

D 5.2.1 – CHARGE CB

Action Plan



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1. INTRODUCTION

This report is part of work package 5 - E Policy Framework for the Adriatic Freight Transport Sustainability, activity 5.2 - Action Plan at the Adriatic level with possible Policy Implementation Scenarios, deliverable D 5.2.1 - CHARGE CB Action Plan.

Main objectives of the CHARGE project are actions to reduce bottlenecks and improving port/node performance, especially for enhancing traffic safety in port access and reducing waiting times.

CHARGE Action Plan aims, on the one hand, to summarise the priority challenges and areas of intervention for the development of the Italian-Croatian ports and, on the other hand, to step up cooperation between all concerned stakeholders, whether these are port authorities, institutional players or stakeholders at large.

On the basis of the analyses carried out in the deliverables 5.1.1 e 5.1.2, in this report a Cross-Border (CB) Action Plan is elaborated to create the framework for port development in the Adriatic over the next years, covering a number of priority areas of intervention such as, improving/optimising port infrastructure and port terminal buildings, enhancing use of ICT technologies, or improving road/rail connections.

CB Action Plan aims to foster an integrate planning approach for infrastructure developments defining joint roadmaps for investments for rail-road, sea-road and sea-rail intermodality structures and services. This include the analysis of different financing schemes and tools suitable to support infrastructural investments and elaboration of models to be applied on real cases, including the potential support services belonging to the entire logistic chain also by using the logic of Public-Private Partnership (PPP) and the principles of Cost Benefit Analysis (CBA).

This report consists of seven chapters, including the introductory and conclusions chapters.

After the first introductory chapter, the second one contains the context analysis that described in details characteristic of project area. In the third chapter an overview on the potential sources

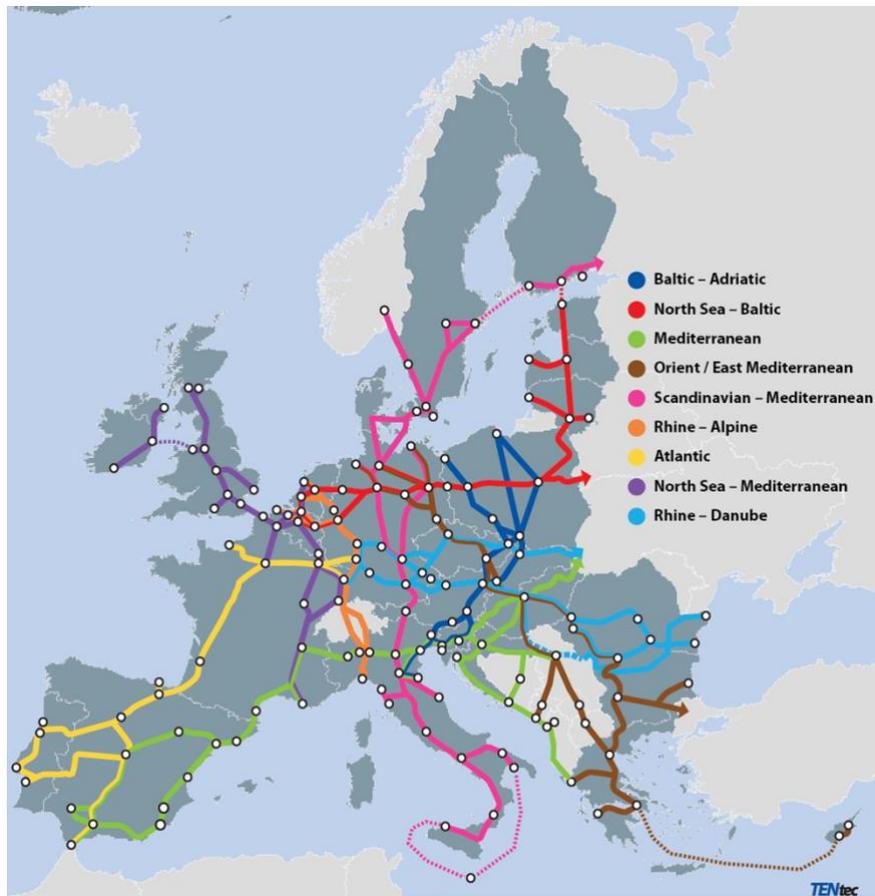
of financing already available in EU has been conducted: International Finance Institutions, Government (State) Finances, Commercial banks, Capital market, and EU finance sources. In the fourth chapter the cost-benefit analysis (CBA) is described; this method represents a decisive step while planning a new MoS or transport service, since it enables to assess the economic viability of the project and is also mandatory when applying for European funding. Chapter five contains a description of public-private partnership (PPP) that is an arrangement between a public authority and a private partner designed to deliver a public infrastructure project and service under a long-term contract. Lastly, in chapter six are described actions outline the priority challenges that create the framework for port development in the Adriatic region over the next 15 years, each of them covering a number of priority areas of intervention.

2. Context analysis

The EU's expansion from 15 to 28 Member States has brought changes to logistics chains and geographical patterns of trade and has raised the structural challenge of rapidly developing the EU's transport infrastructure. Seamless door-to-door mobility for people and goods in the EU depends on an advanced and well-functioning transport infrastructure. Despite progress in the development of transport infrastructure in the EU, challenges remain.

Since the entry into force of the Treaty of Rome has been stressed the importance of trans-European infrastructures and has been established a common transport policy. The aim was help create a single market and reinforce economic and social cohesion in Europe. Infrastructure investment is still perceived as a crucial aspect of the European project and they are fundamental to boost a region's economic growth. The right infrastructures reduce production costs and help the flow of goods, services, people and information. As they integrate markets, they also encourage competition, increasing incentives to innovate and improving productivity. In order to the European single market to perform at an optimum level, the region requires integrated infrastructure networks for transport, energy, telecommunications, etc. that link all its member States.

The development of the Trans-European Networks (TEN) was established as a priority in the 1992 Maastricht Treaty. This includes not only the prominent transport networks (TEN-T) but also those for energy (TEN-E) and telecommunications (eTEN). TEN-T networks consist of nine European corridors that, by 2030, should unite 94 European ports with railway and road connections, 38 key airports with train connections to the major cities, 15,000 kilometres of high-speed trains and 35 cross-border projects to reduce bottlenecks.

