European Commission

Annual Report of the Coordinator

Priority Project 21
Luís Valente de Oliveira

Transport

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PP21 - Motorways of the Sea

A Sustainable Maritime Vision for Europe
Building on Europe's Maritime Legacy and Looking Beyond Global Trade

This report only represents the opinion of the European Coordinator and does not prejudice the official position of the European Commission.

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European Coordinator

Luís VALENTE DE OLIVEIRA

Summary

The development of Motorways of the Sea (MoS) will provide a framework for the deployment of high level standards for efficient, safe and environmentally friendly maritime transport operations which can be fully integrated in a door-to-door transport chain.

MoS, whilst ultimately aiming at the increase of cargo flows to be carried by maritime traffic, aim primarily at the development of efficient ports and better port hinterland infrastructure and connectivity which will facilitate a smooth traffic flow. This development will help to mitigate traffic congestion and land transport deficient links between regions which are detrimental to cohesion and a dynamic internal market.

MoS will be integral to any efficient logistics chain aimed at supporting trade whilst reducing the transport footprint on the environment. Currently, 19 deployment projects and pilots support this contribution to sustainable development. Finally, MoS will become an intrinsic part of the future TEN-T Core Network and as such, fulfil its key role as the main exchange platform for the European foreign trade and increased European competitiveness.

Methodology

The opinions expressed are those of the European Coordinator, based on his findings in the fifth year of his mandate. The Coordinator formulates a number of recommendations that draw upon his contacts and meetings, including those with the Member States and the European representative organisations (both institutional and industrial), on issues that are common throughout Europe. This report relies upon the previous reports as well as on the progress and results of the ongoing MoS projects. The recommendations at the end of the report highlight both recurrent issues and others which need further attention.

1. Foreword

TEN-T Priority Project 21 Motorways of the Sea (MoS) builds on the EU's "2020" goal of achieving a clean, safe and efficient transport system by transforming shipping into a genuine alternative to overcrowded land transport. The MoS concept aims at introducing new inter-modal maritime logistics chains to bring about a structural change to transport organisation: door-to-door integrated transport chains.

Given the holistic approach required from MoS which addresses both of these impacts, international and internal trade across the entire EU and particularly on the EU maritime waterfront, a European Coordinator was appointed in the summer of 2007 to promote the efforts required for its development.

This progress report builds largely on annual findings from 2007 onwards and sets out the Coordinator's new findings in 2012. It also:

- Describes and assesses the progress and results of the 19 ongoing MoS TEN-T projects;
- Addresses the progress made thus far by several MoS initiatives such as the "clustering meetings" and others carried out under different frameworks;

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- Provides more clarity in the MoS concept and describes the foundation of the new MoS TEN-T guidelines and
- Defines a set of recommendations on priority actions to take in the fields of research, innovation and deployment of infrastructure and services.

In 2012, the perspectives for MoS have changed enormously. Not only has the sector accepted the concept, approach and the priorities set out in the Coordinator's previous reports but has massively responded and 19 TEN-T projects are now underway.

The 2010 and 2011 Calls were a great success in quantitative terms: 15 new proposals were selected for funding of more than €140 million. MoS have now the critical mass required to spur change. From the qualitative viewpoint, it should also be highlighted that most of the proposals addressed "wider benefit" issues, e.g. safety, ICT logistics platforms, port single windows and new organisational schemes for ports. Last but not least, they also look at the use of LNG and other technologies to reduce emissions, using pilot projects to develop and demonstrate operational solutions.

In 2012, the Coordinator has continued to promote coordination meetings to bring together the MoS consortia and other stakeholders in order to improve cooperation and exploit synergies, avoid duplicative fforts and make the best possible use of resources. Two meetings were organised in Gothenburg (May 2012) and Limassol (June 2012), attracting more than 150 participants each. They were fundamental to share experiences, raise awareness, disseminate results and foster the development of new proposals. They were also used as sounding boards to identify new priorities and missing links. In addition to the clustering meetings, the ongoing projects have organised progress meetings, peer reviews and final reporting (e.g. Mos4MoS in the European Parliament).

The report also identifies key MoS issues that require further development. Those issues of technological, organisational and procedural nature reflect the new transport policy as outlined in DG MOVE's 2011 White Paper.

Finally, it proposes a foundation for the new definition of MoS based on the revision of the TEN-T guidelines. In short, it promotes MoS as the maritime face (shipping and ports) of the new TEN-T Core Network and consequently as a tool to integrate the key elements of the EU's maritime policy in European transport infrastructure, i.e. ports, maritime operations and TEN-T corridors.

2. Introduction - Motorways of the Sea

The European transport system faces a difficult challenge: to support the continued development of the largest trading block in the world, simultaneously catering for overseas trade and the needs of the internal market. In Europe the challenge is the interconnection of the internal market and mobility to accommodate large trade flows from Asia and the Americas – being transported through the Suez and Panama Canals or South Atlantic. In 2010, the value of EU seaborne external trade was €1452.3 billion. Maritime transport and ports handle up to 90% (in tonnes km) of EU external trade and 40% (in tonnes) of intra-EU freight exchanges. In 2010, European maritime transport and ports handled slightly under 400 million passengers. European ports are directly linked to over 800,000 enterprises, generating in total the direct and indirect employment of about 3 million people.

In times, such as the current conditions, when economic growth is essential, the role of maritime transport and ports is particularly important and thus needs to be adequately reflected in the European transport system/ TEN-T network.

TEN-T requires a dual approach, meaning that it should be developed simultaneously both as a tool to externally connect Europe to the world as well as to link its own countries and regions. For this, maritime operations and ports require efficient tools to be effectively interconnected and utilised. This is the heart of MoS development as it pursues

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the development of these tools. By improving maritime and ports operations, MoS develops the underlying foundation of Europe's foreign trade. As a funding (policy and financing) framework, MoS will improve port infrastructure, develop interoperable port-ship interfaces and efficient port–hinterland connections, link ports and integrate origins and destinations and bridge gaps in and between different trade corridors.

MoS provides a shrewd platform, using sophisticated information systems to integrate important assets, such as ports, shipping and know-how, tackle transport efficiency problems and endeavour to propelyr integrate maritime transport in the global logistics chain. For example, port single windows – single points of contact between ships, cargoes, authorities and logistics operators - will pave the way for a smooth transit of cargo through the necessary customs and phytosanitary controls, saving literally hundreds of millions of euros by eradicating obsolete and cumbersome procedures. There are already practical results in this area, such as in the Mos4Mos project: others are being deployed and will be ready by the end of 2013, such as MIELE which involves ten ports/ authorities and seven different Member States.

In parallel, MoS supports the development of highly efficient shipping operations guaranteeing the smooth flow of large quantities of goods and efficient intermodal connection with the hinterland of ports such as Karlskrona-Gdynia, Trelleborg-Rostock, Gijon-Nantes, London-Bilbao or Zeebrugge-Ejsberg.

MoS fosters and favours cooperation and regional use of resources, such as between Gothenburg-Aarhus and Tallinn, by supporting the development of a common information structure, the development of better links between the ports and high density freight lines with the hinterland. A North Adriatic platform (to be completed by the end of 2013) will join together key ports in the area under a common corporate image, and the "Adriamos" project linking the upper Adriatic and the Hellenic peninsula (results expected in early 2015) supports three different transport Corridors and connects to/from the Baltic rim.

