4-1: Summary of key transport model outputs (full implementation of the proposed scenario vs Reference Scenario 2037)



Examining the results in more detail (as also referenced in the Transport Modelling Report), and assuming full implementation of the Transport Plan in 2037, the following **significant findings** are evident:

- A significant amount of passenger and freight road traffic is diverted to rail and intercity bus due to the modernisation and increase of the efficiency, reliability and therefore attractiveness of these modes, creating thus savings in road vehicle-kilometres for private cars and increasing traffic of the latter two public transport modes.
- The share of the railway is almost doubled in 2037, with the proposed (soft and infrastructural) interventions bringing a 50% increase of the rail passenger traffic share (reaching 7% of total land transport interurban trips) and a 15% increase of the rail freight transport share. The highest rail transport increase rates are identified along the PATHE/P corridor, and more specifically:
  - passenger traffic volume increases around 35% on the Peloponnese section, 45% on the Athens-Thessaloniki section, while it is doubled on the main branch Thessaloniki-Alexandroupolis[12];
  - freight traffic volume (in tonnes) increases around 10-20% depending on the rail section.
- Journey times on the Athens-Thessaloniki corridor are progressively decreasing, reaching 4 hours in 2037 for road users (due to decongestion of the road network and use of the new A1-A8 road link), while for rail passengers a journey time of less than 3 hours becomes possible mostly due to the proposed Thriassio Pedio - Thiva rail link. For international rail services, the travel time will also be reduced significantly, by 34% on the route Athens-Idomeni-border with North Macedonia and for the connections to Bulgaria: by 39% on the Athens-Thessaloniki-Promachonas route and by 22% on the Athens-Thessaloniki-Ormenio route.
- In the same corridor, railway services to accommodate the expected demand are continually improving and are almost tripled (from 5 trains per day today to 1 train per hour) in 2037;
- An overall decrease of approx. 12% in number of road accidents and fatalities is expected, mostly due to the proposed relevant soft measures and their impacts, i.e.:
  - implementation of a maintenance mechanism for the regional road network,
  - rejuvenation of the vehicles' fleet (all types),
  - increase of the visibility for road safety and toughening penalties for road traffic violations,
  - rehabilitation/ reconstruction and upgrade of road sections which are so deteriorated that they are not maintainable, and
  - notable modal shift from road to rail transport mode.
- The Attica port subsystem (cluster of Piraeus, Lavrio, Rafina ports), along with the proposed soft measures and the development of supporting road and rail infrastructures, is becoming more functional, as Lavrio undertakes significant role, supplementary to Piraeus and Rafina, resulting in:
  - decongesting Piraeus port area,
  - providing better land accessibility to the ports for all users, and
  - providing travel time savings to coastal maritime transport especially to/from the islands of Cyclades and North Aegean, for which Lavrio is proposed to be the principal mainland connection port.

[12] Average figures – significant variation is observed along the railway subsections.

- Improvements in accessibility to population/ workforce/ economic activity are evident, as measured by the Effective Density indicator[13], especially for municipalities close to new (rail and road) infrastructural developments (such as Patra, Pyrgos, Grevena, Kalambaka and areas of Western Macedonia and Eastern Peloponnese);
- Changes in route choice patterns are considerable with the new roads attracting traffic from the concurrent ones. As an example, the proposed link connecting the A1 and A8 motorways was analysed and compared to the existing PATHE route. The impact of the new road link seems to be significant as about 15-17% of the traffic from the concurrent route is attracted to the new route, decongesting the north and south road axes connecting Athens with Thiva and Elefsina respectively.
- Annual reduction of 17.5% in the total cost of environmental impacts of transport resulting from an annual reduction of 0.3 million tonnes of CO_2.

4.2 Performance Assessment against High Level Objectives

The above outputs generate a number of positive effects on the economic, social and environmental impact of transport. A more granular analysis of these effects, indicating the overall success of the Transport Plan, is therefore measured through the assessment of the impacts of the preferred scenario (DSS2) against the High Level Objectives.

The analysis presented below describes these measured impacts against the five High Level Objectives and provides an overview of how the Plan can contribute to fulfilling these key strategic goals (HLO) defined for this Transport Plan.

The assessment under each of the High Level Objectives is supported by analysis from the National Transport Model.

4.2.1 HLO1 - Promote Economic Growth and Efficiency

The Transport Plan will generate substantial savings in Travel Time. At a network level, by 2037 the Transport Plan will lead to a reduction of more than 37 million passenger-hours (3.9%) and 11 million tonne-hours for freight (0.11%), as a result of faster journeys. This level of saving equates to an **annual benefit to the economy of about €750 million** in 2037. However, full potential of the transport plan will be unfolded after the completion of the 2037-horizon projects. At 2042 (five years after the 2037 horizon) the reduction will be about 44 million passenger-hours (4.29%) and 13 million tonne-hours (0.12%).

Transport Vehicle Operating Costs will also reduce as a result of the road network improvements, the decongestion of the road network (resulting in higher average speeds) and the transfer of road traffic to other modes. **Vehicle Operating Costs savings will reach €150 million** in 2037 across the full transport network[14].

A summary of the respective savings is presented in the following graphs.

[13] More details on the Effective Density index based on the variables of population and employment can be found in the Transport Modelling Report.
[14] Detailed reporting, regarding Value of Travel Time and Vehicle Operating Costs Savings, is provided in the Deliverable of Task 6 (Measure Selections Report, Section 5.7: Scenario Development and Evaluation).

Figure 4-2: Passenger travel time savings per mode (in pax-hours)

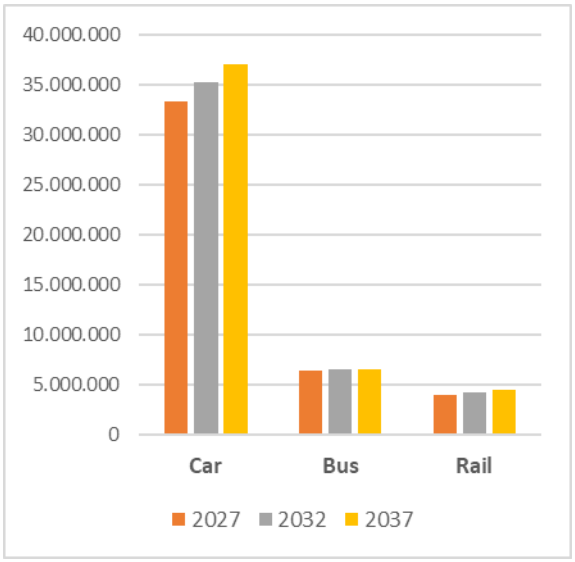


Figure 4-3: Freight travel time savings per mode (in tonne-hours)

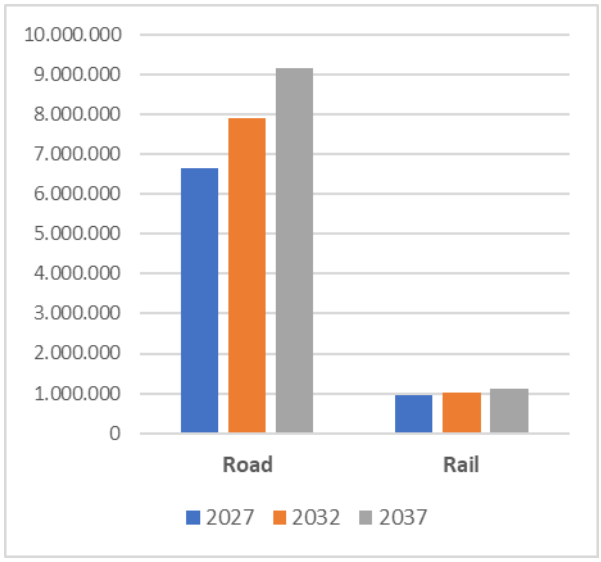
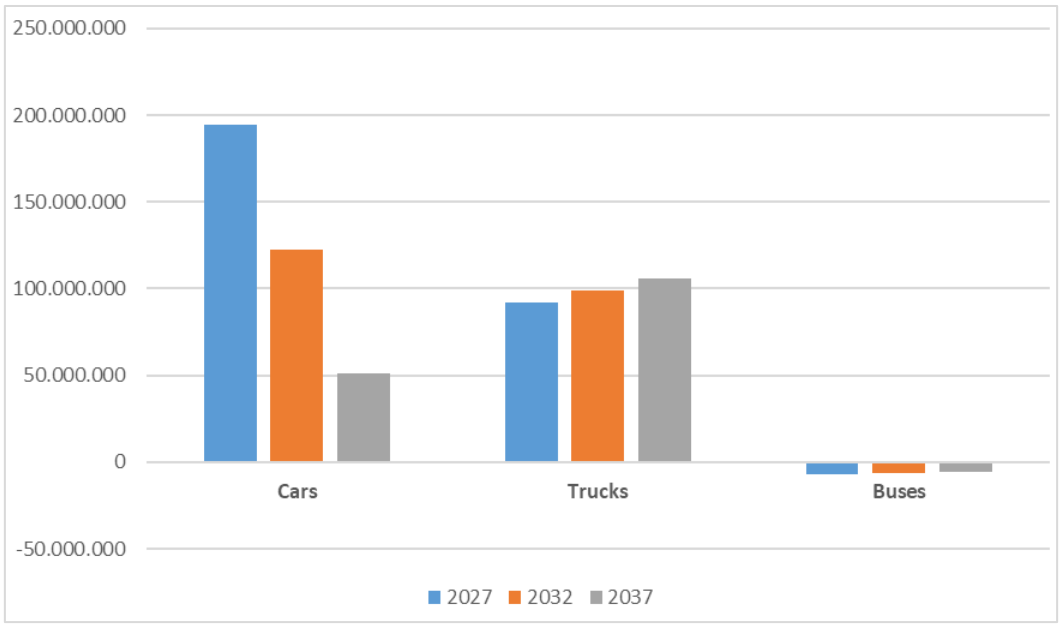


Figure 4-4: Vehicle Operating Costs changes (in €)



The aforementioned effects will generate significant cost savings to the Greek economy. On an annual basis[15], the **resulting economic benefit** – due to VoT and VOC savings - will amount to **about 1 billion Euro**, which will materialise through reduced costs to business, a more effective workforce, and the attraction of new industry as a result of improved logistics efficiencies.

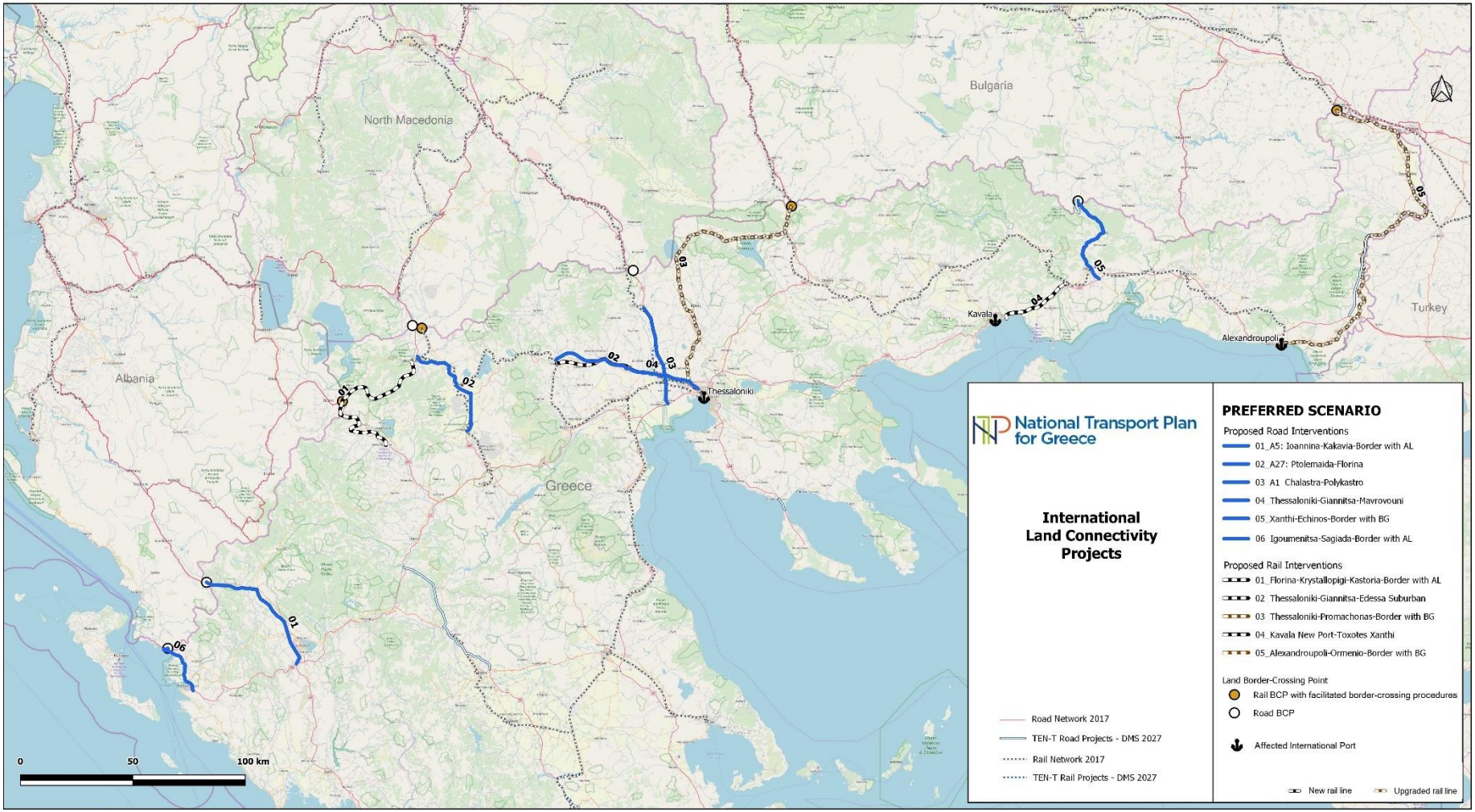
[15] Time horizon from 2027 to 2057.

4.2.2 HLO2 - Increase Regional and International Connectivity

Regional and international connectivity is associated with the desire to build new connections with neighbouring countries to foster increase in the movement of people and goods. The Transport Plan includes investments to improve connectivity towards **ten land cross-border points** (see Figure 4-5), as well as at **seven ports of international importance** and **four airports with international traffic**. In addition, a number of supporting measures aim to improve the efficiency at crossing points which also contributes to improving international connectivity of the country.

Whereas a purely economic objective would lead to a focus on the further development of existing urban agglomerations, the Plan has sought to ensure a diverse investment profile also at peripheral level. The resulting Plan sees **investment in all 13 regions of the country**. Most of the port and airport investments will be implemented in island regions, while most of the road and railway investments are located in continental Greece.

Figure 4-5: Land transport investments improving cross-border connectivity



4.2.3 HLO3 – Ensure Environmental Sustainability

The reduction in vehicle operating costs and also the transfer of passengers and freight onto more sustainable transport modes yields significant socio-economic benefits in terms of reduction in the external costs of transport, that is, environmental cost savings through the proposed measures of the preferred scenario. Environmental costs have therefore been estimated for road (bus, car and freight transport modes) and rail modes through the National Transport Model.

By 2037, the Transport Plan will lead to a significant annual decrease of pollutants from transport, resulting in 14,000 tonnes of CO and 5,000 tonnes of NOx less per year, which is slightly offset by the increase in activity on the rail network. In total, this equates to an ann**ual reduction of 17.5% in environmental impacts of transport**, measured through the economic cost of emissions as outlined in the Measures Selection Report (Section 5.7: Scenario Development and Evaluation and Annexes 4 and 5). Calculations are based on the Update of the Handbook on External Costs of Transport[16].

The Transport Plan will also lead to a net **reduction of 300,000 tonnes of CO_2 per annum** by 2037, with full implementation of the Plan. It is noted that the environmental benefits also lead to net economic benefits, calculated according to the Update of the Handbook on External Costs of Transport, at just over €10m per annum by 2037.

4.2.4 HLO4 - Increase Personal Accessibility and Social Inclusion

The indicator of Effective Density is utilized to represent the accessibility changes forecasted from the implementation of the Transport Strategy. As can be seen from Figures 4-6 and 4-7 below, the Transport Plan will lead to a particular improvement in regional accessibility to the areas of Central and Western Macedonia, Thessaly and Eastern Peloponnese in terms of rail transport.

Similarly, improvements in road accessibility levels are also expected in the remotest regions of mainland Greece, especially South Peloponnese, North Western, Western and North Eastern Greece. At a national level, the **measure of accessibility based on population will increase** by almost 90% for rail and 3% for road with a wide range of impacts at zonal level. The calculation of Effective Density based on employment indicates an increase of over 40% for rail and 2% for road.

In addition, out of a variety of accessibility indicators for impact assessment of the scenarios, travel times of road trips were calculated for the most important cities (Athens, Thessaloniki, Larisa, etc) and it is shown that road accessibility of rural/peripheral areas from/to the closest main cities of the mainland is significantly improved, as travel times are reduced, especially for north-west Peloponnese, the southern part of Central Greece (Sterea Ellada) and the northern part of mainland Greece.

4.2.5 HLO5 - Ensure Safety and Security

The reduction of traffic on the road network and the use of safer road designs for the key corridors will both contribute to a reduction in road accidents. This reduction will be further supported by the “Soft Measures” that have been defined under Pillar 1. With full implementation of the Transport Plan in 2037, there will be a **decrease of 12% in total number of road accidents and 11.6% in number of fatalities** resulting from the infrastructure proposals only. Notwithstanding this, there remains a significant challenge in relation to road safety and there will continue to be a focus on soft measures to further reduce the levels of accidents that are unacceptable at any level above absolute zero.

[16] EC, DG MOVE, 2014, “Update of the Handbook on External Costs of Transport”

Figure 4-6: Rail accessibility level for Reference Scenario 2037

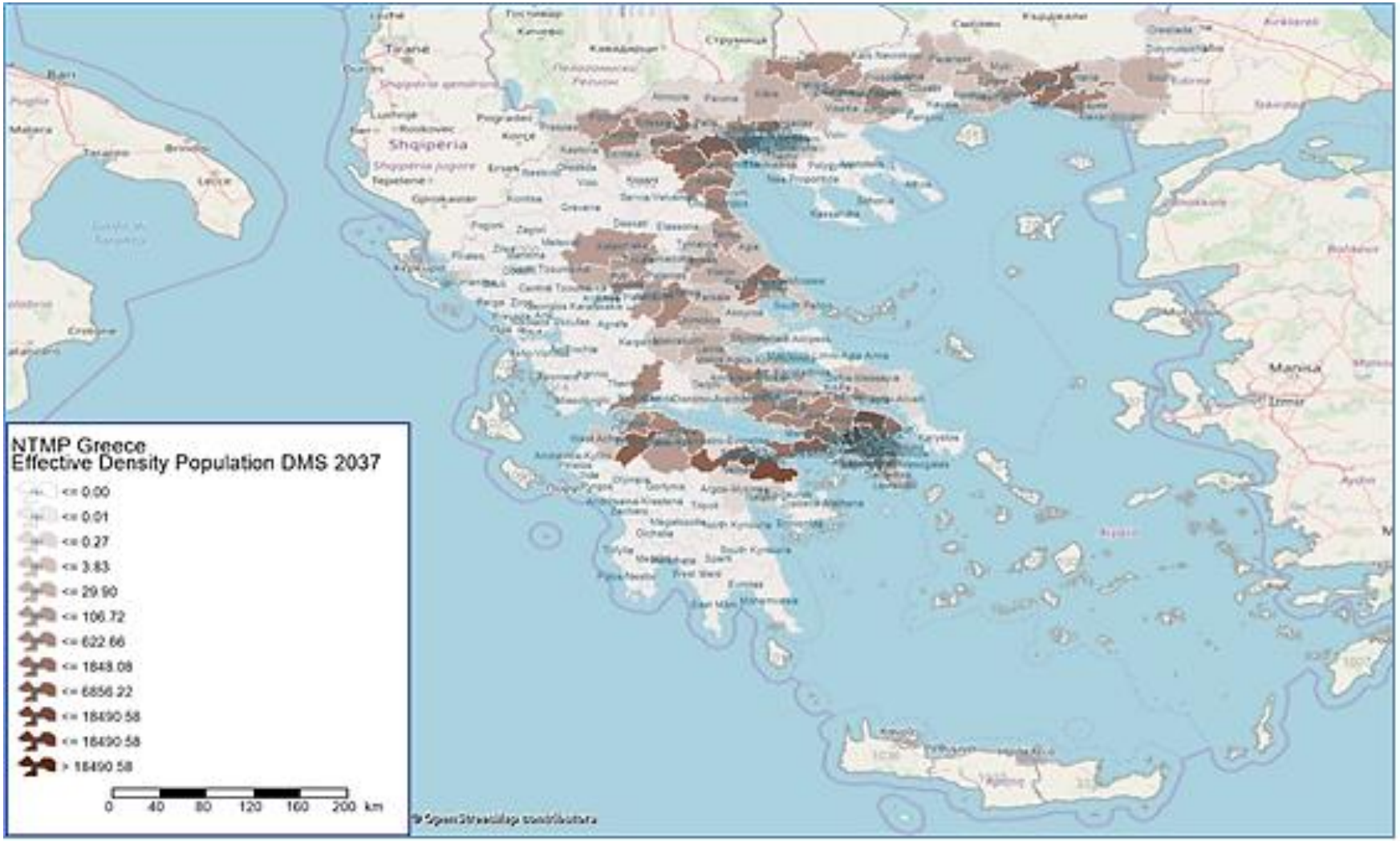
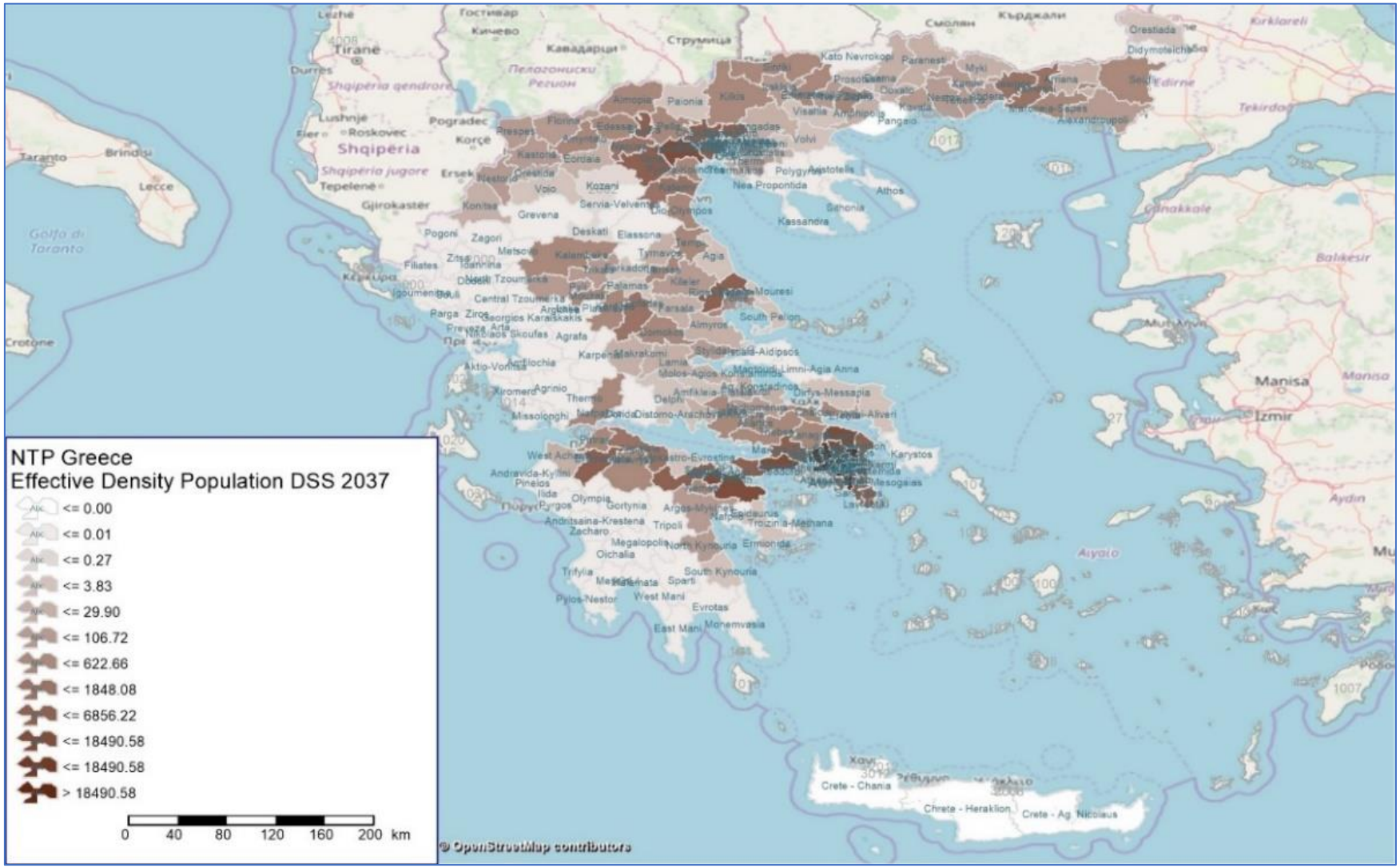


Figure 4-7: Rail accessibility level for the proposed scenario (DSS2) 2037



4.3 Summary

The following figure summarises the main socio-economic benefits expected from the implementation of the Transport Plan. As already discussed, the indicators below relate primarily to the impacts of infrastructure, with the quantification of outputs supported by the National Transport Model.

Figure 4-8: Summary of expected socio-economic benefits for NTPG

An additional analysis has been undertaken that looks to encapsulate the above into a single measure of performance. The Economic Assessment examines the impact on the transport network by combining those outputs that can be quantified in monetary terms, namely travel time savings, vehicle operating cost savings, reductions in pollutants and emissions, and the reduction in road accidents.

This analysis is undertaken in accordance with the 2014 EU CBA Guide[17]. Through this analysis, it was estimated that the Transport Plan generates an Economic Value ($ENPV_{@SDR=5\%}$) of **€10.37 billion** over the appraisal period. This is the economic value that is generated over and above the total investment budget of **around €9.15 bn** (for soft and infrastructure measures) and constitutes the **net beneficial effect to the economy resulting from the Plan**.

In conclusion, the **implementation of the National Transport Plan will improve the overall efficiency of the transport sector and will strengthen the ability of the sector to support economic growth, environmentally sustainable practices, road safety, accessibility and also regional/ international connectivity**. It is therefore clear that the Transport Plan will increase society's welfare as it yields positive outcomes across all key indicators, and therefore the original objectives of the Transport Plan are successfully met.

[17] See also Measures Selection Report, Section 5.7, for detailed methodology.

Chapter 5 - Implementation of the Plan

5.1 Overview

A key element of the preparation of the Transport Plan has been the ongoing consideration of institutional and organisational requirements to ensure efficient and effective implementation of the measures emerging from it. The implementation activities consider the structures within the Ministry of Transport and how those structures can provide the needed strategic planning advice to the implementing agencies in order to ensure that the Plan can be implemented in a coherent way. This also considers the programming of investments, which describes how and when the different measures will be taken through the various stages in the project preparation process. The main measures to be considered in the implementation of the Plan are as follows:

- Building a Strategic Planning Unit, to coordinate the further development of the Transport Plan and the measures emerging from it;
- Provision of Project Preparation Support to implementing agencies, provided by the Strategic Planning Unit;
- Programming the implementation of the measures in the Plan, according to a structured project preparation framework;
- Financial Planning, to understand the resources that are required for implementation; and
- Setting out a series of short-term actions for immediate implementation.

5.2 Building a Strategic Planning Unit (SPU)

The concept of the 'Strategic Planning Unit' has been elaborated during the initial stages of the development of the Transport Plan. This Unit is deemed to developing a stronger transport planning capability within the Ministry of Transport that can streamline the project preparation process and ensure a robust pipeline of new investments. This will allow the Ministry to safeguard and lock-in the valuable work undertaken during the development of the Transport Plan.

5.2.1 Overview of the SPU

The Strategic Planning Unit is already under development within the Ministry of Infrastructure and Transport. In order to reflect the horizontal role of the SPU and to ensure effective communication within the Ministry, a team of staff has been allocated from across the Ministry to part-time roles in the Unit. It remains an objective that this appointed team will be supported by a further core team that will perform a full-time role within the SPU.

Whilst it is envisaged eventually for a Technical Team of about ten persons to fulfil the relevant duties, a short-term objective has been set initially for three fully dedicated people with strong profiles to deliver a functioning Strategic Planning Unit, who will work along with the already established horizontal team. The positions for the initial phase of development of the SPU Core Team shall be:

- **Transport Planner**: key advisor to the Ministry on the broad planning of transport systems, and their consistency with national and regional policy and planning principles. The Transport Planner would rely also on the application of the Transport Model, ensuring that the model is used in a consistent manner to test project ideas, perform corridor analyses or understand the impact of future growth strategies on transport needs. The Transport Planner would prepare the

relevant analyses for assessing policy or infrastructure measures and support the Unit in agreeing technical analysis that is to be undertaken for internal and external use. Other duties involve maintaining the database of transport information and coordinating data sharing with other transport Beneficiaries on a regular basis, following sharing arrangements agreed by the Head of Unit.