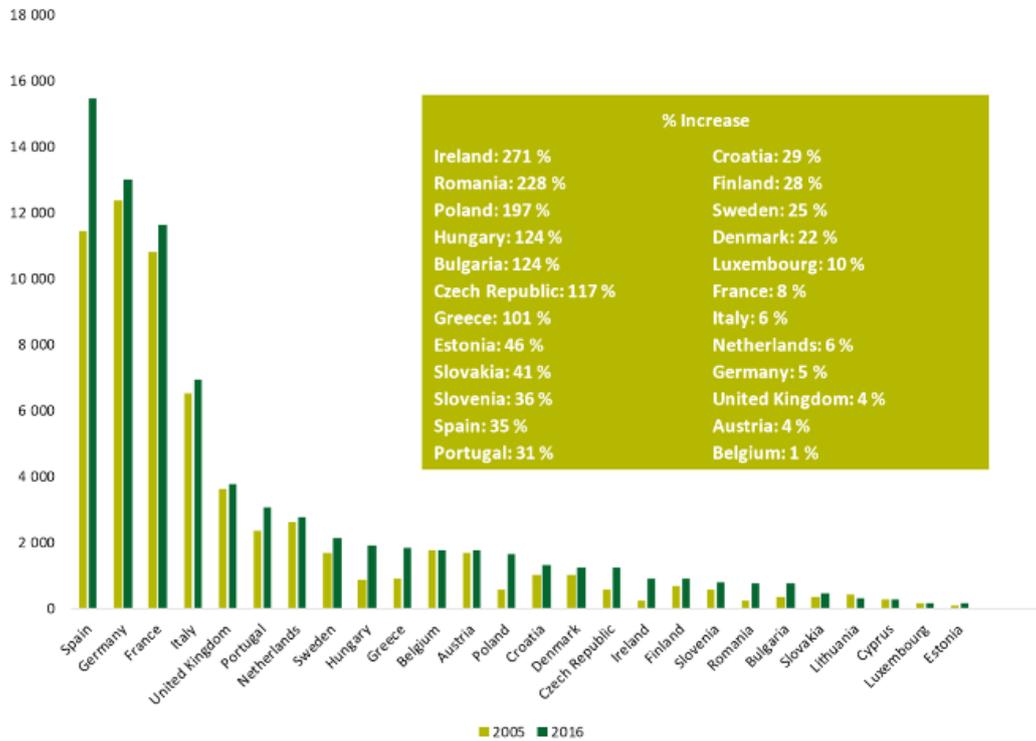


Source: European Commission, Directorate-General for Mobility and Transport

Figure 1 - TEN-T core network corridors

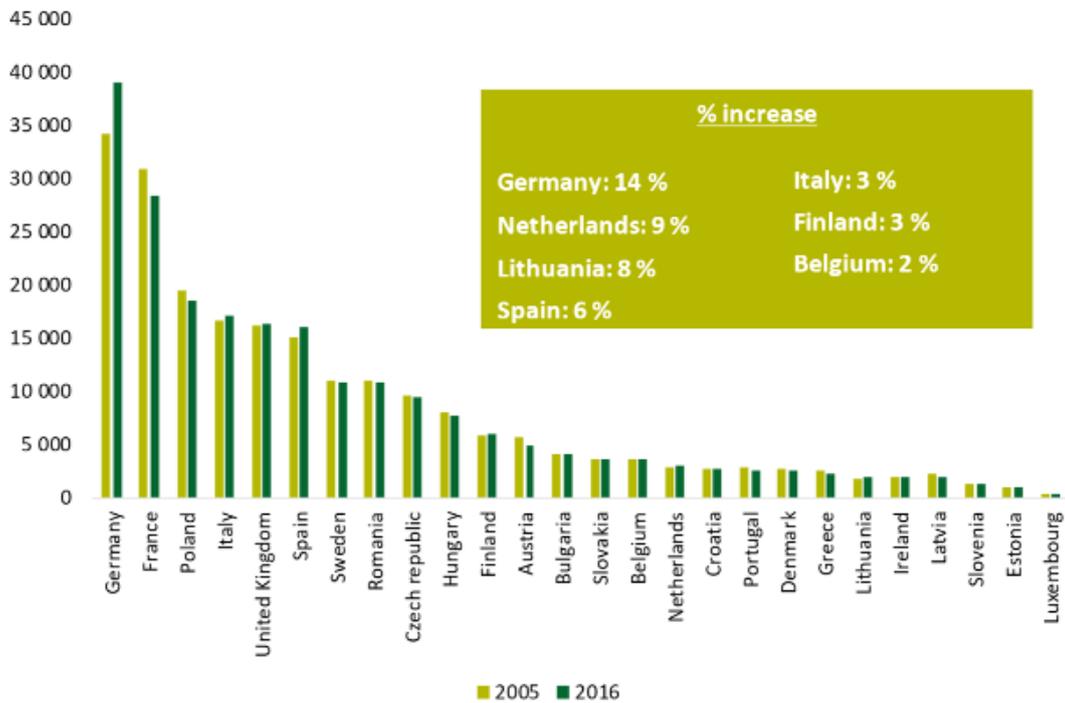
In general, infrastructures have improved substantially in the European Union since the TEN network project has begun, in fact, the key building block in the development of the European transport system is the completion of the TEN-T.

As following figures show, road has adapted most easily to the new reality, while rail, requires more effort to modernise and develop its networks and links.



Source: ECA, based on European Commission (2018), *EU Transport in Figures - statistical pocketbook*
 Figure 2 - Motorway lengths 2005-2016 in the EU 28 (in km)

While some Member States have already completed, or are close to completing, their sections of the TEN-T core network, others still have a lot to do. The Commission issued a progress report on the implementation of the TEN-T in 2014 and 2015. The report concluded that there has been progress achieved, but overall, it can be assumed that in most cases significant improvements are still required and significant investment needed to reach the TEN-T objectives.



Source: ECA, based on European Commission (2018), *EU Transport in Figures - statistical pocketbook*
 Figure 3 - Railway lengths 2005-2016 in the EU 28 (in km)

However, the hefty investment required and the difficulty of selecting the right projects to ensure efficient infrastructure investment has raised the profile of public-private partnerships (PPP) in the European case. Doubts regarding the investment required in such a context of technological change, as well as the degree of risk involved, mean that the public sector is increasingly acting as a catalyst for investment, providing legal security while the private sector takes care of the project design and most of the investment.

The investment plan for Europe, better known as the Juncker Plan, is a paradigm for PPP: it aims to kickstart EU investment by mobilising financial resources more effectively, allowing the European Investment Bank (EIB) to finance riskier but more innovative projects and getting rid of barriers to investment in the EU. The core of the plan is investment project funding via the European Fund for Strategic Investments (EFSI), set up in June 2015. With a capital of 33.5 billion euros, from contributions made by the European Commission (26 billion) and the EIB (7.5 billion) as a guarantee, it aims to promote investment in strategic infrastructure and in smaller

businesses and midcap companies to the value of 500 billion euros between 2015 and 2020. At present, the implementation of the Juncker Plan is going according to plan. In January 2017, 31.5 billion euros of funding had already been approved for 444 operations in 28 EU countries, with an expected total investment of 168.8 billion euros, around 33% of the overall target. Most of the projects are investments in infrastructures and innovation in the sectors of energy, industry and transport, focusing primarily on large countries such as France, Italy, the United Kingdom and Spain. Spain is one of the countries benefitting the most, with funding approved for 40 projects valued at 3.42 billion euros and a total investment of 23 billion euros.

One important part of the Juncker Plan also aims to raise investor awareness of the projects and reduce the difficulties associated with investment, such as regulatory fragmentation. The European Investment Project Portal promotes investment projects to attract private financing and provides support jointly with the European Investment Advisory Hub. The Plan also hopes to improve the investor environment in general, reducing the barriers to investment that still exist in the EU, such as red tape and market fragmentation.

The Juncker Plan acts as a complement to the infrastructure investment already made by the European Commission at a trans-European level, mostly channelled through other programmes such as the Connecting Europe Facility, Horizon 2020 and European structural and investment funds as part of the EU's cohesion policy. In any case, it represents a shift in public intervention in infrastructure investment towards redressing market faults and underinvestment, in which public funding is used to attract private capital and help the financing of a larger number of projects.

CHARGE project area is identifiable with the Adriatic and Ionian Region covered by the EU Strategy for the Adriatic and Ionian Region (EUSAIR) that comprising eight countries: 4 EU Member States (Croatia, Greece, Italy, Slovenia) and 4 non-Member States (Albania, Bosnia and Herzegovina, Montenegro, Serbia). The EUSAIR Action Plan is focused on strengthening maritime safety and security, developing a competitive regional intermodal port system and intermodal connections with the hinterland, both for freight and passengers.



Figure 4 - CHARGE project area

Ports partners of the CHARGE project are:

- **Central Adriatic Ports Authority** (Ports of Ancona, Pesaro, San Benedetto del Tronto, Pescara and Ortona);
- **North Adriatic Sea Port Authority** (Ports of Venice and Chioggia);
- **Southern Adriatic Sea Port Authority** (Ports of Bari, Brindisi, Manfredonia, Barletta and Monopoli);
- **Port of Ploče Authority**;
- **Split Port Authority**.

Furthermore, the project area is also interested by three corridors were designated for the setting up of projects of European interest (see figure below):

- **Baltic-Adriatic Corridors (South);**
- **Mediterranean Corridors (East);**
- **Scandinavian-Mediterranean Corridors (East).**

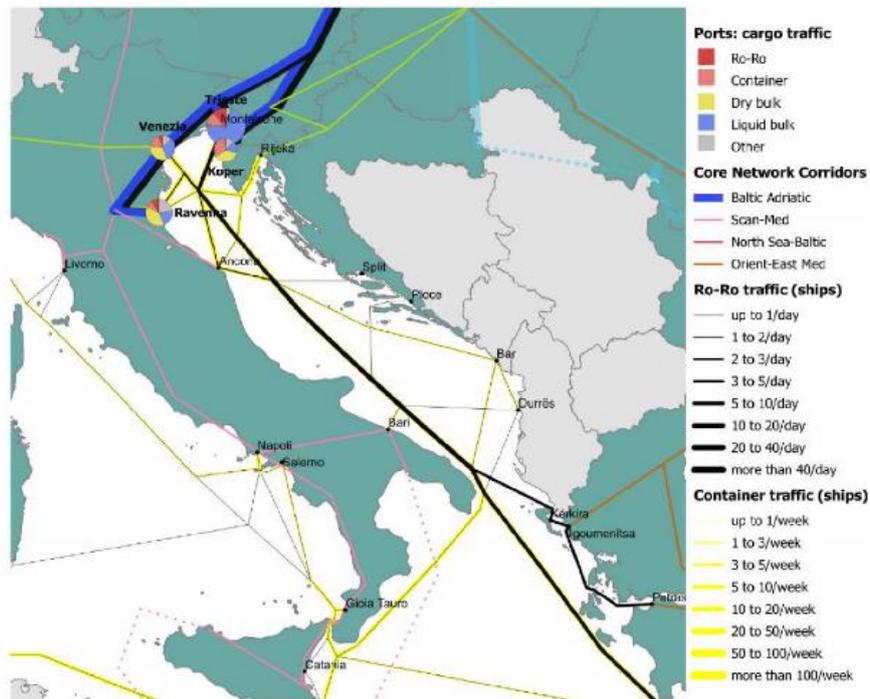


Figure 5 - Baltic-Adriatic Corridors (South)

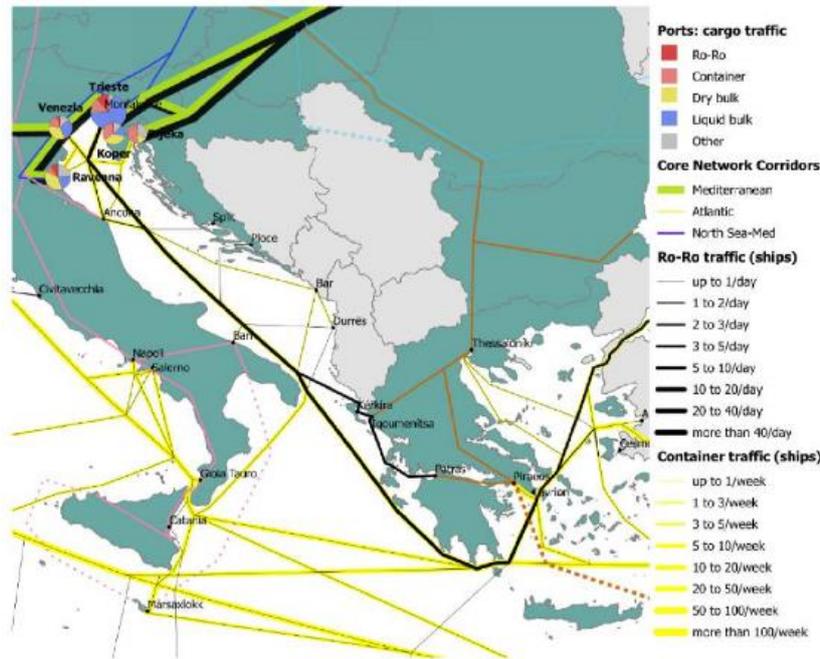


Figure 6 - Mediterranean Corridors (East)