MoS supports safety and protection of the environment, including the development of sustainable maritime operations and the respect of environmental targets. This is particularly important on the Sulphur Emmission Control Areas where MoS activities involve countries, ports and ship operators in the Baltic and North Seas addressing the implementation of remedial tools such as the use of Liquified Natural Gas (LNG) or scrubbers. A masterplan on the issue is currently being developed by Baltic ports and should deliver results in 2014. MoS also supports projects producing new and updated hydrographical surveys, which help ships sail safely and avoid grounding, and more dynamic traffic control to prevent collisions and other accidents. The results of full scale pilots in this area are expected in early 2015). MoS is also exploring the economic use of LNG as a geostrategically relevant fuel for the Atlantic, Mediterranean and Black Sea areas. The results of this project – the COSTA project – are expected in late 2014.

Finally, MoS favours the creation of a knowledge network – building on local knowledge to tackle global problems. This initially started as a network of universities linked to MoS industrial stakeholders, promoting the integration of remotely dispersed experts and multidisciplinary expertise and making it available for education and professional training. The project will be ready at the end of 2014.

TEN-T is trying to optimise use of Europe's large maritime operations capacity, its technical expertise and European ports. The aim is to efficiently use and fully interconnect the over 80 ports in the Core Network and the more than 340 ports in the Comprehensive Network to the global logistics chain.

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3. A new definition for Motorways of the Sea

The new TEN-T Guidelines have cast a new definition for the Motorways of the Sea. Revision of the TEN-T Guidelines. The TEN-T Guidelines constitute the main regulatory basis for the development of the Motorways of the Sea. The Guidelines define the type of eligible actions and the financial support dedicated to MoS in the 2007-2013 programming period where an overall indicative amount of €310 million was flagged. The process of revising the current TEN-T Guidelines started in 2009 and is expected to last until mid-2013. MoS are the framework for the development of actions covering maritime transport/ports and favouring their integration in the global transport chain. In the new Guidelines, MoS are part of the Core Network and link into the Comprehensive Network. They constitute an invisible but fully available transport corridor covering all of the EU's coastal areas and will therefore be a key infrastructure implementation tool in the deployment and operation of the Comprehensive and Core Networks.

Financing – The Connecting Europe Facility (CEF)

For the 2014-2020 financial perspective, the TEN-T programme will be developed under the CEF (Connecting Europe Strategy), which currently proposes €31.7 billion for transport projects.The CEF will be the main financing source for transport infrastructure projects in Europe.

Currently, Member States have a consensual position that MoS should be a horizontal priority in the CEF and that its financing rate should be 30% for projects and 50% for pilots and studies. These rates will only be finalised once there is a final agreement on the CEF.

Foundations for the New Guidelines

The new Guidelines should simplify and clarify the rules of engagement for MoS and re-affirm MoS' aim to support studies, both masterplan style and the preliminary or final design type, which are common to all infrastructure projects. In addition, schemes such as pilot actions, the integration of intelligent infrastructure, and support to start-up services and the deployment of innovative technologies on ships (including retrofitting) are all different but common elements of a coherent MoS development programme. MoS needs to support the key elements of maritime infrastructure: safety at sea and environmental protection. Without investments in these areas, the maritime infrastructure will not be operational.

Finally, the Guidelines should clarify the limits and types of incentive available to combine funding sources on MoS global projects,in order optimise use of available funding.

The new articles on MoS should clarify its role in unifying the Core and Comprehensive Networks, as well as the feedering services to/from other ports without which the core ports will not function. Europe is one of the major world trading partners and most of its trade exchanges are carried by maritime transport. Consequently, ports are the key nodes and ships the fundamental vehicles for trade, connecting European regions to their European or international partners. To properly support these activities, ports and ships must be able to efficiently interact between them as well as with the transport land network.

Geostrategic and transport operations elements

The following text reflects the essentials of the MoS concept:

4.4.1 Motorways of the Sea shall contribute to improve accessibility and cohesion within the European Union. As part of the core network, Motorways of the Sea is the building block for the maritime dimension of TEN-T, covering the European maritime space. As such, it provides a platform for the development of all the activities required to efficiently reconcile all the key elements involved in maritime transport – ports, ships, human element and organisational systems and procedures; in order to achieve the safe, secure and sustainable maritime operations which are instrumental for European competitiveness.

Concerning the European Maritime space proper, activities will cover, inter alia:

- The safety of operations, e.g. ice breaking and year round navigation, human element, hydrographical surveys, safety information systems, dredging, navigation information systems, e-navigation.
- The environmental performance of ships, e.g. innovative waste and waste water treatment systems, improved reception facilities, environmental performance and dynamic ship indexing, improved ship and engine efficiency, reduced emissions as required for ECAS, environmental tailored design and retrofitting procedures as well as life-cycle analysis of ships including easy recycling and disposal and the use of electro-mobility or alternative fuels for ship propulsion.

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- Traffic management and navigation services, e.g. support the deployment of improved vessel traffic management services (VTMS) and of their interface with ships, optimised bridge design and navigation systems as well as e-navigation services, tele-monitoring and remote maintenance and repair of ships, as well as navigation, reporting and positioning systems.
- Optimised ship operations, e.g. short sea shipping and sea-river operations, ship and port interface development to achieve efficient logistics operations

Scope and key elements

4.4.2 Motorways of the Sea shall comprise the European maritime space where ships evolve coming to and from European ports, the safety and security procedures that permit sustainable operations, the traffic management services and the ports as the interconnecting points to other modes and final destinations for passengers and cargo thus guaranteeing both the accessibility requirements and the integration of the different services supporting high volume of trade.

Concerning the interface ship, port and hinterland, the following activities shall be considered as priorities:

- efficient connections from and to the core network ports, e.g. efficient multimodal connections to the European transport network and matching transhipment performances to other ships and other modes, avoidance of bottlenecks namely through terminal efficiency and infrastructure connections, support the deployment of physical infrastructure to integrate ship and port operations in the transport chain .
- ICT integration of ships and ports in the logistics chain: support to the continued development and deployment of single-window type of services and other e-maritime systems to streamline procedures and speed up the transportation process and the official clearance of cargoes. Support to the development of the institutional ICT layer where private services connect in order to exchange all the information required on a door to door type of transport.
- Favour the clustering of ports leading to an optimised use of common infrastructure and to larger economies of scale and thereby gaining efficiencies and avoiding bottlenecks, this will also entail the use of common information services
- Support the development of infrastructure and ancillary infrastructure required for the development of sustainable shipping, e.g. enhanced shore based reception facilities, liquefied natural gas (LNG) infrastructure for refuelling and bunkering services, refuelling services and cold ironing systems.
- Support the development of geo-strategic ports which will guarantee the security of supply for maritime transport services thus avoiding critical stoppages on the flow of goods due to natural calamities or man-made causes. This will address ports, access to hinterland, terminals and ships

Integrated Projects

4.4.3 The Motorways of the Sea projects will also embed the new type of dynamic infrastructure where transport modes and units, physical infrastructure and operational requirements and operations will be brought together and their integration optimised. This will result on a level playing field (framework) able to integrate public and private parties and their respective financing capabilities in the common endeavour of deploying equipment and infrastructure whilst developing effective and optimised operations. This operational infrastructure needs to be developed with door to door services in mind.