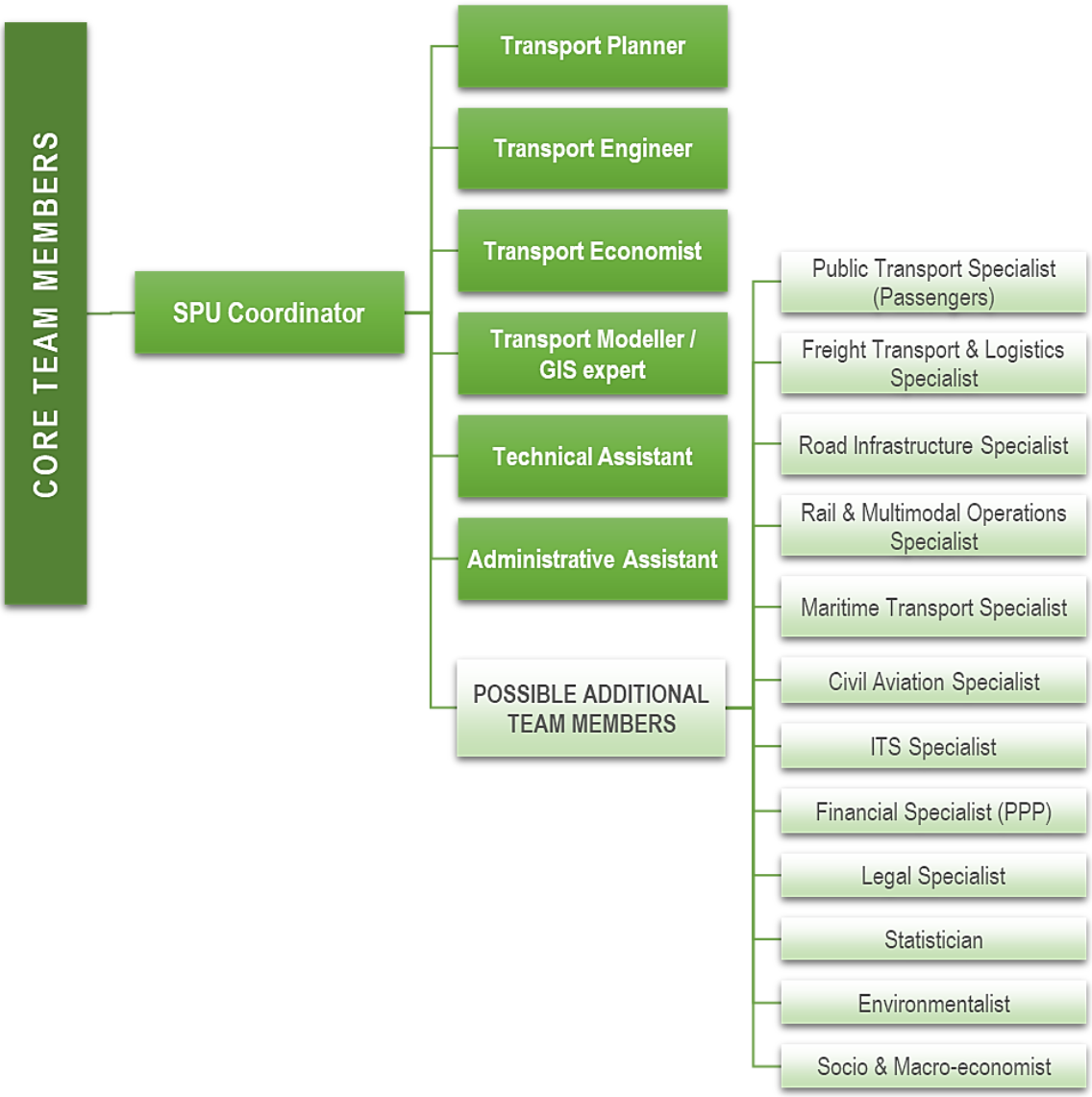
- **Transport Engineer**: internal advisor on technical issues associated with particular infrastructure proposals, supporting the Transport Planner in reviewing those proposals. The Transport Engineer would also support in the preparation of Sector-Level Technical Guidance on the preparation of transport projects, according to the Project Preparation Framework that has been proposed through the Transport Plan project, identifying common issues in project preparation and developing supporting material as needed to streamline future activities.
- **Transport Economist**: providing guidance and data in performing economic analyses and estimating and monitoring KPIs to assess impact of each project. The Transport Economist would also provide support on identification of project financing and make sure that the related necessary analyses are carried out.

A **Head of Unit** is to be selected among these three profiles, being preferably the transport engineer or the transport planner. He/ she would be the public face of the Unit, managing all dialogue with internal departments within the Ministry and with relevant external entities who may request services from the Unit. The Head of Unit would project manage all assignments undertaken for internal and external use and would also engage in promotional activities to inform the sector on the existence of the Unit and the services provided. It is proposed that the core SPU team may need, in a second stage, to be further developed through the appointment of a Transport Modeller/ GIS specialist**,** an Administrative Assistant and a Technical Assistant mainly in charge of IT issues. Additional members may be assigned on an ad-hoc basis (see Figure 5-1).

The horizontal team from MIT has already received training during the two years of the preparation of this Transport Plan, and as such is already in a position to support the work of the appointed technical experts. Some trainings delivered, based on the skills and knowledge of selected staff, were introductory courses. In order to have the Unit fully operational it is recommended to develop further capacity building. One source could be through JASPERS support, as part of its regular missions[18].

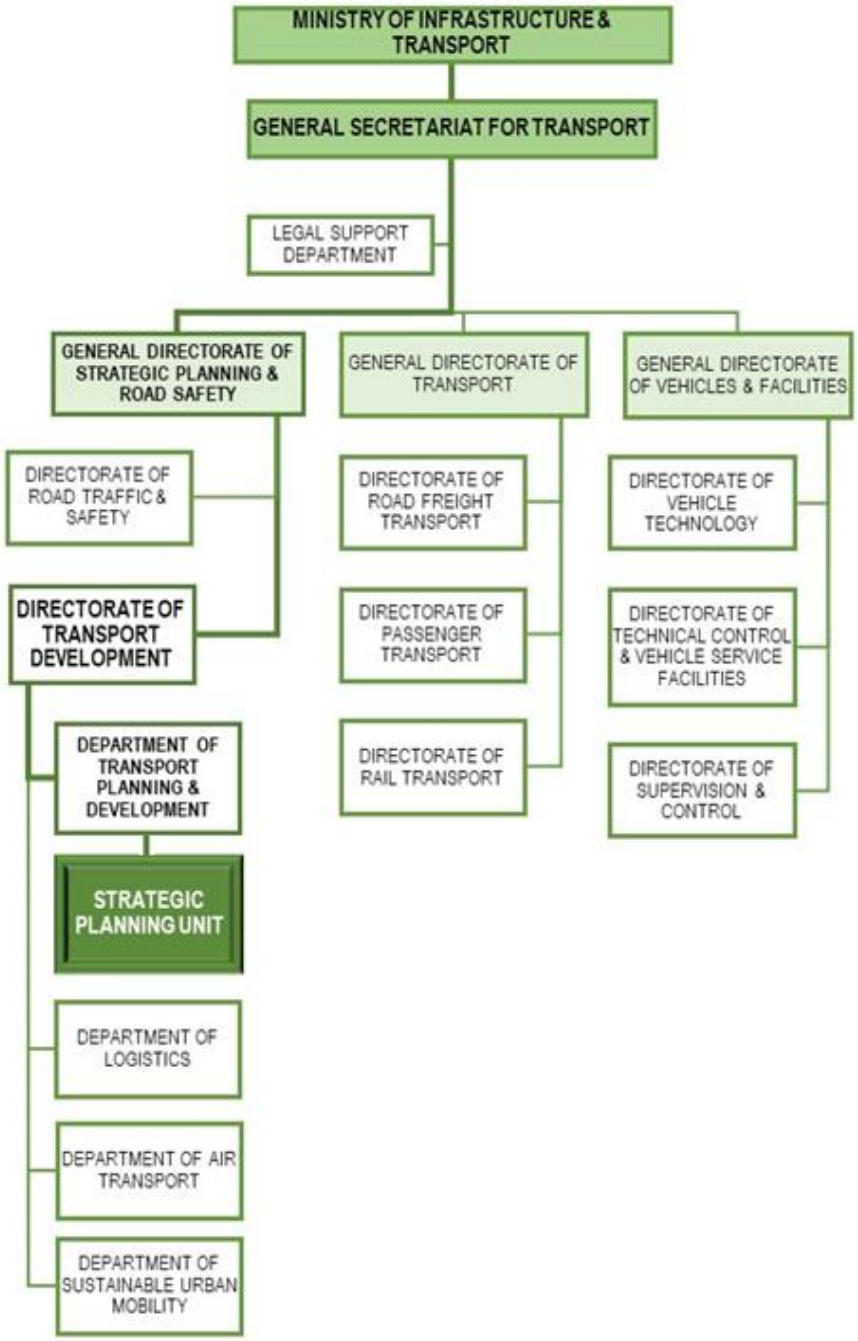
[18] More information on: http://jaspers.eib.org/index.htm and on: http://www.jaspersnetwork.org

Figure 5-1: Proposed SPU team



The SPU is placed within the Department of Transport Planning and Development, the closest related to the roles and responsibilities of the new unit. This approach was recommended as it maximised the applicability and effectiveness of the SPU and could be immediately implemented within the NTPG context, allowing it to be easily harmonised with the ongoing time and work plan of the project.

Figure 5-2: SPU position within MIT



5.2.2 The functions of the SPU

The main SPU function is to provide advice to the MIT and relevant stakeholders by collecting and assimilating raw data sets into information that can lead to a series of recommendations for transport policy and infrastructure planning. Four components constitute the core of its mission:

- **Information Exchange**: The Unit will be a focal point for testing of project and policy ideas that will support internal discussions within the Ministry. In addition, it will compile and provide strategic data for external Beneficiaries to help streamline project preparation. These activities would involve active use of the Transport Model which would be maintained and further developed to reflect the internal needs of the Ministry.

- **International Networking**: Drawing on overseas experience and presenting Greek innovations throughout the transport sector.
- **Coordination**: Acting as a focal point for sector knowledge and processes. Preparing technical guidance for project developers, providing national rules for undertaking activities such as Cost Benefit Analyses, Transport Demand Modelling, Project Evaluation etc. to a common framework.
- **Research**: Providing a unique portal for the Ministry to liaise closely with academic institutions and to collectively explore at a strategic level how future challenges or opportunities in the transport sector can be addressed.

As a result, the SPU shall be the central contact point for knowledge about transport infrastructure, services, equipment/rolling stock and regulation. As such, the SPU staff would provide the relevant information to the General Directors, the Cabinet of the Minister and the Cabinet of the General Secretary to support decision-making for long-term strategic planning, but also translating the proposed strategies into multi-annual budget plans. An annual task would be to prepare and update the mid-term and long-term investment plans, as well as to monitor the results and achievements of the NTPG, while constantly seeking the future vision of the transport system in Greece.

Following an initial period of establishment and trialling of the Unit, an official decree should specify its exact position inside the Ministry of Infrastructure and Transport and the well-defined functions/ responsibilities assigned to the SPU.

5.3 Project Preparation Support

5.3.1 Overview

It has been noted that the SPU will be the main point for the provision of strategic planning advice throughout the Ministry of Transport. It shall also be the main point of coordination for providing support to external implementing agencies as they prepare projects emerging from the Transport Plan. This advice will be provided through a number of support areas as described herein.

5.3.2 Transport Model

The Department of Transport Planning and Development and the SPU have adopted the National Transport Model developed under the current framework, which is a functional four-stage model presenting a global picture of transport patterns in 2017 (Base Year) and 2037 (Horizon Year). The MIT currently holds the licenses for the modelling software package (PTV VISUM 17).

The Ministry of Infrastructure and Transport, and more particularly the Strategic Planning Unit, will act as the custodian of the Transport Model, and shall use it to support the provision of strategic planning information to entities and stakeholders involved in project preparation, enabling thus the creation of more detailed, project-specific models and in-depth analyses at regional or local level. These strategic level outputs can then be further developed using a programme of additional data collection at a more local level by project developers.

Indicative examples of tasks related to the Transport Model utilisation are:

- Generating specific model outputs either based on requests from project developers or according to a standard format and content defined within the MIT;
- Preparation and testing of different project concepts, ideas for new or upgraded transport infrastructures, macroeconomic and demographic scenarios, etc.;

- Production of information for network planning, transport development and safety analyses elaborated by other planning/implementation units.

The procedure for generating and sharing such outputs is the subject of an agreed Model Protocol. This Protocol allows user access to the transport model to support external project preparation or strategic planning activities in a controlled way that does not compromise the integrity of the model. The Protocol states that the National Transport Model is held on a dedicated workstation within the MIT, and that a request for access to the model shall be prepared on the basis of a relevant request issued by any interested public entity or project promoter. After the receipt of each request, either the SPU will produce and provide the requested information or the model can be made available to external users, within the premises of the Ministry of Transport and under controlled conditions. The Protocol will be reviewed on a regular basis according to the observed experience and in relation with the development of internal transport modelling capacities in the Ministry.

On the basis of experience, the Ministry may prepare short seminars for those public entities who wish to make regular use of the transport model in order to familiarise experts with the procedures for accessing information and in relation to the functionality of the model itself.

5.3.3 Preparation of Technical Guidance Documents

In order to bring greater consistency to project preparation, and to incorporate the most relevant Greek socioeconomic and demographic information into project appraisal, the Ministry has identified a need for a broader suite of technical guidance on specific elements of project appraisal, including:

- Guide to Cost-Benefit Analysis for Greek Transport Projects;
- Methodological Guidance on the Preparation of Options Analyses;
- Risk Analysis in Transport Projects;
- Transport Modelling Guidance for Project Preparation; and
- Climate Change in the Transport Sector.

The SPU is the ideal entity to develop a guidance on these aspects that would be used across the transport sector and to disseminate it to relevant Beneficiaries, also through a web-based platform holding all relevant guidance.

5.3.4 Project Preparation Framework

There remains a particular challenge in the preparation of transport projects across the Greek transport sector. Unlike many comparable Member States, Greece does not yet have a clear Project Preparation Framework that guides the relevant activities and phases in the development of projects, relying instead on an output-based requirement. As a result, certain activities are often missed during preparation, which can lead to delays at the end of a project preparation where attempts are made to fill those gaps prior to launching the project. This also often leads to delays and cost overruns in the project delivery.

It is therefore proposed that the Strategic Planning Unit will develop a Project Preparation Manual that will blend the needs of national requirements with the needs of financing entities, drawing on international good practices in project preparation and development. The Project Preparation Framework would comprise:

- A clear phasing of the project preparation process, including a number of interim stages that reflect key decision points in a project;
- A mechanism for monitoring project preparation according to the new framework, which can therefore improve financial planning and resource management; and
- A technical document (Project Preparation Guidance) that will elaborate in detail the activities in taking a project through the various Phases, including approvals required, legal procedures,

reporting requirements, field data requirements and consultation obligations, and shall form the basis for preparation of projects in the transport sector according to the current Greek legislation.

The Ministry will work closely with representatives from across the transport sector through a technical working group in developing this framework and drafting this document. This group would be coordinated by the Strategic Planning Unit and would provide a platform for subsequent seminars and training events on the new Guidance, to be organised by the SPU.

The proposed structure of the Project Preparation Framework, which will form the basis of the above guidance and is already being used to support the Programming Activities of the Ministry, is briefly presented below (Section 5.4.2).

5.4 Programming of the Transport Plan

5.4.1 Responsibilities

The programming activity of this Transport Plan is an ongoing procedure which will also be undertaken by the Strategic Planning Unit, in coordination with the involved Authorities. The SPU staff will be responsible for monitoring and updating the plan every year in line with the available funding sources for each measure, the levels of project maturity and absorption rate at the time, as well as any emerging needs or other factors deemed relevant with the implementation of the Plan.

It is thus evident and highly recommended that the Unit elaborates the programming tasks in collaboration with the relevant internal and external stakeholders (including a Technical Steering Committee[19], the Executive Agencies of MIT and MoMAIP, as well as Managing Authorities competent for the implementation of Operational Programmes for EU funds) at central and regional level.

5.4.2 Defining Infrastructure Project Framework

5.4.2.1 Practices in Greece

The Law Nr. 4412/2016 regarding civil engineering projects design and construction (Circular 11/ ΔΝΣβ/854/ΦΝ 466 - 27/11/2018) presents the main stages and the related scope in relation with transport infrastructure developments. Two cases are considered:

- Road and rail projects
- Marine/ Harbour Engineering Projects

For linear transport infrastructure projects, five stages are currently described under this legal framework:

1. Planning and Preparation of the Public Contract File
2. Conceptual Design
3. Preliminary Design
4. Detailed Design
5. Implementation Design

The law describes the nature of design and related level of details as well as some site works to be carried out such as geotechnical investigations, land survey, geological analysis.

[19] As proposed in the Completion Report.

However, the law does not specify the need for identifying and comparing alternatives neither mentions anything on CBA, financial analysis, risk analysis, climate change or environmental impact assessment at preliminary stage. This has led to weaknesses and subsequent delays in the preparation of projects for external grant funding or financing.

5.4.2.2 The Framework for Programming the Transport Plan

In all EU countries, project development is structured according to national methodologies, guidelines and in some cases by laws, which are defined according to guidelines set by ad hoc commissions and apply to all transport projects of national level, whichever is the transport mode.

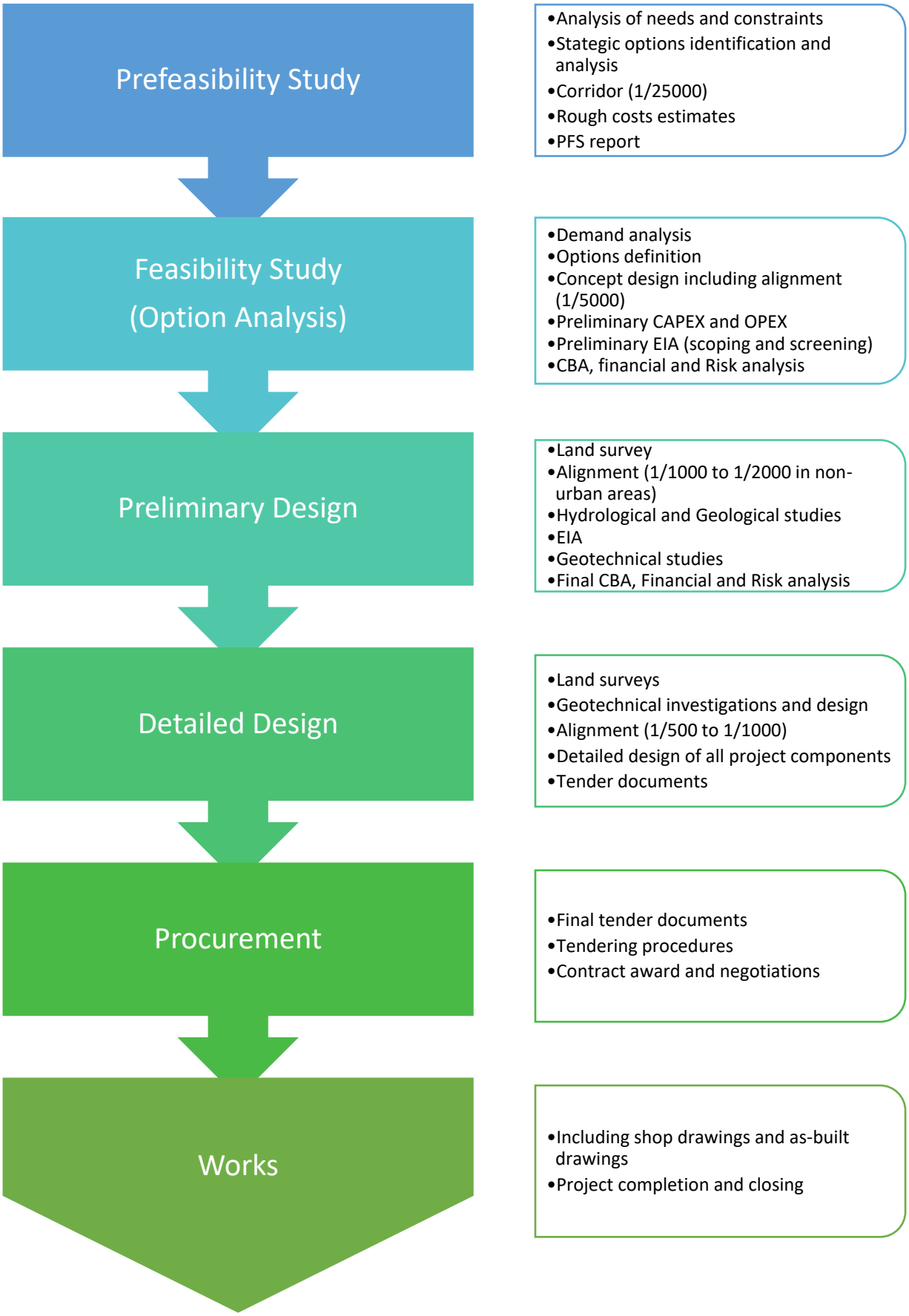
Typically, upstream studies and documentation aim to clarify the scope and definition of a project at the earliest stage and any other related, specific information for decision making. It consists in defining the context and the solution(s) proposed to clarify the technical scope, including a detailed description and requirements for the most important aspects of the project (technical outline of the project).

It also includes all the information that may be necessary to properly pre-assess the project and screen the suitability of the project or to determine whether it should proceed to a selection and move forward to the formulating Phase.

Once selected, design studies are developed following different steps moving from the conceptual idea and the feasibility studies to the production of working documents (shop drawings) for the construction.

The main stages of project development observed or recognized in EU and internationally are presented in the figure shown in next page. Such framework is a preliminary structure that will be further elaborated under the activity outlined in Section 5.4.3.

Figure 5-3: Project cycle



5.4.3 Basis for Programming

The measures proposed in the Transport Plan have different levels of maturity. This means that some of them are in an advanced stage of preparation whereas others require further definition through options analyses. This is the case for several infrastructure and soft measures.

Prior to confirming the allocation of a significant amount of investment, those measures must be detailed and their socioeconomic benefits refined and confirmed. This means going through the stages of "feasibility study & options analysis" of the project cycle framework presented in the previous section. Only then, the justification of a project can be confirmed and actions to mobilise funds from the national budget or from other sources be taken.

The criteria used for programming measures might include:

- Financing: availability of financial resources (from the national budget or from EU, IFIs as EIB, or private funding)
- Maturity: taking into account the stages of project preparation already completed and hence defining the starting point for the further development of the project
- Strategic priority: checking how each project aligns to strategic objectives at either EU or national level, which can often also inform availability of funding (e.g. climate change)
- Project impact, especially if feasibility studies for several of the measures have been completed. In that case, criteria to add would be:
    - Economic impact
    - Social impact
    - Environmental impact.

Programming for measure prioritisation should be reassessed every 2-3 years ideally for the short-/ medium-term measures, and at least every 5 years for the long-term measures simultaneously with an update of the Transport Model. Such programming activities can be done within, but separate to, the overall framework of measures provided by the Transport Plan.

5.5 Financing of the Transport Plan

5.5.1 The Financial Commitment

The total expenditure of the plan is about 9 billion €. Its distribution by period and by type of measure is presented in the table below:

Table 5-1: Total expenditure of the Transport Plan (in M€)

Type	2019-2027	2027-2037	Total
Infrastructure measures	2,696.6	5,317.6	8,014.2
Soft measures	72.6	1,000.0	1,072.7
Total	**2,769.3**	**6,317.6**	**9,086.9**
Annual Expenditure	346.2	631.8	

The amounts have been distributed among periods considering that around 7,000 M€ are already engaged for the Reference Scenario interventions. Due to that, it is more reasonable to assume that most of the expenditure for the period 2019-2027 will be undertaken in the second half of the period, when most of the projects of the Reference Scenario will be in late stage of implementation. Hence during the first five years, expenditure related to measures included in the Transport Plan should focus on soft measures implementation and infrastructure project preparation.

In previous stages of the project, the financial envelope for transport investment between 2019 and 2037 was estimated to 18,726 M€, which results in roughly 1,000 M€ per year for infrastructure investment in the transport sector and a total budget of 2,100 M€ for the transport sector. This was calculated assuming a business-as-usual expenditure scenario, comprising Greek national funds expenditure as usual (0.5%) with EU funding in similar percentage as in the 2014-2020 programme (0.4%).

Adding the expenditure proposed in the transport plan with the amounts already secured for the reference scenario projects, the total amount in transport infrastructure would be about 16,000 M€, so this plan should be feasible financially, provided that EU funds can be mobilised in a roughly similar or slightly lower proportion as in the last 10 years.

In the table below, an estimate of annual total expenditure in the transport sector has been calculated for the years in which the Transport Plan will be in full implementation. This estimate includes provisions for other expenses, such as infrastructure maintenance, PSO or development of urban transport projects.

Table 5-2: Estimated annual expenditure in the transport sector for the period 2024-2037 (in M€)

Type of expense	Amount
Average expenditure in PSO	140
MoMAIP investments	30
Rail and airport maintenance	25
Average annual expenditure in urban projects	333
Average annual road maintenance needs	550
Average annual investment for NTPG	632
Total	**1,710**

Regarding the table above, it is worth mentioning that the total expenditure is below the estimated annual budget of 2,100 M€. The provisions for PSO, urban transport projects and road maintenance should be enough to cover those related expenses. However, the 7,000 M€ envelope already engaged for projects in the Reference Scenario will reduce the budget available for maintenance or urban transport projects during the period 2020-2025. A rebalance between interurban infrastructure investments and urban and maintenance expenditure is foreseen for the period 2027-2037.

Indeed, expenditures in road maintenance will be difficult to channel and will, hence, be insufficient until the proposed Pavement Management System and the funding mechanism are developed and rolled up in all Regions. This may happen between 2024-2027. Therefore, it is quite likely that for the period 2019-2027 there will be over-expenditure in infrastructure development. It is crucial then that during the period 2027-2037 a massive effort is done in implementing a financially sustainable infrastructure maintenance system. Funds will likely be available but their source must be the Greek national budget and this requires that the Greek government is aware of the importance of infrastructure maintenance and avoids transferring those financial resources to the development of new infrastructure projects whose impact might be well below the effect of keeping the current transport network in good condition.

Funding availability will be a key issue as the budget is highly dependent on EU funding. This issue is more developed in the next paragraph.

5.5.2 Available Financing Sources

Three main types of funding have been identified:

- National funding: this includes any financing directly provided by the Greek budget, from either tax revenue or public debt. This budget shall cover maintenance, staff costs of the MIT and the MoMAIP, PSO contracts and an important part of infrastructure investment, as well as the impact of transport reforms.

- Private funding: this includes private participation in transport infrastructure investment. It refers to PPPs but also to private projects (such as certain touristic rail lines).
- Funding from EU institutions: this can be through grants from European Structural and Investment Funds (ESIF) or using lending facilities from the EIB (including EFSI).

Commission proposals have been published with new priorities/ general provisions being developed[20] around five objectives over the period 2021-2027. Regional development investments will strongly focus on objectives 1 and 2. 65% to 85% of European Regional Development Fund (ERDF) and Cohesion Fund (CF) resources will be allocated to these priorities, depending on the Member States' relative wealth.

1. Smarter Europe, through innovation, digitisation, economic transformation and support to small and medium-sized businesses
2. a Greener, carbon-free Europe, implementing the Paris Agreement and investing in energy transition, renewables and the fight against climate change
3. a more Connected Europe, with strategic transport and digital networks
4. a more Social Europe, delivering on the European Pillar of Social Rights and supporting quality employment, education, skills, social inclusion and equal access to healthcare
5. a Europe closer to citizens, by supporting locally-led development strategies and sustainable urban development across the EU.

Among the five ESIF available in the current programming period, two of them provide funding for transport infrastructure and services:

- The European Regional Development Fund promotes balanced development in the different regions of the EU. The ERDF focuses its investments on eleven areas. Among them, four are considered key priority:
  - Innovation and research;
  - The digital agenda;
  - Support for small and medium-sized enterprises (SMEs);
  - The low-carbon economy.

  The ERDF resources allocated to these priorities will depend on the category of region. In more developed regions at least 80% of funds must focus on at least two of these priorities, while it is 60% in transition regions and 50% in less developed regions.

  Furthermore, some ERDF resources must be channelled specifically towards low-carbon economy projects: 20% in more developed regions, 15% in transition regions and 12% in less developed regions. Most Greek regions are transition or less developed regions. Therefore, there is more flexibility regarding the funding of key priorities, and more funds can be allocated to ERDF priority 7: "Promoting sustainable transport and removing bottlenecks in key network infrastructures".
- The Cohesion Fund finances transport and environment projects in countries where the Gross National Income (GNI) per inhabitant is less than 90% of the EU average. In 2014-20, these were Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. The Cohesion Fund allocates a total of € 63.4 billion to activities under the following categories:
  - Trans-European Transport Networks;
  - Environment for projects related to energy or transport, as long as they clearly benefit the environment in terms of energy efficiency, use of renewable energy, developing rail transport, supporting intermodality, strengthening public transport, etc.

[20] More information on:https://ec.europa.eu/regional_policy/en/2021_2027/

Both Funds channel their financing through two main instruments:

- The Connecting Europe Facility (CEF) is a key EU funding instrument, channelling the Cohesion Fund resources that support the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services. CEF investments fill the missing links in Europe's energy, transport and digital backbones.
  In addition to grants, the CEF offers financial support to projects through innovative financial instruments such as guarantees and project bonds. These instruments create significant leverage in their use of EU budget and act as a catalyst to attract further funding from the private sector and other public sector actors.
  The CEF for Transport is the funding instrument to realise European transport infrastructure policy. It aims at supporting investments in building new transport infrastructure in Europe or rehabilitating and upgrading the existing one.
  The TEN-T policy objectives foresee:
    - completion by 2030 of the Core Network, structured around nine multimodal Core Network Corridors;
    - completion by 2050 of the Comprehensive Network in order to facilitate accessibility to all European regions.

  'CEF Transport' focuses on cross-border projects and projects aiming at removing bottlenecks or bridging missing links in various sections of the Core and Comprehensive Network (link), as well as for horizontal priorities such as traffic management systems.
- The Transport Infrastructure, Environment and Sustainable Development Operational Programme is an instrument of co-financing national initiatives that combines ERDF and CF financing. The 2014-2020 OP includes in total 16 priority axes, divided among transport and environment. It bases itself upon the following Thematic Objectives:
    - supporting the shift towards a low carbon economy in all sectors,
    - promoting climate change adaptation, risk prevention and management,
    - preserving and protecting the environment and promoting resource efficiency,
    - promoting sustainable transport and removing bottlenecks in key network infrastructures.

  Relating to transport, the OP:
    - promotes the completion of part of the infrastructures of the core TEN-T (road and rail) and develops/ improves the comprehensive TEN-T (with emphasis on road and rail, but also with focused interventions on ports and airports);
    - promotes combined transport and the modernisation of the transport system;
    - improves the safety of transport;
    - develops and expands sustainable and ecological urban transport (of fixed trajectory and other clean modes of surface transport).

  In terms of funding, the OP receives the following financing:
    - Cohesion Fund (CF): 3,203 M€
    - Regional Development Fund (ERDF): 1,395 M€

Another option for funding is through EIB. Indeed, the European Investment Bank proposes a wide set of financial instruments to provide resources or guarantees under certain conditions. EIB funding options can be divided into two main groups:

- Lending: among the EIB loaning facility, the Project Loans are a classical instrument to support infrastructure development. They are normally allocated to projects exceeding 25 M€ of total investment cost. These loans can cover up to 50% of the total cost for both public and private sector promoters, but on average this share is about one-third. EIB also finances multi-component, multi-annual investment programmes using a single "framework loan". This funds a range of projects, usually by a national or local public sector body, most frequently regarding

infrastructure, energy efficiency/renewables, transport and urban renovation. This type of loans offers a certain degree of flexibility for interest rates making them an attractive banking resource for public institutions. Other potential instruments include intermediated loans.