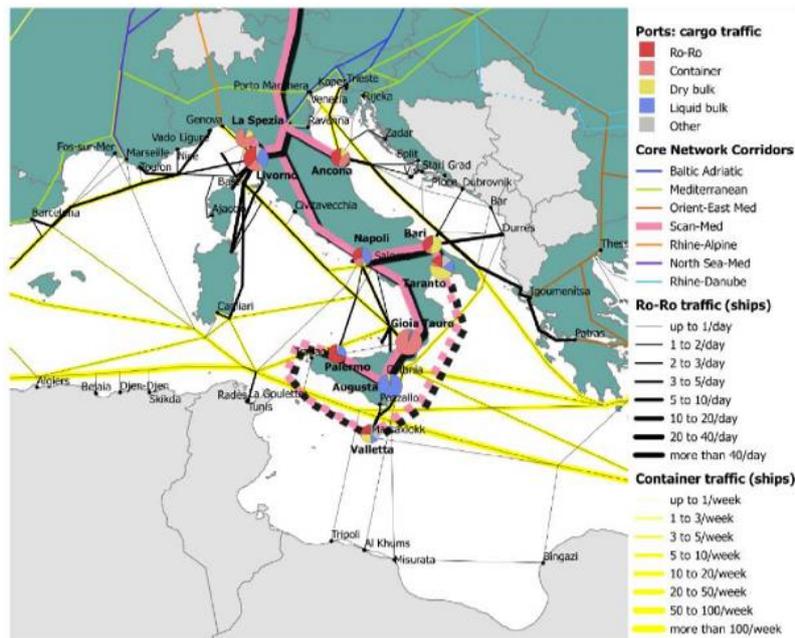


Figure 7 - Scandinavian-Mediterranean Corridors (East)

In general, the accessibility of Italian and Croatian coast to/from the inland areas is ensured by network of motorways and Adriatic state roads, together with the railways.

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In Italy the railways serve the harbour of Trieste and Venezia - Mestre in the north, Ravenna, Ancona and Pescara - Ortona for the centre and Bari, Brindisi, Lecce and Taranto in the south. The rail network is long around 780 kilometres with constant length over the years.

In Croatia road network is quite extensive and the navigation and maritime transport capability of the harbours is good, instead, rail transport of both passengers and goods is mostly of local importance. In fact, length of motorways network in Croatia is increasing through years and comparing to regions of the Italian side has the longest motorways network, around 600 kilometres.

Data for maritime transport of freight in Croatia shows a constant decrease in transported freight through years, while in Italy that data again varies greatly between regions, where in Puglia and Friuli-Venezia that number is by far bigger than in other regions including the Croatian ones.

Maritime transport makes small rate of overall transport in Croatia with very weak multimodal connections to other means of transport. Most important harbours for freight are Rijeka at north and Ploče at south making 90% of all freight maritime transport. Split is most important passenger port with more than 5,5 million passengers and 800.000 vehicles a year.

Freight transport by road, inland waterways, air or sea in Italy and Croatia varies over the years, followed by the same trend of EU28.

For these reasons, in the following chapters, will be suggested some financing schemes (e.g. TEN-T, CEF, Juncker Plan, EIB, EFSI, etc.) and tools suitable to support infrastructural investments (e.g. Public-Private Partnership, Cost Benefit Analysis, etc.). This will allow work on a CB Action Plan to create the framework for port development in the Adriatic over the next years, covering a number of priority areas of intervention such as: improving/optimising port infrastructure and port terminal buildings, enhancing use of ICT technologies, or improving road/rail connections, etc.

3. Potential sources and financial scheme

One important goal of the CHARGE project is to foster infrastructure developments defining joint roadmap for investment.

Shipping, ports and their connections to the hinterland need high investment; although EU MoS grants have made numerous projects possible, investment cannot depend exclusively on grants.

For example, the European Investment Bank (EIB)'s products and new financial instruments will be necessary to finance crucial investments in the European maritime dimension and integration of MoS in the global transport chain.

Furthermore, there are other innovative European funding tools: TEN-T, CEF, Juncker Plan, EIB, EFSI, etc. The basic idea behind these financing tools is to stimulate operators in the sector to invest by making use of EU guarantees that providing easier access to finance and more attractive financial condition.

For this reason, this chapter includes the analysis of different financing schemes and tools suitable to support infrastructural investments.

The projects of transport infrastructure are different in many aspects, and this variety, essential for this matter is seen in financial details defined by financial plans and financing strategy.

Specifically, overview on the potential sources of financing already available in EU has been conducted: International Finance Institutions, Government (State) Finances, Commercial banks, Capital market and EU finance sources.

3.1. EU Finance Sources

EU finance sources are mostly grant finance which are regulated by European Commission (EC).

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According to EC regulation for 2014-2020 there are different finance sources concerning the EUSAIR Action Plan for EU countries (Slovenia, Croatia, Italy and Greece) and non-EU countries (Bosnia and Herzegovina, Montenegro, Serbia and Albania).

“As Partnership Agreements and Operational Programmes for EU countries (Greece, Italy, Slovenia and Croatia) are advised to take the forthcoming Adriatic-Ionian macro-regional strategy into account, attention is being paid to the Strategy in the current negotiation process. In addition, due to the coordinated approach of the Directorate General for Regional and Urban Policy and the Directorate General for Enlargement, Strategy Papers for non-EU countries (Montenegro, Serbia, Bosnia and Herzegovina, Albania) will also explicitly refer to the Strategy. Moreover, considering that the macro-regional strategy will contribute directly to national objectives, thereby becoming an integral component of national, regional and local strategies, all kinds of existing funding sources beside EU level can be harnessed, dramatically increasing funding possibilities in support of cooperation activities throughout the macro-region”.

According to the new regulatory framework there are two most important available programmes for EU and non-EU countries: European Structural and Investment Funds (ESIF) for 2014-2020 and the Instrument for Pre-accession Assistance (IPA). This programme provides significant financial sources and a wide range of tools and technical options.

“The European Structural and Investment Funds or ESI Funds is a common designation for five European funds: the European Regional Development Fund (ERDF), the European Social Fund (ESF), the Cohesion Fund (CF), the European Agricultural Fund for Rural Development (EAFRD) and the European Maritime and Fisheries Fund (EMFF), which operate under a common framework (i.e. the CPR) as well as under fund-specific regulations”.

3.1.1. Connecting Europe Facility (CEF)

The Connecting Europe Facility (CEF) is a key EU funding instrument to promote growth, jobs and competitiveness through targeted infrastructure investment at European level. It supports the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services.

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.

With a proposed budget of €50 billion between 2014 and 2020, the CEF is a key instrument to promote growth, jobs and competitiveness through targeted infrastructure investment at European level. It will support the development of highperforming, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services.

CEF is part of a larger new “European infrastructure package”, as proposed by the Commission in October 2011. The package includes a set of revised policy guidelines setting the objectives and priorities of EU intervention in each of the three sectors of trans-European network development.

CEF 2014-2020		
€50 billion		
Energy Infrastructure	Broadband Infrastructure	Transport Infrastructure
€9.1 billion	€9.2 billion	€31.7 billion

Figure 8 - CEF 2014-2020

CEF funds are managed centrally, meaning that the programming of the use of funds, the selection of projects to be awarded financial support, the allocation of the funds and the control of the use of funds are done directly by the Commission.

The use of funds is organised over the 7 years multiannual financial perspective by means of multi-annual and annual work programmes, to be adopted by the Commission after the approval of the Member States under the examination procedure. The work programmes detail proposal selection and award criteria, as well as the amount of funds concerned. The support provided via innovative financial instruments is managed by means of partnerships that the Commission will establish with the European Investment Bank (EIB) and other financial institutions.

The revised policy guidelines for the Trans-European Transport network (the TEN-T Guidelines) propose a new planning of the TEN-T development, at two levels. The first level is constituted by a larger, basic network, called the “comprehensive network”. This network includes the relevant existing and planned infrastructure in the Member States, and its outline is the result of the updating and adjustment of the existing TEN-T map. The second level (or layer) is constituted of the strategically most important parts of the TEN-T. It was identified on the basis of a specially designed European methodology, and it is titled the “core network”.

The revised TEN-T Guidelines also propose a reinforced approach to coordination in the development of the trans-European transport network. A number of corridors, drawing on the core network, have been identified, following the main trans-European traffic flows. Development and implementation of the infrastructure along the corridor will be ensured by corridor structures that will bring together the Commission, the interested Member States, regions and local authorities as well as infrastructure managers, transport operators and, of course, the financiers. These structures will be placed under the aegis of a European Coordinator, responsible for overall coordination issues and ensuring transparency and accountability in the implementation of a specific corridor. Finally, the new policy approach will place greater emphasis on ensuring:

- effective interconnectivity across borders – cross-border links, and between modes – multimodal platforms;
- effective interoperability – wide deployment and interoperability of intelligent traffic management systems;
- and enhanced safety and environmental friendliness of transport infrastructure – by promoting innovative technological developments.

In the context of the CEF and on the basis of the multi-annual work programme set out in Annex I of Commission Implementing Decision C(2015) 7358 a call for proposals is launched to allocate funding from the general envelope of the CEF.

This call for proposals is launched under of a number of priorities of the multi-annual work programme, falling within one of the following Funding Objectives of the CEF Regulation:

- **Funding Objective 1** (total budget €200 million): bridging missing links, removing bottlenecks, enhancing rail interoperability and improving cross-border sections; in particular: European Rail Traffic Management Systems (ERTMS).
- **Funding Objective 2** (total budget €75 million): ensuring sustainable and efficient transport systems in the long run, with a view to preparing for expected future transport flows, as well as enabling all modes of transport to be decarbonised through transition to innovative low-carbon and energy-efficient transport technologies, while optimising safety; in particular:
 - Deployment of new technologies and innovation in all transport modes, with a focus on decarbonisation, safety and innovative technologies for the promotion of sustainability, operation, management, accessibility, multimodality and efficiency of the network;
 - Safe and secure infrastructure, including safe and secure parking on the road core network.
- **Funding Objective 3** (total budget €815 million): optimising the integration and interconnection of transport modes and enhancing the interoperability of transport services, while ensuring the accessibility of transport infrastructures; in particular:
 - Single European Sky – SESAR;
 - River Information Services (RIS);
 - Intelligent Transport Services for Road (ITS);
 - Motorways of the Sea (MoS);
 - Actions implementing transport infrastructure in nodes of the Core Network, including urban nodes;
 - Connections to and development of multimodal logistics platforms.