An example of this type of priority is the corridor-specific infrastructure project which focuses on infrastructure and facilities, having the objective of improving the capacity, frequency or quality of existing maritime links, or establish new ones, as elements of the broader network of MoS in terms of logistic chain.

Implementation Instruments

4.4.4 Implementation of MoS projects – given the diversity and type of projects which are covered under MoS, the instruments to be used cover studies, pilot projects including full-scale demonstration and development projects.

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TEN-T methodology

Within the overall TEN-T methodology where the main nodes of the Core Network and the links between the main nodes are kernel and need to be identified, the parts referring to ports are very important for MoS and in particular these rules:

Core Network ports: Sea or inland ports or road-rail terminals of an urban main node (S). Outside urban main nodes, sea or inland ports with an annual transhipment volume of at least 1% of the total transhipment volume of all EU seaports, based on linear interpolation between bulk and non-bulk. In insular Member States or NUTS 1 regions with access to the sea where no ports are classified according to the above criteria, as a general rule, along each continuous coastline only one seaport is classified as a main node. It shall be the largest such port, however taking into account also hinterland connectivity.

Comprehensive Network ports: ports with an annual transhipment volume of at least 0.1% of the total transhipment volume of all EU seaports. Motorways of the Sea ensures the links between these main nodes.

The new text of the Guidelines

1. Motorways of the sea represent the maritime dimension of the trans-European transport network. They shall consist of short-sea routes, ports, associated maritime infrastructure and equipment, and facilities enabling short-sea shipping or sea-river services between at least two ports, including hinterland connections. Motorways of the sea shall include:
(a) maritime links between maritime ports of the comprehensive network;
(b) port facilities, information and communication technologies (ICT) such as electronic logistics management systems, safety and security and administrative and customs procedures in at least one Member State;
(c) infrastructure for direct land and sea access.

2. Projects of common interest for motorways of the sea in the trans-European transport network shall be proposed by at least two Member States. They shall take one of the following forms:
(a) […]
(b) constitute a maritime link and its hinterland connections within the core network between two or more core network ports;
(c) constitute a maritime link and its hinterland connections between a core network port and ports of the comprehensive network, with a special focus on the hinterland connections of the core and comprehensive network ports.

3. Projects of common interest for motorways of the sea in the trans-European transport network may also include activities that have wider benefits and are not linked to specific ports, such as activities for improving environmental performance, making available facilities for ice-breaking, activities ensuring year-round navigability, dredging operations, alternative fuelling facilities, as well as the optimisation of processes, procedures and the human element, ICT platforms and information systems, including traffic management and electronic reporting systems.

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4. The ongoing projects

MoS currently has 19 ongoing projects, representing more or less €170 million in EU grants and a total investment of over €1 billion. The individual descriptions and progress of the projects can be found below:

Projects started in 2008 and 2009 – State of progress on 1 June 2012

High Quality Rail and Intermodal Nordic Corridor Königslinie (2008)

The project was partially completed and ended in December 2011 at the request of the beneficiaries. Its main achievements are g:

- Integration of IT systems of the Port of Trelleborg, CargoNet and Scandlines AB
- Adaptation of berths in the Port of Trelleborg (additional roadside ramps and wider breakwater)
- Extension and improvement of the Port of Trelleborg (reconstruction of four rail tracks, making double rail shunting possible, and new areas to handle and temporarily store intermodal units)

Motorways of the Sea projects in the Baltic Sea Area Klaipéda-Karlshamn link (2008)

The project is being implemented with some delay. As a result of the detailed studies carried out on a first phase, some activities had to be reviewed (one cancelled) and their implementation adapted to the requirements of those detailed studies.

Motorways of the Sea Esbjerg-Zeebrugge (2008)

The Action is progressing well and is on track. The activities related to the floating ro-ro ramp and the ro-ro jetty were finalised in 2009 and 2011 respectively. The first part of the port access in Esbjerg opened for traffic in November 2011. The second part is expected to open by the end of June 2012, six months earlier than scheduled.

Baltic Link Gdynia-Karlskrona (2009):

All the project activities except activity 6 have started and are being implemented more or less according to plan. Activities 9 and 10 related to on-shore power supply have been completed. Project implementation is being coordinated with a project to improve port access infrastructure in the Port of Gdynia, co-financed by the Cohesion Fund.

Projects started in 2010 – State of progress on 1 June 2012

MOS 24

The Action is progressing well and is on track. The activity related to the analysis of the context was finalised in 2011, as planned. The activities linked to the design and implementation of the MOS24 demonstrator have started and are on-going. The remaining horizontal activities, related to communication and project management, are being developed and are progressing as planned.

Monitoring and Operation Services for Motorways of the Sea (MoS4MoS)

The Action was completed on 31 May 2012 as planned. The MOS4MOS Masterplan was drafted and publicly presented. 15 initiatives were identified and analysed in-depth. A Cost Benefit Analysis of the forthcoming implementation of the 15 initiatives was elaborated. Piloting and Demonstration resulted in the piloting and demonstration of all 15 initiatives included in the Action, clearly exceeding the initial target of three piloted initiatives.

MIELE

The Action is on schedule and Part A was completed and approved by the Peer Review Group.
The results achieved include:

- Collection and analysis of user needs, best practices and existing and/or under development standards.
- Identification of obstacles and possible solutions to implementation of Directive 2010/65 within and between the five Member States involved.
- Agreement on interoperability standards and MIELE architecture.

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- Start of extended dissemination (toward Member States not part of MIELE) and improvement of website.
- Contacts established with IMO and ASEAN States.
- Development of specifications for use cases (pilots will be tested through demonstrators).

ITS Adriatic multi-port gateway

The preliminary studies, including a port organisation and process analysis, marketing and prospective study and requirement identification and definition of standards, have been completed.
Work on the improvement of the existing port community systems has begun and should be completed by the end of 2012.

Motorway of the Sea Rostock-Gedser

Port works in Rostock and Gedser (primary berth facilities) are on track. Some minor adjustments were made regarding the initial planning, such as the final delivery dates of two new buildings (rescheduled from spring to autumn 2012). Works on the Nykoping Falster bypass are progressing as planned.

The Baltic Sea Hub and Spokes

The project is running behind schedule. Almost all the Action's activities, apart from the design studies, are delayed. The beneficiaries are undertaking the necessary steps to get the project back on track and have put in place the required mitigation measures. The project is however expected to be concluded with an overall achievement of 24% and 98%, respectively, for the investments related to the Aarhus port access and Gothenburg port access.

MonaLisa

Project implementation is generally on schedule. The activity on dynamic and proactive route planning is generating a lot of interest in the sector after the Concordia cruise ship accident, so it may be completed ahead of schedule. The study on a current situation with automated verification of ship crew certificates, together with a concept description, is underway. The hydrographical surveys are progressing and a working prototype of a universal proxy for global sharing of maritime information has been developed.