- Blending: EIB has developed a great expertise in blending their own financial resources with additional instruments as:
  - Structured finance
  - Guarantees (as the Guarantee instrument for TENs transport)
  - Project bonds
  - ESIF financial instruments.

These combinations can be highly suitable for complex projects with high cost involving the private sector.

In addition, it is worth mentioning the advisory services that EIB can provide, in PPP (via EPEC) as in a wide range of technical topics through JASPERS, to providing a key support role, for instance, in relation with the implementation of several soft measures.

Based on the considered sources identified above, the measures included in the Transport Plan report have been assessed to explore whether they might be eligible for EU funding. This preliminary assessment shall be undertaken in much more detail for every measure, preferably after some feasibility studies.

5.5.2.1 Soft measures

The total estimated budget to define and implement the Transport Plan soft measures is 1,072.65 M€. However, of that amount 1,000 M€ is a provision allocated for the measures supporting fleet renewal, for instance tax cuts for low carbon emission vehicles. This measure should be implemented over the two implementation periods, probably mainly between 2027-2037, unless enough charging infrastructure has been installed in the country before 2025, which seems unlikely at this stage.

Of the remaining 72.65 M€, 55.8 M€ (almost 77%) will be spent in the following measures:

- Development of Road Database and Pavement Management System (PMS) at the regional and central levels (6.5 M€)
- Streamlining and strengthening the organization at the national (MIT) and regional levels (Regions and Regional Units) (11.5 M€)
- Fostering multimodality (5.3 M€)
- Development and operation of comprehensive information systems for the maritime transport and port sectors with the aim of better monitoring port and maritime activities, performance and competitiveness (25 M€)
- Implementation of PCS/ MSWS/ NSWS in Greece (7.5 M€).

Therefore, the majority of measures requires very small budget for implementation. In order to speed up the soft measures' implementation, it may be preferable to use national funds. However, considering the characteristics of the soft measures outlined in the transport plan, it should be feasible to access funds from the Cohesion Fund for some measures fostering multimodality (if formulated as low carbon initiatives) and interconnectivity.

In any case, the total cost of defining and implementing all the soft measures, excluding those regarding fleet renewal, is lower than the cost of a relatively small infrastructure project. Considering the expected benefits that the implementation of the soft measures will generate in reduction of transport costs, and in increasing the quality of the data collected and the governance of the sector, funding these actions should be a priority for the Greek Government.

5.5.2.2 Infrastructure measures

The infrastructure projects have been analysed considering the following:

- Their possible funding by the private sector, PPP or not, based on existing information;
- If they are included in the core or at least comprehensive TEN-T network, which would increase highly their chances to receive funding from both the Cohesion Fund and the ERDF;
- Whether they connect with the borders (besides being TEN-T) as this enhances their eligibility for the CEF that channels part of the CF;
- If they support the low-carbon economy, especially railway projects;
- Whether they are located in transition or less developed regions.

Based on that, it has been roughly assumed whether the measures might be eligible for the ERDF or the CF, through the CEF or through the Transport Operational Programme. Using CEF and the Operational Programme past data, it has been possible to assume that the EU co-financing might range between 50-75% depending on the alignment of the project to EU selection criteria.

It must be noted that further due diligences, especially in regard to CBA and project justification after the different stages of project preparation, will be the ones to decide whether the funding of the project by EU instruments continues or not.

Regarding the projects eligible for EIB funding, these must be in line with EIB lending objectives and must be economically, financially, technically and environmentally sound. For this, the promoter of the project must provide sound technical studies following EIB guidelines, in particular in regard to CBA. Concerning the type of projects covered, transport TEN-T networks remain an attractive and eligible type of project as well as urban mobility, rail, aviation, maritime and road projects that are climate-friendly, safe, sustainable and innovative.

In addition, measures or initiatives aimed at making transport cleaner and more efficient can also raise EIB interest. As EIB funding is based on loans or other financial instruments (excluding grants), the eligibility for EIB funding has not been included in the financing table.

The summary of investments by type of funding are summarised in the following table:

Table 5-3: Total costs for the implementation of the transport plan by potential source of funding (in M€)

Type	National Budget	EU/ IFI Funding	Private (tentatively)	Subtotal
Soft Measures	1,048	25	-	1,073
Infrastructure Measures	3,522	4,228	264	8,014
Subtotal	**4,570**	**4,253**	**264**	**9,087**

These comprise the estimated project preparation costs.

5.5.3 Other Financing Sources

There will definitely be possibilities for PPP or private financing in some of the projects. However, the identification of projects to be developed under PPP will need to be subject to a screening activity, which can look to understand the possible market for such projects and the benefits to Greece of taking such projects forward through PPP schemes. Projects which could go through this screening process might include, without being limited to, the following:

- New high quality road connection between A1 and A8 motorways (RI-Infra 12)
- Capacity increase of Schimatari (jct A1/A11) – Lamia section of A1 motorway (RI-Infra 18)

- Capacity increase of Elefsina – Korinthos section of A8 motorway (RI-Infra 19)
- New rail line Volos port & industrial areas - Nea Anchialos airport - Almyros port
- Development of existing rail line Katakolo - Pyrgos - Ancient Olympia as a tourist offering

Other projects such as the rail connection to the port of Kavala or the road and rail links to the port of Lavrio could also be implemented with private participation.

Another rail/road project could also be envisaged for PPP: the rail line Thriassio-Thiva and the road link from A1 to A8. It would require substantial coordination between Piraeus Port concessionaire, the Thriassio Logistics Terminal, the rail operators and OSE.

The final financing structure and the total amount may change, especially for the road measures, as RI-Infra 12 could also be implemented with public funds, if available, and the cost for RI-Infra 18 and 19 might be significantly higher if a solution based on widening the existing alignment is finally selected.

Based on the measures listed above, an amount of 264 M€ has been estimated. This amount might be increased if a PPP structuring was sought for other measures proposed whenever conditions may be attractive enough to the private sector, so further steps in project preparation are required to assess project profitability and risks.

In addition, the network of logistics platforms should be developed entirely by the private sector. The required amounts for that measure could not be identified at this stage. Also, the cargo port capacity extensions (container terminal, bulk facilities) will be privately funded.

Taking into account these potentials, the total amount of private funds mobilised will be likely more around 500-750M€ but these must be confirmed project by project in later stages.

5.6 Implementation

This section briefly introduces implementation issues. Infrastructure measures shall be implemented following the project preparation framework described in section 5.3. Soft measures have a wide set of implementation requirements and these are briefly presented in the following paragraphs.

5.6.1 Review of Soft Measures

As it has been explained in Section 5.4.2, soft measures have different implementation requirements. Some are already easy to define, whereas others will require a lot more understanding and exploration. Most of the soft measures have been split into two stages: measures definition and feasibility and then, Technical Assistance (TA) for implementation. The first group mostly relates to complex measures that still require better definition. The second group comprise measures for which implementation seems more straightforward or there has already been some work on their definition.

The soft measures implementation requirements are summarised in the following table:

Table 5-4: Implementation requirements for soft measures

Code	Title	TA/Consultancy Services for definition	TA for implementation	Other consultancy services
RI-soft 1	Development of Road Database and Pavement Management System (PMS) at the regional and central levels	*X*	*X*	
RI-soft 2	Development and implementation of a mechanism for securing funds for road maintenance	*X*		

Code	Title	TA/Consultancy Services for definition	TA for implementation	Other consultancy services
RI-Soft 3	Streamlining and strengthening the organisational structure at the national (MIT) and regional levels (Regions and Regional Units)	X	X	
RT-Soft 1	Establishment of a comprehensive data base at State-level for the Road Transport Industry	X	X	
RT-Soft 2	Revision of the enforcement set up for road transport	X	X	
RT-Soft 3	Promoting outsourcing of transport and logistic activities to restructure own-account fleet		X	
RT-Soft 4	Promoting cooperation in the Transport & Logistics sectors		X	
RT-Soft 5	Rejuvenating the fleet of vehicles (all types)	X		
RT-Soft 6	Creation of a Land Transport Authority and implementation of the reform of intercity bus transport	X	X	
RT-Soft 7	Increase of the visibility for road safety and toughening penalties for road traffic violations	X		
RA-Soft 1	Facilitating border crossings	X	X	
RA-Soft 2	Modernisation of Rolling Stock	X	X	
RA-Soft 3	Fostering Multimodality		X	X
RA-Soft 5	Consolidating the Rail Sector	X		X
P-Soft 2	Adaptation of schedules of domestic ferry to release congestion during peak periods	X		
MT-Soft 1	Development and operation of comprehensive information systems for the maritime transport and port sectors with the aim of better monitoring port and maritime activities, performance and competitiveness		X	
MT-Soft 3	Development of PCS / MSWS / NSWS in Greece		X	
MT-Soft 4	Promoting initiatives to establish Greece as the South European Logistics Hub		X	
MT-Soft 5	Rationalisation of maritime and port network and promotion of fleet renewal/ modernisation	X		
AT-Soft 1	Maintenance and improvement of the Public Service Obligations in Greek airport system considering synergies between maritime and air PSOs	X		
AT-Soft 2	Facilitating the implementation of new legislation on water airports and seaplane services		X	
L-Soft 1	Integration and partial revision of the legal framework related to Logistics		X	
L-Soft 3	Establishment of a National Logistics Observatory		X	
L-Soft 5	Incentives for encouraging mergers and other types of cooperation in the sector		X	
L-Soft 6	Revision of the legal framework for the development of Freight Villages / Logistics Centres		X	
L-Soft 7	Supporting transparency and information flow in the Logistics market through digital open platforms and standardization practices		X	
H-Soft 1	Support, development and implementation of ITS solutions in all transport sectors		X	
H-Soft 2	Development of a Sustainable Urban Mobility Planning framework		X	
H-Soft 3	Enhancement of Strategic Planning Capacity in MIT and MoMAIP			X

The category “Other consultancy services” relates to specific soft measures consisting in undertaking detailed studies in various topics such as for instance, regional mobility plans or rail node studies.

5.6.2 Short-Term Actions

Some of the soft measures can only be implemented after data of certain level of quality have been collected. Others need a capacity building program or an institution reform. It is logical then to focus initially on those measures that will enable the implementation of others of higher complexity.

The measures comprising institutional, legal reforms, data collection improvements or capacity building programmes that should be implemented urgently in the short term are the following:

- RI-Soft 1: Development of Road Database and Pavement Management System (PMS) at the regional and central levels
- RI-Soft 3: Streamlining and strengthening the organisational structure at the national (MIT) and regional levels
- RT-Soft 1: Establishment of a comprehensive data base at State-level for the Road Transport Industry
- RT-Soft 2: Revision of the enforcement set up for road transport
- RT-Soft 6: Creation of a Land Transport Authority and implementation of the reform of intercity bus transport
    - Consulting services for the creation of a Land Transport Authority
- MT-Soft 4: Promoting initiatives to establish Greece as the South European Logistics Hub
- L-Soft 1: Integration and partial revision of the legal framework related to Logistics
- L-Soft 6: Revision of the legal framework for the development of Freight Villages/ Logistics Centres
- H-Soft 2: Development of Sustainable Urban Mobility Planning framework
- H-Soft 3: Enhancement of Strategic Planning Capacity in MIT and MoMAIP:
    - Capacity building of MIT and MoMAIP staff in Strategic Planning
    - Technical Assistance in Project Preparation Framework for Transport Infrastructure Projects.

The measure RI-Soft 1 will build the data required to finalise the estimation of the financial needs for maintenance that will have been detailed in RI-Soft 2 “Development and implementation of a mechanism for securing funds for road maintenance”. The second part of RI-Soft 1 (implementation) will need to have completed the institutional reform proposed in RI-Soft 3 “Streamlining and strengthening the organisational structure at the national (MIT) and regional levels” to obtain efficient results.

Measures RT-Soft 1 and 2 will build the databases and improve the enforcement framework required to properly implement the rest of the soft measures for the road transport sector.

The measure RT-Soft 6 “Creation of a Land Transport Authority and implementation of the reform of intercity bus transport” is crucial for the success of the Transport Plan and still requires further definition. At least the subtask “Consulting services for the creation of a Land Transport Authority” should be launched urgently to define entirely the scope of the reform.

Legal reforms in the logistics sector (L-Soft 1) will streamline the development of logistics platforms.

The measure H-Soft 2 “Development of Sustainable Urban Mobility Planning framework” is highly urgent to update the urban planning framework with a homogeneous methodology integrating the most recent best practices. This should be developed simultaneously to the preparation of the proposed regional/ urban mobility plans, as it could serve to test the approach developed in the urban mobility framework.

The measure H-Soft 3 “Enhancement of Strategic Planning Capacity in MIT and MoMAIP” and its two sub-measures are among the most important measures to implement in the short term and they will be the basis for proper implementation and monitoring of the plan and for project preparation in general.

In addition, two important measures include studies for further definition that must be implemented urgently. These are the following:

- RA-Soft 3: Fostering Multimodality
  - Development of a platform of information on land transport services in Greece
  - Attica Regional Mobility Plan
  - Thessaloniki Regional Mobility Plan
- RA-Soft 5: Consolidating the Rail Sector
  - Rail Node Studies.

Indeed, the information platform will be a quick win for land transport services. The mobility plans and the rail node studies are necessary to confirm and give more detail to some of the infrastructure measures proposed in the National Transport Plan. Their implementation is hence crucial to avoid delays in the plan implementation.

5.6.3 Actions for Further Study

Some of the soft measures included in the National Transport Plan need further study to define clearly the scope of the intervention. These are:

- RI-Soft 2: Development and implementation of a mechanism for securing funds for road maintenance
- RT-Soft 5: Rejuvenation of the fleet of vehicles (all types)
- RT-Soft 6: Creation of a Land Transport Authority and implementation of the reform of intercity bus transport
  - TA for supporting the Land Transport Authority
  - Consulting services for designing the intercity bus transport reform
  - TA for implementing the intercity bus reform
- AT-Soft 1: Maintenance and improvement of the Public Service Obligations (PSO) in Greek airport system considering synergies between maritime and air PSOs
- P-Soft 2: Adaptation of schedules of domestic ferry to release congestion during peak periods
- MT-Soft 5: Rationalisation of maritime and port network and promotion of fleet renewal/ modernisation
- RA-Soft 3: Fostering Multimodality
  - Support to implement multimodal tariff and ticket system in Attica
- RA-Soft 5: Consolidating the Rail Sector
  - Track Access Charge study
  - Rationalisation of the railway network and services.

The first two measures in the list can have a high impact on Greek finances depending on the approach taken and must be studied thoroughly before being in situation of taking a decision. For most of the remaining measures in the list, the scope of the reforms must be detailed and these actions can be undertaken later than the measures listed in Section 5.6.2, if the government prefers to concentrate resources and attention to those priority measures. As mentioned previously, the Land Transport Authority creation and the intercity bus transport reform are essential and will be implemented in several stages, hence the need to start as soon as possible. Finally, some additional issues requiring further study have been included for RA-Soft 3 and 5, their priority being lower than those included in the previous section.

Annex I – Sub-objectives and indicators for High-Level Objectives

High Level Objectives / Sub-objectives		Transport Mode	Indicator	Base year value	Target for 2027	Target for 2037
1.Promote Economic Growth and Efficiency						
1. 1	Simplify / Harmonise / Optimise legislation and regulation	All modes	Updated legal and contractual network for motorway operation Speed up of licensing procedures and simplification of the framework on the land use Updated legal framework for maritime sector		Legal framework governing motorway operation updated Contractual framework governing motorway concession modernized Law 3845/2010 revised	
1. 2	Streamline and modernize organisations	All modes	Efficiency of MoMAIP, MIT & regional organizations Rationalization of the institutional framework governing the port sector	None	MoMAIP, MIT & regional organisations streamlined 50% of ports managed and operated under new scheme	100% of ports managed and operated under new scheme
1. 3	Improve maintenance of transport networks	Road Infrastructure / Railways / Maritime transport & ports	% of road in poor condition % island ports in poor condition % of rail lines in poor condition	NA NA NA	<5% <50% 0%	0% 0% 0%
1. 4	Increase capacity to accommodate future transport demand (alleviate existing bottlenecks and avoid any	Road Infrastructure / Railways / Maritime transport & ports	Number of road bottlenecks (by Transport Model) Number of ports congested (by Transport Model)	2 0	0 0	0 0

High Level Objectives / Sub-objectives		Transport Mode	Indicator	Base year value	Target for 2027	Target for 2037
	future bottlenecks on the transport network)		Number of rail bottlenecks (by Transport Model)	0	0	0
1. 5	Foster, modernize and streamline freight road transport industry	Road Transport	Share of freight transported by own account fleet in % of t.km	25%		15%
			Share of freight transport companies with 10 or more employees in % of total number of companies	3%	10%	20%
			Average age of truck fleet	18 years		10 years
1. 6	Foster, modernize and streamline logistics industry	Logistics	Market share of 3PL companies (in % of total volume in tons)	18%		50%
			Share of 3PL companies with 10 or more employees in % of total number of companies	11%	25%	40%
			% of logistics "handling" costs and "last mile operations" in total distribution cost	Large variation - in worst cases > 50%		<25%
			Number of "organized" Logistics Centres	1		6
1. 7	Improve port efficiency & competitiveness	Maritime Transport & ports	International benchmarking of port efficiency and competitiveness	None	Effective - Greece in top 10 in EU	Effective - Greece in top 5 in EU
			Number of ports with Port Community System	None	50% of ports of international importance	100% of ports of international importance
1. 8	Improve airport efficiency & capacity	Air transport & airports	Number of airports improving the efficiency of taxiway, aircraft aprons and passenger buildings	0	16	39
			Number of runway extension projects	4	8	9
			Number of airports reaching the maximum runway length according to their category	2	6	7
			Number of new passenger terminals	31 airport terminals can handle traffic sufficiently	5	8
			Number of airports reaching the maximum runway length according to their category	3~10 aircraft movements per hour	6 ~ 12 movements per hour	6 ~ 12 movements per hour
1. 9	Ensure the financial sustainability of the rail sector	Rail	Cost recovery ratio (on the full network)			
			Traffic volume in pax-km & ton-km / year			

High Level Objectives / Sub-objectives		Transport Mode	Indicator	Base year value	Target for 2027	Target for 2037
			Level of public subsidy (average subsidy / pax-km)			
2.Increase Regional and International Transport Connectivity						
2. 1	Improve interoperability between modes	All modes	Volume of freight transported by rail - road (intermodal) (in% of total freight transported by land)	<5%		25%
			% of ports of international interest with good or excellent road connection to their hinterland	40%	75%	100%
			Number of ports of international interest connected by rail with good or excellent rail connection to their hinterland	4	7	9
2. 2	Greece to become the leading European-Mediterranean logistics hub for international freight with emphasis to high quality added-value services	Logistics	Volume of international freight flow in total freight traffic (% in tons)	N/A		
			Volume of investment for logistics facilities and business	N/A		
2. 3	Reduce waiting time at border crossing	Logistics / Road Transport / Road Infrastructure /Rail Transport	Average waiting time at border crossing	NA		
			Number of border crossings with Single Windows System	0	SWS at 50% of main border crossings	SWS at 100% of main border crossings
2. 4	Increase volume of transit freight traffic to/ from neighbouring countries (from Piraeus and Thessaloniki) and volume being processed in Greece to increase the value added	Road Transport / Road Infrastructure /Rail Transport / Maritime transport & port	Volume of transit cargo in Piraeus	35,000 TEUs		
			Volume of transit cargo in Thessaloniki	50,000 TEUs	160,000 TEUs	360,000 TEUs
2. 5	Improve road accessibility of regions with the poorest accessibility	Road Infrastructure	Set of accessibility maps / indicators (effective density and isochrones maps)		Increase in accessibility indicators compared with base year	Increase in accessibility indicators compared with 2027
2. 6	Improve international air connectivity	Air Transport	Number of scheduled air services to foreign cities / countries	scheduled services to 93 cities in 50 countries		

High Level Objectives / Sub-objectives		Transport Mode	Indicator	Base year value	Target for 2027	Target for 2037
			Number of direct international connections to the islands	18 islands connected to 164 cities in 39 countries		20 islands connected to more than 164 cities in 39 countries
2. 7	Improve interregional rail connectivity	Rail	Number of regions not served by rail	6		
3.Environmental Sustainability						
3. 1	Increase share of environmentally friendly transport mode	All modes	Share of cleaner fuels/non-fossil fuel powered road vehicles in the stock of public and private, passenger and freight road vehicles (for each category/type of vehicle) Modal share of rail Share of short-sea shipping (in % of total volume between continental ports) Share of coastal shipping in domestic mainland to island and inter-island passenger traffic	0%		
3. 2	Increase share of public transport in passenger transport	All modes	% of bus+rail share / total land transport			
3. 3	Improve energy efficiency in transport / Promote ISO 50001:2011 Energy management systems certification	All modes	% of electric and hybrid vehicles in the fleet (road) Average age of truck fleet % of pax carried by electrically-powered ferry for very short sea-passages Pax capacity of LNG-powered ferries in % of capacity of total fleet % of old / very old sea craft vessels % ratio train-km electrified / total train-km Fuel consumption by 100 train-km of fuel propelled rolling stock	0,01% 18 years 0% 0%		2-5% 12 years 66% >33% of total pax capacity of large ferry/ catamarans / HSC fleet 0% 100% 0%
3. 4	Decrease the level of noise at airport	Air Transport	Number of airports operating 23:00-7:00	3	2	2

High Level Objectives / Sub-objectives		Transport Mode	Indicator	Base year value	Target for 2027	Target for 2037
4.Increase Personal Accessibility and Social Inclusion						
4. 1	Decrease passenger transport costs	All modes	€/km of bus trip €/km of rail trip €/nm of sea trip	0.10 €/km		0.05 €/km
4. 2	Improve accessibility to islands	Maritime Transport & ports	Transport costs by ferry in % of transport costs on mainland on same distance for selected fast-moving & durable consumer goods	NA	< 100%	< 100%
			% of island ports with appropriate terminal facilities available for pax and vehicles	<20%	50%	100%
4. 3	Improve accessibility to airports	Air Transport	Number of airports with rail/metro connections	1		2
			Number of airports with regular public transport connection	32		35
4. 4	Improve accessibility to interurban railway station	Rail Transport	% of mainland Greece population at less than 1 hour from interurban railway station	N/A		
4. 5	Adapt Interurban Stations to Persons with Reduced Mobility (PRM)	Rail Transport	Number of interurban rail stations adapted to PRM	N/A		All new stations
5.Safety and Security						
5. 1	Align with EU best performing countries in terms of road safety indicators	Road infrastructures / Road transport	Number of fatalities per 100,000 people	6,9		3,8
5. 2	Reduce number of sea accidents in the Aegean Sea	Maritime Transport	Percentage of sea accidents in the Aegean Sea compared to the whole Mediterranean Sea	About 75% and 457 reported marine accidents and incidents reported in 2017 to HBMCI		25%
5. 3	Improvement of airport safety and security	Air Transport	Number of airport upgrading RESA (new requirement of ICAO applied when runways are expanded)			9
			Number of airports with private security	7		30
5. 4	Align rail safety in Greece	Rail Transport	Number of fatalities and accidents in the railway sector / year	13 accidents in 2016 10 fatalities in 2016		

Annex II – Links between Problems and Operational Objectives

Mode	Problems	Operational Objective
Road Infrastructure	The institutional and organizational framework is unnecessarily complex and leads to problems of coordination and cooperation between Directorate / Department with some overlaps of responsibilities	Streamline institutions and organisations in charge of road management at the central and regional levels
	Lack of comprehensive road data base with road inventory and condition data at both the central and regional levels. Added to the absence of systematic traffic counts this prevents from having a clear picture of the road network, its condition and the traffic it carries. This is a serious impediment for rational road planning and programming of road development and maintenance	Develop modern tools for rational planning and programming of the development and maintenance of national and provincial roads
	Lack of modern tools for rational planning of the maintenance of the national and provincial roads	Secure funds for maintenance of national and provincial roads
	Maintenance of national and provincial roads is a challenge and there is no “culture of maintenance” (in particular for periodic maintenance) neither funding clearly allocated for this	
	Future capacity problems in 2027 and 2037	Alleviate existing and future bottlenecks on the road network
	Low values of effective density in north-west Greece (Igoumenitsa, Epirus), north-east Greece (Alexandroupoli, Eastern part of Thrace), central Greece (Karpenissi / Agrinio) and the eastern, southern and western coasts of Peloponnese	Improve road accessibility of regions with poor accessibility
	Relatively low level of international traffic with neighbouring countries	Improve service level on road links to border crossings
	The national road network is rather heterogeneous from a geometric point of view resulting in safety black-spots at places with too abrupt change from one profile to another and / or signage deficiencies Heterogeneous quality of accesses to highways	Alleviate “black-spots” for road safety
	The legal and contractual framework governing motorway operation and services has still a lot of grey zone and sometime obsolete	Streamline legal, contractual and organizational framework governing motorway operation
	Non-existing interoperability between motorways needing physical tolls and hence affecting effective speeds in the infrastructure	Develop new interoperable tolling system based on satellite technology
Road Transport	A poor and inefficient data collection system	Develop tools for making better-informed decisions
	A road transport legislation enforcement system too heterogeneous, lacking appropriate training, coordination and monitoring of regional staff	Increase the effectiveness of the road transport enforcement set up
	Fragmented transport legislation.	Simplify the legal framework and complete the reforms
	Huge part of own-account transport	Reduce the importance of own account fleets in road freight transport
	An old fleet for all types of vehicles	Reduce the age of the fleet, especially for trucks
	A fleet composed mostly by petrol vehicles, with a part of green vehicles growing slower than in most EU countries	Increase the relative part of low-emission vehicles
	Very fragmented freight transport sector with low variety and quality of service and almost no cooperation between companies	Promote cooperation and concentration in the road freight sector
	Intercity bus transport services significantly more expensive than the average in EU countries	Decrease bus passenger transport costs

Mode	Problems	Operational Objective
	Disparities between regions in the quality of service of intercity bus transport, in terms of accessibility, tariffs, commercial services provided by each KTEL	Establish a new tendering system for intercity bus services adapted to EU best practices Develop synergies between rail and road passenger transport
	Number of deaths per billion veh.km	Align with EU best performing countries in terms of road safety organisation and indicators
Rail Transport	Potential future capacity bottlenecks in few specific areas	Alleviate existing and future bottlenecks on the rail network
	Several rail sections with very low traffic and related revenues	Rationalise railway network
	Only Alexandroupoli, Thessaloniki and Piraeus ports connected	Develop additional connections to ports
	Significant delays in implementing rail projects at all stages	Speeding up projects from very initial stages up to their putting into operation
	Western and southern mainland Greece with no or limited access to rail	Improve rail accessibility of regions with poor accessibility
	Poor multimodality with other modes especially road (park and ride, intercity, regional and urban buses)	Improve multimodality
	Except on Attica suburban network, a limited number of stations adapted for PRM	Adapt intercity rail stations to Mobility Disabled People
	High energy costs due to limited number of electrified lines	Reduce energy costs through electrification
	Conditions of the rail line is poor on some low traffic lines	Optimise rail infrastructure maintenance
	Track access charge is low compared to EU average, reducing financing of rail maintenance	Optimise track access charges
	Poor image of railways leading to low likeliness of people to shift to rail	Improve image of railways
	Except of Athens suburban, quality of service is poor: low frequency, old, unsuitable and not clean rolling stock, poor information, train delays	Improve quality of service
	Very high cost of rolling stock lease and maintenance	Reduce rolling stock lease and related maintenance costs
	High staff costs due mainly due to high average age and high number of managers	Reduce staff costs
	Subsidies on some routes is equal to ticket price	Optimise the level of state subsidies
	Revenues per km of line, on most of the network, are very low	Increase income
	Long border crossing process	Streamline border crossing processes
	Lack of interoperability	Deployment of ERTMS on the rail network
	Very high number of level crossings	Reduce the number of level crossings
Maritime Transport	Lack of developed systems for collecting and treating quantified and non-quantifiable data at institutional level Weak legal framework hampering the full and regular collection of data and information entailing incomplete / inaccurate statistical results and poorly maintained general information databases	Streamline the MoMAIP information and functional modes
	Administrative and fragmented institutional structure lacking flexibility and vision	Enhance the MoMAIP organization
	Questionable level of contribution of the Greek shipping community abroad to the sustainable recovery and development of the Greek economy Low involvement of Greek shipping community abroad in the development of the Greek Maritime Cluster Insufficient skilled human resources and financial means allocated to the maritime education system	Revise the Law 3845/2010

Mode	Problems	Operational Objective
	Difficult legal and business situation of main shipyards and protracted shift by smaller enterprises towards marine cutting-hedge technologies	
	Insufficient benchmarking and lack of operational standards and KPIs to measure port activities and productivity	Measure and Benchmark Port Costs, Tariffs and Productivity
	Absence of united and neutral Maritime Single Window System and national Single Window System, lack of digital / e-procedures	Reduce idle time / time losses for vessels and cargo
	Absence of promotion and development strategy in the logistics sector	Build up the Greek Logistics Offer
	Lack of forecasts in passenger maritime traffic taking into account expected development in airborne traffic	Setup of a reliable air and sea pax transport data base
	Rigidity and lack of rationality of the PSO system, weak control of operators and of their business performance / sustainability	Revision of the PSO scheme, definition of a long-term PSO network
	Absence of long-term vision and plans for short-sea and coastal shipping at institutional level	Establishment of an Observatory of Coastal Maritime Transport
Ports	A complex and confusing institutional and organization framework Excessive number of types of port management structures and absence of coordination at regional level Ports managed and operated according to the "service port model" which does not ensure the separation of "administration" and "operation" functions	Streamline port organization
	Lack of developed systems for collecting and treating data (port inventory, traffic, productivity, etc.) at institutional level	Streamline the MoMAIP information and functional modes
	On many islands, the Port Authority is very small, understaffed and lacks qualified staff Uncoordinated plans/projects/strategies drawn by individual ports / islands for the development of their cruise activity	Enhance the MoMAIP organization
	Strong (and growing) dependency of Piraeus upon containerized transhipment trade	Continue upgrading and developing port infrastructure in main ports to accommodate the future traffic
	Poor condition and absence of basic amenities at many island ports	Develop infrastructure for cruise ships in islands with significant prospect for developing cruise traffic
		Upgrade sub-standard port infrastructures in islands
	Underdeveloped land transport and logistics sector and underdeveloped logistics and intermodal infrastructure Low export transit traffic via Greek ports making rail transit operations hardly profitable	Improve / develop land connection between ports and their hinterland
	Insufficient benchmarking and lack of operational standards and KPIs to measure port activities and productivity	Measure and Benchmark Port Costs, Tariffs and Productivity
	Absence of united and neutral Maritime Single Window System and national Single Window System, lack of digital / e-procedures	Reduce idle time / time losses for vessels and cargo
	Increased congestion problems on land side of many ports, especially during summer peak period.	Rebalance the ferry traffic between Piraeus, Rafina and Lavrio ports
		Release congestion at ferry ports during peak periods
Airports and Aviation	The runway length restricts the type and size of aircrafts to be used, which in turn affect the airport's catchment area and the economy of flights. The case of Paros Airport is indicative: the runway extension from 710 m to 1.400 m in 2016 has doubled its passenger traffic. Out of 39 Greek airports, 2 are in ICAO Category 1 (Kastelorizo and Milos airports), 6 in Category 2 (Kalymnos, Naxos,	Extension of runway length of certain airports