Pursuant to Article 9 of the CEF Regulation, only those proposals submitted by one of the following types of applicants are eligible:

- one or more Member States;
- with the agreement of the Member States concerned, international organisations, joint undertakings, or public or private undertakings or bodies established in Member States.

Proposals may be submitted by entities which do not have legal personality under the applicable national law, provided that their representatives have the capacity to undertake legal obligations on their behalf and offer guarantee for the protection of the Union's financial interests equivalent to that offered by legal persons. Proposals submitted by natural persons are not eligible. Third countries and entities established in third countries may participate in actions contributing to projects of common interest where necessary in order to achieve the objectives of a given project of common interest. They may not receive financial assistance except where it is indispensable to the achievement of the objectives of a given project of common interest. In such cases and pursuant to Article 8(1) of the TEN-T Guidelines, applications may be presented by neighbouring countries or entities established in neighbouring countries, with the agreement of a Member State.

Proposals submitted to this call for proposals under the priority MoS must include applicants from (and be supported by) a minimum of two different Member States. For multi-applicant proposals a coordinator must be designated.

3.1.2. Horizon 2020

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness. Horizon 2020 is the biggest EU Research and Innovation programme with €80 billion of funding available over 7 years (2014 to 2020), in addition to the private investment that this money will attract.

For the Transport Challenge, Horizon 2020 has allocated a budget of €6,339 million for the period 2014-2020 and will contribute to four key objectives, each supported by specific activities.

Horizon 2020 will provide funding for a resource efficient transport that respects the environment by making aircraft, vehicles and vessels cleaner and quieter to minimise transport's systems' impact on climate and the environment, by developing smart equipment, infrastructures and services and by improving transport and mobility in urban areas.

Horizon 2020 also aims at a better mobility: less congestion, more safety and security with a substantial reduction of traffic congestion, substantial improvement in the mobility of people and freight, by developing new concepts of freight transport and logistics and by reducing accident rates, fatalities and casualties and improving security.

The aim is to support improved policy making which is necessary to promote innovation and meet the challenges raised by transport and the societal needs related to it.

These activities are addressed in this Work Programme by three Calls for proposals:

- Mobility for Growth
- Automated Road Transport
- Small Business and Fast Track Innovation for Transport

The revision of the Work Programme for 2019 presents a novelty with the new cross-cutting Call “Building a Low-Carbon, Climate Resilient Future: Next-Generation Batteries”, which brings together research and innovation efforts on the next generations of batteries for electro mobility from various parts of Horizon 2020.

3.2. Government (State) Finances

The finances provided by the state government are a very important source of financing in the field of transport infrastructure. Governmental finances for the needs of transport infrastructure are planned by the annual budget.

The governmental finances are mostly used for the following activities: making the preparatory documentation, making the feasibility studies, procurement of goods and services, contracting, financing, construction, operation maintenance, etc.

Regardless which project is in question and which are the primary financial resources the governmental finances and the work of the government administration are an important factor in realisation of each project.

Advantages of Financing from Government Finances are:

- the lowest interest rates;
- the state can finance from the main state revenues (budget), can increase or introduce new taxes, fees, road taxes and the like;
- the privatisation in financing the projects of transport infrastructure can be performed as well;
- many projects cannot succeed without the support of the government and governmental finances.

Disadvantages of Financing from Government Finances are:

- “coercion” of the government to provide the governmental finances or to take governmental credits;
- introducing the private sector into public services is confirmed by the policy of the government;
- strategic specifying the state property and benefits from it;
- resistance of the users against payment of the extra fees (for instance road tax, pay toll) for the services that are traditionally exempted from payment.

3.3. International Finance Institutions (IFI's)

In Europe there are three International Financial Institutions (IFI's) that financing transport infrastructure: World Bank (WB), European Investment Bank (EIB) and European Bank for Reconstruction and Development (EBRD). In this paragraph the role of these institutions in transport financing will be shortly described.

3.3.1. World Bank (WB)

World Bank (WB) is the biggest autonomous creditor for development loans for undeveloped and medium developed countries and it is, also, the main catalyst of similar financing from other sources. The main business of the Bank is: granting the loans, technical assistance and leading the economic policy in order to support the countries.

The members of the World Bank are: International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Financial Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA).

Generally, the World Bank covers the following fields in financing: reform of financial and private sector, reform of state ownership, privatisation, de-monopolization and support to free market (competition), modernisation of economy, modernisation of industry, transport infrastructure, energy, environmental protection, social development etc.

Advantages of the WB Financing are:

- possibility of financing the projects not having the support of commercial banks or other financing sources;
- interest rates are, in principle, lower than in case of other sources of financing;
- the loan repayment term is long (15 -20 years) with the grace period, which is very important for transport infrastructure projects;
- selection of the fixed or changeable interest rate;
- giving credibility (authenticity) to the projects for the evaluated continuation (extending), such as technical aspect, financial, economic, or the aspect of surrounding;
- the bank acts as the catalyst for the participants in financing from other financing sources where the credits are insured by guarantees.

Disadvantages of the WB Financing are:

- the process of approving the project takes a long time;
- bureaucracy in the World Bank;
- strict financial and other formal conditions in the loan agreement;
- procedure of procurement must be carried out according to the WB procedure.

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3.3.2. European Investment Bank (EIB)

European Investment Bank (EIB) was founded as the institution for long-term financing of investments for future European integrations in EU and for improving the economy in EU countries.

It is the characteristic of EIB to invest in large projects and to cooperate with other financial institutions in these projects (co-financing). Regarding the cooperation with other institutions it is necessary to mention the cooperation with EU programmes, donors in realisation of the programme in the field of adjusting the market, transport and other conditions. This cooperation and activity refers to specific projects both, public ones and the projects in the field of the private sector.

All projects financed by EIB are carefully evaluated before making the decision on financing, which ensures economic justified reasons and benefits in relation to the surrounding, as well as technical and financial possibilities.

EIB and EU very close cooperate in new financial possibilities to maximising the benefits from aggregation and risk diversification of transport projects. They facilitate the blending and pooling by combining the grants from the Connecting Europe Facility (CEF) and the European Structural and Investment Funds (ESIF) with the financial instruments and products available under the CEF and the European Fund for Strategic Investment (EFSI).

The projects financed by EIB contributing to the “*Connecting the Region*” pillar of the EUSAIR Action Plan and the support of the TEN-T networks.

The principal products/services of the EIB are:

- **Lending:** the vast majority of financing is through loans, but also guarantees, microfinance, equity investment, etc.
- **Blending:** help unlock financing from other sources, particularly from the EU budget. This is blended together to form the full financing package.

- **Advising:** help with administrative and project management capacity which facilitates investment implementation. Lack of finance is often only one barrier to investment.

Advantages of EIB Financing are:

- the long repayment periods of the credits;
- acceptable interest rates;
- grace period for repayment is minimum time of building;
- active participation of other subjects from IFI's;
- participation of EIB in the projects increases credibility and guarantees for other financiers.

Disadvantages of EIB Financing are:

- credits are not approved without guarantees;
- the time for approving the credit is long and takes a long period of time;
- not more than 50% of the total project value is financed;
- the procedure must follow the nominated regulations by EIB.

3.3.3. European Bank for Reconstruction and Development (EBRD)

The activities of the European Bank for Reconstruction and Development (EBRD) include: improvement of financial institutions, legal system, development of infrastructure, development of the private sector, stimulation of co-financing and direct foreign investments in the private and public sector, mobilisation and engagement of the domestic capital, technical cooperation, etc. The activity of EBRD is based on close cooperation with other IFIs as well as other international institutions thus achieving political, financial and other harmony.

There are three basic functions of EBRD in financing the private and public sector: credits, participation in investments and guarantees. In each of these options, the Bank cooperates with other IFIs as well as private and public financial institutions through co-financing arrangements. Compared to other IFIs the EBRD is to the maximum focused on the private sector and its needs, i.e. on the cooperation of private and public sector.

This link to PPP financial model provides excellent results in mobilising the funds and in increasing the investments of funds in transport infrastructure.

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Furthermore, the Bank tries to preserve and improve the environment and support the overall development of the countries and the region.

Advantages of EBRD Financing are:

- it is the leading participant in financing the international projects;
- it approves the credits and direct participation in projects;
- it lends the funds without guarantees of the state governments;
- the long-term credits have favourable interest rates;
- grace period is related to the period of building in the project;
- active participation in the projects financed by other IFI's;
- participation of EBRD provides credibility of the project and thus;
- encourages other participants in financing.

Disadvantages of EBRD Financing are:

- the process of approving the funds is slow and requires much time;
- the procedure of supplying the goods and services must be strictly in accordance with the prescribed rules of EBRD;
- the projects must have multiple effects and profit for economy (local, regional and national);
- interest rates are higher than at other IFI's.

3.4. Commercial Banks

Commercial banks are an important source of financing of the transport infrastructure, especially in case of big and important projects. The attitude of these banks towards these projects is very specific, as the projects risks and guarantees are analysed with great attention and care.

Due to great care in investing, the commercial banks mainly take part in the projects for which the guarantees are given by IFIs or where these institutions participate in financing.

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The cooperation of the commercial banks with other banks and financial institutions is developed and run in. There are no general rules on cooperation, nor are there the rules of approving the credit, i.e. financing the project. Each bank has its own business policy and relation to project financing.

