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Trans-European Transport Networks

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Motorways of the Sea

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

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**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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Abstract

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, will have as a priority the development of efficient ports and of better port hinterland infrastructure and connectivity which are the stepping stones for traffic to occur and flow smoothly. This development will help to mitigate traffic congestion and land transport deficient links between regions which are detrimental to cohesion and to 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. Finally, MoS should become an intrinsic part of the core network of the future Trans-European Transport Network and as such fulfil its key role as the main exchange platform for the European foreign trade.

Methodology

The opinions expressed are those of the European Coordinator, based on his findings in the third year of his mandate. He does make recommendations of a general nature where his talks, including those with the European representative organisations (both institutional and professional), have convinced him that the issues addressed are common throughout Europe. This report relies much upon the previous one.¹ A great part of the text, namely the recommendations at the end reproduce in a great extent, what has been said before, underlining issues that need to be further addressed.

1. Introduction

The TEN-T Priority Project 21 on 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 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. It will also help to implement the policy initiatives on the European maritime space without barriers and the maritime transport strategy for 2018.

Maritime transport is the backbone of international trade, yet its capacity has not been fully exploited in Europe. Motorways of the Sea, which focus on successful short-sea shipping routes and deep-sea transshipment operations, are designed to shift cargo traffic from heavily congested land networks to where there is more available spare capacity – the environmentally-friendly waterways. This will be achieved through the establishment

¹ Complementarity - for the complete 2007-2008 annual report on this project, see:

http://ec.europa.eu/transport/infrastructure/european_coordinators/2008_en.htm

of more efficient and frequent, high quality maritime-based logistics services between Member States.

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

This report builds on the 2008 and 2009 (largely) reports findings and sets out the Coordinator's new findings in 2010. It describes the main factors that influence the sea leg of the transport chain in the European Union and sets out the key links and likely developments affecting this part of the EU transport chain. The report addresses the progress made so far by several Motorways of the Sea initiatives carried out under different frameworks. It also aims to provide more clarity in the concept of Motorways of the Sea and defines a set of recommendations on priority actions to take on the fields of Research, Innovation and Deployment of infrastructure and services.

The 2010 report builds on the new findings reflecting the state of play in the countries covered by the exploratory visits undertaken by the European Coordinator. Only two of the "maritime" Member States of the European Union are still missing (Ireland and Lithuania will be visited in the last quarter of 2010). Specific geopolitical entities such as Islands States and Archipelagos were heard for the first time and some of their specific transport demands are put forward, namely those requiring specially targeted MoS measures.

Finally, the report identifies MoS as an operational platform, able to integrate the key elements of the Union's Maritime Policy in the European Transport Infrastructure.

2. The Motorways of the Sea Sector (Ships, Ports, Hinterland Connections and Trade)

Motorways of the Sea will help to establish new, regular and frequent maritime links for the transport of goods between Member States and improve access to peripheral and island regions and States. Another primary objective is to ensure year-round navigability across European maritime regions, particularly the availability of facilities for dredging and icebreakers needed for winter access as well as the accessibilities and infrastructure links to the hinterland.

In order to encourage shippers and owners of goods to move away from current land transport-only based schemes (mostly road) and integrate sea-routes in their logistics chain, maritime options must be as good as or better than the other means of transport. As such, innovative logistic solutions need to be sought and implemented by the key transport actors, e.g., land-based transport operators, freight consolidators, logistics companies and the public sector which are all key stakeholders in the success of Motorways of the Sea.

Using TEN-T funding, the Commission is supporting the development of Motorways of the Sea across Europe. In the guidelines², the Priority Project on Motorways of the Sea

² Decision No 1692/96/EC of the European Parliament and of the Council 1 laid down Community guidelines for the trans-European transport network:

1) <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:167:0001:0038:EN:PDF>;

(PP21) refers, inter alia, to four sea areas, i.e.: (i) Motorway of the **Baltic Sea**; (ii) Motorway of the **sea of Western Europe**; (iii) Motorway of the Sea of **South-east Europe** (eastern Mediterranean and Black sea) and (iv) Motorway of the sea of **South-west Europe** (western Mediterranean).

2.1. Ships and Their Impact on MoS

Concerning global trade, the tendency is to advance further on the economies of scale with two main consequences. Firstly, as regards the increase in size of ships the tendency is to have increasingly larger vessels. Container-ships of more than 9.000 TEUS are already in operation and new buildings of up to 14.000 TEUS have already been ordered. This development will require larger and larger access canals and berthing places in ports, larger throughput capacity for the unloading and the transshipment of goods, larger storage areas and finally larger and more efficient infrastructure will be necessary to cope with the handling of those goods.

As an example of the magnitude of impacts of increasingly larger container vessels in the transport infrastructure, it is interesting to note that the big "round the world" canals" (Panama and Suez) have already been or are being upsized to cope with the new demand. The same happens with ports and in particular with transshipment ports where depths of more than 15 meters as well as large parking and storage areas are becoming an ordinary selection factor. This "survival of the Mammoths" factor must be confronted with an European Transport network concept where a global port development strategy unfolds in such a way that door to door logistic lines are not disrupted, sustainability is not endangered and where the fittest "door to door" survives.