Mode	Problems	Operational Objective
	Syros, Astypalaia, Kasos and Leros airports) and 5 in Category 3 (Ikaria, Chios, Kithira, Paros and Skiathos airports), yet their runway lengths are lower than the limits of each Category. Upgrade to a higher Category imposes much more requirements (runway width, safety strips etc.) and for that reason, reaching the limits of each Category is a pragmatic solution.	
	An appropriate terminal size advances the level of service offered and can also have a positive effect on airport revenues (rents of duty free shops, food and beverage stores etc.). A number of Greek airports require bigger terminal buildings. In 14 airports operated by Fraport such projects are in progress. Similarly, requests for passenger terminals improvement exist for airports operated by HCAA (Ioannina, Chios, Naxos, Kalamata, Kasos, Kastoria, Kozani and Paros airports).	Improve passenger terminals (incl. commercial concessions)
	Kalamata, Araxos, Nea Anchialos, Skiros and Chania airports have military presence and activities that humble the airport capacity for civilian aircrafts.	Improve capacity of airports with mixed civil and military operations
	There are international scheduled air services connecting the airport of Athens (AIA) with 50 countries and 93 cities. Thessaloniki Airport is connected with 31 countries and 64 cities. There are direct flights to Greek islands during summer period (39 countries and 164 cities). The number of air services can be further increased in order to establish more direct international connections to the islands and mainland airports that contribute positively to the tourism development of their respective regions.	Improve international and national connectivity and support tourism
	All airport-related projects must be approved by the Environmental Protection Section of HCAA that also checks and renews operation permissions of all facilities. Concerning airport noise there are 3 airports (Heraklion, Corfu, Rodos) with aircraft movements in the period 23:00~7:00 that affect nearby residential areas. This situation can be tackled with ban on night flights or (as in the case of Heraklion) by closing the airport and constructing a new one, far away from residential areas	Maintain environmental sustainability
	A relatively new safety requirement of ICAO is the development of Runway End Safety Area (RESA). RESA is an area symmetrical around the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an airplane undershooting or overrunning the runway. HCAA applies this requirement in every new project for runway expansion. In many Greek airports, the security tasks are currently performed by local Police. In all privatized airports, private security will be used. The HCAA airports are moving in the same direction (to be safeguarded by private police).	Improve airport safety and security
	When air passengers choose an itinerary, they reflect on the transport chain from door to door. For large airports, rail/metro offer an inexpensive and reliable (in terms of trip duration) way of travel. Nevertheless, certain small airports lack public transport services. Taxis are usually available in such cases, yet at a higher tariff.	Improve accessibility and associated services
	Athens International Airport (AIA) and Thessaloniki Airport must be significant components in the international aviation network. Emphasis must be given in penetrating new markets, mainly the air routes to Asia.	Penetration of main airports into new markets
	Air traffic in most regional Greek airports is highly touristic and concentrated in the four-month period from June to September. In order to ensure an adequate level of service during the whole year and to support the economic development and social coherence of the local	Ensure an adequate level for the air services to islands

Mode	Problems	Operational Objective
	communities, many air services are operating under PSO regime.	
	En-route and airport-based delays have an indirect impact on the economics of airlines. Greek airspace is saturated during summer period due to high demand in relation to its capacity. The implementation of new technology air traffic control equipment will reduce the separation between flying airplanes, leading to improved airspace capacity.	Increase airspace capacity and reduce en-route and airport-related delays
Logistics	Polynomiality-bureaucracy	Reduce over-regulation and "multinomy" - promote "self-regulation" procedures
	Lack of strategic spatial planning Lack of land use policy integrating Logistics	Improve legislation regarding licensing less bureaucratic procedures and land use terms, adoption of logistics-wise building terms
	Lack of useful data and appropriate key performance indicators associated with benchmarking data	Establishment of a National Logistics Observatory
	Trade facilitation constraints: high costs and travel time for export and import	Facilitation of transport activity through Agreements with neighbouring European or other third countries
	Economic crisis – scarcity of resources Non-business-friendly environment	Encourage PPP financing methods - reduce bureaucracy
	Small penetration of rail in freight transport and absence of multimodal transport	Development of Logistics Centres including Rail-Road terminals
	Fragmentation of Logistics companies	Reduce fragmentation-promote consolidation of the sector
	Lack of “organized” Freight Villages and Logistics Centres A-typical spatial concentration of logistics companies instead of “organized” Freight Villages	Development of major integrated logistics clusters
	Low degree of outsourcing to 3rd Party Logistics (3PL) Providers	Outsource public sector logistics to 3PL companies and take advantage of synergies in supply chains at inter-ministerial level

Annex III – Proposed operational objectives and measures under each pillar

Pillar	Operational Objective	Measure[21]
Pillar 1: Safety, Sustainability, Efficiency & Competitiveness	Streamline institutions and organisations in charge of road management at the central and regional levels	RI-Soft 3 H-Soft 3
	Develop modern tools for rational planning and programming of the development and maintenance of national & provincial roads	RI-Soft 1
	Secure funds for maintenance of national and provincial roads	RI-Soft 2
	Streamline legal, contractual and organizational framework governing motorway operation	RI-Soft 4
	Alleviate “black-spots” for road safety	RI-Infra 1, 3, 6, 10, 13, 15, 17, 20, 21
	Develop new interoperable tolling system based on satellite technology	*Reference Scenario measure*
	Develop tools for making better informed decisions	RT-Soft 1
	Increase the effectiveness of the road transport enforcement set up	RT-Soft 2
	Reduce the age of the fleet, especially for trucks	RT-Soft 5
	Increase the relative part of low emission vehicles	RT-Soft 5
	Align with EU best performing countries in terms of road safety organisation and indicators	RT-Soft 7
	Rationalise railway network	RA-Soft 5
	Speeding up projects from very initial stages up to their putting into operation	RA-Soft 5
	Optimise rail infrastructure maintenance	RA-Soft 5 RA-Infra 7
	Optimise track access charges	RA-Soft 5
	Reduce rolling stock lease and related maintenance costs	RA-Soft 2
	Reduce staff costs	RA-Soft 4
	Optimise the level of state subsidies	RA-Soft 5
	Increase rail income	RA-Soft 5
	Revise the Law 3845/2010	MT-Soft 2
Pillar 2: Efficient multimodal PATHE corridor	Alleviate existing and future bottlenecks on the road network	RI-Infra 12, 18, 19; H-Soft 1
	Simplify the legal framework and complete the intercity bus reforms	RT-Soft 6
	Decrease bus passenger transport costs Establish a new tendering system for intercity bus services adapted to EU best practices Develop synergies between rail and road passenger transport	RT-Soft 6
	Alleviate existing and future bottlenecks on the rail network	RA-Infra 4 & 10
	Reduce energy costs through electrification	RA-Soft 2
	Improve multimodality	RA-Soft 3
	Adapt intercity rail stations to Mobility Disabled People	RA-Soft 3
	Improve image of railways	RA-Soft 3
	Improve quality of service	RA-Soft 3
	Improve service level on road links to border crossings	RI-Infra 2, 5, 8, 11, 14

[21] The list contains the initial pool of all proposed measures that corresponded to the identified operational objectives and were categorised under the strategic investment pillars 1-8; subsets of these measures formed the two alternative scenarios and measures with moderate ranking under the elaborated preliminary impact assessment were assigned to pillar 9.

Pillar	Operational Objective	Measure[21]
Pillar 3: Stronger International Land Connectivity	Streamline border crossing processes	RA-Soft 1
	Deployment of ERTMS on the rail network	RA-Soft 1 RA-Infra 5, 6, 14
	Reduce the number of level crossings	RA-Soft 1
Pillar 4: Support to Tourism Sector	Prepare and progressively implement a program for developing port facilities for cruise ships	P-Infra 4
	Develop railway connection to touristic destinations in Peloponnese	RA-Infra 2 (+ Katakolo-Olympia rail project)
	Improve international and national connectivity and support tourism	AT-Soft 1 & 2 AT-Infra 1a & 2
Pillar 5: Connectivity to Greek islands	Streamline the MoMAIP information and functional modes	MT-Soft 1
	Enhance the MoMAIP organization	MT-Soft 1, P-Soft 1
	Measure and benchmark port costs, tariffs and productivity	MT-Soft 1
	Setup of a reliable air and sea pax transport data base	MT-Soft 5
	Revision of the PSO scheme, definition of a long-term PSO network	MT-Soft 5
	Establishment of an Observatory of Coastal Maritime Transport	MT-Soft 5
	Upgrade sub-standard port infrastructures in ferry ports	P-Infra 1 & 2
	Rebalance the ferry traffic between Piraeus, Rafina and Lavrio ports	P-Infra 8
	Release congestion at ferry ports during peak periods	P-Infra 1 & 3, P-Soft 2
	Extension of runway length of certain airports	AT-Infra 1a
	Improve passenger terminals (incl. commercial concessions)	AT-Infra 1a
	Improve capacity of airports with mixed civil and military operations	AT-Infra 1a
	Maintain environmental sustainability	AT-Soft 1
	Improve airport safety and security	AT-Infra 1a
	Improve accessibility and associated services	AT-Infra 1a
	Ensure an adequate level for the air services to islands	AT-Soft 1 & 2
	Increase airspace capacity and reduce en-route and airport-related delays	AT-Infra 1a
	Streamline port organization	P-Soft 1
Pillar 6: Efficient Logistics Sector	Reduce the importance of own account fleets in road freight transport	RT-Soft 3
	Promote cooperation in the road freight sector	RT-Soft 4
	Develop additional connections to ports	RA-Infra 8 & 15
	Reduce idle time / time losses for vessels and cargo	MT-Soft 3
	Build up the Greek Logistics Offer	MT-Soft 4
	Continue upgrading and developing port infrastructure in main ports to accommodate the future traffic	P-Infra 5, 6, 7
	Improve / develop land connection between ports and their hinterland	RA-Infra 9, P-Infra 6 & 7
	Reduce over-regulation and "multinomy" - promote "self-regulation" procedures	L-Soft 1
	Improve legislation regarding licensing less bureaucratic procedures and land use terms, adoption of logistics-wise building terms	L-Soft 1
	Outsource public sector logistics to 3rd Party companies and take advantage of synergies in supply chains at inter-ministerial level	L-Soft 2
	Facilitation of transport activity through Agreements with neighbouring European or other third countries	L-Soft 4
	Establishment of a National Logistics Observatory	L-Soft 3
	Encourage PPP financing methods - reduce bureaucracy	L-Soft 6
	Development of Logistics Centres including Rail-Road terminals	L-Infra 1 AT-Infra 1b
	Reduce fragmentation-promote consolidation of the sector	L-Soft 5 & 7

Pillar	Operational Objective	Measure[21]
	Development of major integrated logistics clusters	L-Soft 5, 6 & 7, L-Infra 1
Pillar 7: Efficient Urban/Suburban Public Transport System	Improve multimodality	RA-Soft 3, RA-Infra 15, H-Soft 2
	Develop additional connections to ports	RI-Infra 16 RA-Infra 1 & 14 (+Volos rail project)
Pillar 8: Regional Mobility and Growth	Improve road accessibility of regions with poor accessibility	RI-Infra 1, 3, 4, 6, 7, 9, 10, 13, 15, 17, 20, 21
	Improve rail accessibility of regions with poor accessibility	RA-Infra 3, 11, 12, 13, 14, 16

Key: RI = Road Infrastructure, RT = Road Transport, RA = Rail, MT = Maritime Transport, P = Ports, AT = Air Transport/Airports, L = Logistics, H = Horizontal

Annex IV – Details of Proposed Measures

Pillar 1:	Enhancing Safety, Sustainability, Efficiency and Competitiveness of Transport

Measure Code	Measure Title	Background and Rationale	Description
RI-Soft 1	Development of Road Database and Pavement Management System (PMS) at the regional and central levels	- Lack of comprehensive updated road database with road inventory data at both central and regional levels. - Absence of comprehensive database on road inventory and condition; it is not possible to have a synthetic view of the condition of the Greek National Road Network (typically as % of total length in very poor / poor / fair / good / excellent condition). - Consensus about the lack of road infrastructure maintenance on Greek road network.	The Measure consists of developing and operating a comprehensive road inventory and condition database and a Pavement Management System for rationally planning and programming road maintenance activities. Considering the Greek context, each Road Database / PMS should be developed and kept by the authority responsible for the management of each sub-network, namely: • The MIT for the limited number of roads which remain under its responsibility. • The Regions and Regional Units for roads under the responsibility of regional authorities (i.e. the vast majority of national and provincial road networks). However, it is important that there is some kind of "interoperability" between these databases so that the MIT has aggregated data enabling to have a clear and comprehensive picture of the entire road network (national and provincial), of the traffic it carries and of its condition. The Measure will comprise 3 phases as follows: 1. Develop a pilot project with the MIT and 2 or 3 selected regions for developing a Road Database / PMS for the roads under their respective responsibility. 2. Pilot project assessment after one year of operation. 3. Pilot project generalization to all regions.
RI-Soft 2	Development and implementation of a mechanism for securing funds for road maintenance	There is a consensus about the lack of road infrastructure maintenance on Greek road network. In addition to organisational and management issues, maintenance deficiencies are also the consequence of insufficient funding. Although the gap between the needs and the available resources is still very difficult to assess, analysis of available data and information strongly suggests that maintenance funding is a serious issue in Greece as it is in many countries: a preliminary and rough analysis has shown that funds which would be required for maintaining the national and provincial road networks are in the order of 550 million € per year (routine and periodic), of which	The Measure will investigate the possible mechanisms for securing funds for road maintenance. The new MIT Agency of Road Fees could be the one managing revenues toward this goal, as these are currently paid to the Central Budget. It is also proposed to investigate the possible contribution of the motorway concessionaires to the maintenance of the national and provincial networks, as well as the introduction of new fees (like transit fee) for foreign vehicles. The Measure will comprise four phases as follows: 1. Carry out an in-depth analysis on 2 or 3 selected pilot regions, to quantify precisely the gap between the needs and the funds effectively allocated to maintenance and identify the mechanisms currently in force in Greece for allocating funds for maintenance. 2. Based on the findings of the previous phase and benchmarking of best practices worldwide, identify mechanisms likely to fill

Measure Code	Measure Title	Background and Rationale	Description
		150M€ for 8500 km of national roads (on average ~19000 €/km per year) and 400M€ for 30000 km of provincial roads (on average ~12000 €/km per year). Available figures on current maintenance budgets at the regional level show that the allocation is far from these amounts.	the gap, and explore their feasibility in the Greek context. 3. Carry out detailed analysis of the preferred mechanisms (including financial and legal) and prepare draft law and regulation. 4. Put in place the mechanisms adopted at the previous step.
RI-Soft 3	Streamlining and strengthening the organisational structure at the national (MIT) and regional levels (Regions and Regional Units)	The institutional and organisational framework governing road management (development, maintenance and operation) is unnecessarily complex: at the ministerial level there are at least four Directorates and two special services (EYDE) involved in road infrastructure; at the regional level the responsibility of road management is shared between the Departments of Technical Works for each Region and for its Regional Units, the relations between them being "horizontal" without hierarchical authority of the regional Department over the regional units. Furthermore, both at the ministerial and regional levels, most Directorates/ Departments have responsibilities which are not limited to road infrastructure. Due to this complex organisation none of the Directorates / Regional Departments has a comprehensive view of road infrastructure issues. This leads to diffused responsibilities hindering rational planning and programming of road development and maintenance. At the ministerial level, these issues are exacerbated by two successive reorganisations (in 2014 and 2017) and by the fact that, although the number of staff in MIT is relatively high, it generally lacks the required qualifications.	This Measure aims at proposing and putting in place institutional and organisational measures to improve the capacity of the MIT and the Regions for managing the Greek road network under their responsibilities (see also H-Soft 3). The objective is to streamline the organisation with the aim of clarifying the relations between Directorates / Departments and avoiding any overlap of responsibility. The Measure should for example investigate the feasibility of moving toward the most usual model worldwide which is a unique Directorate of Road Infrastructure at both the national and regional levels, the responsibilities of which encompass all aspects of road infrastructure (development, maintenance and operation), but are strictly limited to road infrastructure. At the MIT level, the Measure will comprise: 1. Comprehensive diagnosis of the existing organisation including in terms of human resources (staff number and qualification); 2. Based on the findings of the diagnosis and benchmarking of best international practices, proposing measures aimed at streamlining the organisation in charge of road management at the national level; 3. Preparation of a comprehensive human resources plan including a training plan; 4. Putting in place the proposed measures and implementing the human resources plan. At the regional level, the Measure will comprise three phases: 1. Developing pilot projects with 2 or 3 selected regions. The implementation of these pilot projects should be monitored by a working group comprising representatives of the central government and of the selected regions; 2. Assessment of the pilot projects after at least one year of operation; 3. Generalisation of the pilot projects to all regions.
RT-Soft 1	Establishment of a Comprehensive Database at State-level for the Road Transport Industry	Poor and inefficient data collection procedures also due to the absence of relevant legal instruments; absence of centralisation and processing; lack of standard / automated analyses; and production of Key Performance Indicators (KPIs) for the Road Transport Industry. Resulting ill-informed decision-making processes.	A) General: Revise the procedures of data collection of the vehicle fleet publishing more data about fleet age, fuel consumption, and linking the data to the owners (especially transport operators and private companies using vehicles for own account transport) B) Freight transport: Revise the typology and procedures of collection of socio-economic, financial and technical data for freight transport and freight companies. Design and implement ad-hoc legal instruments and

Measure Code	Measure Title	Background and Rationale	Description
			regulations C) Passenger transport: Depending on the model of reform chosen, revise the typology and procedures for collection of socio-economic, financial and technical data from public and private passenger transport operators (buses, coaches, etc.). Design and implement ad-hoc legal instruments and regulations. D) Define sets of standard data analyses and KPIs. This must include the identification and monitoring of fixed assets of public use (bus stops, stations, parking areas, etc.), their owners and operators.
RT-Soft 2	Revision of the enforcement set up for road transport	The legal framework for road transport enforcement lacks clarity, while there is also a need for defining and implementing common procedures and training standards, to increase financial resources, and to recruit enough qualified staff. In addition, the transport law and regulation enforcement is weak while, reportedly, there is a significant number of unchecked cabotage operations carried out illegally. This situation is highly detrimental to the domestic road transport industry and needs to be fixed. This Measure calls for the implementation of a globally dissuasive penalty system and the adaptation of existing regulations and ways of working to fight and eradicate clandestine cabotage.	This measure is composed of two sub-measures: M-1: Revision of the institutional framework for road transport enforcement. There are two possibilities: a) Keep road transport law enforcement decentralised as it exists today; this implies the enforcement is delegated to Regions and specific staff needs have to be identified. At the same time a definition must be given of standard positions and education and training requirements; or b) Re-centralise the road transport law enforcement tasks with the creation of transport agencies managed directly by the MIT. M-2: Strengthen the controls against false cabotage. For this, the following activities will be carried out: - Training of the enforcers to detect fraud - Identification and random controls of the main companies carrying out "cabotage" operations - Recording law-breakers (transport companies) and their clients (Shippers/Consignees) - Drawing a black list of offenders (transport companies) within the MIT's Comprehensive Data Base - Notifying Shippers/Consignees whose cargo has been carried illegally and warning them they will be held responsible too as from, for instance, the third recorded offense - Fining Shippers and Consignees (regardless of who ordered/ paid for the road transport operation).
RT-Soft 5	Rejuvenation of the fleet of vehicles (all types)	The Greek fleet is among the oldest in Europe. It has been ageing in all segments due to the ongoing crisis since 2008. In recent years the situation has reportedly worsened further for truck and bus fleets as purchases of new vehicles have been almost negligible. Contrary to what is observed in the rest of Europe, an overwhelming majority of freight transport in Greece is carried out by the oldest part of the truck fleet. This is consistent with the fact that own-account fleets, which mainly consist of old and	The measure involves several actions with the following three being most important: M-1: Restriction on age of imported vehicles (all types): Currently there are almost no limits on the age of vehicles imported into the country (there exists a provision for a maximum 15-year age for imported second-hand buses). It is suggested to agree upon a progressive schedule of age restriction for imported vehicles by type of vehicle, for both 2027 and 2037 horizons. M-2: Bonus-malus system of taxes and incentives for new/old vehicles and 'clean'/'polluting' vehicles (all types):

Measure Code	Measure Title	Background and Rationale	Description
		very old vehicles, take the lion's share of domestic transport. Obviously, this situation affects negatively Greek road transport sector's competitiveness, efficiency, safety and environmental sustainability. To meet the requirements of a growingly export-oriented economy and to ensure a full integration of Greece in global supply chains, there is an urgent need to reverse present trends and support a renewal of the (domestic) commercial vehicle fleet. Simultaneously, ecological and economic reasons call for a rejuvenation of the private car fleet.	There is a lack of differentiated incentives for old/new and 'clean'/ 'polluting' vehicles. It is recommended to setup a progressive schedule of incentives/ discounts/ taxes/ custom duties by type of vehicle, fuel type and age for both horizons. M-3: Laying down a scale of maximum allowed ages and/or levels of emissions for all road vehicles: Currently there are almost no limits to the age of the vehicles driven in the country (there is a provision for a maximum 27-year age for buses). The proposal is to fix a partial or total geographical driving-ban depending on the age/level of emissions of the vehicles and progressive schedule of age restriction by type of vehicle, for both horizon-years. The use of cleaner fuels and electric vehicles is to be further promoted through the development of an inclusive national strategy for electromobility.
RT-Soft 7	Increase of the visibility for road safety and toughening penalties for road traffic violations	Besides the low institutional visibility at political level for road safety, there are other dimensions of the problem that, if addressed, could lead to improvements in road safety: - The level of fines for these issues in Greece is relatively much lower than in other EU countries and existing penalties do not constitute a sufficient deterrent - Low level of awareness of the Greek population towards that issue - Motorbike accidents are over-represented, and a safety policy focused on such type of vehicles is needed.	The measure includes the following actions: - Upgrade the political relevance of road safety by putting it under the direct responsibility of the Prime Minister - Revision of the levels of fines and sanctions - Installation of road safety devices/ features - Dedicated awareness campaigns, especially motorbike safety programmes
RI-Infra-1	Rehabilitation/ reconstruction of road sections which are so deteriorated that they are not maintainable	Although a large extent of the network seems in fair or good condition, there are still a significant number of road sections that are significantly deteriorated (extensive cracking reflecting excessive fatigue; important deformations reflecting structural weaknesses; rutting; etc.). Even if some of these roads can still be maintained (periodic maintenance), a significant number of road sections suffer from such a severe maintenance backlog and are so deteriorated that they are not "maintainable"; these road sections need to be rehabilitated or reconstructed before they can be appropriately maintained on a regular basis. It has to be noted that some of these roads are presently in such a poor condition that there is a risk that the traffic is interrupted. Rehabilitating / reconstructing	One problem is that due to the lack of comprehensive data on road inventory and condition it is presently not possible to have a clear view of the extent of the network which is so deteriorated that it cannot be maintained and needs to be rehabilitated / reconstructed. Thus, this measure will be implemented in two phases as follows: 1. Project identification: - Preparation in close cooperation with the Regions of a list of priority roads (national and provincial) which are in the poorest conditions and need to be urgently rehabilitated / reconstructed as there is a risk of traffic closure. - Based on preliminary studies at the pre-feasibility level for each road of the above list, preparation of a phased priority rehabilitation / reconstruction programme. 2. Project implementation: - Technical study of priority projects. - Preparation of tender documentation and tender procedures. - Work implementation.

Measure Code	Measure Title	Background and Rationale	Description
		these roads is urgent and should be given the highest priority.	
RA-Soft 5	Consolidating the Rail Sector	The rail sector in Greece is currently heavily subsidized through several mechanisms. Despite such State support, its financial standing is poor. The expected development of traffic, especially on PATHE/P corridor and the suburban rail subsystems, shall support financial improvements. The proposed rationalization of the organisation would also have a positive impact.	Three main sub-measures are foreseen: 1. Increase and adapt track access charges (TAC) to foster rail services and increase revenues As regards to TAC adaptation, any modification shall be addressed carefully so to avoid affecting negatively the potential demand growth. 2. Rationalisation of the railway network and services It is proposed to promote procedures for concession projects (modernisation, operation); indicatively for the line from the port of Katakolo to Ancient Olympia as the development of cruise business serving the port of Katakolo could provide the necessary ground for such private involvement. 3. Elaboration of Rail Node Studies that would examine the operational concept for suburban railway networks, mainly in the regions of Attica and Central Macedonia, and would develop an investment pipeline for any ongoing/ planned improvements.
H-Soft 3	Enhancement of Strategic Planning Capacity in MIT and MoMAIP	Building on the training programme elaborated within the NTPG scope, it is recommended to make the Strategic Planning Unit of the MIT sustainable and increase its long-term efficiency through further capacity building activities. Relevant training sessions can be tailored not only for the SPU staff needs, but also for other public servants of MIT, MoMAIP and other transport-related entities who are directly involved in strategic planning operations. For MIT, the goal is to establish the SPU as the key interface between the MIT political leadership and all transport-related entities (ministerial departments, transport operators, stakeholders, etc.) for the implementation and monitoring of relevant infrastructure and soft measures. For MoMAIP, the Measure mainly aims to enhance productivity in ports and to improve their ability to provide reliable, efficient and cost-effective high-quality services for cargo and passengers and thus attract traffic flows.	Two sub-measures are included in this measure: M-1: For MIT, this measure aims at enhancing the Strategic Planning Capacity within the ministry, including a specific training programme for the members of the SPU and other relevant strategic planning ministerial services. Some key areas for capacity building may involve, among others: • Facilitation of data sharing and provision of strategic guidance, • Provision of transport demand information, • More specialised training modules (transport planning, modelling, assessment, etc.). For MoMAIP, the proposed measure comprises capacity building and training of personnel in relevant areas, such as: • ITS and smart port technologies, • optimization of operation and procedures, • automation and digitization of port operation, • safety and security measures, focusing mainly on the ports of the Core and Comprehensive TEN-T. M-2: Development of a national Project Preparation Framework for transport infrastructure projects, to be adopted by the MIT aiming to improve the monitoring of project development activities.

Pillar 2: Making PATHE an efficient multimodal corridor

Measure Code	Measure Title	Background and Rationale	Description
RI-Infra 12	New high quality road connection between A1 and A8 motorways	The Transport Model shows that at horizon 2027 there will be a bottleneck on the southern section of A1 between Schimatari (jct A1/A11) and Thiva. In 2037, the bottleneck will extend from Athens to Lamia. The construction of a new high quality road linking directly A1 to A8 and bypassing Athens metropolitan area is expected to release these bottlenecks by diverting the traffic travelling from the north and going south and west of Athens (and vice versa). This project has been tested with the Transport Model, proving that this is effectively the case: the traffic diversion through this new corridor is sufficient to alleviate the bottleneck south of Schimatari, except in the very vicinity of Athens metropolitan area which can be considered as urban network and outside the scope of this Transport Plan. The need for the project shall be confirmed through the feasibility study phase on the basis of the observed traffic demand and related forecasts.	The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that the new road corridor will connect A1 north of Thiva, with A8 at Elefsina. It will be approximately 53 km-long. It has been tested as a new motorway (2 x 2 lanes with emergency lane).
RI-Infra 18	Capacity increase of existing A1 South, Section: Schimatari (jct A11) - Lamia	The Transport Model shows that at horizon 2037 there is a bottleneck on the southern section of A1 motorway from Schimatari (jct A1/A11) to Lamia which is presently 2 x 2 lanes plus emergency lane. It has to be noted that the proposed construction at horizon 2027 of the new high quality road connection between A1 and A8 motorways will alleviate most bottlenecks south of Schimatari. The need for the project shall hence be confirmed through the feasibility study phase on the basis of the observed traffic demand and related forecasts.	The approximate length of the road section is 150 km of which a few kilometres in very difficult terrain where there are tunnels and viaducts. The measure may consist of different actions to increase capacity of the road corridor. ITS solutions and demand management schemes are preferred to the widening of the existing motorway from 2 x 2 lanes to 2 x 3 lanes, considering the required construction of tunnels in sections of difficult terrain.
RI-Infra 19	Capacity increase of existing A8 (Olympia Odos), Section: Elefsina - Korinthos (jct A7)	The Transport Model shows that at horizon 2027 there is a bottleneck on the section Elefsina - Korinthos (jct with A7 Moreas motorway) of A8 motorway (Olympia Odos), which is presently 2 x 3 lanes plus emergency lane. The need for the project shall be confirmed through the feasibility study phase on the basis of the	The approximate length of the road section is 58 km of which a few kilometres in very difficult terrain where there are tunnels and viaducts. The measure may consist of different actions to increase capacity of the road corridor. ITS solutions and demand management schemes are preferred to the widening of the existing motorway from 2 x 3 lanes to 2 x 4 lanes, considering the required construction of tunnels in sections in difficult terrain and the existence of the railway line.