The network of commercial banks (USA, Japan, Canada, Europe, Asia) in the world is greatly spread and through their main offices and subsidiaries they enable the contacts and activities for participation in the projects of transport infrastructure.

The network of the commercial banks is developed and their possibilities are very different. Competition among the banks is great and the offered conditions do not substantially differ regarding the rate. The rate is not, nor may it be the only decisive factor in selecting the bank. The additional factors that must be taken into consideration are the following: size of the bank, experience in the same or similar projects, give the support regardless the cases and events that can occur regarding credit instability, credit restrictions, etc.

Advantages of financing through Commercial Banks are:

- a good and large source of financing of transport infrastructure projects;
- the credits can be approved also for the period longer than ten years;
- commercial banks can approve the state facilities for the interest rates so that they can be controlled in international exchange;
- the negotiations about financing and the project are much faster and simpler than the ones with IFIs and there is no additional bureaucratizing;
- a wish to lend without guarantees.

Disadvantages of Financing through Commercial Banks:

- interest rates and costs are higher than the ones with IFIs;
- the credits are due within shorter period than required by the transport infrastructure projects;
- grace period required by the project is, mostly, not approved and is shorter than requested;
- they are not willing to approve financial participation (equity) for the transport infrastructure projects;

- the credits must be insured by the property project-company and the project cash-flows.

3.5. Capital Markets

Capital market offers the greatest possibilities for credit financing of investments for companies or state ministries in case of transport infrastructure.

The access to the market is based on credit relations depending on credit validity, diffusion and limitation of the risks and other conditions. The best credit relations are with the lowest risks and the lowest costs of insurance at the international capital market. Project-company has extremely good access to the capital market especially if these are the private investments or credit insurance. This relation is based on good reputation, credit reliability, and the conditions convenient to both parties, and the project provides good results in all stages of the project with the greatest insurance.

Companies dealing with transport infrastructure search very much for this kind of financing so that it has led to great expansion of capital market development in the world. These investments are simpler, faster, more operational, so for that reason many decide for this financing source, much more compared to the commercial banks.

Advantages of Financing through Capital Market are:

- confirming the international profile of the emitters (issuers);
- access to the big and liquid financing source;
- long maturity dates are possible with fixed interest rates;
- credit reliability of the issuer is determined according to the internationally recognizable standards;
- the investor can trade with bonds or can keep them until maturity date;
- domestic insurance of bonds can be reduced to the relation of the risks in international exchange;
- the access of the investor is possible from a great number of countries.

Disadvantages of Financing through Capital Market are:

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- high costs of emission of bonds;
- the required credit relation lasts for a longer period of time;
- insufficient flexibility in terms and repayment;
- negative impact to degrading the credit relation;
- the great commitment of the management during the time of processing the market and achieving the best credit relation.

4. Cost Benefit Analysis (CBA)

The cost-benefit analysis (CBA) represents a decisive step while planning a new MoS or transport service, since it enables to assess the economic viability of the project and is also mandatory when applying for European funding. The analytical framework of CBA refers to following concepts:

- **Opportunity cost.** The opportunity cost of a good or service is defined as the potential gain from the best alternative forgone, when a choice needs to be made between several mutually exclusive alternatives. The rationale of CBA lies in the observation that investment decisions taken on the basis of profit motivations and price mechanisms lead, in some circumstances (e.g. market failures such as asymmetry of information, externalities, public goods, etc.), to socially undesirable outcomes. On the contrary, if input, output (including intangible ones) and external effects of an investment project are valued at their social opportunity costs, the return calculated is a proper measure of the project's contribution to social welfare.
- **Long-term perspective.** A long-term outlook is adopted, ranging from a minimum of 10 to a maximum of 30 years or more, depending on the sector of intervention. Hence the need to:
 - set a proper time horizon;
 - forecast future costs and benefits (looking forward);
 - adopt appropriate discount rates to calculate the present value of future costs and benefits;
 - take into account uncertainty by assessing the project's risks.Although, traditionally, the main application is for project appraisal in the ex-ante phase, CBA can also be used for in medias res and ex post evaluation.
- **Calculation of economic performance indicators expressed in monetary terms.** CBA is based on a set of predetermined project objectives, giving a monetary value to all the

positive (benefits) and negative (costs) welfare effects of the intervention. These values are discounted and then totalled in order to calculate a net total benefit. The project overall performance is measured by indicators, namely the Economic Net Present Value (ENPV), expressed in monetary values, and the Economic Rate of Return (ERR), allowing comparability and ranking for competing projects or alternatives.

- **Microeconomic approach.** CBA is typically a microeconomic approach enabling the assessment of the project's impact on society as a whole via the calculation of economic performance indicators, thereby providing an assessment of expected welfare changes. While direct employment or external environmental effects realised by the project are reflected in the ENPV, indirect (e.g. on secondary markets) and wider effects (e.g. on public funds, employment, regional growth, etc.) should be excluded. This is for two main reasons: most indirect and/or wider effects are usually transformed, redistributed and capitalised forms of direct effects; thus, the need to limit the potential for benefits double-counting. It is recommended, however, to provide a qualitative description of these impacts to better explain the contribution of the project to the EU regional policy goals.
- **Incremental approach.** CBA compares a scenario with-the-project with a counterfactual baseline scenario without-the-project. The incremental approach requires that: o a counterfactual scenario is defined as what would happen in the absence of the project. For this scenario, projections are made of all cash flows related to the operations in the project area for each year during the project lifetime. In cases where a project consists of a completely new asset, e.g. there is no pre-existing service or infrastructure, the without the project scenario is one with no operations. In cases of investments aimed at improving an already existing facility, it should include the costs and the revenues/benefits to operate and maintain the service at a level that it is still operable (**Business As Usual - BAU**) or even small adaptation investments that were programmed to take place anyway (**do-minimum**). In particular, it is recommended to carry out an analysis of the promoter's historical cash-flows (at least previous three years) as a basis for projections, where relevant. The choice between BAU or do-minimum as counterfactual should be made

case by case, on the basis of the evidence about the most feasible, and likely, situation. If uncertainty exists, the BAU scenario shall be adopted as a rule of thumb. If do-minimum is used as counterfactual, this scenario should be both feasible and credible, and not cause undue and unrealistic additional benefits or costs. As illustrated in the box below the choice made may have important implications on the results of the analysis; o secondly, projections of cash-flows are made for the situation with the proposed project. This takes into account all the investment, financial and economic costs and benefits resulting from the project. In cases of pre-existing infrastructure, it is recommended to carry out an analysis of historical costs and revenues of the beneficiary (at least three previous years) as a basis for the financial projections of the with-project scenario and as a reference for the without-project scenario, otherwise the incremental analysis is very vulnerable to manipulation.

In order to compare costs and benefits of the identified actions, the Net Present Value can be used. This is a parameter which allows to assess the present value of the project's projected future income and it's equal to the difference between the global benefit and the investment costs discounted on the same base date. The NPV is a reliable instrument to compare and select different projects, by choosing from those which have a positive NPV, the one with the higher NPV.

The guidelines provided by the European Commission, suggest following discount rates: 5.5% for Cohesion and IPA countries, and for convergence regions elsewhere with high growth outlook; 3.5% for competitiveness Regions 22.

In general, standard CBA is structured in seven steps:

1. Description of the context;
2. Definition of objectives;
3. Identification of the project;
4. Technical feasibility and Environmental sustainability;
5. Financial analysis;

6. Economic analysis;
7. Risk assessment.

The **first step** (Description of the context) of the project appraisal aims to describe the social, economic, political and institutional context in which the project will be implemented. The key features to be described relate to:

- the socio-economic conditions of the country/region that are relevant for the project, including e.g. demographic dynamics, expected GDP growth, labour market conditions, unemployment trend, etc.;
- the policy and institutional aspects, including existing economic policies and development plans, organisation and management of services to be provided/developed by the project, as well as capacity and quality of the institutions involved;
- the current infrastructure endowment and service provision, including indicators/data on coverage and quality of services provided, current operating costs and tariffs/fees/charges paid by users, if any;
- other information and statistics that are relevant to better qualify the context, for instance, existence of environmental issues, environmental authorities likely to be involved, etc.;
- the perception and expectations of the population with relation to the service to be provided, including, when relevant, the positions adopted by civil society organisations.

The **second step** (Definition of objectives) of the project appraisal aims to define the objectives of the project.

From the analysis of all the contextual elements listed in the previous step, the regional and/or sectorial needs that can be addressed by the project must be assessed, in compliance with the sectorial strategy prepared by the authorised body and accepted by the European Commission. The project objectives should then be defined in explicit relation to needs. In other words, the needs assessment builds upon the description of the context and provides the basis for the objective's definition. As far as possible, objectives should be quantified through indicators and targeted, in line with the result orientation principle of the Cohesion Policy. They may relate, for

example, to improvement of the output quality, to better accessibility to the service, to the increase of existing capacity, etc.

The **third step** (Identification of the project) of the project appraisal aims to identify the project. In particular, a project is clearly identified when:

- the physical elements and the activities that will be implemented to provide a given good or service, and to achieve a well-defined set of objectives, consist of a self-sufficient unit of analysis;
- the body responsible for implementation (“project promoter” or “beneficiary”) is identified and its technical, financial and institutional capacities analysed;
- the impact area, the final beneficiaries and all relevant stakeholders are duly identified.

The **fourth step** (Technical feasibility and Environmental sustainability) of the project appraisal aims to assess the technical feasibility and environmental sustainability. Although both analyses are not formally part of the CBA, their results must be concisely reported and used as a main data source within the CBA. Detailed information should be provided on:

- demand analysis;
- options analysis;
- environment and climate change considerations;
- technical design, cost estimates and implementation schedule.