LNG infrastructure of filling stations and deployment in ships

The study on the LNG bunkering infrastructure has been completed and its recommendations have been vetted by the relevant stakeholders. The final conference took place. However, the pilot phase on installation and testing the LNG fuelled engines is delayed and will take place in 2013.

Projects started in 2011

Adriatic Motorways of the Sea (ADRIAMOS)

The Action aims to enhance a viable, regular and reliable sea-based transport service integrated in the logistisc chain along the Adriatic-Ionian transport corridor between the Port of Venice and the Ionian Sea/West Greece port cluster (Igoumenitsa and Patras), thereby contributing to the reduction of economic, social and environmental costs related to port and logistics activities.

TrainMoS

TrainMoS aims to support and train the human element of Motorways of the Sea by defining the basis for a future EU virtual open MoS University and by pulling together local competences and knowledge of different EU universities along with stakeholders' needs.

LNG in Baltic Sea Ports

The aim of the proposed Action is to develop a harmonised approach towards LNG bunker filling infrastructure in the Baltic Sea region. By sharing knowledge between eight Baltic partner ports (Aarhus, Helsingborg, Helsinki, Malmö-Copenhagen, Tallinn, Turku, Riga, Stockholm) from five countries and their stakeholders, a more standardised process for planning and constructing LNG infrastructure will be achieved.

COSTA

The COSTA Action aims to develop framework conditions for the use of LNG for ships in the Mediterranean, Atlantic Ocean and Black Sea areas. It will result in the preparation of an LNG Masterplan for short sea shipping between the Mediterranean Sea and North Atlantic Ocean as well as for deep sea cruising in the North Atlantic Ocean

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towards the Azores and Madeira. The feasibility study results will promote Motorways of the Sea sustainability, contributing to the common effort to address climate change, in particular in view of the forthcoming requirements for the implementation of the requirements of Annex VI of the MARPOL Convention.

IBUK – intermodal corridor

The proposed action aims to improve MoS capacity along a corridor from the Iberian Peninsula to the UK. The proposed Action's main objectives are to increase modal shift from road onto the Spanish hinterland rail network and to improve the efficiency of the link in the multimodal transport chain of this corridor; in particular ensuring that the MoS route from Bilbao to Tilbury has suitable infrastructure, superstructure and information technology to handle the forecasted increase in cargo volumes.

Green Bridge on Nordic Corridor

The Action infrastructure development is built around the equipment of two roll on-roll off (roro) ships with exhaust gas cleaning technologies in form of scrubbers. This will require the vessels to be converted. To allow efficient future handling of the modified ferries and to ensure most flexible and smooth port operations, ferry berths in all three ports have to be re-constructed. In Trelleborg, port navigation conditions (breakwaters and water depths) will also have to be adjusted to the dimensions of the converted ships.

Onshore Power Supply-an integrated North Sea network

The project objective is to establish onshore power supply (OPS) at three DFDS freight ferry terminals for three freight ferries (ro-ro vessels) that frequently call the terminals. The terminals and ships form part of DFDS' freight shipping network in the North Sea.

5. The impact of 2020 priorities on MoS

The Europe 2020 strategy for smart, sustainable and inclusive growth contains important guidance and support for many necessary MoS developments.

Funding

The new Guidelines stress the need to coordinate the mobilisation of public funding - Structural Funds, Cohesion Fund, R&D framework programme, TENs and EIB in order to achieve MoS goals - and stimulate the smart mix and use of these funds. This has already led to the creation of the Motorways of the Sea One Stop Helpdesk, set up in 2010, to give advice to stakeholders and other interested parties on the best source of support for their specific project (www.mos-helpdesk.eu).

Economic and Financial Background

Creating innovative instruments to finance the needed investments, including public-private partnerships (PPPs): this will be particularly suitable for logistics platforms, "dry ports" (like the one in Zaragoza) and even port terminals. Fostering European growth through our participation in open and fair markets world wide: this aim will only be achieved if a system of efficient ports is in place, assuring good external connections.

Research

Modernising and de-carbonising the transport sector: Past reports proposed new research in the field of fuels (energy efficiency, economics). This report also puts emphasis on pursuing research on efficient engines, catalysts and scrubbers, as well as efficient hull and propeller design.

Innovation

Inspired by previous MoS reports, on-going pilot actions now show how to give impulse to the development of a

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good mix of: research, the setting up of common industrial standards and the development of the necessary infrastructure to achieve the deployment of innovation in daily life practices.

Developing a deeper knowledge of the implications of the different types of fuels which can be used, particularly on their environmental impacts (NOx, SOx, CO2 and particulates): There are great expectations that Liquefied Natural Gas (LNG) may drastically improve the current situation. Nevertheless, LNG poses a number of challenges such as safety requirements, distribution networking and shipping economics. This new field requires further investigation, either by gathering current knowledge and integrating multi-disciplinary issues or by identifying and supporting the development of required research actions and studies to address technical problems.

MoS deployment issues

ICT Infrastruture, aplications and Intelligent Transport Systems – ITS

- Improving and fostering intelligent traffic management systems and services, ranging from the single window to the interface of road and railway systems with port systems.
- Developing an effective space policy to provide the tools to address some of the key global challenges and, in particular, to deliver Galileo and GMES. The suggestion regarding chips (tags) either for vessels or for containers comes under this umbrella.
- Developing smart, upgraded and fully interconnected transport infrastructures and make full use of ICT: The integrated MoS transport chains being implemented are a good practical example.

Clustering of ports and development of corridors

- Ensuring a coordinated implementation of infrastructure projects, within the EU Core Network, which critically contribute to the effectiveness of the overall EU transport system: There are many practical examples under this theme, e.g. the connection of the round-the-world trip, location of new transhipment ports in the Mediterranean Sea, railway corridors between north and south, articulation of a grouping of ports, and a deeper knowledge of the flows which cross the Suez and Panama Canals.
- Accelerating the implementation of strategic projects with high European added value and addressing critical bottlenecks, in particular cross border sections and inter-modal nodes (cities, ports, logistics platforms): Both safety devices for ships (see EMSA) and chips for containers are of particular importance. The banning of "convenience flags" for European companies or companies wanting to call on European ports must gradually be implemented.

European Internal market and logistic chains

- Reducing the transaction costs of doing business in Europe: Improvement of the efficiency and competitiveness of logistics chains has been a repeated recommendation.
- Promoting better logistics: This requires a global approach, ranging from the construction of logistics platforms to the training of the numerous professions in the field. The importance of this field has been systematically underlined in all previous reports.

External Trade

- Ensuring that transport and logistics networks enable industry throughout the EU to have objective access to the single market and the international market beyond: This is the main purpose of the geo-strategic considerations regarding connections with the Far East, South and North America and Africa.
- Developing a closer partnership with Africa: Ports are are an essential factor in this development. Ports in Europe and in Africa must both cooperate, in addition to everything else that comes as a result of MoS and its connection of ports with their hinterland. The EU has prospered through trade, exporting round the world and importing raw materials and finished products. Consequently, MoS needs to take the wider external dimension and related aspects into account, such as transhipment ports, the Suez and Panama Canals, connections to Africa and South America, impacts of round-the-world trips in the Mediterranean Sea, port hubs and new transhipment ports in the Mediterranean (besides Marsaxlokk, Gioia Tauro, Algeciras and Tangiers-Med).