Measure Code	Measure Title	Background and Rationale	Description
		observed traffic demand and related forecasts.	
RT-Soft 6	Creation of a Land Transport Authority and implementation of the reform of intercity bus transport	Law 4199/2013 sets an intercity bus transport reform system mostly based on the concession of bus routes or networks. However, the full liberalisation of certain routes might have a quicker and stronger impact in terms of reducing costs for passengers. It would seem preferable the Law be revised along these lines to avoid perpetuating the existing system where each route/ network is conceded on an exclusive basis to an operator (e.g. today to KTEL companies). This does not mean to implement a full liberalisation of the sector but provide the regulator with a wide range of tools to apply different models depending on the need. In any case, the reform will have to be done with strong monitoring from the public sector, ensuring that the quality of service does not decrease in any area of the country. The Law set also the creation of a Bus Passenger Regulatory Authority (RAEM); this Authority would monitor the intercity bus transport sector whereas RAS would do so for the rail sector. However, two parallel land transport regulatory authorities managing separately road and rail could be inefficiently competing, each one trying to develop its own mode (for instance, under the pressure of different lobbies) without taking a general view. A single authority for land transport, as in many EU countries, will be able to develop a holistic approach and implement a more efficient national strategy. This combined policy would also have a positive effect in terms of PSO management as for each route the best possible mode could be chosen. Finally, the reform of bus services and the potential concession of some networks create a unique opportunity to impose electric vehicle/ renewable energy fleet requirements in the procurement.	The most important actions within this Measure are: M-1: Explore the institutional issues and options of merging RAS and RAEM. Check whether/ assess which changes could be needed in their legal status to remain in compliance with existing EU Directives/ Greek Laws. Define the scope of work of the new public entity under the MIT and estimate the staff needs. Alternatively, a required measure is to redesign the intercity passenger transport routes (rail PSO and road low passenger volume and frequency services) with a view to rationalizing and optimizing the combined rail and bus operations. M-2: Revision of the Law 4199/2013 on intercity bus transport M-3: Establishment of the Land Transport Authority and capacity building programme M-4: Implementation of the reform of intercity bus transport with steps: - Identification of the type of concession/ regulation to be used in each type of transport (long-distance, intra-prefectural, islands, etc.); - Redefine accordingly the system of PSO considering the combination of rail and bus services; - Prepare and implement the concessions identified; - Monitor the implementation of the reform with KPIs, with particular attention to passenger tariffs, passenger throughput and PSO payments. M-5: Prepare a time-table and fare database and an operational intercity bus passenger transport model, focusing first on PSO routes and later redesigning the full bus network. M-6: Revise the ownership and operational status of coach terminals after the reform; promote intermodality for future bus stations. The Measure is expected to enhance the efficiency and sustainability of the entire transport system of the country, but the majority of expected benefits would be observed for operations along the PATHE multimodal transport corridor.
RA-Soft 2	Modernisation of Rolling Stock	Intercity passenger rail rolling stock is old and in a bad condition leading to deteriorated image of the sector as well as very high maintenance costs.	The measure aims to foster the procurement and consequent use of modern rolling stock for passenger rail operation. This objective can probably be achieved through different means, typically:

Measure Code	Measure Title	Background and Rationale	Description
		Furthermore, it is not suitable for reaching high operational speed. Investments in modern and suitable rolling stock for passenger rail services will contribute to improving rail image and favour mode shift toward rail.	• Incentive pricing policy on track access charges (TAC) • Purchase of rolling stock by GAIAOSE/OSE in "agreement" with train operator(s) or support provided to TRAINOSE (and other operators) to acquire modern rolling stock • Electrification of branches to PATHE/P corridor to reduce overall running costs (compared to diesel) and increase interoperability (depending on the case for each individual intervention). Several infrastructure managers apply differentiated track access charges taking into account rolling stock age and characteristics. As TAC are already low in Greece, the measure would lead to significantly increasing TAC level for old rolling stock. Another measure that could be implemented is to introduce a charge on noise produced especially by old rolling stock.
RA-Soft 3 – P2	Fostering Multimodality - Programme for upgrade of rail stations at national level	Currently multimodality between rail and other modes is very limited. This is particularly the case for the following: - Intercity Bus/ Rail: KTEL and TRAINOSE are competing while proper arrangements between the companies could be beneficial for both clients and companies, especially as bus could play the role of feeder, not only for suburban but also for intercity rail - Urban transport/ Rail: rail stations are poorly connected with public transport modes (metro, LRT and bus) even in Attica. In provincial cities, KTEL is usually the urban transport operator and services to rail stations are usually limited resulting from low usage of trains and probably the competing situation between KTEL and TRAINOSE. - Rail/ Private cars: very limited parking spaces are provided at OSE stations, including suburban rail stations. Also, accessibility for PRM is still limited in several stations.	The measure will include both soft and infrastructure interventions; the latter include the following: - Station renewal - Develop multimodal hubs - Provide necessary facilities to PRM - Develop park-and-ride and parking facilities at (suburban and major interurban) stations (probably under PPP schemes). The proposed interventions in the stations aim at increasing accessibility within and to stations, enhancing safety, improving passenger information in buildings and on platforms.
RA-Infra 10	Rail improvements between Athens and Thiva	This is a project already planned by OSE to address the rapid development in rail transport over the next years. Due to the increased demand and the market reform it is possible soon to reach capacity on the existing rail line (section: SKA-Inoi-Thiva). At a first stage, this section Ska- Inoi will be improved including the creation of side tracks in some stations to	M-1: Upgrade of SKA-Inoi section: This action involves upgrading the existing railway line from Acharnes Traffic Center (SKA) to the existing Railway Station of Inoi, (approx. 52 km) incl. renovation and widening of the existing infrastructure to serve TSI requirements, construction of overtaking tracks especially for freight trains, to increase network capacity and improvements in railway stations/stops. M-2: New rail line Thriassio Pedio – Thiva:

Measure Code	Measure Title	Background and Rationale	Description
		increase capacity by allowing higher speed trains to overtake slow trains. However, this improvement is not expected to reduce journey times: the construction of a new section between Thriassio Pedio and Thiva will reduce journey times and distance, especially for freight and high-speed passenger trains, enhancing further the intermodal container transport from Piraeus port to Greece and Europe (and vice versa).	The concept includes a new electrified rail line starting from Thriassio Pedio, via the area of Kitheron Mountain, and reaching the national rail network in the area of Thiva. It is 60 km long which, if implemented, would shorten the Athens-Thessaloniki route by 30 km.
H-Soft 1	Support, development and implementation of ITS solutions in all transport sectors	The regulatory framework covering issues for Intelligent Transport Systems (ITS) deployment derives mainly from Directive 2010/40/EU, adopted by the national legislation as per PD 50/2012, as well as other relevant delegated EU regulations/ decisions. The National ITS Strategy 2015-2025 aims to create a coherent and effective framework for the development and operation of ITS across the country. It is envisaged that ITS will modernise the transport sector and generate social, environmental and economic benefits. The core mission of the strategy is to put forward new transport patterns, changing the way people and goods are moved, in order to find ways to upgrade the saturated transport systems without major increase in investment capitals. Apart from individual ITS measures proposed for each transport mode, there is an underlying need to support initiatives for the implementation of the national action plan across sectors at regional, national or even international level.	The measure concerns the promotion and wide implementation of available ITS solutions, as per the current National ITS Strategy. Besides the ITS actions already being implemented (eCALL, NAP, PICASSO, SESAR) and measures proposed under each transport sector (databases, platforms, PCS/SWS, etc.), the relevant MIT department(s) should prepare a programme to identify and prioritise sectorial and horizontal ITS solutions to be deployed. The ultimate aim of the programme would be to increase efficiency, connectivity and interoperability of the national transport system with first priority to avoid future bottlenecks on major corridors and nodes approaching the limit of level of service. The below indicative list consists the primary source of ITS actions, as identified in the National ITS Strategy: 1. Information Systems (advanced traveller information & route guidance (pre-trip, on-trip, multimodal, etc.); traffic information (road safety information, real time traffic information); public transport information; points of interest (service areas, bus stops, toll stations, parking areas, intelligent truck parking, etc.); urban mobility centres; intermodal HUBs; National ITS Access Point; road data exchange centres (static, dynamic, real traffic, etc.); logistics (freight/cargo data exchange, etc.); floating car data) 2. Management Systems (traffic & incident management (traffic control centres, traffic signals control, e-CALL PSAP, etc.); public transport management; low emission zones; modal shift & priority lanes; lane change management; construction/ maintenance road works management; parking space management; freight & fleet management (intelligent truck parking); port safety & security management) 3. Technology & Innovation Systems (electronic toll systems; smart ticketing; road charging – pricing; parking reservation services; law enforcement; intelligent vehicle systems; cooperative systems (C-ITS, i.e. V2V, V2I, I2I

Measure Code	Measure Title	Background and Rationale	Description
			technologies) that enable operations of connected and automated vehicles); road data exchange protocols (static, dynamic, real traffic, etc.); intermodal data exchange protocols; nomadic devices) In addition, permanent monitoring mechanisms should be used to fully assess ITS performance, such as the establishment and regular maintenance of a National ITS Observatory including the utilisation and update of uniform qualitative ratings and quantitative indicators. The Measure is expected to enhance the efficiency and sustainability of the entire transport system of the country, but the majority of expected benefits would be observed for operations along the PATHE multimodal transport corridor.

Pillar 3: Building Stronger International Land Connectivity

Measure Code	Measure Title	Background and Rationale	Description
RI-Infra 2	New high quality road connection Ioannina - Kakavia - border with Albania (A5 North)	This extension of A5 (Ionia Odos) motorway to the border between Greece and Albania is part of the Core TEN-T network and of the Adriatic-Ionian Transport Corridor. Kakavia is a key border-crossing point, serving significant traffic volumes to/from Albania (annually 1.750 million passengers). In Albania, the existing road is connected to the national highway network which does not follow motorway standards.	The approximate road length is 55km. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the road would be of motorway standards (possibly 2x2 lanes plus emergency lane with a reference speed of 130 km/h) following a new alignment.
RI-Infra 5	Upgrade of road axis Igoumenitsa – Sagiada - Mavromati - border with Albania	This road would provide a direct access to the border with Albania from Igoumenitsa bypassing the city centre. The current cross-border road link is of very poor characteristics and can be classified as missing.	The approximate road length is 25 km of which 5 km for Igoumenitsa bypass and 20 km for the road Igoumenitsa – Mavromati. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the Igoumenitsa bypass would be a dual-carriageway following a new alignment. The road to Mavromati is assumed to be single-carriageway with lower reference speed, generally following the existing alignment (road upgrade).
RI-Infra 8	Upgrade to motorway standard of A27 North to the border with North Macedonia (Section: Ptolemaida - Florina)	Egnatia Odos Vertical Axis 50 (A27) Kozani-Florina-Niki/border with North Macedonia is part of the Pan-European Axis X. It is totally 78.5 km-long parts of it have already been built or are under construction in the context of past and existing contracts. The central sub-section Ptolemaida-Florina is aimed at completing VA 50/A27 and will serve settlements with large population (Filotas, Amyndeo, Perdika etc.) and important facilities of PPC (DEI).	The Ptolemaida-Florina section is about 50 km-long depending upon the alignment followed. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the road is upgraded to motorway standard (2 x 2 lanes with emergency lanes). One proposal would be to upgrade the existing National Road along 39 km-long and to build a new alignment for remaining distance. This alignment would require a long tunnel. An alternative alignment aimed at reducing the costs would consist of upgrading the existing National Road from Ptolemaida to the existing motorway in Amyndeo (25 km) and then to build a new 20 km-long motorway following a new alignment shifted to the east, to reduce the length of the tunnel originally proposed.
RI-Infra 11	Upgrade of road axis Xanthi - Echinos - border with Bulgaria	Egnatia Odos Vertical Axis 70 starts from the city of Xanthi and reaches the Greece-Bulgaria border crossing in the area of Echinos. It is part of the comprehensive TEN-T network. The existing section from Xanthi to Dimario has sub-	The characteristics of the new road have been fixed under a Transnational Agreement between Greece and Bulgaria. The Xanthi – Dimario - border with Bulgaria road is 40 km-long. The feasibility and option analysis study shall define the technical

Measure Code	Measure Title	Background and Rationale	Description
		standard geometrical characteristics (design speed 30 kph). The 9 km-long section between Dimario and the border with Bulgaria is only an unpaved forest road.	specifications. In the framework of the current analysis it was assumed that the road is upgraded to expressway standards with 2 lanes (single carriageway) following the existing alignment except for specific sections.
RI-Infra 14	Upgrade to motorway standard of A1 North to the border with North Macedonia (Section: Chalastra - Polykastro)	The northern section of A1 from its junction with A2 at Chalastra to the border with North Macedonia is part of the Core TEN-T network. The northern portion from Polykastro to the border with North Macedonia at Evzonoi already follows motorway standards. The southern portion from Chalastra to Polykastro is expressway (2 x 2 lanes w/o emergency lanes and median) and still needs to be improved to motorway standards. This project will complete the A1 motorway all the way from Athens to the border with North Macedonia.	The Chalastra-Polykastro section of A1 is about 43 km-long. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the measure consists of improving the existing 2-lane expressway to motorway standards (2 x 2 plus emergency lanes and median).
RA-Soft 1	Facilitation of border crossings	Border crossings between and its neighbouring countries (North Macedonia and Bulgaria) are slow for different types of reasons, i.e. technical, operational, administrative and organisational. This leads to long transit time at borders reducing the competitiveness on the PATHE/P corridor.	The most important actions envisaged in this Measure are: 1 - Coordinate with neighbouring railways to guarantee availability of staff and traction locomotives 2 - Coordinate border crossing controls with neighbouring countries
RA-Infra 5	Improvement of rail line to Bulgaria (Upgrade section Thessaloniki-Promachonas)	Part of the Core TEN-T, the electrification and general upgrade of the line is necessary for full network interoperability and to foster transit traffic through Thessaloniki port.	The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that it involves the installation of electrification along the Thessaloniki – Strymonas – Promachonas rail corridor, 143 km long; implementation of localized interventions for the improvement of the line and railway stations in the section, as well as installation of Automatic Level Crossing Systems.
RA-Infra 6	Upgrade of rail section Alexandroupoli – Ormenio - GR/BG border (Sea-to-sea project)	Greece and Bulgaria have signed a Memorandum of Understanding (MoU) for the development of a multimodal transport corridor between the Aegean ports of Thessaloniki, Kavala and Alexandroupolis and the ports of Burgas and Varna on the Black Sea. The programme, called Sea2Sea, includes the construction of an electrified fast railway line with an integrated European Rail Traffic Management System (ERTMS) and further development of the ports, which are part of the pan-European Corridor VII, part of the TEN-T	The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that it involves the renovation of infrastructure – trackwork in located stretches of the line, as well as installation of electrification – signalling – ETCS Level 1 along the entire Alexandroupolis – Ormenio – Bulgarian borders line.

Measure Code	Measure Title	Background and Rationale	Description
		transport network. The multimodal corridor will be jointly managed by Greece and Bulgaria. The upgrading of the rail section Alexandroupolis-Ormenio-Bulgarian border would be a first stage of the development of the Sea2Sea corridor, that could be followed in the future by other interventions as the improvement/new line Thessaloniki-Amphipolis-Kavala or the connection of the Port of Kavala to the corridor.	
RA-Infra 14 – P2 & P3	New rail line Florina / Kastoria - Krystallopigi - GR/AL border and electrification of section Edessa - Florina / Neos Kafkasos - border with North Macedonia	Part of Core and Comprehensive TEN-T, this measure partly aims at connecting the Greek Railways to the borders with Albania and North Macedonia. The measure aims at improving the existing rail connection up to Florina and Neos Kafkasos (border with North Macedonia), as well as implementing the missing links from Florina and the city and airport of Kastoria to Krystallopigi and the border with Albania, enhancing thus the regional and international connectivity of these Greek cities with the neighbouring countries. Component 3 will need to be initiated simultaneously with the projected rail line Pogradec-Bilisht on the Albanian side in order to allow for the connection of the two countries by rail.	Component 2 of this measure includes the upgrade and electrification of the existing line from Skydra to Florina and the section towards North Macedonia border (Neos Kafkasos/ Bitola); this component will also allow for some journey time savings estimated at 15 min. Component 3 of this measure includes the construction of a 90 km new single rail line Florina - Krystallopigi - Kastoria airport that will also connect to the GR/AL border crossing point. The exact alignment of Component 3 is under study, foreseen to connect the cities of Florina and Kastoria, the local airport and industrial areas with Albania. The proposed actions should be further examined through a proper business plan for the respective cross-border transport corridors, potentially including a joint Greece-Albania and Greece-North Macedonia transport and logistics concept and additional measures from the other side (Albania and North Macedonia) to connect and ensure interoperability, swift border crossing and overall operations. The feasibility and option analysis study shall define the exact technical specifications of this measure.

Pillar 4: Supporting the Tourism Sector

Measure Code	Measure Title	Background and Rationale	Description
RA-Infra 2	Upgrade and potential realignment of Korinthos-Argos-Nafplio single rail line	This project is part of Comprehensive TEN-T network. There is an existing rail line in meter gauge which had been serving Peloponnese since the 19th century and was abandoned in 2011. By upgrading it, accessibility with public transport to East Peloponnese will increase.	The measure aims at re-opening rail operations on the line (60 km). A feasibility study needs to be carried out so as to select the most suitable alternative including a comparison between reconstruction with meter gauge and upgrade at standard gauge including electrification and ERTMS in order to extend PATHE/P corridor under interoperable characteristics.
Private project	Development of existing rail line Katakolo - Pyrgos - Ancient Olympia as a tourist offering	It is proposed to promote procedures for concession projects (modernisation, operation) for the rail line from the port of Katakolo to Ancient Olympia. The development of cruise business serving the port of Katakolo could provide the necessary ground for such private involvement.	The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the measure includes the standardisation of rail gauge and upgrading of existing single-track railway line. The 43-km section is considered to be awarded as concession. A potential heritage rail service could be operated on this line.
P-Infra 4	Preparation and progressive implementation of a programme for developing port facilities for cruise ships	Greece is one of the key destinations for cruise tourism in the Eastern Mediterranean region. In 2017, Greece received about 4.6 million cruise passengers of which 8% were home-port (embarking, disembarking). The Port of Piraeus (>1 mln pax) is a key existing node in the cruise network, where there is an objective in the Concession Agreement for the further development of cruise facilities. Cruise traffic in Greece is presently highly concentrated in a limited number of ports which are not always equipped with appropriate facilities for accommodating cruise ship. In the most internationally renowned islands (e.g. Mykonos, Santorini) the massive influx of tourists during the peak season is a concern and raises the issue of the sustainability of the development of tourism in general and of cruise tourism in particular. The less visited islands (in particular within the Cyclades), as well as some mainland destinations (e.g. Katakolo), have the opportunity to take an increasing share of the cruise tourism insofar as they target the appropriate segment of the market (namely cruises with small or medium size cruise ships). However, most of these ports presently lack any basic facilities.	The measure aims to prepare and implement a programme for developing port facilities for cruise ships (including berthing facilities for cruise ships or tender boats commuting between ship and shore) in destinations showing good prospects for developing cruise tourism. It must involve all necessary stakeholders in order to make this measure part of a bigger plan aiming at assessing the sustainability of cruise tourism in Greece. The measure will comprise 2 phases: 1. Preparation Phase: • Comprehensive market study for all segment of the cruise industry. • Identify in close cooperation with representatives of the cruise industry, the areas showing good prospects for the development of cruise tourism but need infrastructure improvement. • Launch feasibility studies including an exhaustive assessment of all expected socio-economic and environmental impacts. • Prepare a programme for developing port facilities for cruise ships in the sites where they prove feasible. 2. Implementation phase with a staged construction of the proposed infrastructure.
AT-Infra 2	Development of a core network of water airports for the provision of seaplane	The first seaplanes flights performed in 2005 in Ionian Sea and then expanded to Patras port. Next, seaplane flights from Lavrio port (in the wider Athens region), Attica to islands of Cyclades, Dodecanese, Ionian Sea and Patras	A water airport network is under development. Three seaplane bases have been licensed in the ports of Kerkira, Paxoi and Patras, while 4 more seaplane bases are under evaluation by the Hellenic Civil Aviation

Measure Code	Measure Title	Background and Rationale	Description
	services from, to and between islands	were introduced. A main drawback in the operation of these seaplane services was the unfavourable term of Law 3333/2005 which states that it is not possible to operate more than three flights per water airport. In 2007, the Ministers of Mercantile Marine and of Transport and Communications announced that they will speed up the procedures for creating new water airports. According to Official Gazette (OG 956/14-06-07), the restriction for two mainland water airports changed. The allowable flights limit for Patras water airport increased to 5 flights per day and for Lavrio water airport increased to 9 flights per day. Nevertheless, this relaxation was not enough. Seaplane companies, hoping that their business will go up with a quick pace, had signed leasing contracts for more (than required) seaplanes and long-term contracts with many seaplane pilots. The idle seaplanes and pilots generated high operating costs and in 2008 the seaplane companies stopped their operations. Later on, Law 4146/2013 eliminated totally the restrictions on total daily flights for an authorized water airport (Article 43). Nowadays a new legislation is in force for the "Establishment, operation and occupancy of airports on water surfaces". Following a long "maturing period", the new Legislation Law 4568/2018 (that includes more favourable terms for the establishment and operation of water airports) was presented in the Greek Parliament for discussion (September 2018) and was ratified in October 2018.	Authority in Thessaloniki, Ios, Heraklion and Pylos. More than 20 other applications for authorization are pending (awaiting the new legislation approval). Furthermore, in Athens region, a metropolitan seaplane basis in planned (most probable in Faliro or Agios Kosmas locations).

Pillar 5: Enhancing Connectivity to the Greek Islands

Measure Code	Measure Title	Background and Rationale	Description
MT-Soft 1	Development and operation of comprehensive information systems for the maritime transport and port sectors with the aim of better monitoring port and maritime activities, performances and competitiveness	There is generally a lack of legal and regulatory instruments and developed systems for collecting, compiling, processing and analysing quantified and non-quantifiable sector data at Ministry level. In addition, given the importance of sea-transport in Greece, the MoMAIP is a naturally complex and massive structure. It seems that there is room for improvements in the administrative set-up to achieve less compartmentalized organisation with a clearer delineation of responsibilities and tasks.	The measure aims to develop comprehensive information systems (databases) and to set up within the MoMAIP, operational cross-functional units having, through these IT systems, a comprehensive view of the port and maritime sectors with the aim of: • Monitoring ports and maritime activities in order to better plan their development; • Measuring the performance and competitiveness of Greek ports and benchmarking them with their international competitors. The recommended databases should be developed and kept by the MoMAIP but official communication channels and working relations must adopt certain protocols between the data providers (most generally the port authorities), ELSTAT and the main users (including RAL). The measure can be broken down into 7 projects which are closely interlinked; these are as follows: A. Develop port inventory / description database; B. Develop database on Key Performance Indicators (KPI); C. Develop tariff database; D. Develop passenger maritime traffic database; E. Develop integrated air and coastal maritime transport database; F. Develop port cargo traffic database; and G. Set up operational cross-functional units within the MoMAIP.
MT-Soft 5	Rationalisation of maritime and port network and promotion of fleet renewal/ modernisation	Within the framework of an integrated port and coastal maritime strategy, the restructuring and rationalization of the domestic coastal maritime network on the basis of the transport demand to/from the Greek islands, is urgently requested. In addition, the existing Public Service Obligations (PSO) network has not been designed in a comprehensive and uniform manner and therefore shows several inconsistencies. Weaknesses in the tendering and operation processes have also been highlighted. The lack of data prevents making informed decisions and prohibits any change / modernization of the system. Finally, the sustainability of the system is questionable given the way it is monitored at State-level. At the same time, it is generally considered necessary to renew the fleet	The measure includes the following components: M-1: Improving accessibility of the islands by determining precisely passenger and freight traffic-flows per pair of ports, and by drawing forecasts for the next 5-10 years taking into account observed trends in tourism and air transport, also via the establishment of an Observatory of Coastal Maritime Transport. M-2: Updating specifications for ship renewal and/or retrofitting (in terms of size, type, alternative fuels such as electricity, LNG, etc.) and technical specifications for port infrastructure design considering both the demand outputs and the specifications of contemporary vessels. This action will promote new technologies and best practices to help manage resources and streamline operations in a more sustainable and cost-effective way. The action will mainstream sustainability in port operation and development and reduce environmental footprints of the Greek port industry. Furthermore, it will contribute to the improvement of the relationship between the ports and the cities, promote maritime spatial planning, integrate Blue Growth in port operation and development, enhance resilience and reduce vulnerability of ports. M-3: Optimize coastal PSO by using the outcomes of component 1, including the following tasks:

Measure Code	Measure Title	Background and Rationale	Description
		of ferry ships, also in view of the imminent environmental constraints, as well as to reconstruct/ upgrade the infrastructure and facilities of the Greek port system, by modernizing the relevant design, environmental and construction specifications.	• Determine a core PSO network trying to rationalize services by combining connections where possible; • Assess the needs in terms of fleet; • Revise the tendering process awarding longer contract periods (multi-annual PSO contracts) with fleet renewal incentives; • Establish strict financial-economic monitoring & auditing of all PSO-subsidy recipients; • Induce the banking sector to support investments in the coastal fleet based on longer PSO contracts / guaranteed funding.
P-Soft 2	Adaptation of schedules of domestic ferry to release congestion during peak periods	At ferry and cruise ports, congestion is limited to a few hours during the peak period. For ferry ports, congestion seems to be more a question of road access than of marine facilities. The main reasons are that ships' arrivals and departures are concentrated during a short period of time (ferry) or on the same day (cruise). In such situation, the construction of new infrastructure does not seem the most cost-effective solution and congestion could be significantly released by adapting the ship schedules so that arrivals / departures are more evenly distributed during the whole day (ferry) or week (cruise). It is expected that such measures should significantly postpone the need for infrastructure development in many ferry ports. However, for commercial reasons, ferry companies seem to be reluctant to change their schedule.	The Measure aims to adapt the schedule of domestic ferry in order that arrivals / departures are more evenly distributed during the whole day. This objective can probably be achieved through different means, typically: • Implementation by MoMAIP of a departure/ arrival slot tendering policy for coastal maritime transport in line with slot management systems. • Incentive pricing policy applying to port dues which could differ depending upon the departure/ arrival slots. • Other. The Measure will comprise 3 phases: 1. Develop of a pilot project which could cover Rafina and the Cyclades served to/from Rafina: ✓ Set up a working group between the MoMAIP, other concerned ministries (Ministry of Internal Affairs, etc.), representatives of the ferry operators, the port authorities and the municipalities to identify and investigate measures which could be taken and accepted by the parties in order that arrivals/ departures are more evenly distributed during the whole day. ✓ Put in place the agreed measures. 2. Pilot project assessment after one year of operation 3. Pilot project generalization
P-Infra 1	Preparation and progressive implementation of a programme for improving port facilities for domestic ferry passengers	Many islands of various sizes are important touristic destinations during the summer peak period. Very often, the number of tourists they host annually largely exceeds the local permanent population. The respective ports connecting mainland and islands do not generally present important capacity constraints at the "sea side" - to a small number of exceptions- as far as docking and berth allocation is concerned. However, there is an important lack of basic facilities for passengers and vehicles at	The measure aims to prepare and implement a programme for improving facilities for passengers at the domestic ferry ports where they are inadequate. Indicatively, the following islands face severe problems within and around the port's land zones, especially during the summer months: Andros (Gavrio), Sifnos, Paros, Symi, Samothraki, Skyros, Skopelos, Skiathos, Alonissos, Zakynthos, Kefalonia (Poros), Kymi. Interventions in the mainland ports are also required, indicatively in the ports of Volos, Agios Konstantinos, Kavala and Kyllini. The Measure will comprise 2 phases: 1. Preparation Phase aimed at preparing a staged programme for improving facilities for passengers and vehicles at domestic ferry ports (terminal buildings, pedestrian and vehicle flows, parking areas, land access, etc.).

Measure Code	Measure Title	Background and Rationale	Description
		the “land side”, in particular in terms of terminal buildings, pedestrian and vehicles flows, parking areas and road access.	2. Implementation phase from technical studies to construction of interventions
P-Infra 2	Preparation and progressive implementation of a programme for upgrading substandard port infrastructure and modernising ship service facilities	Port infrastructure in the islands is not always adequate and, generally, not in good condition: • Most of them have inadequate reception facilities, while nine out of ten would have problematic shore ramps. • Long waves would be a problem at over 70% of the ports. • Depth and manoeuvring issues are encountered at nearly half of the ports, hindering calls by new, modern coastal shipping vessels. • Port infrastructures are most often not in good condition and in some cases require immediate corrective interventions of small or large scale. This results in safety issues and negatively impacts accessibility, especially of insular regions.	The measure aims to prepare and implement a programme for improving port infrastructure in island and mainland ports, where they are inadequate, not in good condition and/ or do not meet the latest technical specifications. Indicatively, the following islands face severe problems of basic port infrastructure: Santorini, Andros (Gavrio), Paros, Samothraki, Karpathos, Kasos. Interventions in the mainland ports are also required, indicatively in the ports of Volos, Agios Konstantinos, Kavala and Kyllini. The measure includes the following components: M-1: Immediate heavy maintenance and/or reconstruction of port infrastructure on ports where it is deemed urgent for reasons of safety and accessibility of the islands. M-2: Preparation and implementation of a programme of upgrading port infrastructure, facilities and equipment, based on the new engineering and technological requirements for users (passengers, ships and stakeholders) – as resulting from measure MT-Soft 5. This task will comprise 2 phases: 1. Preparation Phase: - Carry out a comprehensive inventory of port infrastructure including the condition of infrastructure and a review of operational issues. - Identify ports where infrastructure needs to be rehabilitated and/or improved, as well as facilities and equipment of ship services need to be modernized (alternative fuels, electric charging, waste treatment, etc.). - Launch feasibility studies for the corresponding rehabilitation / improvement works at each port including socio-economic and environmental impact assessment. - Prepare a staged programme for rehabilitating / improving port infrastructure and facilities. 2. Implementation phase with a staged rehabilitation / improvement of the proposed infrastructure and facilities.
P-Infra 3	Port relocation – new port developments in island cities where traditional ports are landlocked by urban extension	In a number of Aegean islands, the existing ports are tightly encircled and landlocked by the urban developments in the cities. This makes the port operations more inefficient, the fluidity of movements between seaside and landside constrained and generates significant negative external effects for the local population. In parallel, the economic structure of the islands has changed. Tourism is much more developed and demand for touristic flows is steadily increased in terms	The measure aims to prepare and implement a programme for relocating the main ports of islands with relatively large/dense cities. It will comprise 2 phases: 1. Preparation Phase: - Identify the ports and respective cities where the aforementioned problems are intense. - Carry out an inventory of islands where plans for main port’s relocation are under various phases of development. - Launch pre-feasibility studies for the remaining islands. - Prepare a staged programme for relocating ports. 2. Implementation phase from technical studies to construction.