Secondly, the so-called "Great Liners", serving the "round the world" trade, do not like to make deviations, representing additional and inefficient mileage. Consequently, they prefer ports "en route" which translates in ports located close or along the "round the world trade" route, namely in the Mediterranean which explains a new development i.e. the appearance of ports unrelated to urban areas or a natural hinterland and rather focusing on good transshipment characteristics i.e. available inexpensive space and good sea access. These so called "hubs" require feeder ports ("spokes") or land transport feeder services.

Container traffic from the Far East to Europe declined 22% during the first 9 months of 2009. Most of the companies are concentrating traffic (3 trips into 2). Many ships were "parked" (laid up). However, traffic is expected to recover rapidly particularly from China.

There is a need to meet these new demands, as maritime transportation is growing at rates higher than the evolution of world economy and trans-continental transport is growing at a higher rate than national or even intra-European transport. Furthermore, the last ten years have witnessed an increase of 40% of the tonnage transported by sea. Ports can be expected to grow up by 40% in the next 10 years. The prospects are that we may have an additional more 30.000 ships in the next 10 years.

2) http://ec.europa.eu/transport/infrastructure/basis_networks/guidelines/guidelines_en.htm

Maritime Transport Trends - some figures :

- ***More than 80 % of world trade is carried by sea;***
- ***More than 400 million sea passengers pass through European ports every year;***
- ***By 2018 the total capacity of maritime transport is still expected to surpass 2.1 billion deadweight tons (DWT), up from 1.2 billion DWT in 2008;***
- ***40 % of intra-European freight is carried by sea;***
- ***Latest figures indicate that the trend in the world fleet approaches an annual 4% growth factor;***
- ***Latest UNCTAD figures show a growth of the Asian fleets with China and Japan on the rise. Japan becomes the largest fleet whilst Greece steps down to second position [Some analysts consider that Greece is moving from a quantity to a quality fleet, scrapping old vessels and ordering new buildings].***

Moreover, even if the impact of the economic crisis is due to moderate some of these figures for the moment, it is expected that the maritime sector could swiftly take up again in the near future. For the moment, it seems to be matching the global economic growth factor (4%/year).

Within the development of MoS concepts and operations and particularly concerning the Safety of Maritime operations, the co-operation of EMSA is essential to guarantee success. As an example, the information system developed by EMSA is one of the most advanced systems in the world. The system is in connection with more than 1000 ports. It can also be articulated with local area VTS systems.

2.2. Impact of the Human Element in MoS

If current trends are confirmed, there may be, in the EU of 27 Member States, a shortage of 10,000 to 15,000 merchant marine officers. Tackling this problem implies that adequate, education and professional training as well as promotion strategies must be addressed by both the Member States and the Commission, otherwise a strategic reserve of manpower with key knowledge for the whole chain of transport may disappear (pilottage, port and terminals operations, traffic management and control, etc.).

A 2009 study on labour market and employment conditions in EU Maritime Transport (ECORYS) indicates an overall figure of 80% for European Seafarers crewing EU/EEA flags. Whilst in 6 EU Member States only nationals are employed (BG, IS, FR, LT, PL, RO), in 6 other EU flags, national represent 90% of the crew and for the remainder, figures range from 30% of non-nationals (IT and IE) to a maximum of 95% non-nationals (and mostly non-EU) for Malta.

Moreover and concerning the new approach that MoS encapsulates integrated transport concepts; Education and training is required for all the actors involved in the MoS chain from the cargo owner to the gantry crane operator and from the ship's officer to the forwarding agent. In particular, all the actors in the transport chain must have an adequate training in logistics.

A tailor-made knowledge and trainees exchange system, building on the Erasmus system could help to stimulate the attraction for seafarers' professions, reduce the wastage and the attrition in terms of knowledge (too many small schools in too many different places). Such a system would also address the MoS human resources issue at European level, allowing educators, trainers and trainees to be connected, creating a critical mass in

terms of access and preservation of knowledge whilst keeping the schools in their historic communities (as Winston Churchill once put it "a country without memory is a country without future").

A better training of the shore-based personnel involved in maritime transport and Motorways of the Sea, is favored by many stakeholders as one of the efficient ways to reduce the cost of transport to the cargo owner. The Commission should develop different actions to promote the necessary training. In order to avoid wastage of resources, priority should be given to the existing institutions to act as the main implementing actors, e.g., nautical schools, polytechnic institutions, universities to the very practical short sea shipping schools. Those actors should cooperate together in order to offer the different courses. The thread line for training should be efficient logistics in order to attain competitive transport. The target industries should be not only the transportation firms but the key enterprises and industries which exports or imports goods or need to place their products in non-local markets.

2.3. Ports and Their Impact on MoS

Ports are central for world trade and the economies of scale push in the sense of a reduction of the number of ports, thereby increasing the payload in vessels and equipments and putting enormous pressure on the infrastructure. This type of demands in a port represents a heavy burden for any decision makers in the chain, as investments are important and permanently required.

On the other hand, many countries or regions legitimately plan having their ports recovering the operation of cargoes from and to their natural hinterland. This is, in fact, the objective of each and every one of the ports. Nevertheless, the "smallness" of size of their individual home market jeopardises regular calls for large vessels, as it does not create sufficient economies of scale to justify for instance, the weekly call of a large container-carrier.