Education, Training and employment

- Insisting on Education, Training and Lifelong-Learning: New training for the numerous professions linked to maritime transportation, logistics and operations in harbours must be implemented. This is fundamental for the provison of a good level of initial training rather than the on the job training currently used today.
- Promoting student mobility and trainers' mobility, and improving the employment situation of young people:

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We have suggested setting up an Erasmus type programme for maritime professions, using mercantile marine schools in Europe. This could eventually lead to the creation of a council of schools at European level. Countries without apparent problems (Greece, Romania, Latvia and Norway) could induce more dynamic action on the others.

Promoting efficient, sustainable and competitive maritime transport: Blue Links

There is a market demand for innovative projects using new operational concepts, and new financial engineering solutions should be promoted. The "blue links" approach is a promising system, as it targets the support of all partners involved in a trade and transport venture in order to get competitive transport solutions, whilst using technological innovation and environmentally friendly solutions.

The system will be open and of European wide application, thereby avoiding regional distorsions or distortions of competition. However, Member States and private operators concerned by such a scheme must first agree on common methodologies to assess potential benefits and consequently define practical terms of support. This new approach effectively aims to replace or phase out outdated or financing schemes such as Marco Polo or Ecobonus. The main advantage of the new blue links scheme is that it favours the emergence of integrated maritime operations meeting the new environmental and technical requirements embedded in the TEN-T Core Network and will pave the way for the achievement of a more competitive European market.

List of development priorities

The definition of criteria allowing the identification of funding priorities for projects labelled as Motorways of the Sea needs to be improved, and the new TEN-T Guidelines and the CEF will provide the ideal basis. As clearly stated in all relevant meetings held throughout the year, priorities are to fund both infrastructure (hinterland connections and within ports) and intelligent infrastructure (procedures, vehicles and cargoes).

Operations, although of great relevance and the ultimate goal of activities, are not the primary objective of TEN-T funding. There are funding schemes better adapted to fund private sector operations (maritime, ports or other), such as the Marco Polo programme, and obviously because before any operations can start the infrastructure needs to be in place. Accordingly, TEN-T concentrates on developing infrastructure. This is highly time consuming, taking on average ten years from preliminary studies to operation.

Finally, priority should be given to studies. Any large infrastructure investment project requires both preliminary and detailed studies to be completed prior to building works or final investment decisions. Furthermore, for a wide and complex subject such as MoS, studies also need to include the operational and team building component, i.e. the platform necessary to bring together all key actors, as well as the platform to be used as an integrator of technologies and operational requirements. Such a venture prototype needs to be supported by a dedicated tool. The proposed studies in the form of pilot actions seem to be adequate.

In order to better clarify the different funding and development priorities an indicative list of the most important MoS elements is given as follows:

Within port areas

- Railways connections to quays and piers.
- Superstructures, and systems allowing for more efficient flows of goods and better coordination of administrative procedures (one stop shop/guichet unique) e.g. customs, health and sanitary, veterinary police, emigration, security screening devices and port operations' services.
- Superstructures, construction works and equipment aiming to create efficient management of cargo flows in the port area, e.g. port gateways, cranes, piers, etc.
- Dredging of berths and canals to keep navigation or to increase the size of the target vessels.

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- Alternative re-fuelling facilities for ships (e.g. LNG bunkering).
- Promotion of the role of European ports and the MoS network. Once the new TEN-T network is defined, the core network of ports and MoS should be promoted in a brochure outlining its operational characteristics and potential, based on common indicators (such as on similar UNCTAD reports).

Hinterland connections

- Connections to the hinterland for railways, inland waterways, motorways and, logistics platforms located in the interior.
- Building of logistics platforms and dry ports.
- Junctions, bridges, tunnels and other access elements that could improve connections to the hinterland.
- New railway lines or sections, bypasses and other upgrades which could help lower travel time and increase punctuality
- Integrated MoS systems, such as single window and/or port community systems, connecting shipper and receiver and facilitating the development of door-to-door operations and services (systems connecting ships/ports/hinterland and services operators).

Telecommunications

- Port information systems, vessel traffic management and information services, river information services (within the ports and when interfaces occur).
- Port community systems interfacing with logistics information systems (e.g single windows).
- Intelligent infrastructure, e.g. tracking and tracing devices, terminal info systems.
- Tracking and tracing systems and services for goods and vehicles (ships, port and inland vessels, ports and hinterland).
- MoS information systems, integrating vessels, VTS, port community, interfaces with other modes (e.g. ITS, ERTMS and RIS) and with intermodal platforms and business information interfaces.

Ships

It has been suggested that vessels and re-fuelling barges should be considered a special type of infrastructure, in particular when large retrofitting is required to accommodate new equipment and/or when innovative equipment has be installed on a new build (e.g.engines for a new type of fuel, scrubbers, etc). [Further discussion with stakeholders on this theme is required, in order to define the conditions under which the construction or the acquisition of a ship could be considered a funding priority].

Human Resources

- Priority should be given to training the whole range of staff involved in maritime operations: from seamen to pilots, VTS operators, dockers and crane operators.
- Training on the efficiency of processes in the transport chain needs to be provided to both operational and administrative staff, and training in logistics needs to be provided for all the actors in the MoS chain.
- An MoS Erasmus scheme should also be encouraged.

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6. Conclusions and recommendations

Motorways of the Sea has, so far, been a key factor for the development of maritime transport. By supporting maritime areas such as safety, security, protection of the environment, training, information management and efficiency and competitiveness, which are instrumental for the development and operation of any transport mode or system, MoS has played the right methodological approach and constituted a fundamental contribution to the new TEN-T network bringing the right complementarity required to the development of corridors, as it bridges the gaps between the corridors through the maritime continuum that it represents.

In practical terms, this translates so far as the deployment of 19 development projects already described.
The MoS priorities that need to be pursed are fourfold:

- Support Europe's trade, in particular external trade: i.e. Concentrating on actions fostering the smooth flow of external European trade and exploiting four natural geographical pathways for trade: Atlantic, North Sea and Baltic, Mediterranean-Black Sea and Suez Canal. The new opportunities opened by the North Sea route gateway (including Artic access) were also taken into account. Examples: Baltic Sea Hub and Spoke, Adriamos.
- Fostering maritime transport within the internal market (e.g. Short Sea Shipping). Examples – single window: Miele, Mos4mos and Mos24.
- The cornerstone elements which allow for maritime transport - safety, protection of the environment, traffic management and training - as well as specific regional requirements, such as year round navigation, were also taken into account. Examples: Monalisa, Trainmos, LNG infrastructure, LNG masterplan for Baltic ports, Green Bridge on Nordic Corridor, Costa, On shore power supply.
- Developing ports to perform their required role as the main gateway for European tradehas included port development, port-ship and port-hinterland improved interfaces. Examples: Trelleborg-Sassnitz link, Klaipeda-Karlshamn link, Esbjerg-Zeebrugge link, Gdynia-Karlskrona, Rostock-Geddser link, Baltic Sea Hub and Spoke, Ibuk.

The fulfilment of these priorities will guarantee the full and smooth integration of maritime transport operations in the European logistics chain and support global trade operations.