Measure Code	Measure Title	Background and Rationale	Description
		of passengers and touristic ships (yachting, sailing etc) creating needs for a new port "profile". To respond to this situation, the rational solution is to: • Consider converting the old ports into marinas, ports for serving touristic vessels (yachts and sailing boats) or other types of operations; and, • Relocate the main port outside the dense urban area with appropriate connections and suitable vehicle traffic management. In Mytilene and Chios, related port Master Plans are under development and/or public consultation. The same measure should also apply in certain smaller islands of intense touristic flows, where urban/ tourism developments have been important during the last decades (e.g. Santorini, Naxos and Paros islands in the Cyclades).	
P-Infra 8	Development of Lavrio port as an alternative to Piraeus and Rafina for domestic ferry traffic	Due to its favourable configuration (well protected port nearest to the Cyclades) Lavrio port was initially planned to be one of the main ports in continental Greece for serving the islands in the Aegean Sea (Cyclades, North Aegean Islands). In addition, with regard to road access the situation is presently critical in both Piraeus passenger terminals (ferry and cruise) and Rafina ferry port: • In spite of the impressive road and urban works carried out during the last two decades Piraeus remains a very congested place with an uneasy access to a rather unwelcoming port area. • The very last kilometres of the 30 km-long road between Athens and Rafina run through Rafina city centre where it is a 2 lanes street highly congested during the peak season. For its part, Lavrio north port, where the ferry, Ro-Ro and cruise facilities are located, has very good road access	The objective of the measure is to develop Lavrio port as an alternative to Piraeus and Rafina port for the domestic ferry traffic. This requires: • Improvements of the existing 2 x 2 lanes road between Athens and Lavrio: construction of grade-separated junctions to alleviate local bottlenecks at grade junctions or construction of a new motorway parallel to the existing road. • Developing a suburban rail link between Athens (Koropi) and Lavrio port. • Implementing administrative measures required to facilitate the development of domestic ferry traffic in Lavrio port. • Once the domestic ferry-traffic develops at the north port building a new road access to the south port (Lavrio bypass) in order to make possible to shift international Ro-Ro traffic to these facilities. The Measure will comprise 2 phases: 1. Preparation Phase consisting of a comprehensive feasibility study including an exhaustive assessment of all expected socio-economic and environmental impacts; 2. Implementation phase with a staged construction of the rail and road accesses to Lavrio port (north and south port).

Measure Code	Measure Title	Background and Rationale	Description
		from/to Athens: it is directly served by a good 2x2 lanes road with grade junctions linking Athens and Lavrio which ends at the port north gate. One of the reasons why Lavrio port is presently underutilized for domestic ferry traffic is probably the absence of good public transport connection between Athens and the port.	
AT-Soft 1	Maintenance and improvement of the Public Service Obligations (PSOs) in Greek airport system considering synergies between maritime and air PSOs	PSOs have been imposed on scheduled (domestic) air services since 2001. Currently, in the Greek airport system 28 routes are operating as PSOs: 22 of them are direct airport to airport connections (e.g. Athens-Paros, Athens-Zakynthos), 2 transit flights (Athens-Kozani-Kastoria & Thessaloniki-Limnos-Ikaria) and 4 transit flights that serve more than one intermediate airports namely (a) Rhodes-Karpathos-Kasos-Siteia (b) Limnos-Mytilene-Chios-Samos-Rhodes (c) Rhodes-Kos-Kalymnos-Leros-Astypalaia and (d) Corfu-Aktio-Kefalonia-Zakynthos-Kithira. The flight frequency depends on season: (a) the high season lasts from June until September (b) the medium season refers to April, May and October and (c) the low season lasts from November until March that provides at least 3 return flights on a weekly basis per destination.	PSOs can be further improved towards two directions: (a) Further improvement of the PSO contract terms. According to the current schema, air carriers operating the 4 transit flights are committed to land in all intermediate airports even though there is no passenger to travel ("touch and go"). For environmental and economic reasons, ways should be investigated to avoid unnecessary landings. (b) Establishment of synergies between existing maritime and air PSOs (common ticket, timetable synchronisation, port-airport transfer etc.).
AT-Infra 1a	Planned projects of airports operated by HCAA aiming to resolve safety/security & operational problems	Following the privatisation of the Athens International Airport and the 14 international airports of Fraport, the Hellenic Civil Aviation Authority (HCAA) remains responsible for the management, operation and development of 23 airports (Alexandroupolis, Araxos, Ioannina, Kalamata, Kastoria, Kozani, Nea Anchialos in mainland, Sitia in Crete and Astypalaia, Chios, Ikaria, Kalymnos, Karpathos, Kasos, Kastelorizo, Kithira, Leros, Limnos, Milos, Naxos, Paros, Skyros and Syros), as well as of the Heraklion	Projects aiming to improve the safety of runway and airside operations include: Alexandroupolis: Completion of new Air Traffic Control and upgrade of central light control system. Astypalaia: The embankment in the northern part of the runway has been corroded and must be restored. Ioannina: Maintenance of runway lights, maintenance of airport obstacle lights and maintenance of VOR communication. Kalamata: Upgrade of runway and taxiways, construction of Air Traffic Control, construction of subsidiary building and upgrade of the electrical network and the illuminated runway/taxiway signs and guidance signs. Kalymnos: Installation of obstacle lights in the wider aerodrome area Kastelorizo: Restoration of safety zones and obstacle-free zones and maintenance of obstacle

Measure Code	Measure Title	Background and Rationale	Description
		airport which will also be privatised. For the above 23 airports, the Problem Analysis revealed various drawbacks and associated HCAA requests/studies to improve the safety of landside and airside airport operations, enhance airport security, alleviate operational bottlenecks and upgrade the level of service offered and finally increase their potential for future growth.	lights Limnos: The airport requires an upgrade of air navigation infrastructure, maintenance of runway and taxiways, water tower construction and Precision Approach CAT I on the edge 04 Milos: Maintenance and upgrade of VOR, installation of apron lighting system, upgrade of airport security fencing, obstacles removal in runway threshold 08. Runway length expansion by 330 m (up to its maximum of 1200m), width expansion by 30 meter (instead of today's 25m) and improvement of safety zones. Nea Anchialos: Improvement of pavement strength, development of runway/taxiway guidance signs. Paros: Development of Rescue and Fire Fighting Services Station Syros: The hill Neraida is within the Obstacle Limitations Surface of the airport and HCAA plans to remove it. The runway must be extended by 20 meters. In addition, a safety zone of 60 meters plus a 150 m clearway must be developed in both ends of the runway. Sitia: Supplementary fencing and ground earthworks, maintenance of airfield lights Projects aiming to alleviate operational bottlenecks and upgrade the level of service offered by the airport (including airport-related flight delays and airport accessibility): Alexandroupolis: The airport serves 160.000 passengers annually and has only 4 medium sized aircraft stands. Apron expansion and new taxiway construction are required. Ikaria: Apron expansion, new taxiways, improve road accessibility. Kalamata: The airport serves 230.000 passengers per year while the existing terminal building is only 2.800 m^2. HCAA plans to expropriate land and perform the passenger terminal expansion and rearrangement plus the apron expansion and a new taxiway construction. Kalymnos: The runway length is short (1.015 meters) and should be extended by 60 meters (cannot be extended more due to the geomorphology of the area). Karpathos: The airport offers 3 aircraft stands while it requests additional four. Two of these stands can be justified by the current level of airport traffic (during summer). The declared airport capacity is expected to be increased for 4 to 8 airplane movements per hour. That, in relation to the island's strong tourism potential (confirmed by the Consultant's model-based analysis) supports the need for 2 more aircraft stands. It is suggested to develop 2 new airplane parking stands with area provision for 2 additional places (to be constructed when the traffic is increased). Kasos: The airport of Kasos has very limited traffic (about 3.500 passengers per year). The runway length is 983 m and its orientation is not optimal. If the wind speed is greater than 18 knots, an aircraft cannot be landed. The apron provides one aircraft stand. HCAA plans to expand the apron to provide 2 additional stands.

Measure Code	Measure Title	Background and Rationale	Description
			Given the low traffic of the airport, the development of 1 additional aircraft stand (instead of 2) seems to be a more pragmatic alternative. Kastelorizo: The airport's runway is 798 m long by 25 m wide. The terminal building covers only 120 m^2 and the apron provides 1 aircraft stand. HCAA plans to extend the runway by 250 m, increase its width to 30 meters and construct a new passenger terminal of 500 m^2. Milos: Terminal building improvement/rearrangement. Paros: The new Paros Airport operates since 25/07/2016. In 2016 the annual passenger arrivals were doubled. The runway is 1.400 m long and the terminal building is only 745 m^2. HCAA plans to construct a new terminal of 8.400 m^2 (main building plus app. 3700m^2 for auxiliary spaces) and extend the runway length by 400 m, extend the apron, develop the vehicle parking area and a fuel farm. Chios: The airport serves annually about 200.000 passengers. The runway length is 1.511 m and should be extended to allow flights from more destinations. HCAA plans to extend the runway to 1.800 m, the area in front of the runway was expropriated, yet there is a need to fence the plot, and to upgrade the existing passenger terminal of 1.200 m2. There are also plans for the development of a new terminal building of 4.000 m^2. Kithira: Runway expansion from 1.461 m to 1.800 m. The runway elongation is justified by the fact that the older 737 series aircrafts widely used by tour operators travelling to Greek islands, are gradually replaced by the new generation 737-800 airplanes (also known as 738) which cannot take-off from the existing runway of Kithira airport. Naxos: The runway length is only 900 meters and should be increased to 1200 meters to cope with the airline requests. An even longer runway length is out of question due to the fact that the airport is adjacent to protected and residential areas. The airport terminal is 350 m2 and cannot accommodate efficiently the passenger traffic (35.135 pax/year in 2016). HCAA plans to extend the runway length to 1.200 m and construct RESA in both sides of the runway, to construct two new taxiways, to extend the apron by 8.000 m2 and to expand the terminal building by additional 2.100 m2.

Pillar 6: Improving the Efficiency of Logistics Sector

Measure Code	Measure Title	Background and Rationale	Description
RT-Soft 3	Promoting outsourcing of transport and logistics activities to restructure own-account fleet	Certain legal provisions may favour the use of own-account vehicles. Many private companies are totally ignorant of the benefits and savings of outsourcing transport and logistics activities.	This measure is composed by two sub-measures: M1: Raise awareness of shippers through Chambers of Commerce and road transport professional associations of the benefits of outsourcing their transport and logistics activities - Establish dialogue between transport operators and shippers, separating the latter in two groups: big shippers and SME - Organize regularly and frequently dedicated seminars and workshops M2: Clarification of the conditions of rent / lease for trucks with / without drivers - Revise the definition and possibilities of professional rent and lease of commercial vehicles - Decide whether lease with driver is legal and which conditions should apply - Review the possibility for licensed third-party trucking companies to hire trucks from truck dealers/manufacturers and operate them with their own plates
RT-Soft 4	Promoting cooperation in the Transport & Logistics sectors	Necessity to change the cultural tradition of managing everything individually which impedes the concentration of the sector and the creation of synergies between companies Besides, there is a need for a legal status different of SA to induce the individual transport operators to regroup while keeping control of their own activities	• Implementation of a technical assistance by institutional stakeholders and associations to support the road transport operators in establishing forums and discussion platforms • Implementation of seminars, workshops and vocational trainings for road transport operators to demonstrate the benefits of professional cooperation • Development of Freight Exchanges and industry networks (which do not exist yet in Greece) at regional and national levels to endorse truckers combining efforts in order to rationalize the employment of their fleet and decrease the number of empty journeys. • Induce small companies to merge to achieve critical size with State support through fiscal bonuses and other incentives Recommended accompanying measure: • Explore the possibilities of implementing the cooperative legal status
RA-Infra 8	New rail connection of Kavala port 'Philip II' with main rail network	The connection of the Port of Kavala to the rail network would be a possible initiative to strengthen the Sea2Sea corridor by adding a third Greek Port to the corridor after having improved the main sections from Alexandroupoli and Thessaloniki.	The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis the construction of a new single-track railway line, app. 32km long, was considered, connecting Kavala freight port (Philip II Port, in the area of Nea Karvali) with the existing railway line Thessaloniki – Alexandroupolis. The opportunity to serve Nea Karvalli, Perni and Gravouna settlements is to be further studied. The link will then mostly run parallel to Egnatia Odos Motorway and meet the existing railway line Thessaloniki – Alexandroupolis in the area of Toxotes Xanthi.

Measure Code	Measure Title	Background and Rationale	Description
Private project	New rail line Volos port & industrial areas - Nea Anchialos airport - Almyros port	Main aim is to promote intermodality in freight transport and upgrade accessibility of transport nodes, by connecting the port and industrial areas of Volos with the nearby airport at Nea Anchialos and the port and industrial zone of Almyros.	The measure is envisaged as a private (or PPP) initiative to upgrade the rail connection from the port to the industrial areas (VIPE 1 & VIPE 2) of Volos and build a new rail link to/from the nearby airport at Nea Anchialos and the port and private industrial zone of Almyros.
AT-Infra 1b	Planned projects of the airports operated by HCAA aiming to improve airport potential	Following the privatisation of the Athens International Airport and the 14 international airports of Fraport, the Hellenic Civil Aviation Authority (HCAA) remains responsible for the management, operation and development of 23 airports (Alexandroupolis, Araxos, Ioannina, Kalamata, Kastoria, Kozani, Nea Anchialos in mainland, Sitia in Crete and Astypalaia, Chios, Ikaria, Kalymnos, Karpathos, Kasos, Kastelorizo, Kithira, Leros, Limnos, Milos, Naxos, Paros, Skyros and Syros), as well as of the Heraklion airport which will also be privatised. For the above 23 airports, the Problem Analysis revealed various drawbacks and associated HCAA requests/studies to improve the safety of landside and airside airport operations, enhance airport security, upgrade the level of service offered and increase their potential for future growth.	Kastoria: The airport has a runway of 2.700 meters, yet very low annual domestic traffic (7.300 passengers) and negligible international traffic. The apron offers 2 stands for small airplanes. The existing terminal covers 1.150 m2. Plans exist for a new terminal building of 3.500 m2 and improvements of its surrounding area, as well as the apron expansion for two more stands and the completion of the new Air Traffic Control Kozani: The airport has a runway of 1.822 meters, yet very low annual domestic traffic (5.600 passengers) and no international traffic. The apron offers 1 airplane stand. The existing terminal covers 300 m2. The airports of Kastoria and Kozani are close to each other (distance about 77km). The recent development of Egnatia Odos motorway has reduced the road connection from the cities of Kastoria and Kozani to Thessaloniki, (2 and 1,5 hours respectively), shifting the modal split from air to road. An option for these airports is to seek for a new role, namely, to attract international flights for tourism purposes in their region. However, the need for the operation of both airports is questionable. It is proposed to maintain and develop Kastoria airport with focus on logistics operations, and to keep Kozani airport as a training centre for new pilots and other staff. Nea Anchialos: In addition to the projects for pavement and runway/taxiway signs, the airport requires an alternative access road as the entrance to the civil airport installations passes through the military area. To resolve this problem a new (yet very expensive) local road must be constructed. A new rail access is also proposed to connect the airport with the neighbouring industrial areas and port of Volos. It is thus proposed to further develop air freight and logistics operations in Nea Anchialos airport.
MT-Soft 3	Development of Port Community Systems / Single Window Systems (PCS/SWS) in Greece	Port schedule reliability has become a crucial operational element for liner shipping companies, especially for liner services, since vessels are now given fixed time-windows at each and every port of call. The need for short calls or, at least, duration of port calls not exceeding the window limits, is exacerbated by the fact that liners (and a vast majority of tramps) are steaming at	The Measure aims to progressively develop in Greece: • Port Community Systems (PCS) which are secured IT-based systems aimed to standardize and simplify all business processes between all port stakeholders, public and private (i.e. B2G, B2B, G2G) • Maritime Single Window System (MSWS); and • National Single Window System (NSWS). The Measure includes the following actions: • Request a Technical Assistance or

Measure Code	Measure Title	Background and Rationale	Description
		slow/super-slow speed to save on fuel expenses. Consequently, it is expected that time savings at ports can provide for more time available at sea, therefore vessels can reduce speed on the next leg, saving fuel and emissions and ensuring timely arrival at their next port of call. Streamlined, paperless, transparent procedures for cargo clearance and release at ports are key to reduced lay-time, lower port storage and inventory cost and thus decreased cost of goods. They also allow for better planning of transport operations between the port and its hinterland, thus alleviating traffic congestion in and around the port, and a better planning of further logistics operations. From the point of view of shipping lines, faster cargo deliveries mean quicker turnover and optimized utilization of the container equipment, lower container fleet inventory and therefore reduced container equipment cost.	Twinning from one of the leading EU countries in the field of PCS/ MSWS/NSWS. • Develop an inter-professional public-private joint working programme of analysis and re-engineering of business processes. • Tests-pilot implementations at Piraeus and Thessaloniki. • Extend it gradually to other main ports and land-border crossings. • Promote the Authorized Economic Operator status.
MT-Soft 4	Promoting initiatives to establish Greece as the South European Logistics Hub	Transit and transhipment cargo-flows support Greek port activity. However, they would prove more beneficial if high-value services could be added to these goods while passing through Greece. Apart from the implementation of many ad-hoc policies at state level, there is a need for logistics service providers to unite their efforts, ideas and capabilities to build a Greek logistics product of high quality and promote and sell it.	The measure entails the following actions: • Analyse success stories in the field of logistics in other EU countries and implement their best (transferable) practices • Establish cross-sectional working groups between Associations to identify issues and lobby for trade facilitation and other measures of common interest • Establish a dialogue with private port/terminal operators of Piraeus and Thessaloniki with a view to making both Greek ports the leading South European and Mediterranean logistics hubs •Promote sea-based and intermodal transport through Core and Comprehensive TEN-T ports in Greece by improving their infra- and superstructure. Targeted interventions will enable ports to participate in transport corridors and logistic chains, and thus their further integration in the TEN-T. Interventions will be defined and selected based on an assessment of the specific characteristics, real needs, possibilities, opportunities and perspectives of each port. • Promote Motorways of the Sea and intermodal transport with a significant sea-based part in the Adriatic-Ionian region within the framework of the EUSAIR, as well as connect Greek ports and other non-EU ports, in third countries and neighbouring regions, especially in the BSEC region and the Mediterranean Sea (Union for the Mediterranean), establishing viable and significant transport corridors and logistic chains.

Measure Code	Measure Title	Background and Rationale	Description
			• Establish a National Logistics Platform/Forum • Organize seminars and workshops and business group visits abroad to canvass new Customers, find partners, and grow a network. The actions proposed mainly involve stakeholders from the private sector (Professional Associations, Chambers, Port stakeholders, etc). MIT, in cooperation with MoMAIP, may play a role of coordination in initiating meetings and discussions at a first stage. MIT might also play a role as contributor to wider promotion of transport/logistics service offer of the Greek sector through its administrative channels and through its participation in international institutions and communication fora.
P-Infra 5	Improvement of land access to Thessaloniki port	Following the recent privatization of ThPA S.A. and because transit traffic to the neighbouring countries in the Balkan and Central Europe is a major prospect for developing the traffic in Thessaloniki port, the improvement of connections of the container and dry bulk terminal to/from the motorway and rail networks is essential. However, the development of this transit traffic is presently hindered by the poor road and rail connections between the port and its hinterland.	The objective of the measure is to improve land access to Thessaloniki port. This requires building a new direct road connection from the western gate near the container and dry bulk terminal up to PATHE motorway. This measure will comprise 2 phases: 1. Preparation Phase consisting of a finalizing the ongoing studies carried out by Egnatia Odos 2. Implementation phase with the construction of the direct road access from the western gate near the container and dry bulk terminal to main motorway network.
P-Infra 6	Extension of Thessaloniki container terminal	The privatization process of ThPA S.A. has been recently finalized. Under its concession agreement, the new concessionaire has the obligation to carry out a programme of “compulsory investments” including the extension of the existing container terminal at Pier 6-West. Together with the improvement of its road and rail hinterland connections, this will allow Thessaloniki port to aggressively develop its share of transit and, thus, take full advantage of its geographic position as gateway to the southern Balkans and Central Europe.	This measure aims to extend the existing container terminal at Pier 6-West of Thessaloniki port to allow for developing the transit traffic of containers to/from the southern Balkans and Central Europe. The project consists of building a new quay 425 m-long and 16 m-deep in the alignment of the existing berth (which is 425 m-long and 12 m-deep). The new container berth will be equipped with post-Panamax rail mounted gantry cranes. With this extension the capacity of the container terminal will be about 1 million TEU per annum (compared with 440,000 TEU presently).
P-Infra 7	Development of capacity for dry bulk ports	85% of the dry bulk traffic handled in port of international importance (excluding private ports) is accommodated at the 3 major “dry bulk” ports, namely: Thessaloniki, Volos and Elefsina. In these ports, and although data on port capacity was not available for Volos and Elefsina, capacity development might be required in the next 20 years for coping with the increase of dry bulk traffic. Presently, both Thessaloniki and	This measure aims to develop the capacity for accommodating dry bulk cargo in the ports where the volume of traffic is likely to result in bottlenecks. In Thessaloniki port, the Port Master Plan prepared by Thessaloniki PA S.A. makes provision for the extension of dry bulk facilities at Pier 6 – East by constructing two additional berths 300 m-long each with a depth of 16 m and by replacing the existing old rail-mounted quay cranes by modern ones. This project is not included in the “compulsory investments” to be made by the

Measure Code	Measure Title	Background and Rationale	Description
		Volos are still equipped with relatively old handling equipment the productivity of which is probably not in accordance with the highest international standards, reducing accordingly the capacity.	concessionaire under his contract. Before any infrastructure extension is envisaged, one should ensure that the best is made of the existing ones by installing the most appropriate equipment ensuring the highest handling performances considering the type of commodity and of operation (loading / unloading).
L-Soft 1	Integration and partial revision of the legal framework related to logistics	Over the years, there has been a proliferation of ad-hoc regulations applied to logistics activities in Greece, with much duplication, overlap of administrative responsibilities, and unnecessary constraints. In addition, there has been relatively weak implementation and enforcement capacity in several areas. This situation leads to several distortions including incentives to inefficient practices, weak or non-compliance with regulations and missing or underdeveloped markets for some logistics activities. The number of regulations in itself is not the problem. It is however the lack of coherence and consistency among the regulations and their uneven implementation that creates inefficiencies and distortions. Regulations, typically, have a legitimate purpose and a Third-Party Logistics (3PL) provider in any country will have to deal with several national-level regulations. For Greece, regulations also have to be EU compliant. The regulatory framework of the logistics sector suffers from additional difficulties: • The logistics provider is not given a comprehensive and exhaustive list of regulations to comply with and documents to produce. This translates into higher information costs and sub-optimal private economic decisions. • Over-regulation in some areas coexists with gaps in regulation in other areas, and old regulation sometimes coexists with new regulation. The challenges of “doing business” across the country are mirrored in the logistics sector: over-regulation, excessive cost of, and long time for opening a business.	There is a need to carry out an inventory of the existing laws and regulations in order: - to identify, harmonize and streamline the vocabulary and definitions of logistics real estate objects and other facilities erasing the confusing polynomiality. The same goes with the vocabulary related to (transport and) logistics professions. - to have these objects as well as all corresponding personal or company licensing, fixed or mobile equipment registry, land-use permits and other necessary setup and operational arrangements legally considered and dealt with under a single specific group of ‘transport and logistics’ laws and processed under a single clearly-identified bureaucratic channel, if possible, in one single Ministry acting as a one-stop-shop or single window system. • to provide the opportunity to get rid of certain legal provisions which can be obsolete or void. Greece being increasingly included in global supply chains, national participants in these chains must adapt to logistics sector’s international rules and standards which do not depend on the Greek or any other national legal public framework. Relevant public authorities here have the duty, in cooperation with professional associations, to encourage and promote continuously the development of these global self-regulation processes through seminars, workshops, and other dissemination tools. Mapping of who is doing what between ministries, within the ministry, between central, regional and local governments for each logistics services segment will help regulatory coordination and harmonization, reduction of duplications and gaps, and hence simplification of the process of legislation and implementation of policy making for the logistics sector in the medium-term.
L-Soft 3	Establishment of a National Logistics Observatory	There is lack of useful data and appropriate key performance indicators associated with benchmarking data. The only entity that collects data regarding logistics performance is the	The development of an appropriate National Logistics Observatory is necessary with regard to the following ultimate objectives: • To have a full, clear and reliable picture of the logistics, including all aspects of the logistics system, e.g. market actors,

Measure Code	Measure Title	Background and Rationale	Description
		Hellenic Statistical Authority, supervised by Eurostat, but this task has mainly been designed to understand and analyse transport issues and not purely "logistics" performance aspects. Statistics for logistics per se are not easily "visible" in transport and economic data bases in Greece. Therefore, the establishment of a National Logistics Observatory is an action of high importance for rational policy-making and planning, as also foreseen in the National Action Plan for Logistics.	infrastructure, location of facilities and technical capacities, transport means, traffic volumes and patterns, service types offered, various direct and indirect impacts and, their evolution through time • To monitor these evolutions • To understand and assess the results of previously implemented policies and other socio-economic developments • To estimate future trends and evolutions • To assess, rank and select different possible future policies The expected output is the recording and provision of the situation of the Greek logistics system and its relationships with economic and other factors at any time. Technical support has been given via SRSS for the establishment of this observatory, in particular a study that defined inter alia the relevant indicators, the thematic fields of database, the data collection procedures and recommendations on missing data collection. Support for establishing the observatory is yet to be implemented focusing in particular on the architecture of the database.
L-Soft 5	Incentives for encouraging mergers and other types of cooperation in the sector	The logistics sector in Greece appears as a two-tier system. international logistics operators are present in Greece and, along with few large Greek companies, offer modern integrated services. They coexist with a plethora of small businesses providing limited and low value added trucking and warehousing services. The small businesses dominate the second and third tiers of supply chains, controlling notably local distribution. Below the international logistics companies, the current organisation of nationwide logistics to serve the final customer is sub-optimal and fragmented, consisting a major source of unreliability, additional costs, and low logistics performance. There are several layers (and quality levels) of distribution services. International and large Greek companies typically contract an intermediate layer of medium-size domestic 3PL providers to ensure distributions to warehouses in the provinces. Local distribution within provinces and warehousing is carried out by small companies, which operate small trucks on own account and own logistics facilities.	Reduction of fragmentation needs improving the business environment to help users and suppliers of logistics services achieve economies of scale in their core business, mainly through the outsourcing of non-core activities. To achieve those aims, several incentives should be developed in order to facilitate consolidation. Models of merging or promotion of participative schemes, associating small companies in larger integrated schemes, by foreseeing "secure" provisions for the viability of participants must be developed. Provisions for the governance of those "hybrid" collaborative schemes need the definition of transparent and simple governance rules. Obviously, prevention of constraints as cartels and free exercise of logistics activities, by encouraging new entries to the market and ensuring more effective functioning of the current actors, should be ensured. In addition, incentives should include measures for facing persisting cash flow problems of the sector companies under a "philosophy" combining "rights" and "obligations". As an example, companies to be merged might obtain loans with specific advantages (e.g. in time scale for paying back, but with the obligation to achieve a certain size threshold). Independent auditors can be assigned to monitor the process and evaluate the results, with processes and methods to be defined.
L-Soft 6	Revision of the legal framework for the	The Public-Private Partnerships arise as the most appropriate financing schemes for the creation of Logistics Centres/Freight	A partial revision of the existing legal framework for the development of Business Parks (Law 3982/2011-Part C) might specify a few provisions better adapted to the

Measure Code	Measure Title	Background and Rationale	Description
	development of Freight Villages / Logistics Centers	Villages, since they justify the mutual interest and motivations even if the logic behind the public sector's and the market players' actions respectively differ in nature. The development of Freight Villages is currently ruled by Law 3982/2011, which does not really promote PPP business models. However, in the current context the involvement of public authorities is necessary to encourage initiatives of the private sector for the development of Freight Villages.	specificities of Freight Villages and Logistics Centers, further facilitating their creation and the adoption of private and PPP funding models. The role of public authorities in issues like construction of connecting infrastructure and land availability is of crucial importance.
L-Soft 7	Supporting transparency and information flow in the logistics market through digital open platforms and standardization practices	This action firstly refers to the need of (potential) users for complete, continuous and reliable information about the logistics market services supply and related quality performance issues and costs. From the supply side, there is a need to encourage the private logistics companies to invest in quality certification procedures, initiate customer satisfaction assessment processes and adopt quality standards. There is no accreditation body oriented to logistics, neither officially accredited body that delivers relevant certifications for professionals of the sector. So far there are in practice no certification procedures for logistics, as in other EU countries, though there is a need for the development of a certification scheme and the creation of an integrated system for accreditation of bodies that certify the skills of professionals as well as the designation of professional profiles.	Various forms of accreditation and unformal quality reputation assessment internationally exist. Some of them are directly "market driven". As an example, open access platforms, initiated by professional associations (3PL providers, forwarders, etc.), diffuse information about supply of services, suppliers' performance assessment and customer satisfaction rates. This type of "interface" between logistics supply and demand acts as an instrument for diffusing information, continuously monitoring the market quality performance and increase competitiveness. These practices significantly improve self-regulation. It is therefore proposed to establish a National Interactive Platform for Logistics which will comprise a forum for diffusing information and thus assessing the quality of services provided by the market players.
L-Infra 1	Completion of a backbone network of Freight Villages	Logistics Centers generate larger-scale or external (network) effects, such as traffic diversion and modal shift, land use reorganisation, changes in local economy, employment, energy consumption and the environment.	A "backbone" national network of six (6) Freight Villages is proposed, with Freight Village locations in the following areas respectively: • Attica region-Thriassion Rail Terminal and Freight Village • Thessaloniki region- "Gonos" former army camp • Alexandroupoli • Larisa-Volos area • Patras • Igoumenitsa The proposed network provides a rational coverage of the Greek territory.