Currently, eleven ports operate almost 70% of the whole freight flowing round the world. In the short term, a great effort has to be made in order to diversify and cut this value down to 50%. That new distribution pattern, although far from perfect, would ensure an increased use of smaller ports thus reducing dependency and congestion. Those eleven ports represent the "First League". Four of them are in USA; three in Europe; three in China and one in Dubai. It is necessary to create the conditions to allow for ports of the "second" and even "third" order of ranking to step in and become part of that trade in order to reduce congestion and heavier environmental footprints. In parallel, this would ensure a fairer distribution of cargo which will be closer to natural hinterlands and more attractive to shippers and transport operators.

Whilst the ambition of every transshipment port is to be, at the same time, a hinterland port, most of them experience difficulties to carry both functions simultaneously. These shortcomings are either due to their geographic location e.g. being located in an island like Marsaxlokk in Malta, or because the connections with the hinterland are poor e.g. Gioia Tauro in Italy. Other ports, perfectly placed to serve a natural hinterland are far from the "round the world" trade routes or do not have any remaining growth possibility, like many old ports born from their towns and encroached in them like Lisbon in Portugal. Some happy few can envisage playing both roles - e.g. Rotterdam, Hamburg and Antwerp or even Algeciras in Spain. Some

new transshipment ports do not aspire to become important hinterland ports like Tangiers-Med in Morocco whilst others invest all they can to become also hinterland ports as Sines in Portugal looking at the Portuguese and Spanish hinterlands.

In Europe, the North Atlantic connection favours mainly three main ports: Rotterdam, Hamburg and Antwerp that reach far away from their natural hinterland. The North Atlantic ports are responsible for 75% of the European foreign trade. The remaining 25% go to the European Southern ports in the Mediterranean and Atlantic. The Atlantic façade of Europe (from Cadiz to Glasgow) receives only 6% of the freight coming from abroad.

The huge concentration on this range of ports generates large economies of scale and the building up of skills and competences, which, bundled together, create the most interesting and unrivalled offer of both transport and logistics services in Europe. One of the consequences has been the increasing tendency to use those ports coupled to extensive land transportation (particularly road) to extend the hinterland of those ports and reach a very large share of European inland areas. The resulting economic imbalance also translates into congestion and negative environmental footprints.

On the other hand, the multiplicity of small ports, whilst guaranteeing closeness to the natural hinterland, is also responsible for large economic inefficiencies and for duplications of investment without guaranteeing high levels of efficiency (specialised equipment, methods and staff). This situation is well portrayed in Europe, where approximately 300 ports are classed as "TEN-T class A". It is time to consider innovative solutions such as the formation of multi-port gateways. This approach would allow for the specialisation of ports in certain types of trade (but not exclusively) and thereby maximise the results of investment whilst guaranteeing competition. This approach will require an articulation of services and procedures that are common to a given region/gateway and thereby easily identifiable by shippers or shipping operators that will find the same procedures and working culture within the same gateway. Some gateways are already being explored. North Adriatic and further volunteer associations of ports should be encouraged e.g. Flanders ports; Ligurian ports; North Sea Ports; Baltic ports; West-Atlantic ports, etc.

Barcelona is a big hinterland port. It is connected with the dry-port of Zaragoza, but it has also invested in dry ports in Toulouse and Perpignan, as well as in the Inland port of Lyon and, even, across the Mediterranean in Tangiers-Med. Ports have to establish commercial links and counters in the most important places of their hinterland and foreland. Investment in "dry-ports" close to great consumption centres is important to ensure the use of maritime ports, provided that proper inland connections (preferably railways or waterways) exist between both of them.

For any port it is important to ensure two different types of connectivity: one to other ports (facilitating transshipment, feeding or other SSS operations), the other will assure a sound hinterland relationship.

One thing is certain: Europe needs more transshipment ports, in particular for the connections with the Far-East, better articulation between transshipment and hinterland ports. This articulation can minimize the length of trips from ports to consumption and production's centers hence the carbon footprint. The same needs to exist for traffic coming from America (U.S. and Panama) to Northern Europe and return cargoes. The answer will be similar: we need more and better transshipment-hinterland ports or

transshipment ports articulated with hinterland ports. One common trait - to succeed, all of them have to be very efficient as competition is fierce, visible and very sophisticated.

2.4. A Framework for MoS

First and foremost an adequate framework for Motorways of the Sea must integrate the relevant European Maritime policies. In particular, the excellent principles of the Commission's "Communication on European Ports Policy"³ from October 2007 and the more specific prospective policies put forward in the "European maritime space without barriers"⁴, whose main drive is to facilitate trade flows. Two other important elements for MoS are the works in progress concerning guidelines on "State Aids" and on the "Environment", as those will very much impact on the economics and on the planning of MoS projects respectively.

Ports are the key nodal points for trade. Strong port communities, integrating all inland modal operators, are fundamental for the intermodal efficiency of any given port. Efficient ports, whether small or large are fundamental for a well lubricated transport chain. Thus, improving the efficiency of ports is the stepping stone for projects and development actions to be carried out until 2013. Achieving a better image for ports will have a very positive effect on the shift of more freight to maritime transportation.

For Finland, the key objective of MoS activities is rather geo-strategic. In fact, the main priorities for the Finnish transport community are cohesion and accessibility rather than modal shift.