The **fifth step** (Financial Analysis) of the project appraisal aims to:

- assess the consolidated project profitability;
- assess the project profitability for the project owner and some key stakeholders;
- verify the project financial sustainability, a key feasibility condition for any typology of project;
- outline the cash flows which underpin the calculation of the socio-economic costs and benefits.

The financial analysis methodology mainly used is the Discounted Cash Flow (DCF) method, in compliance with section III (Method for calculating the discounted net revenue of operations generating net revenue) of Commission Delegated Regulation (EU) No 480/2014.

The **sixth step** (Economic Analysis) of the project appraisal aims to appraise the project's contribution to the welfare. The key concept is the use of shadow prices to reflect the social opportunity cost of goods and services, instead of prices observed in the market, which may be distorted. Sources of market distortions are manifold:

- non-efficient markets where the public sector and/or operators exercise their power (e.g. subsidies for energy generation from renewable sources, prices including a mark-up over the marginal cost in the case of monopoly, etc.);
- administered tariffs for utilities may fail to reflect the opportunity cost of inputs due to affordability and equity reasons;
- some prices include fiscal requirements (e.g. duties on import, excises, VAT and other indirect taxes, income taxation on wages, etc.);
- for some effects, no market (and prices) are available (e.g. reduction of air pollution, time savings).

The standard approach suggested consistent with international practice, is to move from financial to economic analysis. Starting from the account for the return on investment calculation, the following adjustments should be:

- fiscal corrections;
- conversion from market to shadow prices;
- evaluation of non-market impacts and correction for externalities.

After market prices adjustment and non-market impacts estimation, costs and benefits occurring at different times must be discounted. The discount rate in the economic analysis of investment projects, the Social Discount Rate (SDR), reflects the social view on how future benefits and costs should be valued against present ones. After the use of the appropriate SDR, it is possible

to calculate the project economic performance measured by the following indicators: Economic Net Present Value (ENPV), Economic Rate of Return (ERR) and benefit/cost ratio (B/C ratio).

The **seventh step** (Risk assessment) of the project appraisal is required to deal with the uncertainty that always permeates investment projects, including the risk that the adverse impacts of climate change may have on the project. The recommended steps for assessing the project risks are as follows:

- **sensitivity analysis:** enables the identification of the „critical“ variables of the project. Such variables are those whose variations, be they positive or negative, have the largest impact on the projects financial and/or economic performance. The analysis is carried out by varying one variable at a time and determining the effect of that change on the NPV. As a guiding criterion, the recommendation is to consider „critical“ those variables for which a variation of ± 1 % of the value adopted in the base case gives rise to a variation of more than 1 % in the value of the NPV.
- **qualitative risk analysis:** the first step involves the identification of adverse events that the project may face. Building a list of potential adverse events is a good exercise to understand the complexities of the project. Furthermore, the qualitative risk analysis shall include a risk matrix for each adverse event indicating, an interpretation of the risk matrix including the assessment of acceptable levels of risk and a description of mitigation and/or prevention measures for the main risks, indicating who is responsible for the applicable measures to reduce risk exposure, when they are considered necessary.
- **probabilistic risk analysis;**
- **risk prevention and mitigation.**

5. Public-Private Partnership (PPP)

A public-private partnership (PPP) is an arrangement between a public authority and a private partner designed to deliver a public infrastructure project and service under a long-term contract. Under this contract, the private partner bears significant risks and management responsibilities. PPP projects can provide significant benefits to the public sector as well as to the project users.

Data published by EPEC (European PPP Expertise Center) shows that in the last 10 years (2009-2018) the Public Private Partnership (PPP) market in Europe has registered 1,802 PPP operations, for an amount exceeding 500 million euros, which reached financial closing for a total amount of approximately 368.6 billion euros. The United Kingdom is defined as the nations that dominate the European PPP market both in terms of financial closing and in terms of value at the top, with 1,032 closed contracts worth 160 billion euros, followed by France with 183 contracts and a value of 38.5 billion euros and from Spain with 161 contracts and a value of 35.2 billion euros. Italy ranks sixth with 39 closed contracts worth € 14.9 billion in value, preceded by Germany and followed by Greece. Instead, in Croatia has registered 3 PPP operations (all in transport sector), for an amount of 1 billion euros.

As regards the sectors, the PPP market is dominated in an important way by the transport sector (total value of 86.26 billion euros for 149 operations) that represents 23% of the market, followed by the health sector (19.68 billions of euros for 111 transactions), education (15.82 billion euros for 211 operations) and environment (11.48 billion euros for 54 operations).

Nevertheless, as the data and experiences show, although it is possible to use PPP models for the implementation of initiatives in the freight transport sector and in port infrastructure, the investment costs are so high that it would be possible to reach the economic-financial equilibrium only at tariffs for the users so high to cancel the benefits deriving from the construction of the work. For this reason, for these types of works defined as *“lukewarm”* or *“cold”*, it can be said that the economic-financial balance can only be achieved if the participation of a public loan is present.

In general, EPEC data show that on transactions of high economic value an important role of institutional investor participation is evident. In fact, of the 39 transactions that reached financial closing in 2018 in Europe, 21 have involved the participation of public administrations, banks, insurance companies and pension funds, as well as the participation of European funds allocated for this purpose.

For example, within the European Union program "Horizon 2020" there is an initiative called Shift2Rail, which aims to promote PPP in rail transport, by promoting research and innovation in this sector. In addition to the EU Commission, eight partners of the sector (Alstom, Ansaldo, Bombardier, Construcciones y Auxiliar de Ferrocarriles, Network Rail, Siemens, Thales and Trafikverket) are involved in the initiative, with a total budget of around 1 billion euros both public and private financing. Initiative have the goal of: doubling the capacity of the European rail transport system, reducing the costs of its life cycle of 50% and decreasing unreliability and delays of 50%.

These are the reasons why historically some sectors have been supported only by public investments, but recent international experiences show how it is possible to start PPP initiatives also in these sectors with important repercussions in terms of quality and lead times.

5.1. A proposal of PPP: DBFM solution

The Public Private Partnership (PPP) includes both "financially free standing" and "non financially free standing" initiatives, that is able to generate or not generate sufficient financial flows to guarantee an adequate return on the investments made. In the event that cash flows are insufficient, the public sector, in addition to playing the role of a flywheel, is called to take on an economic-financial risk component through a public contribution. This public contribution is necessary to achieve the economic and financial balance of the project and is added to the risk, debt or intermediate capital provided by the private sector.

Among the monetary forms of public contribution, we can mention the financial contribution (contribution to investment, takeover value), the fees (availability fee and service fee), the integration of revenues (contribution to management, integration tariff and shadow rates). To

guarantee the profitability of these works, it is possible that the public party can also make a non-monetary contribution, using incentives such as the concession period, tax advantages, tax credits and guarantee instruments or by acting on the assets real estate (transfer of ownership of real estate, real rights of use of real estate, sale of public areas). The latter is the typical case of punctual works and in particular of station areas where PPP operations generally involve the granting of areas for the commercial management or sale of entire assets to cover part of the investment costs.

The freight transport sector and in port infrastructure works fall into the "cold work" case that reaches the economic-financial balance through the public contribution (financial contribution in investment account, operating fees, tariff integration) since the investment costs are so high that if the only rates were to guarantee the economic-financial balance, they would be so high as to eliminate the benefits produced related to the realization of this kind of works (reduction of polluting emissions, lower consumption of territory, lower energy consumption, greater transport safety, reduced road traffic congestion). Therefore, the approach adopted by the public part to improve the infrastructural endowment and the offer of transport services for the benefit of the entire community is decisive.

The methodology proposed is applied to a DBFM (Design Build Finance Maintenance) solution of project finance, implemented for a new or restoration works and limited to a part of them, only for the technological part (ICT, energy, control and command and signalling, the traffic control, other plants). With this model of DBFM the private party is responsible for the design, financing, construction and maintenance work. The private party do not assume the demand risk but, exclusively and completely, only the construction risk of technological systems, and the maintenance risk of its availability guarantee, in the face of availability charges payed by the public. In addition, it is possible for certain types of plant predict the maintenance of the property (with the possible option of final redemption) in the hands of a private operator. The role of the public is relevant as it will finance the construction of civil works (60%-65% of the total work); while the project finance model will entrust to the private part, the construction and maintenance of technological part (34%-42% of the total work), reducing the risk of project implementation and encouraging the development and technological innovation. In any case, the infrastructure management, both technical and commercial, remains within the competence of the public part

or the related manager. The overall management infrastructure can in fact be divided into the following activities:

- marketing infrastructure (this activity will be performed by the infrastructure manager);
- operations (this activity will be performed by the infrastructure manager);
- facilities management (this activity will be performed by the infrastructure manager);
- maintenance and renewal of plants (this activity will be performed by the private).

The DBFM already widely used internationally for the implementation of other infrastructure projects, although limited to a part of them, it can transfer to the private exclusively and completely the risk of the construction and maintenance of technological systems in the face of availability charges guaranteed by the public.

As pertains to the procedural legal structuring of the various models of PPP, it is first possible to distinguish two main categories of partnerships based on the tools provided by the Italian law through which such operations are carried out: contractual partnership, based on contractual links between the subjects involved in the transactions, which provides the grant of one or more tasks to a private partner; institutionalized partnership, which implies the existence of an entity having legal personality held jointly by the public partner and the private partner. Figures of contractual partnership, which is usually applied in the two PPP models outlined above, are defined in the national codes of contracts for public works, services and supplies, that sets out the key principles that should govern the award of contracts. The main legal institutions required and used for the private financing of public works with a DBFM solution are the ongoing leasing and the contract of availability.