What should be done?

During the past five years, the Coordinator has visited many European ports and discussed with hundreds of European actors interested in MoS ranging from master mariners, politicians, planners, businessmen, pilots and terminal operators to port managers, mayors, freight forwarders, civil servants, engineers, scholars, shipowners, ministers, traffic managers, road hauliers, shipbuilders, and shippers. All play a different role but share a common goal – they all support and believe in an increased role of maritime transport as a key development factor for a better Europe.

The Coordinator organised two large workshops in 2012, involving the 19 TEN-T MoS projects and integrating other frameworks, e.g. Interreg actions. The workshops were also open to the participation of third countries, in particular of the neighbouring Mediterranean countries. Latin America also actively participated. The Coordinator has summarised some of their visions and ambitions in the following 12 recommendations for European MoS support priorities:

- Development of integrated port infrastructure (trade, procedures, movement of goods, information systems, superstructure, vehicles and operations). Key enablers are: close cooperation between port authorities and city/regional authorities, port masterplans, and a good networking between the port community and the cargo owners (shippers). The formation of port communities should be fostered. Finally, certification of port activities or at least of port management should be widely promoted and implemented.
- Improved hinterland infrastructure connections, development of the missing links and value added links in the door-to-door transport chain integrating sea legs. MoS logistics will become a key element for industrial logistics. In the future land-locked countries should be called to actively participate in defining their requirements and

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identifying key coastal connections.

- Deployment of intelligent infrastructure services (e.g. tracking and tracing) to better reconcile the shipper and its goods, increasing safety and security and allowing for a fully controlled just in time delivery system. Concerning the actual development of the European maritime space without barriers, EMSA already operates the key maritime electronic information management tools which are required to deploy the system.
- Promote activities and launch studies to better understand how to help the sector. Areas to be covered range from the identification of trade patterns within the internal European market (origin and destination matrix), to benchmarking efficiency in transport chains and nodes and on how best to foster cooperation among ports and co-modal actors to facilitate the deployment of innovative technologies. Each port should have an observatory monitoring both its hinterland and foreland.
- Support for the articulation of ports and port activities (ranges, gateways, hub and spoke) exploiting know-how and comparative advantages, creating a favourable environment for the development of new business opportunities and services. This articulation of ports will lead to an improved capacity service for transport corridors as connection to the sea will be done through a delta of ports instead of one single port. This is an important concept for regional development as it will increase critical mass and flexibility, thus offering better and more diversified services to the market. Foster the permanent dialogue between cities and their ports – there must be a joint development pact, a win-win venture, reinforcing the natural ties between cities and their ports.
- MoS would enormously benefit from improved education, training and cooperation efforts throughout the entire human element pillar in the area. This refers both to on-board staff and the numerous shore based professions which require knowledge in logistics as the basis of their know-how. A European-wide and comprehensive effort to improve education, training and attractiveness for maritime transport related careers needs to be launched. It should lead to the development of a MoS Erasmus type network – i.e. building on an aggregated European knowledge to improve access to knowledge, whilst keeping a sustainable diversity of training places.
- Develop actions and information systems to integrate procedures and operations in a one stop shop for the entire chain: foreland (shipper), feeder, port, shipping operator, port, feeder, hinterland (receiver). Clearly promote wherever and whenever possible the use of sea-river technologies, systems and services.
- Support the launch of actions aimed at fostering research and technological development to develop ships and equipment with reduced emissions and increased safety and environmentally friendliness as these measures will have a very positive impact on MoS. It's important not to forget that ships require many innovations to keep abreast of change. Cruise ships have immensely innovated amd the other types of vessel should follow example.

On the technology side, the objective is to develop studies and pilot actions on the use of different types of fuel, giving priority to LNG, addressing inter alia: shipping economics, operational strategies and LNG supply logistics, and support the devopment of masterplans for deployment in ports. Further research may be required on retrofitting techniques, energy efficiency and ship's structural design.

Concerning foresight, strategic transport research policy actions, with clear areas of priority, need to be established for maritime research in general and for MoS in particular in order to boost the sector in a similar way as in the mid-1990s (e.g. short sea shipping, maritime safety and competitiveness in shipping). Furthermore, the EU should promote and improve the gathering of statistics concerning ports, maritime transportation, shipowning; hinterlands/forelands trade patterns, etc.

- Better articulate the different funding frameworks, whilst respecting their specificity in order to avoid duplication and achieve critical mass for innovation and change. Coordination of the different MoS funding is fundamental to achieve effective promotion and development of MoS. The creation of a single dedicated funding for MoS would be instrumental for this. An MoS development policy needs to target PPPs as the ultimate tool for deployment and target users on the demand side as its prime objective/customers (innovative financing).
- Simplify bureaucracy where possible and facilitate the use of benchmarked solutions in support of competitive maritime operations (Blue Links).
- Extend the reach to neighbouring countries and Africa, supporting the development of complementary efficient logistics chains in the Mediterranean and in the sub-Saharan regions. Improvement of port management in Africa should be our first cooperation priority. In particular, third country cooperation should have due regard to connections with eastern neighbouring countries (Ukraine, Belorussia, Russia and Moldavia) and Eurasia (especially Kazakhstan), which are very much dependent on railway connections to European ports and on changing-of-gauge devices.

In order to collect strategic information, foster the development of geo-strategic studies addressing the maritime

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connections of Europe with our main trade partners in the world and try to define a global view of the challenges that we have to meet, the importance of Europe/US traffic cannot be overlooked, as it still represents about one-third of the total European traffic.

- Support the development of more electronic customs' services, to drastically simplify procedures whilst improving security. Customs operations are very complex and important and therefore need to be streamlined in order to increase the efficiency of ports and thus of the whole logistics chain, which rely heavily on customs for the quality of their operation. Supporting the development and practical application of Directive 65 on "ships' mandatory reporting" as well as to IMO's "FAL" Convention is crucial.

The Coordinator expects that many of these recommendations, as well as the example set by the 19 new TEN-T projects will be followed and implemented in the forthcoming years, paving the way for a more efficient and innovative European transport system.

7. Closing Remarks

19 TEN-T MoS projects have been already implemented, representing a total investment of over €1 billion. They demonstrate that the MoS framework constitutes a strong platform for the implementation of technical concepts aimed at improving the quality of maritime operations and their integration in the global transport chain.

The promotion of MoS has further boosted the development of many small actions that have improved port infrastructure, information systems and the efficiency of maritime operations, as well as the development of better infrastructure connections between ports.

MoS has been the precursor for identifying and promoting innovative issues with practical solutions, e.g. intelligent infrastructure and LNG technologies. In both cases, pilot actions have been developed which are expected to deliver practical results in 2012. Unifying rather than fragmenting, MoS activities play a coordinating role, fostering the development of operational standards and common procedures, as well benchmarking operations. In short, MoS translates policy requirements into practical and concerted European solutions.

The programme also provides a sound basis for cooperation between ports and sea regions, such as in the Baltic area. A common understanding on ice operations, environmental protection and traffic safety is steadily developing and helping to reinforce these collaborations. Other sea areas (e.g. the Adriatic) are developing partnerships leading to an articulation between different ports and countries (e.g. the northern Adriatic range), adressing common strengths and weaknesses, and thereby increasing the attractiveness of these regions. International cooperation with neighbouring countries and regions, such as the Mediterranean and Black Sea areas and Africa, has also been initiated.