The same happens with ultra-peripheral regions such as the European archipelagoes and Islands that must give guaranteed accessibility through a good cohesion policy. These ultra-peripheral regions must be used to the advantage of Europe, by widening their own areas of influence.

The European Coordinator pin-points 5 main elements for port efficiency i.e. good infrastructure in the port, sound hinterland connections, excellent procedures, perfect integration of the information services and well trained staff.

Concerning, for instance, the integration of information services - "Single Window" procedures must be generalized throughout European ports (and their hinterland corridors). Telecommunications and telematics services will enormously facilitate an otherwise rather complex operation.

Furthermore the most efficient management model appears to indicate that ports should be, in large majority, "landlord ports" (with concessions to efficient and specialized operators) and that the adoption of the "harbourmaster" model should be generalized as it facilitates the general coordination of operations in ports.

³Communication on a European Ports Policy:

http://ec.europa.eu/transport/logistics/freight_logistics_action_plan/doc/ports/2007_com_ports_en.pdf

⁴ For the complete document see the link below: Maritime Transport without Barriers

http://ec.europa.eu/transport/strategies/doc/2007_logistics/memo/memo_maritime_en.pdf

Ports also play a key role on the environmental friendliness of the transport system. Being the interface between sea and land they are central to ecosystems and consequently must meet the environmental challenges to achieve sustainability.

Electricity supply of ships will pose new challenges for ports and in particular for cruise ports (as each cruise ship is like a small town of 3000 inhabitants). Electricity supply in the ports is a key element. Using wind or solar energy for that purpose is a very acceptable answer if the power consumption is not particularly sizable and concentrated in time.

The costs for lowering carbon and sulphur emissions on maritime operations are not yet fully well established. The entering into force of the ECAS in the Baltic and North Seas poses a challenge on how to reconcile lower emissions with economic shipping operations. There is a risk of shifting back cargoes to other modes with negative impacts for climate change (CO2) and bottlenecks. In 2015, only very high quality diesel (<0.1) will be allowed, innovation is required covering the full range of possibilities, e.g. from "scrubbers" to LNG fuelling and retrofitting technologies. The Atlantic and Mediterranean countries need to prepare for the foreseeable impact as an LNG shipping policy will impact on ships' operations and economics.

Large parts of the Baltic coastal areas are covered by ice in the winter. Baltic cooperation on icebreaking and winter navigation as well as on traffic management and pollution prevention are fundamental features for successful MoS in the area.

Europe must work at the improvement of port services (stevedoring, pilotage, towing operations). All these three services must be considered as an integral part of the logistic chain. Consequently, their staff should work under the same conceptual umbrella and share a common aim that will entail the privatization of docker's services and the use of concessions as a common rule of thumb. Training and education will be fundamental to guarantee the required evolution of mentalities and the ability to render highly efficient services. Furthermore, all the agents in the transport chain must have a sound training in transport logistics.

Strategic plans for ports should anticipate master plans. Their existence, duly approved by the proper authorities, should be an element of preference, when analyzing any candidacies for public funding (EU, EIB, etc). The identification of strategic needs of ports is fundamental for any decision making.

Finally, freight forwarding needs to become the "transportation solution providers". The profession needs to further evolve and be able to advise all the actors in the entire logistic chain on the best ways for timely carrying a given load from one place to another. MoS forwarders have to keep a very close relationship with port administrations and shippers.

Benchmarking Articulation – a Scandinavian example

Instead of continuing their dependence on transshipment carried out in other larger ports in the North Sea and then mostly carried by road to Danish and Swedish hinterlands, both Danish and Swedish regions decided to gather forces thus creating a sufficiently large demand for the regular full loading/unloading in their ports of containers carried by a large container vessel [and having a residual number to be

carried out) to a feeder port (spoke) in the Baltic].

The Gothenburg/Aarhus Hub dealt with 8M TEU⁵s in 2008 and aims at 20 M TEUs in 2020.

In order to meet this growing demand for operational capacity and avoid negative impacts in the urban areas, the towns/ports decided to improve their hinterland connections.

The port of Gothenburg exploits properly the connection to the railways system. Currently, 45% of the loaded/discharged containers are linked to railways transportation to and from the hinterland. From Gothenburg (70% of global Swedish traffic) cargoes can reach, by rail, any major destination in Sweden within 24 Hours. Block trains operated by ten different operators, using the national railways system infrastructure (coinciding with the TEN-T network and particularly with the PP 12, "Nordic Triangle") link all major hinterland areas and notably Stockholm. Nevertheless, there is a growing bottleneck on the railways interconnecting with the Port. The priority of Gothenburg as a "Town-Port" is therefore the bypass of this bottleneck – by building a new rail bridge and improving the rail port terminal. This will guarantee improved operation whilst reducing stress and impact on the urban tissue.

A few miles across the upper Baltic, the port of Aarhus deals with 65% of maritime freight of all Danish ports. In order to be able to accommodate growth, transport infrastructure improvements will have to take place in order to reduce impacts on the surrounding urban area. This entails improvements both on rail and road connections between the port and the hinterland. Concerning road connections – a tunnel will be built to bypass all crossings in the urban area, i.e. all freight traffic will use only the tunnel thus freeing the surface to urban uses. Concerning rail connections, those will consist on improved connections to the Danish rail network (that mostly coincides with the TEN-T network of projects of common interest). In particular, the strategic developments linking the Danish mainland to the island of Copenhagen will determine the way this network will evolve.