As regards the method of financing of the DBFM solution mentioned, you can resort one of the types listed below: project financing, financial leasing, structured financing proper. Although the first two modes of financing also represent forms of structured financing, structured financing for itself, it means a medium to long term financing made by the private developer that collects on the debt capital market to finance usually not more than half of total work in PPP. The cost of capital is determined by reference to the credit guarantees private operator. In this context belong project bonds subscribed only by qualified investors (banks, management companies, SICAVs, pension funds, insurance, banking foundations) and whose guarantee system is based

on the rating of the subject issuer and the rating of the work. Financial leasing is to fund a project in PPP through recourse to the total debt capital using a leasing company. In this case the cost of capital is determined by reference to the credit guarantees of the public and is therefore lower than other forms of structured financing because it allowed a lower provision for supervision of the counterparty private lending. In each case it is scheduled for a public option part of the final redemption of the completed work. The project financing includes always, unlike the other two forms of financing mentioned above which may be an option, that the funding is not directed at a previous firm but for the benefit of a newly incorporated company (SPV Special Purpose Vehicle) whose sole purpose is the construction and operation of the project. The project company is a legally distinct from that of the promoter of the project, resulting in the separation of the flows generated by the project from those of any other activity of the promoter. The double result is that, in the event of project failure, the lender will not retaliate against the assets of the promoter other than those owned by the project company and, symmetrically, in case of bankruptcy of the promoter the project company will continue to exist pursuing its purposes. In addition, the establishment of a SPV allows lenders to apply formulas to control as well as of contractual obligations and corporate very stringent.

It is possible to summarize the main features of the project financing as follows:

- the project is evaluated by lenders mainly (but not exclusively) for its ability to generate cash flows;
- cash flows, related to the management of the project, are the primary source for debt repayment and for the remuneration of risk capital;
- in order to isolate those cash flows from other assets of the shareholders it consists of a special project company that is in charge of developing the initiative and the financial resources required for its implementation;
- the management phase of the work is of prime importance (like its construction), as only effective management and high quality used to generate the cash flows necessary to meet banks and shareholders;

- the main guarantees associated with the transaction are contractual in nature rather than real;
- the structure of the transaction is defined as a result of a negotiation process between the different stakeholders (shareholders, banks, trading partners) on the allocation of risks between the different parties of the initiative.

However, in more general terms, the realization of a Project Financing operation can be generally broken down into three specific phases:

- 1) **Ideation or identification:** This stage includes a description of the business idea (target identification of demand to be met, bidding strategy, identification of assets, price, structure and operational costs), its proposal to lenders (definition of a risk matrix for their contractual allocation, security package), studies and analysis of the case involving a careful collection and analysis of all relevant data. This results in the preparation of a feasibility study, a financial model (business plan or PEF) and a term sheet (sensitivity analyzes to test the financial viability in terms of economic advantage or profitability, both in terms of financial viability or bankability, and definition of quantitative scenario and cost more likely).
- 2) **Start-up or implementation** (competition, design, construction and start-up): in this phase is the SPV formed by preparing the appropriate documents (articles of incorporation and bylaws), they are signed commercial contracts and financing are built, monitored and finally tested the works included in the project. Those lenders will progressively available to the project the financial resources required for its implementation. Normally most of the financial resources made available by a syndicate of banks through special loan agreements in which there are strict procedures that in turn allow the disbursement of individual tranches of the loan for work progress. It occurs if the project was carried out in the manner prescribed. They are, therefore, triggered a series of tests designed in particular to check the project's ability to function in the manner prescribed in the construction contract and, therefore, to generate the cash flows needed to repay debts to lenders. If the project fails to deliver the expected performance levels will

have to be activated a number of actions to bring the project in terms of provision of benefits provided for in the construction contract.

- 3) **Operational management**: once the start-up, the project begins to generate the cash flows necessary to repay loans (debt repayment in the repayment period established) through the management of activities / services created and the respective proceeds commercial revenues (the management of the works are flanked maintenance). It is at this stage that will be really tested the project's ability to meet its financing agreements for its implementation through the cash flow generated. Included in this phase also the operations of payment of dividends and finally transfer to the government of the works created.

From a strictly financial point of view it is possible to classify the structure of Project Financing depending on the type of recourse of the lenders on the shareholders of the project company. In particular, it is possible to identify:

- 1) **operations “without recourse”**: PF operations that excludes the recourse of the lenders of shareholders; in this case banks operate according to logic non-traditional shouldering risks close to those entrepreneurial, alternatively, there are third parties who provide individually or in a combined manner appropriate safeguards;
- 2) **operations with “limited recourse”**: operations PF where the revenge of the lenders of shareholders is limited in time and/or in the amount and/or quality;
- 3) **operations with “full recourse”**: PF operations in which the recourse of the lenders on the shareholders of the project company is total.

The solution proposed in the terms described above represents an important evolution of project finance solutions.

5.2. The risk analysis

The risk analysis and the distribution of risks between the public partner and the private partner depends on the parties' ability to identify, assess, monitor and manage these risks (construction, availability, demand, commissioning, administrative, expropriation, environmental, archaeological, regulatory, political, financing, insolvency, financial, industrial relations, residual value, technical obsolescence, interferences). Moreover, depending on the Eurostat risk allocation (Eurostat Decision 11.02.2004: construction risk, availability risk, demand risk) investment will be considered by the government and then consolidated in its financial statements (on balance), or the private partner (construction risk and at least one of availability and demand) and therefore deconsolidated from the public (off balance). The contract constitutes the main guarantee instrument for an efficient execution of the infrastructure, for the correct allocation of risks between the parties and for the keeping of the risks transferred to the private partner. To achieve the aforementioned objectives, the transfer of risks to the private sector imposes the presence of adequate contractual provisions of Service Level Agreements (SLA) and penalties based on objective and certain evaluation criteria, through the preliminary processing of KPIs determined in relation to the contents and characteristics of the contract and monitored by the sector regulation, with the automatic deduction of the fee. The application of the penalties foreseen in the contract must have as essential features of automaticity, proportionality and significance (penalties must have impact on the financial statements of the private partner).

Therefore, any PPP operation must be preceded by an adequate and accurate phase of identification, analysis and allocation of project risks. The sustainability of the operation also depends on the ability to carry out this process, otherwise, there could be financial implications for the public part and / or the project's inability to achieve its objectives.

In fact, risk management is not a simple project phase but rather a continuous process that continues throughout the duration of a PPP project, and can be summarized in five phases (Partnership Victoria "Risk Allocation and Contrattual issues" - 2001):

1. **Risk identification:** it is necessary to identify the main risks for the investment through an accurate identification process, foreseeing both those present during its construction phase and in the operational phase.

2. **Risk assessment:** it is necessary to determine the probability that an event associated with the various risks identified will occur and to assess the extent of the consequences also in economic terms. In the railway sector, a table like the one in Figure below can be used (Source: CEI EN 50126) which, based on the frequency and magnitude of an event, returns a risk value classified as negligible, tolerable, undesirable and intolerable.
3. **Risk allocation:** consists in assigning the risk and the consequent responsibility to face the consequences to one of the parts of the PPP contract and, therefore, to the public or private part, or establishing a mechanism for sharing the risk between the parties.
4. **Risk mitigation:** in this phase it is necessary to try to reduce the probability of a certain risk occurring and / or to identify mechanisms that allow to minimize the effects deriving from an event.
5. **Risk monitoring and review:** the risks identified must be referred to in the contract with the related clauses. Furthermore, it is necessary to provide for continuous monitoring and review of the identified risks and, possibly, the management of the new risks that emerged during the implementation of the PPP project.

Severity level of hazard consequence	4	4	8	12	16
	3	3	6	9	12
	2	2	4	6	8
	1	1	2	3	4
		1	2	3	4
<i>Frequency of occurrence of a hazardous event</i>					
<i>Negligible</i>		<i>Tolerable</i>	<i>Undesirable</i>	<i>Intolerable</i>	

Source: CEI EN 50126

Figure 9 - Risk Assessment

The risk analysis is therefore a cyclic and continuous process throughout the life of the PPP contract that can be summarized and outlined through a risk matrix, which must be attached to the contract, and which can also be used to plan and monitor the project in its various phases.

	PROBABILITY	COSTS	MITIGATION	PUBLIC ALLOCATION	PRIVATE ALLOCATION	CONTRACT ARTICLE
CONSTRUCTION RISK						
AVAILABILITY RISK						
DEMAND RISK						
.....						

Figure 10 - Risk Matrix

In the process of defining a PPP initiative, the proponents, in addition to assessing the revenue and financial sources linked to the economic sustainability of the project, must initiate a careful and accurate risk analysis. A thorough risk analysis reduces the probability of failure of the initiative.

According to the Eurostat recommendation, in order for the PPP operation to be considered off balance for the public body, the private partner must assume the construction risk and at least one of the availability risk and the demand risk.

The DBFM model proposed in this study assigns to the private party the construction and availability risk (relative only to the part of the technological systems); while it attributes to the

public part the risk of demand and construction of the infrastructure, which due to the high costs is one of the most critical elements of a PPP initiative in this sector.

In this model, therefore, the market risk is transferred to the public part that pays the fee for the use of the infrastructure to the private regardless of the fluctuation of the demand.

Demand risk can be fully allocated to the private party even where a government subsidy is involved. The government subsidy should be a bid element, set before the contract is signed. In such cases, the private party fully bears all fluctuations in patronage revenue and is therefore fully exposed to demand risk.

As regards the availability risk, this is linked to the capacity of the private part to provide the service according to the contract, both in terms of volume and quality standards. In this case, to guarantee an effective transfer of the risk of availability to the private it is necessary to include penalties in the contract, which to be effective must have the following characteristics: automaticity, proportionality and significance in terms of economic impact.

Instead, with regard to the assignment of the construction risk to the private part, this takes the form of the total or partial non-payment of the rent, in the event of delays in delivery times, increased costs, non-compliance with project standards, inconveniences technicians, etc ...

Finally, a penalty can be considered effective if it affects the Gross Operating Margin; in other words the private subject must be largely penalized by an inadequate performance, up to the extreme case of the revision / rescission of the contract.