Pillar 7: Developing an efficient Urban and Suburban Public Transport System to support National Transport System

Measure Code	Measure Title	Background and Rationale	Description
RA-Soft 3 – P1	Fostering Multimodality	Currently multimodality between rail and other modes is very limited. This is particularly the case for the following: - Intercity Bus/Rail: KTEL and TRAINOSE are competing while proper arrangements between the companies could be beneficial for both clients and companies, especially as bus could play the role of feeders, not only for suburban rail but also for intercity rail (especially by maximizing the use the PATHE corridor) - Urban transport/Rail: rail stations are poorly connected with public transport modes (metro, LRT and bus) even in Attica. In provincial cities, KTEL is usually the urban transport operator. Services to rail station are usually limited resulting from low usage of trains and probably also competing situation between KTEL and TRAINOSE. - Rail/Private cars: very limited parking spaces are provided at OSE stations, including suburban rail stations. - Ferry/Rail: only Piraeus port is directly connected by rail (also by metro). - Airport/Rail: only Athens airport has a rail (and metro) connection Also, accessibility for PRM is still limited. There is no joint (bus+rail) tariff policy, neither at urban (Attica), regional or interurban levels. Moreover, no multimodal website does provide combined proposals.	The measure will include both soft and infrastructure interventions. The soft measures include: - Development of a platform of information on land transport services in Greece - Provide information on land transport services and tariffs to multimodal internet platforms - Prepare reform of the bus sector so to foster multimodality - Develop multimodal tickets, first in Attica, as a pilot project
RA-Infra 1-P1	Suburban rail line Koropi - Markopoulo - Lavrio	The rationale of this component of the measure is to complete the existing suburban rail network through extensions to Mesogeia & Lavreotiki areas to capture their increasing urban population, also in line also with new Master Plan of Athens/Attica. The Advanced Reconnaissance Alignment Study with the preliminary EIA is completed and approved. In addition, this project will definitely foster the potential of Lavrio Port as a ferry port operating with the islands.	The measure includes the rail connection of Lavrio city and port with the existing suburban line from Koropi Railway Station, totalling 32 km. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the line will accommodate 7 rail stations/stops (Markopoulo, Kalyvia, Keratea, Daskalio, Thoriko, Kyprianou, Lavrio Port). From the existing Koropi RS until the new stop of Thorikos a double-track railway line with high speed is considered, equipped with electrification and signalling. In the last section, from Thorikos railway stop to Lavrio Port RS, a single-track railway line is considered, with lower speed, also equipped with signalling and electrification. Another alternative to be examined is a single-track line along the entire length of the line, with provision for future

Measure Code	Measure Title	Background and Rationale	Description
			construction of double-track. The feasibility study shall compare and assess all alternative solutions.
RA-Infra 1-P2	Suburban rail line Athens Airport - Rafina (15km)	This measure component entails aims at extending the existing suburban rail network through to the area of Mesogeia, to capture the increasing urban population, but most importantly to serve the port of Rafina. The extension will serve the city and port of Rafina, upgrading the port's importance and changing travel behaviour between west and east coasts of Attica. The connection will further enhance the port's domestic maritime passenger traffic, especially during the peak summer period. The rail project is rather complex, crossing even densely populated area, and two options have been studied: from Airport (12 km) and from Pallini area (18 km).	The measure entails the design and construction of a new suburban electrified line of about 15 km. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis an alignment to the city and port of Rafina has been assumed from the existing suburban rail station of Athens International Airport as a shorter, easier to implement solution with less technical complexity.
RA-Infra 14 - P1	New suburban rail line Thessaloniki - Giannitsa - Edessa	This measure partly aims at improving the accessibility of urban agglomerations in Central and Western Macedonia, by providing direct suburban services between Thessaloniki and its satellite-cities (Chalkidona, Giannitsa, Edessa). Together with the other components of RA-Infra 14, this measure aims at reducing the travel time and operating cost along the existing rail corridor Thessaloniki-Edessa-Florina/ Neos Kafkasos (border with North Macedonia), as well as to the border with Albania in the future. It will thus enhance not only the interregional connectivity among the main cities in the area, but also the international connectivity with the neighbouring countries.	The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that Component 1 of the measure includes the construction of 50 km of new single-track electrified rail link from Gefyra (near Thessaloniki) to Skydra. Component 1 will allow to reduce current journey distance (via Veroia) by 25 km and journey time by 30 min. It will also connect Thessaloniki with several major towns by rail: Giannitsa, Pella, Chalkidona.
RI-Infra 16 - P1-3	Attica metropolitan road network: - Markopoulo bypass - Upgrade Markopoulo-Lavrio - Sounio-Lavrio (incl. Lavrio bypass)	Within the wider metropolitan area of Attica, an important intervention comprises the upgrade of the current 2x2 lanes Koropi – Markopoulo – Lavrio road axis, providing thus improved access to the port of Lavrio and alleviating the local bottlenecks (around Markopoulo and Lavrio). Another sub-project entails the upgrade of the existing Sounio – Lavrio road link including also partially new alignment, as well as the bypass road of the city of Lavrio that will provide direct access to the commercial port of Lavrio.	The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that the upgrade of the existing 2 x 2 lanes road between Athens and Lavrio comprises the construction of grade-separated junctions to alleviate local bottlenecks at grade junctions along the entire 30km axis and construction of a 5km bypass (motorway) at Markopoulo area. Moreover, the upgrade of the existing 2-lane road between Sounio and Lavrio includes its widening and re-alignment, where needed, as well as the construction of Lavrio bypass road (app. 5km) that will divert all heavy traffic outside the centre of the city and will provide easy access to the south (freight) port. This measure should be considered in coordination with the studies related to RA-Infra 1-P1 and H-Soft 2.

Measure Code	Measure Title	Background and Rationale	Description
RI-Infra 16 - P4	Attica metropolitan road network - Extension of Kymis Avenue to A1	The Transport Model shows that at horizon 2027 there are road bottlenecks in the wider metropolitan area of Attica, including large parts of the two main motorway axes (A1 and A8) and the ring road (A6). One major intervention is the extension of Kymis Avenue up to A1 that will alleviate traffic congestion at the intersection between A1 and A6. This intervention has been linked to the concession of Attiki Odos motorway and may be considered as part of its future extension.	The approximate road length of Kymis Avenue extension is 4 km, most of which is an urban tunnel of 3km, passing under the northern suburbs of Athens. The feasibility and option analysis study shall define the exact technical specifications of this measure.
H-Soft 2	Development of a Sustainable Urban Mobility Planning framework	Based on the relevant EU and national legislation, the promotion of Sustainable Urban Mobility Plans (SUMP) aims to improve the transport patterns for passengers and freight, and to shift them to more environmentally friendly transport modes in cities. In larger urban agglomerations (e.g. Athens and Thessaloniki metropolitan areas), there is a specific need to establish an Urban Mobility Planning framework which would be developed within a top-down approach and could bring all local authorities into a single planning activity in order to achieve the best results through integrated urban transport policies for the entire study area.	The measure includes the enhancement of the legal framework to establish an Urban Mobility Planning framework, primarily for Attica and Thessaloniki areas, and to add the necessary provisions for the cooperation of regional and local authorities to elaborate, implement and monitor SUMPs (and/or Regional Transport Plans) for these metropolitan areas. In compliance also with the outcomes of the NTPG, these plans will further focus on the specific transport and land use conditions in each region, capturing the predominant urban and suburban transport patterns and proposing measures to promote a sustainable and integrated transport system (e.g. use of green vehicles/ alternative fuels in urban public transport, continuing development of metro/light rail in major urban areas, deployment of ITS, safety and multimodal solutions at urban/regional level, etc.).

Pillar 8: Fostering Regional Mobility and Growth

Measure Code	Measure Title	Background and Rationale	Description
RI-Infra 3	Upgrade of road axis Lamia-Amfissa-Itea-Antirrio	This road is part of the comprehensive TEN-T network and of E65 European route. It can serve as alternative itinerary between Lamia and Patra and serves districts which have presently poor accessibility.	The approximate road length is 160 km. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis it was assumed that the road will be single-carriageway possibly with crawler lane on the mountainous areas between Lamia and Itea, and with alignment and safety improvements on the coastal section Itea-Antirrio. It is assumed that it will generally follow the existing alignment (road upgrade). The below sub-projects are considered as mature: • Upgrade of 42km with 7 at grade and 4 elevated I/Cs, and partially approved environmental terms. • Upgrade from Bralos to Amfissa, 30.5 km long, with approved environmental terms and completed study.
RI-Infra 4	Improvement of road accesses of Astakos and Agrinio to A5 Ionia Odos	The proposed intervention consists of two vertical axes of A5 (Ionia Odos) connecting the city of Agrinio and the port of Astakos with the motorway. The former section is part of the comprehensive TEN-T network and provides improved connection for Agrinio, while the latter enhances significantly the port's access to the national and European road network. The project mainly serves mountainous districts in Western Greece which presently have poor accessibility level.	The approximate road length is 50 km. The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that the road is single-carriageway with improved characteristics, generally following the existing alignment (road upgrade), except for segments where this is not feasible or cost effective.
RI-Infra 6	Upgrade of road axis Pyrgos - Kalo Nero – Tsakona	This road is part of the comprehensive TEN-T network. The Transport Model shows that the existing road south of Pyrgos will be congested at horizon 2037 and, thus, needs to be upgraded to increase its capacity. This road upgrade was initially part of the concession agreement with Olympia Odos. It was removed from contract after reset in 2013. The need for the project shall be confirmed through the feasibility study phase on the basis of the observed traffic demand and related forecasts.	There are two consecutive sections (Pyrgos – Kalo Nero and Kalo Nero – Tsakona). The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that both are to be upgraded with local alignment, safety and capacity improvements, with 2 lanes and wide shoulder. The approximate length of the first section is 55 km. The Council of State decided in 2010 that the Samiko – Giannitsochori 25 km-long section cannot be widened due to the constraints of crossing a NATURA 2000 area. Accordingly, the upgrade is assumed to comprise alignment improvements from Pyrgos bypass till Samiko intersection and from Elea to Kalo Nero bypass, while for the middle section from Samiko interchange to Elea, the upgrade would be limited to road safety improvements (i.e. roundabouts, paving, improve hazardous curves) without any road widening. For the 28km road section Kalo Nero – Tsakona, it is possible to have alignment and capacity improvements with road widening and safety improvements.

Measure Code	Measure Title	Background and Rationale	Description
RI-Infra 9	New road link Preveza - Ionia Odos (A5)	The measure corresponds to a Vertical Axis of Ionia Odos connecting the motorway with the city of Preveza via Filippiada intersection.	The total length of the road is 31 km. The feasibility and option analysis study shall define the technical specifications. In the framework of the current analysis a motorway (2 x 2 lanes with emergency lane) was considered. It will partly follow a new alignment and partly the existing one with upgrade / widening of national road Filippiada-Preveza.
RI-Infra 10	Upgrade of road axis Igoumenitsa-Parga-Preveza	This 100 km-long road has presently numerous sections in poor or very poor condition which raises safety issues. About 20 km have already been improved. It crosses districts which are poorly ranked in terms of accessibility.	The total length of the road remaining to be upgraded is about 80 km. Major upgrades of the existing road keeping the current profile and following the existing alignment of the Igoumenitsa-Preveza national road are proposed.
RI-Infra 13	Upgrade of VOAK Eastern (Agios Nikolaos - Siteia) & Western (Chania-Kissamos Kastelli) road sections	These road sections are part of the comprehensive TEN-T network. Except for localized sections which have already been improved, they have poor characteristics and raise safety concerns.	The total length of the road sections still to be improved is about 72 km. The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that the roads will be single carriageway with improved characteristics. They would mostly follow the existing alignment (road upgrade).
RI-Infra 15	Upgrade of North-South Evvia road axes	This road is part of the comprehensive TEN-T network. Both branches (north and south) serve districts of Evia island which have presently poor or very poor accessibility as measured by the effective density.	The total length of both road axes is 250 km. The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that the road will be single carriageway with improved characteristics. It would generally follow the existing alignment (road upgrade) with some new sections.
RI-Infra 17	Upgrade of road axis Thessaloniki - Chalkidona - Giannitsa – Mavrovouni	The Transport Model shows that at horizon 2037 there are bottlenecks on the road route between A1-Veroia-Edessa, i.e. the road south of the link Thessaloniki – Giannitsa - Mavrovouni. It is expected that increasing the capacity of the latter will divert some traffic from Egnatia Odos and the Veroia – Edessa link. This project has been tested with the Transport Model and the results show that indeed, the capacity increase on the Thessaloniki – Mavrovouni axis alleviates the bottlenecks south of Edessa. The need for the project shall be confirmed within the next 10 years through the feasibility study phase on the basis of the observed traffic demand and related forecasts.	The approximate road length is 63 km. The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that it would be upgraded with capacity increase (widening) following the existing alignment.
RI-Infra 20	Upgrade of South Road Axis of Crete (NOAK) and its Vertical Axes	The Transport Model shows that at horizon 2037 there is a bottleneck on the existing road between Heraklio - Agioi Deka - Tympaki, which is part of the	The total length of the axes is approximately 170km, including the NOAK section Tympaki-Ierapetra and the Vertical Axes Heraklio-Agioi Deka and Pachia Ammos - Ierapetra. The feasibility and option analysis study shall define

Measure Code	Measure Title	Background and Rationale	Description
	(Heraklio–Agioi Deka and Pachia Ammos–Ierapetra)	South Road Axis of Crete (NOAK) and its Vertical Axes to VOAK. The links are also part of the Comprehensive TEN-T on the island of Crete. The need for the project shall be confirmed within the next 10 years through the feasibility study phase on the basis of the observed traffic demand and related forecasts.	the technical specifications of this measure. In the framework of the current analysis it was assumed that the measure consists of upgrading and widening the existing single-carriageway roads to increase their capacity, to improve substandard sections and to enhance road safety level.
RI-Infra 21	Upgrade of road axis Kalamata-Rizomylos-Pylos	This road serves districts of Southwest Peloponnese which have presently poor or very poor accessibility as measured by the effective density. The project will also support the regional economic development, especially in terms of tourism, since large parts of the current road network are of poor geometry and low road safety level.	The total length of the road is approximately 42 km and there will be local interventions where needed. The feasibility and option analysis study shall define the technical specifications of this measure. In the framework of the current analysis it was assumed that the road will remain single carriageway in most parts, except for the first section near Kalamata urban area (divided by median). It would generally follow the existing alignment (road upgrade) with some new sections.

Annex V – Measures correlation to Pillars

CODE	MEASURE TITLE	PILLAR 1 Enhance Transport Safety, Efficiency, Sustainability & Competitiveness	2 Make PATHE an efficient multimodal corridor	3 Build Stronger International Land Connectivity	4 Support the Tourism Sector	5 Enhance connectivity to Greek islands	6 Improve Efficiency of Logistics Sector	7 Develop efficient Sub/Urban PT System to support national transport	8 Foster Regional Mobility & Growth	TYPE (Institutional, Operational, Infrastructure)
RI-Soft 1	Development of Road Database and Pavement Management System (PMS) at the regional/ central levels	✓							✓	INST
RI-Soft 2	Development and implementation of a mechanism for securing funds for road maintenance at the regional/ central levels	✓							✓	INST
RI-Soft 3	Streamlining and strengthening the organisational structure at the national (MIT) and regional levels (Regions and Regional Units)	✓							✓	INST
RI-Infra 1	Rehabilitation/ reconstruction of road sections which are so deteriorated that they are not maintainable	✓			✓				✓	INFRA
RI-Infra 2	New high quality toad connection Ioannina-Kakavia-border with Albania (A5 North)			✓					✓	INFRA
RI-Infra 3	Upgrade of road axis Lamia - Amfissa - Itea - Antirrio	✓							✓	INFRA
RI-Infra 4	Improvement of road accesses of Astakos and Agrinio to A5 Ionia Odos						✓		✓	INFRA
RI-Infra 5	Upgrade of road axis Igoumenitsa - Sagiada - Mavromati / border with Albania including Igoumenitsa Bypass			✓						INFRA
RI-Infra 6	Upgrade of road axis Pyrgos - Kalo Nero – Tsakona	✓			✓				✓	INFRA
RI-Infra 8	Egnatia Odos Vertical Axis 50 (A27): Kozani - Florina – Niki / border with North Macedonia, Section: Ptolemaida - Florina		✓	✓						INFRA
RI-Infra 9	New road link Preveza - Ionia Odos (A5)	✓			✓				✓	INFRA
RI-Infra 10	Upgrade of road axis Igoumenitsa – Parga - Preveza	✓			✓				✓	INFRA
RI-Infra 11	Egnatia Odos Vertical Axis 70: Xanthi-Echinos-Dimario - border with Bulgaria		✓	✓						INFRA

CODE	MEASURE TITLE	PILLAR 1 Enhance Transport Safety, Efficiency, Sustainability & Competitiveness	2 Make PATHE an efficient multimodal corridor	3 Build Stronger International Land Connectivity	4 Support the Tourism Sector	5 Enhance connectivity to Greek islands	6 Improve Efficiency of Logistics Sector	7 Develop efficient Sub/Urban PT System to support national transport	8 Foster Regional Mobility & Growth	TYPE (Institutional, Operational, Infrastructure)
RI-Infra 12	New high quality road connection between A1 and A8 motorways	✓	✓							INFRA
RI-Infra 13	Eastern (Agios Nikolaos – Siteia) and Western (Kissamos – Chania) sections of VOAK (A90)	✓			✓				✓	INFRA
RI-Infra 14	Upgrade of A1 North to the border with North Macedonia, Section: Chalastra (jct A1/A2) - Polykastro		✓	✓			✓			INFRA
RI-Infra 15	Upgrade of North and South Evia Road Axes	✓			✓	✓			✓	INFRA
RI-Infra 16	Attica metropolitan road network: - Markopoulo bypass - Upgrade Markopoulo-Lavrio - Sounio-Lavrio (incl. Lavrio bypass)				✓	✓	✓	✓	✓	INFRA
	- Extension of Kymis Avenue to A1		✓					✓		INFRA
RI-Infra 17	Upgrade of road axis Thessaloniki-Nea Pella-Giannitsa-Mavrovouni	✓							✓	INFRA
RI-Infra 18	Capacity increase of Schimatari (jct A1/A11) – Lamia section of A1 motorway	✓	✓							INFRA
RI-Infra 19	Capacity increase of Elefsina – Korinthos section of A8 motorway	✓	✓							INFRA
RI-Infra 20	Upgrade of South Road Axis of Crete (NOAK) and its Vertical Axes (Heraklio - Agioi Deka and Pachia Ammos – Ierapetra)	✓			✓	✓			✓	INFRA
RI-Infra 21	Upgrade of road axis Kalamata – Rizomylos – Pylos	✓			✓				✓	INFRA
RT-Soft 1	Establishment of a comprehensive data base at State-level for the Road Transport Industry	✓					✓			INST
RT-Soft 2	Revision of the enforcement set up for road transport	✓					✓			INST
RT-Soft 3	Promoting outsourcing of transport and logistics activities to restructure own-account fleet						✓			OPER
RT-Soft 4	Promoting cooperation in the Transport & Logistics sectors						✓			OPER
RT-Soft 5	Rejuvenation of the fleet of vehicles (all types)	✓					✓			INST
	M-1: Restriction on age of imported vehicles (all types)									

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	M-2: Bonus-malus system of taxes and incentives for new/old vehicles and 'clean'/'polluting' vehicles (all types)									
	M-3: Laying down a scale of maximum allowed ages and/or levels of emissions for all road vehicles									
RT-Soft 6	Creation of a Land Transport Authority and implementation of the reform of intercity bus transport	✓	✓		✓				✓	INST
	M-1: Exploring the institutional issues of merging RAS and RAEM									
	M-2: Revision of Law 4199/2013 on intercity bus transport									
	M-3: Establishment of the Land Transport Authority and capacity building programme									
	M-4: Implementation of the reform of intercity bus transport									
	M-6: Revision of the ownership and operational status of coach terminals after the reform									
RT-Soft 7	Increase of the visibility for road safety and toughening penalties for road traffic violations: M-2: Toughening penalties for road traffic violations, taking preventive and educational measures	✓								INST
RA-Soft 1	Facilitation of border crossings The most important actions envisaged in this Measure are: 1 - Coordination with neighbouring railways to guarantee availability of staff and traction locomotives 2 - Coordination border crossing controls with neighbouring countries		✓	✓	✓		✓			INST/ INFRA
RA-Soft 2	Modernisation of Rolling Stock	✓	✓						✓	OPER
RA-Soft 3	Fostering Multimodality:	✓		✓	✓			✓	✓	INST/ OPER
	Development of a platform of information on land transport services in Greece									
	Providing information on land transport services and tariffs to multimodal internet platforms									
	Preparing reform of the bus sector to foster multimodality									

CODE	MEASURE TITLE	PILLAR 1 Enhance Transport Safety, Efficiency, Sustainability & Competitiveness	2 Make PATHE an efficient multimodal corridor	3 Build Stronger International Land Connectivity	4 Support the Tourism Sector	5 Enhance connectivity to Greek islands	6 Improve Efficiency of Logistics Sector	7 Develop efficient Sub/Urban PT System to support national transport	8 Foster Regional Mobility & Growth	TYPE (Institutional, Operational, Infrastructure)
	Developing multimodal tickets, first in Attica, as a pilot project									
	Programme for upgrade of rail stations at national level	✓	✓							INFRA
RA-Soft 5	Consolidating the Rail Sector	✓	✓					✓	✓	INST
RA-Infra 1 - P1	Suburban Railway Line Koropi-Markopoulo-Lavrio	✓				✓		✓		INFRA
RA-Infra 1 - P2	Suburban Railway Line Athens Airport-Rafina	✓				✓		✓		INFRA
RA-Infra 2	Upgrade and potential realignment of Korinthos-Argos-Nafplio single rail line	✓			✓				✓	INFRA
RA-Infra 5	Upgrade of Thessaloniki-Promachonas line	✓	✓	✓					✓	INFRA
RA-Infra 6	Upgrade of rail section Alexandroupolis - Ormenio - GR/BG Border (part of Sea2Sea Project)			✓					✓	INFRA
RA-Infra 8	New rail connection of Commercial Port of Kavala “Philip II”			✓			✓		✓	INFRA
RA-Infra 10	Rail improvements between Athens and Thiva	✓	✓				✓	✓		INFRA
RA-Infra 14 - P1	New suburban rail line Thessaloniki - Giannitsa - Edessa	✓						✓	✓	INFRA
RA-Infra 14 – P2&3	New rail line Florina / Kastoria - Krystallopigi - GR/AL border and electrification of section Edessa - Florina / Neos Kafkasos - border with North Macedonia			✓					✓	INFRA
Private project	New rail line Volos port & industrial areas - Nea Anchialos airport - Almyros port						✓		✓	INFRA
Private project	Development of existing rail line Katakolo - Pyrgos - Ancient Olympia as a tourist offering				✓				✓	INFRA
P-Soft 2	Adaptation of schedules of domestic ferry to release congestion during peak periods	✓			✓	✓				
P-Infra 1	Preparation and progressive implementation of a programme for improving port facilities for domestic ferry passengers	✓			✓	✓				INFRA

CODE	MEASURE TITLE	PILLAR 1 Enhance Transport Safety, Efficiency, Sustainability & Competitiveness	2 Make PATHE an efficient multimodal corridor	3 Build Stronger International Land Connectivity	4 Support the Tourism Sector	5 Enhance connectivity to Greek islands	6 Improve Efficiency of Logistics Sector	7 Develop efficient Sub/Urban PT System to support national transport	8 Foster Regional Mobility & Growth	TYPE (Institutional, Operational, Infrastructure)
P-Infra 2	Preparation and progressive implementation of a programme for upgrading substandard port infrastructure and modernising ship service facilities	✓			✓	✓				INFRA
P-Infra 3	Ports relocation – new port developments in island cities where traditional ports are landlocked by urban extension	✓				✓				INFRA
P-Infra 4	Preparation and progressive implementation of a programme for developing port facilities for cruise ships	✓			✓					INFRA
P-Infra 5	Improvement of land connection to Thessaloniki port		✓	✓			✓			INFRA
P-Infra 6	Extension of container terminal in Thessaloniki port		✓	✓			✓			INFRA
P-Infra 7	Development of capacity for dry bulk cargo in main "dry bulk" ports (Thessaloniki, Volos, Elefsina)	✓					✓			INFRA
P-Infra 8	Development of Lavrio port as an alternative to Piraeus and Rafina for domestic ferry traffic				✓	✓		✓		INFRA
MT-Soft 1	Development and operation of comprehensive information systems for the maritime transport and port sectors with the aim of better monitoring port and maritime activities, performance and competitiveness	✓				✓	✓			INST
MT-Soft 3	Development of PCS / MSWS / NSWS in Greece			✓			✓			INST
MT-Soft 4	Promoting initiatives to establish Greece as the South European Logistics Hub	✓	✓				✓			INST
MT-Soft 5	Rationalisation of maritime and port network and promoting fleet renewal/ modernisation				✓	✓				INST
AT-Soft 1	Maintenance and improvement of the Public Service Obligations (PSOs) in Greek airport system considering synergies between maritime and air PSOs				✓	✓			✓	INST
AT-Infra 1a	Planned projects of airports operated by HCAA aiming to resolve safety, security & operational problems	✓			✓	✓				INFRA
AT-Infra 1b	Planned projects of airports operated by HCAA aiming to improve airport potential						✓		✓	INFRA
AT-Infra 2	Development of a core network of water airports for the provision of seaplane services from, to and between islands				✓	✓			✓	INFRA

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L-Soft 1	Integration and partial revision of the legal framework related to Logistics						✓			INST
L-Soft 3	Establishment of a National Logistics Observatory						✓			INST
L-Soft 5	Incentives for encouraging mergers and other types of cooperation in the sector	✓					✓			INST
L-Soft 6	Revision of the legal framework for the development of Freight Villages / Logistics Centres						✓			INST
L-Soft 7	Supporting transparency and information flow in the Logistics market through digital open platforms and standardization practices	✓					✓			OPER
L-Infra 1	Completion of a backbone network of Freight Villages	✓					✓		✓	INFRA
H-Soft 1	Support, development and implementation of ITS solutions in all transport sectors	✓	✓				✓	✓		OPER
H-Soft 2	Development of Sustainable Urban Mobility Planning framework							✓	✓	INST
H-Soft 3	Enhancement of Strategic Planning Capacity in MIT and MoMAIP	✓								INST

Annex VI – Decision of Environmental Conditions

Α. Π.: ΥΠΕΝ/ΔΙΠΑ/19273/1264
Ημ/νία: 24/06/2019

ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΥΠΟΥΡΓΕΙΟ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΚΑΙ ΕΝΕΡΓΕΙΑΣ
ΓΕΝΙΚΗ ΔΙΕΥΘΥΝΣΗ ΠΕΡΙΒΑΛΛΟΝΤΙΚΗΣ ΠΟΛΙΤΙΚΗΣ
Διεύθυνση Περιβαλλοντικής Αδειοδότησης
Τμήμα Γ
Ταχ. Διεύθυνση: Λ. Αλεξάνδρας 11
Τ.Κ.: 114 73
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ΠΡΟΣ: **ΥΠΟΥΡΓΕΙΟ ΥΠΟΔΟΜΩΝ ΚΑΙ ΜΕΤΑΦΟΡΩΝ**
ΓΕΝΙΚΗ ΔΙΕΥΘΥΝΣΗ ΣΤΡΑΤΗΓΙΚΟΥ ΣΧΕΔΙΑΣΜΟΥ ΜΕΤΑΦΟΡΩΝ ΚΑΙ ΟΔΙΚΗΣ ΑΣΦΑΛΕΙΑΣ
Διεύθυνση Ανάπτυξης Μεταφορών
Τμήμα Σχεδιασμού και Ανάπτυξης Μεταφορών
Αναστάσεως 2 και Τσιγάντε,
10191 Παπάγου

ΑΠΟΦΑΣΗ

Θέμα: Περιβαλλοντική έγκριση του Εθνικού Στρατηγικού Σχεδίου Μεταφορών βάσει της Στρατηγικής Μελέτης Περιβαλλοντικών Επιπτώσεων.

Ο ΑΝΑΠΛΗΡΩΤΗΣ ΥΠΟΥΡΓΟΣ ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΚΑΙ ΕΝΕΡΓΕΙΑΣ ΚΑΙ Ο ΥΠΟΥΡΓΟΣ ΥΠΟΔΟΜΩΝ ΚΑΙ ΜΕΤΑΦΟΡΩΝ

Έχοντας υπόψη:

1. Το ΠΔ 132/2017 (ΦΕΚ 160 Α/30.10.2017) «Οργανισμός Υπουργείου Περιβάλλοντος και Ενέργειας (Υ.Π.ΕΝ)».
2. Την ΚΥΑ με α.π. ΥΠΕΧΩΔΕ/ΕΥΠΕ/οικ.107017/2006 (ΦΕΚ 1225 Β/5.9.2006) «Εκτίμηση περιβαλλοντικών επιπτώσεων ορισμένων σχεδίων και προγραμμάτων σε συμμόρφωση με τις διατάξεις της Οδηγίας 2001/42/ΕΚ», όπως τροποποιήθηκε από την ΚΥΑ υπ' αρ. 40238/2017 (ΦΕΚ 3759 Β/25.10.2017).
3. Την ισχύουσα νομοθεσία της Ελλάδας και της Ευρωπαϊκής Ένωσης που αφορά σε μέτρα, όρους, περιορισμούς και υποχρεώσεις για τη διαχείριση και προστασία του περιβάλλοντος, όπως στα επιτρεπόμενα όρια εκπομπής στερεών, υγρών και αέριων ρύπων και θορύβου, στην προστασία του θαλάσσιου περιβάλλοντος, στη διαχείριση στερεών και

υγρών αποβλήτων, στη διαχείριση των υδάτων, στην προστασία της βιοποικιλότητας, των οικοτόπων και των πτηνών κ.ά.

4. Το με α.π. ΥΠΕΝ/ΔΙΠΑ/14389/989/28.2.2019 έγγραφο της Διεύθυνσης Περιβαλλοντικής Αδειοδότησης του Υπουργείου Περιβάλλοντος και Ενέργειας, με θέμα «Αξιολόγηση του τεύχους προσδιορισμού της έκτασης και του βαθμού λεπτομέρειας των πληροφοριών της Στρατηγικής Μελέτης Περιβαλλοντικών Επιπτώσεων για το Εθνικό Στρατηγικό Σχέδιο Μεταφορών».

5. Το με α.π. ΝΤΡG/17548/386/1.3.2019 έγγραφο του Τμήματος Σχεδιασμού και Ανάπτυξης Μεταφορών της Διεύθυνσης Ανάπτυξης Μεταφορών του Υπουργείου Υποδομών και Μεταφορών, με το οποίο υποβλήθηκε στη Διεύθυνση Περιβαλλοντικής Αδειοδότησης του Υπουργείου Περιβάλλοντος και Ενέργειας η Στρατηγική Μελέτη Περιβαλλοντικών Επιπτώσεων για το Εθνικό Στρατηγικό Σχέδιο Μεταφορών (α.π. ΥΠΕΝ/ΔΙΠΑ/19273/1264/1.3.2019).