The demand for an increased volume of goods to be traded in a single operation in ports, places an enormous strain both in the existing infrastructure and in the planning for new infrastructure. Given its European dimension, the Trans-European Network for transport (TEN-T) is directly concerned. Not only TEN-T shapes the offer for European infrastructure but it needs as well to permanently meet new demands for improvement and for the enlargement of the European transport infrastructure network.

Safety at Sea is essential. "Tracking and tracing" will help on safety matters. Lost containers are a danger to Navigation and in particular for pleasure crafts; many accidents have already taken place, for instance in the Golf of Biscay, in the Mediterranean and in the Baltic Sea. If containers are equipped with a chip they can easily be located, salvaged and towed or carried to a port. Container's "chips" (identifiers) could not only provide a useful mean of locating stray containers (washed overboard or otherwise but reconcile the container with the cargo carried

⁵ Container units capacity measure: referring to a twenty foot container as the measuring unit, thus TEU = Twenty Equivalent (20 foot) Units

and the type of trade (origin/destination) as well).

The MoS initiative, by stimulating the use of maritime links, rather than that of land legs, for the carriage of goods over medium and long distances and by improving the integration of maritime connections in the door to door logistics chain, will favour a more flexible approach to trade flows. In fact, to diversify the offer of efficient infrastructure and increase the co-modal interoperability of ports and ships is central to the development of a balanced trans-European transport system which boosts flexibility of transport services and regional development as tools to foster cohesion and economic development.

2.5. Hinterland Connections

Good land connections are cardinal to efficient trade and logistics hence to maritime logistics and Motorways of the Sea. In this sense, the Trans-European Networks for transport translates quite well the concept of a complex transport mesh that connects a whole continent.

Whilst for a pure transshipment port the links to the natural hinterland are not very relevant, for a "normal" port the quality of its land infrastructure links is the determinant factor for success.

Key co-modal connections are in fact those linking ports to inland waterways and to railways axes. Nevertheless, Sea-River connections whilst of the highest interest have a limited geographical domain where to deploy, as each river or canal has its own characteristics and those determine the type of crafts to be used (preventing the use of the same type of crafts across all geographic areas in Europe).

Marseille is developing a new and improved sea-river interface. The new container terminal in the port (Fos) is now directly linked trough a new canal to the Rhone River. This hinterland connection (suitable for large barges) not only reaches the inland Port of Lyon but goes further up river, feeding logistics platforms close to Dijon (550 km in total).

On the Northern French façade, the Port of Rouen, rich of its 33 different terminals spread over a length of 122 Km, looks at its natural hinterland, i.e. "Ile-de-France" and the enlarged accessibility that the interface with the new "Seine-l'Escaut" waterways will provide, creating a sea-river inter-connection e.g. "La Manche-Paris-Antwerp-Rotterdam-North Sea" with a very large hinterland.

Both developments feed the raising of a futuristic vision supporting a direct waterways connection from the North Sea and the English Channel to the Black Sea area.

Priority should be given to the connections ports-railways and to the operation of railways. The same applies to the provision of railways in the quays and the railway connections to logistic platforms.

Baltic, Atlantic and Mediterranean ports form three sets or gateways which should be connected. Railway connections between North Adriatic ports and South Baltic ports have to be drastically improved. In general, this connection can roughly be formed by two or three existing and or upgraded lines. In the North, Gdansk, Gdynia and, even, Hamburg could represent an adequate destination of the freight coming from Far-East

and disembarking in Southern European ports. An Adriatic–Baltic railway corridor should be considered almost as a structuring project. Instrumental to this connection are the TEN-T road Priority Projects (PPs) 7 and 25 and the railways PPs 22 and 23, connecting the Baltic to the Adriatic, Ionian, Aegean and the Black Seas and serving a large hinterland geographical band.

Logistic platforms have as one of their main functions the grouping of freight which is important to give scale to any operation. Countries should be induced to define national networks for logistics platforms. The main connections between ports and their logistic platforms should ideally be railways or inland waterways based. Cargo railway corridors must have good connections to ports. Bottlenecks in those corridors should be removed, in order to assure that freight can be transhipped via railways (e.g. railway ring of Lille). In certain cases no better solution exists than connections by land-based motorways (e.g. Romania and Poland).

Regarding the development of "logistic platforms", backing up MoS (acting as back-door ports), new financing schemes should be looked for; in particular the Public Private Partnerships type of venture. One of the new examples is the logistic platform in Zaragoza which associates the region and the city as investors and manages the venture from on a market economy basis.

Logistics platforms networks have to be considered in connection with the network of transshipment ports and hinterland ports. An integrated map of this freight "core" network should be produced in order to identify potential for development and "desert areas" (missing links).

In Poland, the extension and the quality of the roads are a major concern. MoS may connect, in the future, the most important ports of Poland (Gdansk, Gdynia, Szczecin and Swinowjécie) to forelands abroad and therefore require good inland waterways (e.g. Oder), railways and roads. The general feeling among the Polish transport community is that, without a good road network, development of industries will be difficult. Polish port authorities and other authorities connected with development ascribe to the road system the highest priority. From a MoS point of view, ports will not be developed without good connections to the hinterland and in some areas the quickest way of achieving results is by implementing a good road network. At the same time, efforts have to be made to improve drastically the railway system.