MoS makes smar use of different implementation tools, taking advantage of the array of financial schemes and funding tools available. In general, Marco Polo finances services while TEN-T focuses on integrated infrastructure development (both physical and information systems) for ports and their hinterland connections (e.g. logistics centres). TEN-T has a dedicated budget of approximately €300 million for MoS for the 2007-2013 programming period. In the 2014-2020 financial period support for Motorways of the Sea is expected to greatly increase to levels adequate to its relevance: more than 70% (in tonnes) of external trade and almost 40% of internal trade.

Harvesting opportunities, short term actions to meet market demands:

- Smooth integration in TEN-T Corridors (hinterland connections);
- Meeting the SECA challenges for 2015 (LNG, scrubbers, re-fuelling, etc);
- Harvesting the SECA market opportunities – e.g. newbuildings, retrofitting, green shipping, innovative port bunkering and revival of the European Shipbuilding industry - building new ships and retrofitting existing ones to

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meet the European market demands.

- increasing safety and security standards by stimulating voluntary industrial actions

The new priorities and tools proposed in the 2012 TEN-T call (expected in November 2012) and the pilot actions are expected to continue to raise interest among stakeholders. This type of tool allowing may represent the ideal basis for testing a venture without touching on competition issues. It will enable the embracing of technical, operational and procedural issues and the emulation of resulting transport operations, allowing for the start-up of the commercial phase immediately upon completion of the pilot action.

By providing support to the development of highly complex technical tools for efficient transport operations such as information systems and customs requirements interfaced with electronic cargo manifests and logistics information systems, MoS is bringing innovation to the real world and making a definite claim on its ability to support European growth and competitiveness.

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Priority Project 21

Motorways of the Sea

Trans-European transport network. Achievement of the Priority projects

0 250 500 km

Cartography: DG MOVE, October 2012
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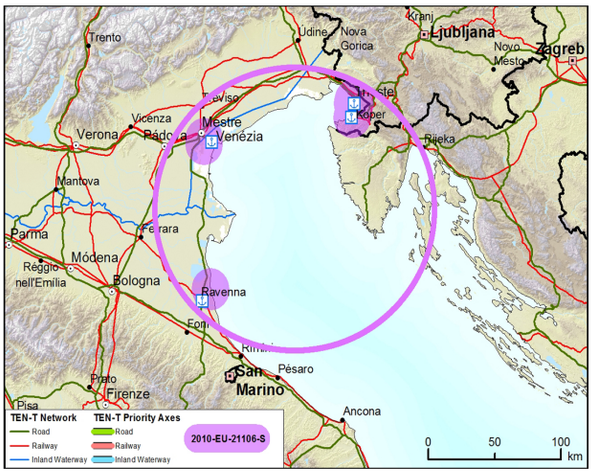
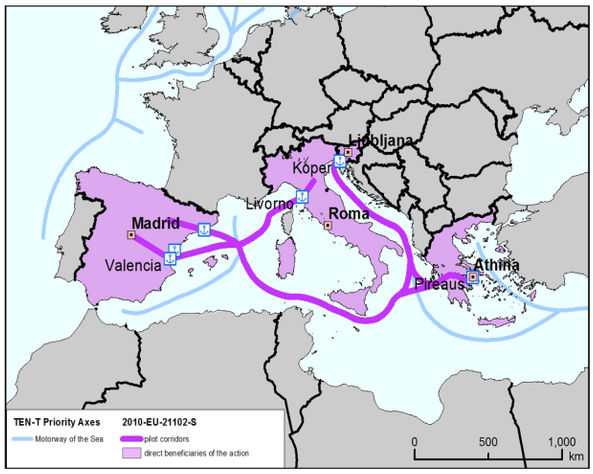
© EuroGeographics 2001 for the administrative boundaries

- Completed
- Completed in 2011
- Works ongoing
- Works to start between 2012 and 2013
- Works to start after 2013