6. Priority challenges and areas for intervention

Waterway transport plays a key role in the development of sustainable intermodal transport, especially since it has a relatively low environmental impact. Thus, the creation of an efficient multimodal transport system in the region may become a driving force in support for its sustainable development. The relatively low offer of routes between the two shores of the Adriatic is affecting the accessibility of the overall area.

Beside the need for optimisation of individual modes of transport there is need of coordination capacity and substantial investments in order to meet all the challenges for a sustainable, environmental friendly and low carbon transport system.

This result may be achieved by means new MoSs that must be accompanied by any possible actions:

- promotion of cross-border maritime routes and connectivity between different areas;
- adaptation and improvement of port infrastructure and inter-port in relation to operational and managerial aspects;
- promotion of maritime freight transport services efficient and sustainable in line with the adoption of environmental low-impact mobility plans;
- improving coordination between ports of the area for exploiting synergies and complementarities;
- sharing strategic functions and harmonizing ports processes through a common Intelligent Transport System (ITS);
- green upgrading of ships, of port machinery and port activities (e.g. cranes, power supply from shore, fuel switching to LNG, retrofitting, etc.);
- support port multimodal connectivity through the development of Short - Sea Shipping and the improvement of road and railway connections.

These actions outline the priority challenges that create the framework for port development in the Adriatic region over the next 15 years, each of them covering a number of priority areas of intervention. These priority challenges can be streamlined as follows:

1. Improving and/or optimising port infrastructure, in order to increase capacity, improve accessibility and safety & security;
2. Enhancing use of ICT technologies, in order to provide real-time information and trip planning;
3. Improving road/rail connections (infrastructures and services) between the port and its city centres/hinterland as well as its nearby railway stations/airports.

Long-term, sustainable results can be first achieved by ensuring high quality standards in the development and delivery of facilities and services, while implementing innovative solutions (e.g. infomobility) to increase level of attractiveness of port facilities.

As requirements evolve, innovative approaches and technologies must be sought out to achieve continuous improvement and drive sustainable change.

For ship, it is essential to ensure that itineraries are effective and attractive, that berthing is efficient, and that congestion on arrival at destinations is minimised. Congested ports can have a negative impact on the freight transport. In addition, traffic congestion can lead to a significant increase in air emissions in the port area, with potential negative impacts on the health of local communities.

Ports and destinations need, therefore, to ensure that good quality transport infrastructure as well as quality public transport connections between the port and its hinterland exist. Action can include the provision of appropriate waiting facilities at the port, aiming to bring transport infrastructure (e.g. railway lines) in to the port wherever feasible.

Promoting and ensuring safety and security of everyone involved is equally of paramount importance.

In the light of these considerations, are exposed the three priority challenges for the future development of the Adriatic ports. For each challenge their main objective is briefly summarised and the identified priority areas of interventions presented.

Priority challenge 1: Improving/Optimising port infrastructure

The objective of this second priority challenge is to take effective measures to increase capacity, improve accessibility and safety & security of port terminals.

The goal of this priority area of intervention is to provide a safe and secure environment within the port terminal infrastructure. The most important function of a terminal is the safe and efficient movement of ships, freight, vehicles and people, and this should be one of the principle that influences the design and operation of the terminal. In this respect, safety has two distinct aspects:

- safety of the terminal environment relates to avoiding hazards;
- safety also relates to personal security of the user.

Other goal of this priority area of intervention is to improve accessibility to terminals. Good accessibility and the availability of suitable mobility services can be critical factors not solely for the port development but also for the local economy in the vicinity of the ports. A terminal should have good connectivity and accessibility between the available transport modes and its precinct. To encourage use of port services it is, therefore, important that modal integration (linking the various modes of transport) is as seamless as possible and transfers are convenient and comfortable.

For these reasons, the following actions may be taken:

Short-term and Medium-term actions (timeline 2 up to 4 years)

- electronic check-in system for vehicles;
- security equipment (e.g. video surveillance, specific equipment to detect explosives, chemical substances, etc.);
- secure infrastructures (e.g. secure people and vehicles pathways, etc.);
- strengthening security staff capacity and skills;
- availability of parking areas for commercial vehicles;
- ICT solutions for mobile device for operators.

Medium-term actions (timeline 5 up to 8 years)

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- dedicated (separated) gate access to port for private cars and commercial vehicles;
- availability of public transport stops/terminals.

Long-term actions (timeline 9 up to 15 years)

- improvement/Upgrading of security equipment and electronic check-in of vehicles;
- improvement/Upgrading of parking areas for commercial vehicles and services.

Priority challenge 2: Enhancing use of ICT technologies

The objective of this priority challenge is to take effective measures to provide freight operators with real-time information and trip planning.

The goal of this priority area of intervention is to develop info-mobility solutions with the aim of fostering attractiveness and to making the port system more efficient.

The provision of info-mobility services can potentially improve effectiveness and efficiency of ships, commercial vehicles and transshipment operations. The provision of info-mobility solutions (e.g. platforms) is key for freight operators. It is also worth saying that the continuing development and availability of technology is facilitating and lowering the cost of info-mobility. Finally, info-mobility is crucial as it contributes to integrate the port terminal with its hinterland, by increasing the accessibility of the port through the improvement of its attractiveness for its users.

For these reasons, the following actions may be taken:

Short-term actions (timeline 2 up to 5 years)

- deployment of ITS services to offer customized/user-friendly real-time information (e.g. through interactive information displays, web platforms, smartphone apps);
- multi-language information also integrating pre- and post-travel information;
- e-ticketing.

Medium-term and Long-term actions (timeline 5 up to 15 years)

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- improvement/Upgrading of real-time information services and systems.

Priority challenge 2: Improving road and rail connections

The objective of this priority challenge is to take effective measures to improve infrastructures and services between the port and its city /hinterland as well as its nearby railway stations/airports. It is first important to minimise port impacts on vehicle and pedestrian traffic. This priority challenge involves one priority area for intervention: transport infrastructures. The goal of this priority area of intervention is to identify the priority gaps in relation to terrestrial connections and implement necessary activities to improve capacity to facilitate growth within the port sector.

The lack of adequate transport infrastructure often prevents the freight from easily reaching the port terminal. Good connections between terminals and its hinterland. Therefore, the infrastructural layer is where the intrinsic port accessibility is valorised. On this issue, the availability of adequate infrastructure in transport nodes (seaports and inland terminals) and on the links/corridors in the network is a prerequisite for the development of transport activities. Infrastructure should act as an enabler of port-related market dynamics that lead to efficient and sustainable co-modal freight transport services.

For these reasons, the following actions may be taken:

Short-term actions (timeline 2 up to 5 years)

- infrastructure rehabilitation/extension for improved road/rail connections between the port and its city/hinterland;
- plan future port development and optimise the design of port infrastructure.

Medium-term and long-term actions (timeline 5 up to 15 years)

- improved road/rail connections;
- improved port infrastructures (seaports and inland terminals).

Furthermore, based on the analysis above as well as a successive brainstorming with stakeholders, can be adopted other actions for the successful implementation of a Joint Strategic Plan of MoS routes. The actions that could be adopted by States of the Adriatic Region for the development of MoSs are, for example:

- adapt the legislative framework to increase autonomy and flexibility for the Port Authorities;
- plan, design and integration of a comprehensive transport network including rail, inland waterways, nodes and hubs and prepare their integration into the Trans-European Transport Network (TEN-T);
- strengthen and extend the collaboration between public and private entities;
- assess different mechanisms to improve MOS uptake (decrease of port tariffs, implementation of ECOBONUS-like system, decrease of the bottlenecks, etc);
- promote the MoS Corridor to the users nationally, regionally and internationally;
- improving port electricity connections and diversifying their energy sources in order to enhance security of energy supply, diversify energy offerings to the vessel operators and promote environmental sustainability;
- develop common promotion centres in the region with authority to expedite time-consuming national frameworks;
- adopt multi-national committees, in order to foster cross-border collaboration;
- adopt a mechanism for frequent exchange of information between coastal countries, including the development of an Integrated Vessel Traffic Monitoring and Information System in order to improve the safety and security of maritime traffic in the Region;
- developing ports and port terminals so as to offer value added logistics services thus to support maritime transport, short-sea shipping capacity and cross-border connectivity;
- developing motorways of the sea by improving road and rail infrastructure that links the port with the hinterland, improved infrastructure and ITS solutions.

7. Conclusion

A transport infrastructure is a work with a high level of technical complexity and a high cost of investment. The possibility to use the models of project finance presented here, permit to increase the investments, reduce the direct costs for the public part and increase the development of new technologies by private part. Moreover, the risk analysis and the risk matrix proposed here, permit to guarantee the good result of the investment. This report presents an innovative methodology for the risk analysis with a related risk matrix and a new solution of project finance applied to the transport infrastructures in order to stimulate the increasing and the diffusion of new solutions and new possibilities linked to the use of a DBFM model of project finance. By performing a risk analysis and attaching a risk matrix to the contract, such as proposed, a decrease in contingencies is expected thanks to a better and more accurate risk assessment, verification and control of the public/private investment in order to guarantee cost, time and quality for the transport infrastructure realized in project finance. Proposed project finance solution, risk analysis and risk matrix, could be further specialized in according to international approaches and best practices, to the different contract models in relation to the national and international legal aspects and related code regulations, in order to produce an ever more complete risk matrix as monitoring tool in relation to the different international approaches used for the transport public/private investments.

All finances sources above mentioned can be involved in PPP projects, including International Finance Institutions, Government Finances, Commercial banks, Capital market and EU finance sources. For this reason, it's possible involve decision makers (including CHARGE partners) and practitioners of the intermodal freight transport for the preparation of PPP initiatives. Priority initiatives might be outline through a CBA, as described in chapter six.

Lastly, methods, schemes and analysis examined in this report can be adopted for the successful implementation of a Joint Strategic Plan of MoS routes for a sustainable development of the intermodal freight traffic in the CHARGE area.

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