For Polish authorities responsible for roads and motorways, the most important road connection is North-South oriented (not West-East). Motorway A1 is the highest priority: connecting Gdansk to Katowice (coal mines) and to the Czech Republic. It is already under construction, partly as a public venture, and partly as a PPP. Being 600 km long, it is expected to be ready by 2012/2013.

Port platforms, quays and warehousing areas are expensive and represent a rare resource. Thus, inland platforms (dry ports, back door ports, etc) must be seen as good complementarities to ports as they supply logistics space to otherwise scarce and expensive storage and transshipment space. Those should preferably be connected to ports by railways.

Concerning the mass carriage of oil and gas, an additional point relates to the construction of pipelines for transporting those commodities. Pipelines should be deployed as much as possible, being particularly useful when used to bypass sea transport in "closed or confined" sea areas such as the Baltic, Adriatic, Mediterranean, Black and Marmara Seas. In those areas, the risks of accidental or operational pollution will be very important unless traffic management and other safety measures are deployed and used. The same risks apply to straits, restricted waters and other zones where maritime traffic is very intense. Areas like Gibraltar, the Channel and the Marmara Sea, will be in considerable danger as the carriage of oil by Sea increases. Pipelines have to be seen as an alternative to tankers at sea and to tankers on the roads. Accordingly, pipelines should be considered as a key infrastructure element. More initiatives to build underground (where possible) pipeline systems for oil and gas should be stimulated.

The Central Mediterranean is an area which is a folding-joint between the East and West Trade. Strategic transshipment ports are Gioia Tauro, Augusta, Marsaxlok and possibly Taranto). An example of a new development is the Canal Port-Cagliari (Sardinia), which is mainly a transshipment port with terminals for containers and Ro-Ro (with a good depth between 16 m and 18 m). In the opposite Southern Mediterranean bank competition is taking place with newly envisaged developments such as the port of Efidha in Tunisia. When assessing the impacts of the external trade on the future TEN-T these new trends need to be taken into account.

3. Intelligent Infrastructure

As integrated transport chains of the 21st century, MoS cannot deploy without telematics and information systems that lubricate interfaces and avoid information gaps. Permanent access to continuously updated information on the key elements of the transportation process, inter-connecting permanently goods (cargo, containers), processes (e.g. transport, customs) and persons (e.g. shipper, carrier and receiver), should be one of the main characteristics of MoS. Without such functionalities, the chain will be interrupted and service discontinued.

New trade and logistics objectives demand larger throughput quantities of a wider range of products in less time for yet a larger number of different destinations. How to meet these (sometimes conflicting) demands and guarantee both the underlying safety and security principles as well as the basic needs to reconcile the goods traded with their owner (which has been one of the most complex tasks that operators have to perform so far), the answer most certainly lies in the use of IT technologies adequately reflecting the transport chain processes and organisation.

Presently, the access to a vast array of information systems and telematics tools, facilitates the task but entails the need for striking a balance between individual systems and common communication platforms, in other terms, it sets a demand for the interoperability standards between all these individual technical systems which will be able to deliver a higher value service to the community of users of that specific logistics chain.

The info-structure existing on a port must provide, at least, three different functions: a) promotion window; b) information management tool; c) an operational tool integrating procedures and transport operations.

Finland has been developing a maritime information system (PortNet) that already displays many of these functionalities.

The European Maritime Safety Agency (EMSA) has developed a vast array of tools with new potential uses which are very interesting and important. They can precisely track ships at any time; they can identify those which are polluting e.g. washing their tanks. An evaluation of the use of this potential in particular concerning tracking and tracing of ships and cargoes, bearing in mind, namely, the formation of a Single European Maritime Space and the necessary integration with other information systems to produce a fully reliable MoS information system.

It is the Coordinators' firm belief that a priority must be given to the deployment of such information systems. The information which they will provide will be permanently accessible to all stakeholders and most importantly it will permit to reconcile a cargo owner with the goods it trades, allowing him at all times to know where his cargo geographically is, exposed to what temperature, acceleration forces and humidity and undergoing which procedures.

The feasibility of such a "tracking and tracing" system has been vastly demonstrated and many tools based on state of the art technologies, ranging from the satellite systems to the daily used GSM, already exist or constitute excellent platforms for deployment.

Empty containers constitute a major problem which must be addressed with great determination and imagination. A great variety of solutions must be evaluated ranging from better administrative information and coordination measures to the conception

and design of cheaper, discardable and of land re-usable containers. Efficient tracking and tracing systems will certainly have a major role to play on this.

What is really missing, is a meta-level link integrating a common sense technical tool, i.e. an information integration platform; a sort of "dedicated transport internet" accessible to all actors and stakeholders which integrates the information concerning the cargo and the transport and trade characteristics of each specific operation. The stepping stone for this is to achieve the interfacing of the information originated in the different proprietary systems e.g. operator, traffic manager, customs authorities, etc which entails the interoperability of those systems.

Furthermore, the platform should bear the burden of integrating and translating the information to and from all those different systems. Given these requirements, in its initial stages the platform should be developed at an institutional level in order to guarantee a level playing field for all stakeholders.