- Completion Date
- Priority sections

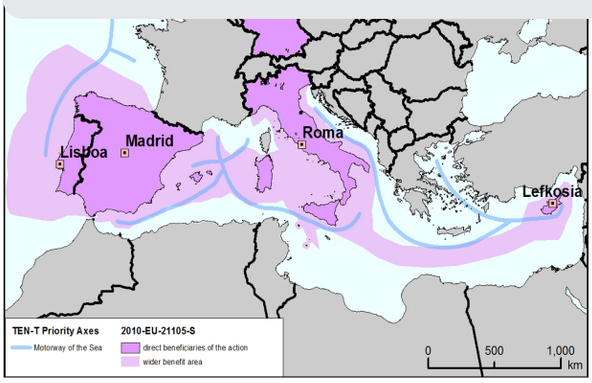
TENtec

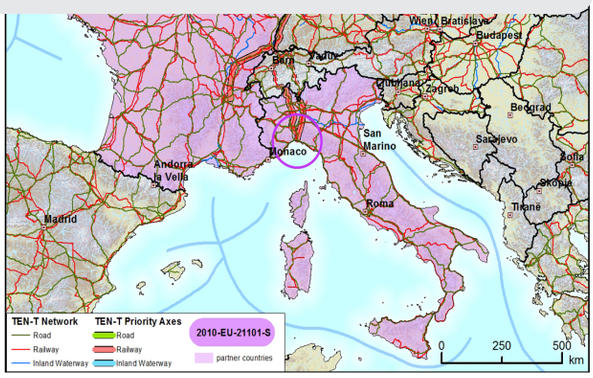




2010-EU-21106-S ITS Adriatic multi -port gateaway

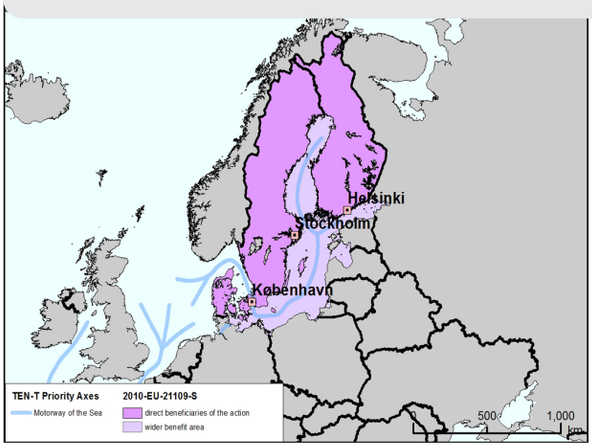
2010-EU-21102-S MOS4MOS

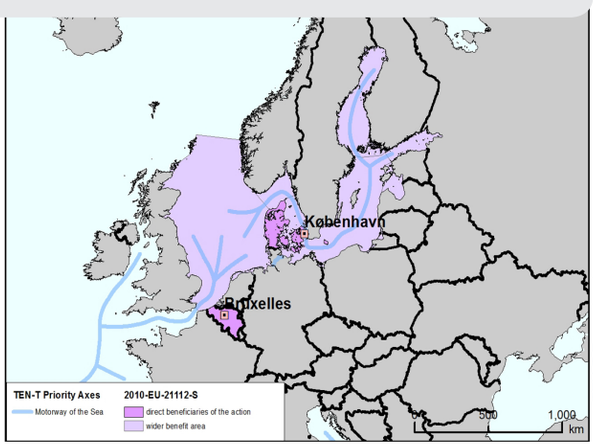




2010-EU-21105-S MIELE

2010-EU-21101-S MOS24





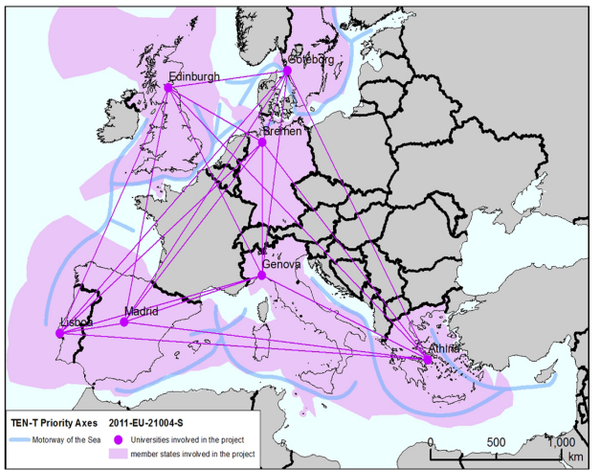
Source: TEN-T Executive Agency

2010-EU-21109-S Mona Lisa

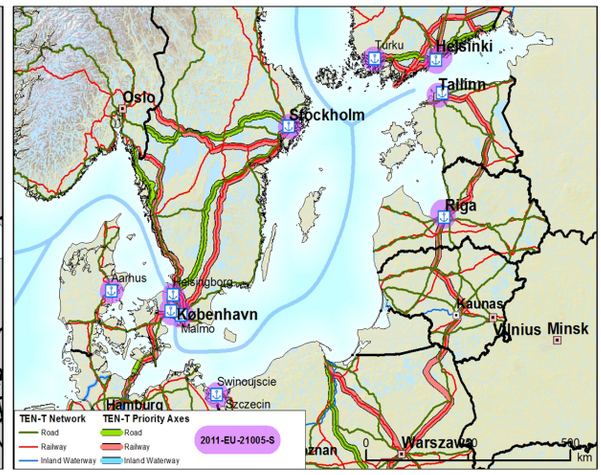
2010-EU-21112-S LNG

Priority Project 21
Motorways of the Sea

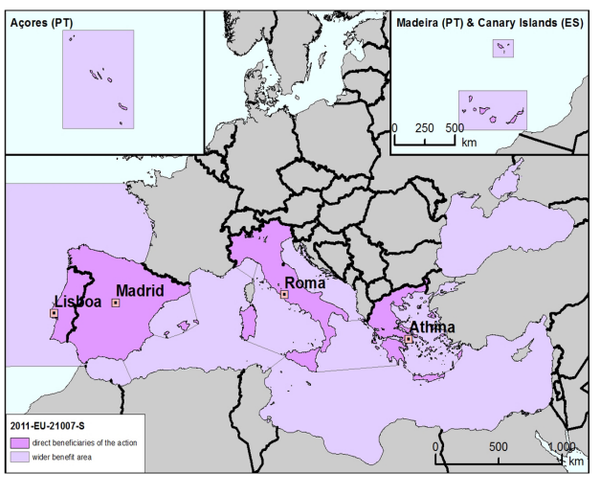
Trans-European transport network. Achievement of the Priority projects



2011EU-21004-S Train MoS



2011-EU-21005-S LNG in Baltic Sea Ports



2011-EU-21007-S COSTA

1. **2008-EU-21010-P** High Quality Rail and Intermodal Nordic Corridor Königslinie

2. **2008-EU-21015-P** Motorways of the Sea projects in the Baltic Sea Area Klaipéda-Karlshamn link

3. **2008-EU-21020-P** Motorways of the Sea Esbjerg - Zeebrugge

4. **2009-EU-21010-P** Baltic Link Gdynia-Karlskrona

9. **2010-EU-21107-P** Motorway of the Sea Rostock-Gedser

10. **2010-EU-21108-P** The Baltic Sea Hub and Spokes Project

13. **2011-EU-21001-M** Adriatic Motorways of the Sea (ADRIAMOS)

14. **North Sea network 2011-EU-21002-P** On Shore Power Supply - an integrated

18. **2011-EU-21009-M** IBUK – intermodal corridor

19. **2011-EU-21010-M** Green Bridge on Nordic Corridor

Ongoing and completed projects financed by the 2007-2013 TEN-T Programme (TEN-T support figures refer to the initially adopted Decision)	**Member State(s)**	**TEN-T support (in million)**	**Project status**
The Baltic Sea Hub and Spokes Project	DK, EE, SE	€24.8	Ongoing
Motorway of the Sea Rostock - Gedser	DE, DK	€24.5	Ongoing
Green Bridge on Nordic Corridor	DE, SE	€19.8	Ongoing
Baltic Link Gdynia-Karlskrona	PL, SE	€17.1	Ongoing
Adriatic Motorways of the Sea (ADRIAMOS)	EL, IT	€12.2	Ongoing
MonaLisa	DK, FI, SE	€11.2	Ongoing
Motorway of the Sea - High Quality Rail and Intermodal Nordic Corridor Konigslinie	DE, SE	€10.2	Ongoing
LNG infrastructure of filling stations and deployment in ships	BE, DK	€9.6	Ongoing
MIELE	CY, DE, ES, IT, PT	€8	Ongoing
IBUK – Intermodal Corridor	ES, UK	€7.3	Ongoing
Motorways of the Sea Esbjerg - Zeebrugge	BE, DK	€5.3	Ongoing
Motorways of the Sea projects in the Baltic Sea Area Klaipéda-Karlshamn link	LT, SE	€5.2	Ongoing
Monitoring and Operation Services for Motorways of the Sea (MOS4MOS)	EL, ES, IT, SI	€2.8	Ongoing
MoS 24 - ICT based Co-modality Promotion Center for integrating PP24 into Mediterranean MoS	BE, FR, IT, MT	€2.5	Ongoing
LNG in Baltic Sea Ports	DK, EE, FI, LV, SE	€2.4	Ongoing
COSTA	EL, ES, IT, PT	€1.5	Ongoing
ITS Adriatic multi-port gateway	IT, SI	€1.4	Ongoing
TrainMoS	DE, EL, ES, IT, PT, SE, UK	€1.3	Ongoing
On Shore Power Supply - an integrated North Sea network	BE, DK, SE, UK	€1	Ongoing
TOTAL		**€168.2**	

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Data cut-off: 31 October 2012 (please note that this report does not contain any financial data)

Contact details:
European Commission - Directorate General for Mobility and Transport
Directorate B - European Mobility Network
Unit B.1 – Trans-European Networks and Investment Strategy
Sector B.1.001 – Open Method of Coordination: TENtec & Innovation
http://ec.europa.eu/transport

Trans-European Transport Network Executive Agency
T0 – Office of the Executive Director, Information & Communication Department
T4 – Technical & Financial Engineering, GIS & Monitoring
http://tentea.ec.europa.eu

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