6. Το με α.π. ΥΠΕΝ/ΔΙΠΑ/21864/1425/8.3.2019 έγγραφο της Διεύθυνσης Περιβαλλοντικής Αδειοδότησης του Υπουργείου Περιβάλλοντος και Ενέργειας με το οποίο, στο πλαίσιο του άρθρου 7 της ΚΥΑ υπ' αρ. ΥΠΕΧΩΔΕ/ΕΥΠΕ/οικ.107017/2006, διαβιβάστηκε αντίγραφο της ΣΜΠΕ προς:

   - Τα Περιφερειακά Συμβούλια του συνόλου των Περιφερειών της χώρας.
   - Τη Διεύθυνση Χωροταξικού Σχεδιασμού, τη Διεύθυνση Κλιματικής Αλλαγής και Ποιότητας της Ατμόσφαιρας, τη Διεύθυνση Διαχείρισης Φυσικού Περιβάλλοντος και Βιοποικιλότητας και τη Διεύθυνση Σχεδιασμού Μητροπολιτικών, Αστικών και Περιαστικών Περιοχών του Υπουργείου Περιβάλλοντος και Ενέργειας.
   - Το Γραφείο Γενικού Γραμματέα του Υπουργείου Υποδομών και Μεταφορών, το Γραφείο Γενικού Γραμματέα Υποδομών του ίδιου Υπουργείου, καθώς και το Τμήμα Σχεδιασμού και Ανάπτυξης Μεταφορών της Διεύθυνσης Ανάπτυξης Μεταφορών του ίδιου Υπουργείου, προκειμένου να δημοσιοποιήσει τη ΣΜΠΕ στο κοινό ως Αρχή Σχεδιασμού.
   - Το Γραφείο Γενικής Γραμματέως Τουρισμού και το Γραφείο Γενικού Γραμματέα Τουριστικής Πολιτικής και Ανάπτυξης του Υπουργείου Τουρισμού.
   - Το Γραφείο Γενικής Γραμματέως του Υπουργείου Πολιτισμού και Αθλητισμού.
   - Το Γραφείο Γενικού Γραμματέα του Υπουργείου Ναυτιλίας και Νησιωτικής Πολιτικής, καθώς και το Γραφείο Γενικού Γραμματέα Αιγαίου και Νησιωτικής Πολιτικής και το Γραφείο Γενικού Γραμματέα Λιμένων και Λιμενικής του ίδιου Υπουργείου.

   Στο ως άνω έγγραφο της ΔΙΠΑ αναφέρεται ότι, σύμφωνα με τη ΣΜΠΕ, το σχέδιο δεν αναμένεται να προκαλέσει διασυνοριακές περιβαλλοντικές επιπτώσεις και ως εκ τούτου δεν είναι απαραίτητη η διαβούλευση με όμορα κράτη που είναι είτε μέλη της Ευρωπαϊκής

Ένωσης είτε συμβαλλόμενα μέρη στη σύμβαση του Espoo για την εκτίμηση των περιβαλλοντικών επιπτώσεων σε διασυνοριακό πλαίσιο.

7. Το με α.π. 75783/15.3.2019 έγγραφο του Τμήματος Συλλογικών Οργάνων της Διεύθυνσης Ανθρώπινου Δυναμικού της Περιφέρειας Αττικής, με το οποίο διαβιβάστηκε η ΣΜΠΕ στη Διεύθυνση Περιβάλλοντος και Κλιματικής Αλλαγής της Περιφέρειας (α.π. ΥΠΕΝ/ΔΙΠΑ/23794/1531/15.3.2019).
8. Το από 21.3.2019 μήνυμα ηλεκτρονικού ταχυδρομείο του κ. Σ. Τέλλογλου που, στο πλαίσιο της διαβούλευσης επί της ΣΜΠΕ, αναφέρεται στη έλλειψη δυνατότητας μετατροπής συμβατικού ιδιωτικού οχήματος σε ηλεκτρικό (α.π. ΥΠΕΝ/ΔΙΠΑ/26419/1682/22.3.2019).
9. Το με α.π. 69538/26.3.2019 έγγραφο του Τμήματος Συλλογικών Οργάνων της Διεύθυνσης Διοίκησης της Περιφέρειας Κρήτης, με το οποίο διαβιβάστηκε προς τους Δήμους της Κρήτης ο διαδικτυακός σύνδεσμος της ΣΜΠΕ και ζητούνται οι απόψεις τους (α.π. ΥΠΕΝ/ΔΙΠΑ/26777/1704/26.3.2019).
10. Το με α.π. 21496/9036/29.3.2019 έγγραφο του Τμήματος Συλλογικών Οργάνων της Διεύθυνσης Διοίκησης της Περιφέρειας Ιόνιων Νήσων, με το οποίο διαβιβάστηκε η ΣΜΠΕ στη Διεύθυνση Περιβάλλοντος και Χωρικού Σχεδιασμού (α.π. ΥΠΕΝ/ΔΙΠΑ/29828/1979/3.4.2019).
11. Το με α.π. ΝΤΡG/26986/685/3.4.2019 έγγραφο του Τμήματος Σχεδιασμού και Ανάπτυξης Μεταφορών της Διεύθυνσης Ανάπτυξης Μεταφορών του Υπουργείου Υποδομών και Μεταφορών, με το οποίο διαβιβάστηκαν στη Διεύθυνση Περιβαλλοντικής Αδειοδότησης του Υπουργείου Περιβάλλοντος και Ενέργειας τα αποκόμματα δημοσίευσης της ανακοίνωσης δημοσιοποίησης της ΣΜΠΕ σε δύο εφημερίδες εθνικής εμβέλειας (α.π. ΥΠΕΝ/ΔΙΠΑ/30539/2051/4.4.2019).
12. Το Πρακτικό 3/10.4.2019 της Επιτροπής Περιβάλλοντος, Χωρικού Σχεδιασμού και Ανάπτυξης της Περιφέρειας Ηπείρου, με την ομοφώνως θετική γνωμοδότησή της επί της ΣΜΠΕ (ΑΔΑ: ΩΤ7Ο7Λ9-ΙΣΡ, α.π. ΥΠΕΝ/ΔΙΠΑ/37161/2442/22.4.2019).
13. Το με α.π. 104716/379/10.5.2019 έγγραφο του Τμήματος Συλλογικών Οργάνων της Διεύθυνσης Διοίκησης της Περιφέρειας Στερεάς Ελλάδας, με το οποίο διαβιβάστηκε η ΣΜΠΕ στην Επιτροπή Περιβάλλοντος του Περιφερειακού Συμβουλίου και στη Διεύθυνση Περιβάλλοντος και Χωρικού Σχεδιασμού (α.π. ΥΠΕΝ/ΔΙΠΑ/43400/2801/14.5.2019).
14. Το με α.π. 2963/1146/27.5.2019 έγγραφο της Διεύθυνσης Προϊστορικών και Κλασικών Αρχαιοτήτων του Υπουργείου Πολιτισμού και Αθλητισμού, στο οποίο δεν διατυπώνεται καταρχάς αντίρρηση για τη ΣΜΠΕ (α.π. ΥΠΕΝ/ΔΙΠΑ/47983/3084/28.5.2019).
15. Το από 31.5.2019 έγγραφο του Συμβουλίου Ανάπτυξης και Ανταγωνιστικότητας Εφοδιαστικής, με παρατηρήσεις επί της ΣΜΠΕ (α.π. ΥΠΕΝ/ΔΙΠΑ/49550/3168/31.5.2019).

16. Το με α.π. ΝΤΡG/45483/1187/4.6.2019 έγγραφο του Τμήματος Σχεδιασμού και Ανάπτυξης Μεταφορών της Διεύθυνσης Ανάπτυξης Μεταφορών του Υπουργείου Υποδομών και Μεταφορών, με το οποίο διαβιβάστηκε στη Διεύθυνση Περιβαλλοντικής Αδειοδότησης του Υπουργείου Περιβάλλοντος και Ενέργειας υπόμνημα με την επεξεργασία των παρατηρήσεων της διαβούλευσης επί της ΣΜΠΕ (α.π. ΥΠΕΝ/ΔΙΠΑ/50599/3230/4.6.2019).

α π ο φ α σ ί ζ ο υ μ ε

Την περιβαλλοντική έγκριση του Εθνικού Στρατηγικού Σχεδίου Μεταφορών βάσει της Στρατηγικής Μελέτης Περιβαλλοντικών Επιπτώσεων και των αποτελεσμάτων της δημόσιας διαβούλευσης, με τους ακόλουθους όρους, περιορισμούς και κατευθύνσεις, που θα πρέπει να τηρούνται κατά την εξειδίκευση και υλοποίησή του, με μέριμνα της Αρχής Σχεδιασμού, καθώς και του συνόλου των φυσικών και νομικών προσώπων που θα συμμετάσχουν στις ως άνω ενέργειες.

Α. Συνοπτική περιγραφή του προγράμματος

Το Εθνικό Στρατηγικό Σχέδιο Μεταφορών (ΕΣΣΜ εφεξής) αποτελεί μία ενιαία και ολοκληρωμένη στρατηγική μεταφορών για όλη την ελληνική επικράτεια με ορίζοντα σχεδόν εικοσαετίας (έως το 2037), η οποία θα αποτελέσει το μακροπρόθεσμο πλαίσιο για το σχεδιασμό, την υλοποίηση και την παρακολούθηση όλων των μελλοντικών επενδύσεων σε υποδομές και των απαιτούμενων οργανωτικών και θεσμικών μέτρων στον τομέα των μεταφορών.

Ο σκοπός του Σχεδίου είναι να αποτελέσει τη βάση για την αειφόρο ανάπτυξη των υποδομών και υπηρεσιών του μεταφορικού συστήματος της Ελλάδας, μεσοπρόθεσμα και μακροπρόθεσμα, η οποία θα συμβάλλει στην ανταγωνιστικότητα του τομέα μεταφορών της χώρας.

Οι στρατηγικοί στόχοι του Σχεδίου είναι οι εξής:

1. Ενίσχυση Οικονομικής Ανάπτυξης και Αποδοτικότητας, με επιμέρους στόχο την αύξηση της ικανότητας για εξυπηρέτηση μελλοντικής ζήτησης μεταφορών (ανακούφιση υφιστάμενων και αποφυγή μελλοντικών σημείων συμφόρησης στο δίκτυο μεταφορών).
2. Ενίσχυση Περιφερειακής και Διεθνούς Συνδεσιμότητας.
3. Διασφάλιση της Περιβαλλοντικής Βιωσιμότητας που επιτυγχάνεται με τη στροφή σε πιο φιλικά προς το περιβάλλον μέσα μεταφοράς.
4. Ενίσχυση της Προσβασιμότητας και Κοινωνικής Ένταξης Πολιτών μέσω έργων που αυξάνουν την προσβασιμότητα περιοχών οι οποίες επί του παρόντος δε θεωρούνται ικανοποιητικά προσιτές με βάση το δείκτη προσβασιμότητας: λειτουργική πυκνότητα.
5. Διασφάλιση Ασφάλειας και Προστασίας.

Β. Διαφοροποιήσεις που επιβάλλονται στο πρόγραμμα από την ενσωμάτωση της περιβαλλοντικής διάστασης και όροι, περιορισμοί και κατευθύνσεις για την προστασία και διαχείριση του περιβάλλοντος που πρέπει να συνοδεύουν την έγκριση του προγράμματος

Β.Ι. Διαφοροποιήσεις που επιβάλλονται στο πρόγραμμα από την ενσωμάτωση της περιβαλλοντικής διάστασης

Η διάρθρωση και το περιεχόμενο του Σχεδίου, όπως αυτό περιγράφεται στη ΣΜΠΕ δεν χρειάζεται να υποστούν διαφοροποιήσεις πριν την έγκρισή του, διότι:

- Το ΕΣΣΜ ενσωματώνει επαρκώς την περιβαλλοντική διάσταση σε όλες τις κύριες επιδιώξεις του.
- Ειδικότερα ο 3ος στρατηγικός στόχος, που αναφέρεται στη διασφάλιση της περιβαλλοντικής βιωσιμότητας και στη στροφή σε πιο φιλικά προς το περιβάλλον μέσα μεταφοράς, ενισχύει σημαντικά την περιβαλλοντική συμβατότητα του Σχεδίου.
- Οι δυνητικές περιβαλλοντικές επιπτώσεις του ΕΣΣΜ αφορούν κυρίως την υλοποίηση ορισμένων έργων και παρεμβάσεών του, και θα αντιμετωπισθούν με τους όρους, τους περιορισμούς και τις κατευθύνσεις που τίθενται ακολούθως για την έγκρισή του.

Β.ΙΙ. Όροι, περιορισμοί και κατευθύνσεις για την προστασία και διαχείριση του περιβάλλοντος που πρέπει να συνοδεύουν την έγκριση του προγράμματος

Για την πληρέστερη προστασία και την ορθολογικότερη διαχείριση του περιβάλλοντος, η έγκριση του ΕΣΣΜ θα πρέπει να συνοδεύεται από τους όρους, περιορισμούς και κατευθύνσεις που ακολουθούν.

1. Η ολοκληρωμένη μέριμνα για την πρόληψη, τον περιορισμό και την αντιμετώπιση των επιπτώσεων στο περιβάλλον θα πρέπει να αποτελέσει οριζόντια απαίτηση κατά τις διαδικασίες υλοποίησης του ΕΣΣΜ. Για το σκοπό αυτό, η Αρχή Σχεδιασμού οφείλει να εγκαθιδρύσει και να εφαρμόζει κατάλληλη διαδικασία ώστε να διασφαλίζεται ότι οι επενδύσεις σε υποδομές και τα θεσμικά και οργανωτικά μέτρα υλοποίησης του ΕΣΣΜ θα χαρακτηρίζονται από επαρκή περιβαλλοντική συμβατότητα. Δομικά στοιχεία της διαδικασίας αυτής θα μπορούσαν να αποτελέσουν, ενδεικτικά και όχι αποκλειστικά, τα εξής:
    1.1. Αξιολόγηση του βαθμού στον οποίο, κατά τη διαμόρφωση των χαρακτηριστικών μιας υποδομής ή υπηρεσίας που πρόκειται να υλοποιηθεί στο πλαίσιο του ΕΣΣΜ, έχουν ληφθεί υπόψη:
        1.1.1. Η εθνική στρατηγική και οι ευρωπαϊκές πρωτοβουλίες για τη βιοποικιλότητα.

1.1.2. Οι εθνικές και ενωσιακές δεσμεύσεις για την κλιματική αλλαγή, τόσο σε ότι αφορά στη μείωση των εκπομπών αερίων του θερμοκηπίου όσο και στην προσαρμογή στις μεταβολές που συντελέσθηκαν ή επέρχονται, όπως τα παραπάνω αποτυπώνονται στα σχετικά εθνικά ή περιφερειακά σχέδια.

1.1.3. Οι κατευθύνσεις και απαιτήσεις των Σχεδίων Διαχείρισης Λεκανών Απορροής Ποταμών και των Σχεδίων Διαχείρισης Κινδύνων Πλημμύρας των Υδατικών Διαμερισμάτων της χώρας.

1.1.4. Το σύστημα χωρικού σχεδιασμού (ν. 4447/2016 όπως ισχύει) και τα σχέδια που έχουν εγκριθεί στο πλαίσιο εφαρμογής του.

1.1.5. Το νέο Ρυθμιστικό Σχέδιο Αθήνας – Αττικής (ν. 4277/2014 όπως ισχύει), καθώς και ανάλογα σχέδια που ενδέχεται να θεσπιστούν για τη Θεσσαλονίκη και άλλες μεγάλες πόλεις της χώρας.

1.1.6. Οι εξελίξεις στο εθνικό και ενωσιακό επίπεδο που αφορούν στην ολοκληρωμένη θαλάσσια πολιτική, στο θαλάσσιο χωροταξικό σχεδιασμό και στη γαλάζια ανάπτυξη.

1.2. Απαίτηση ένταξης στο σχεδιασμό των παρεμβάσεων υλοποίησης του ΕΣΣΜ, ιδίως σε εκείνων που αφορούν σε υποδομές και συνδυασμένες μεταφορές, ενός εσωτερικού μηχανισμού ο οποίος θα διασφαλίζει ότι ο σχεδιασμός, η υλοποίηση και η λειτουργία των έργων που θα προκύψουν θα χαρακτηρίζονται εξαρχής από επαρκείς δυνατότητες συμμόρφωσης στις περιβαλλοντικές απαιτήσεις που θα θέτει το εκάστοτε πάγιο ρυθμιστικό πλαίσιο του περιβάλλοντος και οι περιβαλλοντικοί όροι των έργων. Παραδείγματα τέτοιων απαιτήσεων είναι η χαρτογράφηση του θορύβου και η ανταπόκριση σε σχετικά σχέδια δράσης, η επεξεργασία υγρών αποβλήτων και η διάθεση του ανακτημένου νερού κατά τον περιβαλλοντικά βέλτιστο τρόπο, η ορθή διαχείριση στερεών και επικινδύνων αποβλήτων από τη λειτουργία μεγάλων μεταφορικών υποδομών κ.ά.

2. Για την προστασία του φυσικού περιβάλλοντος και την ορθολογική διαχείριση φυσικών πόρων, στο σχεδιασμό, την υλοποίηση και τη λειτουργία των υποδομών που υλοποιηθούν στο πλαίσιο του ΕΣΣΜ θα πρέπει να ακολουθούνται οι εξής κατευθύνσεις:

2.1. *Ελαχιστοποίηση ζωνών κατάληψης*: Τα πλάτη των γραμμικών έργων εντός εκτάσεων του φυσικού περιβάλλοντος θα πρέπει εξαρχής να ελαχιστοποιούνται, ενώ τα συνοδά έργα κατασκευής ή λειτουργίας θα πρέπει να χωροθετούνται κατά το δυνατόν σε εκτάσεις με χαμηλή ή/και αραιά βλάστηση, με τη διάταξη των επιμέρους εγκαταστάσεων σχεδιασμένη κατά τον πυκνότερο δυνατό τρόπο.

2.2. *Διασφάλιση υπηρεσιών οικοσυστήματος*: Τόσο οι θεμελιώδεις υπηρεσίες των επηρεαζόμενων οικοσυστημάτων (κύκλος νερού, παροχή ενδιαιτήματος, παραγωγή οξυγόνου, εδαφογένεση κ.ά.), όσο και οι ρυθμιστικές υπηρεσίες που τα οικοσυστήματα παρέχουν (αντιπλημμυρικός και αντιδιαβρωτικός ρόλος των δασών, διαμόρφωση μικροκλίματος, επικονίαση καλλιεργειών κ.ά.) θα πρέπει εξαρχής να συναξιολογούνται στο σχεδιασμό των παρεμβάσεων που θα υλοποιούνται στο πλαίσιο του ΕΣΣΜ, ώστε να επιλέγονται τεχνικές και χωροθετικές παράμετροι που να διασφαλίζουν την ελαχιστοποίηση των άμεσων και έμμεσων επιδράσεων στις υπηρεσίες αυτές.

2.3. *Περιορισμός κινδύνων και οχλήσεων ως προς το φυσικό περιβάλλον*: Τα λιμενικά έργα θα πρέπει να ενσωματώνουν σχέδια περιορισμού και αντιμετώπισης κινδύνων ρύπανσης, ενώ τα γραμμικά συγκοινωνιακά χερσαία έργα θα πρέπει να οχλούν κατά το δυνατόν λιγότερο βιοτόπους σημαντικών ή ευαίσθητων ειδών πανίδας και ορνιθοπανίδας.

2.4. *Αποφυγή αλλοιώσεων στα ποιοτικά και ποσοτικά χαρακτηριστικά των υδάτων*: στο σχεδιασμό όλων των χερσαίων μεταφορικών υποδομών θα πρέπει να λαμβάνεται μέριμνα για την ελαχιστοποίηση των μεταβολών στο υδρογραφικό δίκτυο και στην ποιότητα των υδάτων.

2.5. *Ελαχιστοποίηση αλλοιώσεων στο εδαφικό ανάγλυφο*: οι χαράξεις των γραμμικών έργων και η χωροθέτηση των κέντρων συνδυασμένων μεταφορών θα πρέπει να σχεδιάζονται λαμβάνοντας μέριμνα για την όσο το δυνατόν μικρότερη επίδραση στο ανάγλυφο του εδάφους.

2.6. *Εξαρχής λεπτομερείς προβλέψεις αποκατάστασης*: Από το στάδιο σχεδιασμού και περιβαλλοντικής αδειοδότησης κάθε χερσαίας συγκοινωνιακής υποδομής, θα πρέπει να καθορίζονται οι λεπτομέρειες της αποκατάστασης όλων των ελεύθερων επιφανειών που θα προκύψουν κατά την υλοποίηση του έργου, ενώ οι σχετικές δαπάνες θα πρέπει να εντάσσονται στους προϋπολογισμούς των επενδύσεων.

2.7. *Ελαχιστοποίηση Πλημμυρικού Κινδύνου*: οι χαράξεις των γραμμικών έργων και η χωροθέτηση των κέντρων συνδυασμένων μεταφορών θα πρέπει να σχεδιάζονται λαμβάνοντας υπόψη τα αποτελέσματα των Χαρτών Επικινδυνότητας Πλημμύρας για τις τρεις περιόδους επαναφοράς (χαμηλή, μέση, υψηλή) καθώς και τους προβλεπόμενους όρους και περιορισμούς των εν ισχύ εγκεκριμένων κάθε φορά Σχεδίων Διαχείρισης Κινδύνων Πλημμύρας των Υδατικών Διαμερισμάτων της χώρας σε εφαρμογής της Οδηγίας 2007/60/ΕΚ.

3. Για την προστασία του ανθρωπογενούς περιβάλλοντος, στο σχεδιασμό, την υλοποίηση και τη λειτουργία των υποδομών που υλοποιηθούν στο πλαίσιο του ΕΣΣΜ θα πρέπει να ακολουθούνται οι εξής κατευθύνσεις:

   3.1. *Ενσωμάτωση αρχών βιώσιμης κινητικότητας*: Τα έργα εντός των αστικών συγκροτημάτων θα πρέπει να σχεδιάζονται ενσωματώνοντας τις αρχές της ελαχιστοποίησης των ατμοσφαιρικών εκπομπών και του θορύβου, της ενθάρρυνσης τρόπων μετακίνησης που διακρίνονται από φιλικότητα προς το περιβάλλον και της ενίσχυσης της χρήσης μέσων συλλογικής αντί ατομικής μετακίνησης.

   3.2. *Προστασία και ανάδειξη της πολιτιστικής κληρονομιάς*: Οι υποδομές μεταφορών θα πρέπει να λαμβάνουν εξαρχής μέριμνα αποφυγής επιβλαβών επιδράσεων σε σημαντικά στοιχεία πολιτιστικής κληρονομιάς, επιδιώκοντας επιπροσθέτως την ενσωμάτωση τρόπων προβολής και ανάδειξης ιστορικών και πολιτιστικών στοιχείων της περιοχής τους.

   3.3. *Ενίσχυση της ασφάλειας ως προς την αποφυγή ατυχημάτων με επίπτωση στο περιβάλλον ή/και ελαχιστοποίηση των συνεπειών τους*: Στο σχεδιασμό των επενδύσεων, ιδίως εκείνων που αφορούν άμεσα ή έμμεσα στην ενίσχυση της ασφάλειας των μεταφορών, θα πρέπει να συμπεριλαμβάνεται μέριμνα για την πρόληψη ατυχημάτων που θα μπορούσαν να προκαλέσουν περιβαλλοντική υποβάθμιση, καθώς και μέτρα για τον περιορισμό και την αποτελεσματικότερη δυνατή αντιμετώπιση των συνεπειών τους.

4. Οι προβλέψεις του ΕΣΣΜ που αφορούν στην ηλεκτροκίνηση, η οποία μεταξύ άλλων συνοδεύεται από σημαντικά οφέλη ως προς το περιβάλλον των μεγάλων πόλεων, θα πρέπει να εξειδικευθούν και να εφαρμοστούν κατά τον ταχύτερο δυνατό τρόπο, είτε ως αυτοτελείς δράσεις (π.χ. αύξηση των σημείων φόρτισης) είτε ως μέρη άλλων δράσεων (π.χ. ανανέωση στόλου οχημάτων).

5. Οι παρεμβάσεις του ΣΠΕΜ που σχετίζονται ευθέως ή εμμέσως με την «έξυπνη κινητικότητα», όπως π.χ. η αύξηση χωρητικότητας αυτοκινητοδρόμων, η βελτίωση του επιπέδου ασφάλειας των οδικών μεταφορών, καθώς και οι νέοι αυτοκινητόδρομοι ή οι αναβαθμίσεις υπαρχόντων, θα πρέπει να ενσωματώνουν εξαρχής μέριμνα για τις επερχόμενες τεχνολογίες αυτόνομων και συνδεδεμένων οχημάτων, οι οποίες αυξάνουν σημαντικά την αποτελεσματικότητα των μεταφορών και ως εκ τούτου προσφέρουν σημαντικά οφέλη στο περιβάλλον. Κατ' ανάλογο τρόπο, το σκέλος των θεσμικών και επιχειρησιακών μέτρων του ΕΣΣΜ θα πρέπει να εμπλουτιστεί κατάλληλα ώστε να συμπεριλάβει εγκαίρως ρυθμίσεις και ενισχυτικές παρεμβάσεις για τα αυτόνομα και συνδεδεμένα οχήματα.

6. Η εφαρμογή των προτάσεων αντιμετώπισης των περιβαλλοντικών επιπτώσεων που διατυπώνονται στην ενότητα 7.3 της ΣΜΠΕ καθίσταται υποχρεωτική, εφόσον δεν έρχεται σε αντίθεση με τα παραπάνω.

Γ. Σύστημα παρακολούθησης των σημαντικών περιβαλλοντικών επιπτώσεων από την εφαρμογή του προγράμματος

1. Η παρακολούθηση των σημαντικών επιπτώσεων στο περιβάλλον από την εφαρμογή του ΕΣΣΜ, θα πρέπει να πραγματοποιείται με τη συλλογή και επεξεργασία των στοιχείων που θα καταγράφονται:
   1.1. Στις εκθέσεις περιβαλλοντικής παρακολούθησης των επιχειρησιακών προγραμμάτων που αφορούν στις μεταφορές.
   1.2. Στις εκθέσεις Αρχών που ασκούν ρυθμιστικό ή διαχειριστικό ρόλο στον τομέα των μεταφορών.
   1.3. Σε δημοσιευμένα στοιχεία που αφορούν περιβαλλοντικά μεγέθη σχετιζόμενα με τις μεταφορές, όπως οι καταγραφές εκπομπών αεριών του θερμοκηπίου κ.ά.
2. Η συλλογή και επεξεργασία των στοιχείων αυτών θα πραγματοποιείται μια φορά ανά πέντε έτη, δεδομένου του μακροπρόθεσμου χαρακτήρα του σχεδίου και των σχετικώς μεγάλων διαστημάτων υλοποίησης των παρεμβάσεων που περιέχει, και θα καταλήγει σε έκθεση περιβαλλοντικής παρακολούθησης του ΕΣΣΜ. Στην έκθεση θα πραγματοποιείται επίσης:
   2.1. Αξιολόγηση των παρατηρούμενων μεταβολών, με κριτήριο την επίτευξη των περιβαλλοντικών στόχων του σχεδίου.
   2.2. Έλεγχος αποτελεσματικότητας των μέτρων πρόληψης και αντιμετώπισης των περιβαλλοντικών επιπτώσεων τα οποία τέθηκαν παραπάνω, καθώς και διερεύνηση αναγκαιότητας λήψης πρόσθετων μέτρων.
3. Η παραπάνω έκθεση περιβαλλοντικής παρακολούθησης θα δημοσιοποιείται με ανάρτησή της στο διαδικτυακό τόπο της Αρχής Σχεδιασμού ή του Υπουργείου στο οποίο αυτή ανήκει, δίνοντας παράλληλα τη δυνατότητα στο ενδιαφερόμενο κοινό να εκφράσει τις απόψεις του για το περιεχόμενο της έκθεσης.
4. Η εφαρμογή των προτάσεων περιβαλλοντικής παρακολούθησης που διατυπώνονται στην ενότητα 7.4 της ΣΜΠΕ καθίσταται υποχρεωτική, εφόσον δεν έρχεται σε αντίθεση με τα παραπάνω.

Δ. Χρονικό διάστημα ισχύος της απόφασης

Η παρούσα απόφαση ισχύει καθ’ όλη τη διάρκεια υλοποίησης του Εθνικού Στρατηγικού Σχεδίου Μεταφορών.

Σε περίπτωση τροποποίησης του σχεδίου, απαιτείται η τήρηση των διαδικασιών που προβλέπονται στην ΚΥΑ με α. π. ΥΠΕΧΩΔΕ/ΕΥΠΕ/οικ.107017/5.9.2006 (Β΄ 1225).

Ε. Δημοσιοποίηση και άλλες διατάξεις

Η Αρχή Σχεδιασμού (Τμήμα Σχεδιασμού και Ανάπτυξης Μεταφορών της Διεύθυνσης Ανάπτυξης Μεταφορών του Υπουργείου Υποδομών και Μεταφορών) προβαίνει, εντός δέκα ημερών από την παραλαβή της παρούσας, σε δημοσιοποίησή της για την ενημέρωση του κοινού, με δημοσίευση σχετικής ανακοίνωσης σε δύο τουλάχιστον ημερήσιες εφημερίδες εθνικής εμβέλειας, καθώς και με δημοσίευση της παρούσας στο διαδικτυακό τόπο του Υπουργείου.

Η ΣΜΠΕ αποτελεί αναπόσπαστο μέρος της παρούσας απόφασης.

Στις πράξεις ή αποφάσεις έγκρισης του σχεδίου πρέπει να αναφέρεται ρητά η παρούσα απόφαση.

Ο ΑΝΑΠΛΗΡΩΤΗΣ ΥΠΟΥΡΓΟΣ
ΠΕΡΙΒΑΛΛΟΝΤΟΣ ΚΑΙ ΕΝΕΡΓΕΙΑΣ
Σ. ΦΑΜΕΛΛΟΣ

Ο ΥΠΟΥΡΓΟΣ
ΥΠΟΔΟΜΩΝ ΚΑΙ ΜΕΤΑΦΟΡΩΝ
Χ. ΣΠΙΡΤΖΗΣ

Αναρτητέα Πράξη