Finally, more support is required for the joint development of transport information systems that facilitate the integration of maritime transport in the global transport chain and pursue the development of concrete projects, infrastructure and services (e.g. tracking and tracing systems supporting logistic services) making the removal of bureaucratic difficulties an easier task whilst increasing the overall safety level of the transport system. In the Maritime area, the framework created by the e-maritime initiative and the latest results of the research project MARNIS seem to be a good starting point that should lead to practical results in a short time.

In particular the coordination with River Information Services (RIS) should be developed, given the existing potential for Sea-river operations where the same craft will be required to operate in the two different areas with consequent impacts, namely on the on-board equipment required.

The port of Dunkerque is abreast of new technologies and is testing their value to gain comparative advantages. The port is currently testing and developing a new IT solution interfacing and interconnecting "Port Community Systems" and "River Information Services" thereby streamlining logistics connections to Inland waterways and logistic platforms and increasing the reach and efficiency of the hinterland connections of the port.

4. A New Definition For Motorways Of The Sea

In pace with the development of the new guidelines for the TEN-T, the concept of Motorways of the Sea (MoS) needs to evolve. In fact they are:

"safe, environmental-friendly and efficient maritime transport (sea lanes) sea corridors connecting the trans-European network of Motorways of the Sea Ports and the European hinterland". As such, they perform a key geo-strategic role for Europe linking the production centres with other hinterlands and forelands, supporting trade and guaranteeing sustainable transport solutions for peripheral areas as well as for a competitive industry and business. Furthermore, MoS constitute the dorsal spine of the European Foreign trade by providing accessibilities and connections between the "round the world", "intercontinental" trades and the European internal Market.

These high-quality maritime connections need to share interoperable ICT systems which allow the precise positioning of each parcel of cargo transported at every moment and thus constitute a fundamental security and safety tool as well a value added logistic information system.

Building on the comprehensive short sea shipping network of ports and services, the MoS network will focus on supporting the core network, connecting key points of the trans-European core network of transport. The MoS network will reconcile the final customers with the production (and consumption) centres through the core ports, logistic centres and intermodal terminals.

The network will be supported by an ICT system which mirrors in real time the whole transportation process and replicates the physical transport operation, thereby allowing for a perfect monitoring of both the cargo parcel and of its carrier.

5. On-Going Activities

Since 2004, the Commission and Member States initiated coordination activities on MoS. From these activities the first studies on the role of MoS have resulted and the first geographic area task forces were set-up. Furthermore, several development projects and studies were carried out by stakeholders with the support of European Institutions and funds such as the EIB, structural funds, Marco Polo and TEN-T.

In different geographic areas, MoS calls for proposals have been organised jointly by Member States in order to involve stakeholders, e.g. the joint Call France-Spain in 2009.

Unfortunately, large MoS projects have not yet succeeded so far. Until now, four different studies on MoS were carried out, and one MoS Marco Polo project was launched in 2007 under the framework of Marco Polo. In 2008, 3 MoS TEN-T projects (2008) were selected for funding and are implemented (for details see Annexes 5, 6 and 7). In 2009, one project was selected for funding and is about to be implemented (see Annex 8).

Under other frameworks, e.g. EIB and structural funds, other MoS or MoS related projects were launched. Still and as the key stakeholders point out, the state of play for the ongoing MoS studies and projects is markedly insufficient, in particular if compared with all the other maritime transport development actions proposed and retained during the same period.

5.1. Baltic, Mediterranean and Black Seas

5.1.1. BALTIC

Maritime strategy and operations can be briefly characterised as a mix of the Hanseatic type of trade throughout the long coastline, innumerable Short Sea Shipping lines, coupled with the search for round the clock accessible hub ports supporting international trade. Whilst maritime operations are clearly marked by winter ice-free accessibilities and Russian oil exports, trade potential is extremely linked to the 60 million inhabitant's hinterland targeting Moscow and St. Petersburg.

In the Baltic, the European Coordinator has visited the Ports of Hamina, Kotka and Helsinki in Finland, and the Port of Gdansk in Poland and in the contiguous Kategatt/Sund area, the ports of Aarhus in Denmark and Gothenburg in Sweden.

Looking for new markets and offering better services, the very efficient and cost-effective Finnish Ports (e.g. Kotka, Hamina and Helsinki) guarantee an important share of the operations for the St.Petersburg / Moscow hinterland.

Some ports join efforts to diversify markets or types of operation. A good example is given by the Gothenburg – Aarhus ports which want to become the gate of the Baltic Sea, avoiding big ships to go into an environmentally very sensitive area and assuring a mix of transshipment and hinterland services.

TEN-T applications were selected in the 2008 Call and consist of three projects:

- The Motorways of the Sea Ejsberg (Denmark) - Zeebrugge (Belgium), supporting an upgraded Ro-Ro link and receiving an EU contribution of 5.3 M€
- The Motorways of the Sea in the Baltic sea area Klaipeda (Lithuania) - Karlshamn (Sweden) link supporting an upgraded Ro-Pax and rail unitized goods link and receiving an EU contribution of 5.2 M€
- The Motorways of the Sea "high rail and intermodal Nordic corridor Konigslinie", supporting an upgraded Rail ferry link between the ports of Trelleborg (Sweden) and Sassnitz (Germany) and receiving an EU contribution of 10.2 M€

5.1.2. ADRIATIC

The northern Adriatic area offers an exceptional concentration of ports, most of them with good inland connections (including TEN-T PPs 1 and 6). They are (clockwise): Ravenna, Venice, Monfalcone, Trieste, Koper and Rijeka. This cluster is composed of ports with different conditions and potentialities. But, together, those ports represent an enormous potential and source of wealth for Europe. All of them are hinterland ports, serving prosperous areas. These ports must develop their individual potential but also articulate activities thereby taking advantage of their joint resources whilst protecting their common heritage.

Investments will be required to improve their hinterland connections. However, the range offers a potential for international trade within the Mediterranean basin but also, with the

Far-Eastern markets. For the "round the world"- Suez trade routes, an efficient North Adriatic gateway may represent important savings both time and money wise.

The Coordinator has fostered a first articulation initiative promoted by the Port of Venice in April 2009 and integrating the ports of the Northern Adriatic range. The development of a state of the art common information network should be supported. The shared information network should interconnect the six North Adriatic ports (Ravenna, Venezia, Monfalcone, Trieste, Koper and Rijeka), the sea-river canal (i.e. the Venice – Mantova), the calling vessels, the railways and logistics platforms activities. Such an integrated platform, covering larger market offer and opportunities, would represent an added value for any Asian trader wishing to place its merchandise in Europe.

5.1.3. BLACK SEA

The Black Sea is an extremely complex geopolitical area connecting two continents and a large number of countries. In this area, the trade and transport of strategic Oil and Gas supplies is central, the European Union's Black Sea coast is long and deploys a number of Sea ports and Sea-River ports and Canals in the territories of the Member states Bulgaria (Varna and Bourgas) and Romania (Constanza and Galati). The larger port in the Black Sea is Constanza and it serves hinterlands in large neighbouring countries such as Russia, Turkey and Ukraine. From Constanza, feeding activities cover the whole Black Sea range.

Constanza is the biggest port of the Black Sea. Its role will be even more reinforced if navigation along the Danube is improved. The canal Danube-Constanza connects the river to the harbour itself. Presently, it is estimated that Romania receives 1.2 million containers per year, 90% of which have as destination Romania itself (natural hinterland). Most of the remnant is transhipped to Ukraine in feeder vessels. Constanza still offers many possibilities of expansion for such different sectors as oil, dry bulk (coal, iron ore, cereals, etc.) and containers. The Romanian authorities wish to enhance the performance of the port, transforming it in a great hub. Plans also exist to add a ro-ro and ferry terminals. Authorities also wish to improve the railways and roads connections, as in Romania the most severe problem is linked with the connection to the hinterland: roads, railways and, of course, the Danube. The Danube represents an enormous comparative advantage to Romania which has 25 inland ports along their 1000 km stretch of Danube.

The strategic links with the Caspian and with the Mediterranean via the Bosphorus where crossings are naturally limited in terms of frequency of passage and size of ships determine the background for the development of MoS concepts and activities.

Bulgaria has two important ports: Bourgas and Varna. Both are operating at less than 40% of their capacities. They can represent good transshipment points regarding "feeding" operations to ports in Ukraine, Russia, Georgia and other countries and ports in the Black sea. In Varna, particular reference should be made to an existing "railways gauge interface" able to convert rolling stock from and to European and Russian types of gauges. This asset is totally under-used. Bourgas is set on an immense bay able to shelter a great number of vessels. A pipe-line connection to Alexandropolous could save much traffic and danger in the Bosphorous area. Apparently it is a complex work as it crosses, in part, a "Natura 2000" area. The

by-passing via an underground pipeline should be evaluated.

5.2. Archipelagos and Island States

The Atlantic and Mediterranean archipelagos and Islands pose specific challenges that need to be met in order to guarantee the cohesion of the whole system.

Ultra-peripheral regions (islands) suffer mostly from lack of accessibility. Most of them are import regions with one or few exporting goods. But some of them can represent good irradiation points for European Union influence. That is the case of Canary Islands (Tenerife and Las Palmas) that could assure concentration functions (hub functions) to several African ports (Casablanca, Agadir, Layoume, Novadhlbou), Novakchot, Dakar, etc). Almost the same for Madeira (Caniçal). Surely the same for Martinique. They can extend the influence of Europe.

Archipelagos present a very difficult situation. Azores and Canarias have islands around 600 km far. The cost of travelling from one to the other is many times the cost of land connections. Some of the islands are at the centre of many maritime routes (e.g. Martinique). They should be used as a hub of a special nature. Duplication of the Canal of Panama will have repercussions on the area.

It is important to reinforce the strategic position of islands. They should be considered as logistics platforms of Europe. That is a way of expanding the area of influence of Europe.

As they currently are, MoS under TEN-T and particularly under Marco Polo are useless for islands as they do not consider their specific problems. Likewise Short Sea Shipping Regulations should expressly consider the problem of ultra-peripheral region (U.P.R.) islands, as islands are affected by specific requirements, as flows of traffic vary according to the season. This unevenness of demand complicates even more their situation. Other problems relate to freight operations as the number of empty containers in islands is enormous due to the imbalance between import and exports. The formation of "hubs" in one of the archipelago ports connected with other ports in the neighborhood could help mitigating this problem. Islands complain that Cabotage rules should be clear regarding public service obligations relative to islands and specifications relative to national and international services. In particular, there is not a clear definition of public service obligations or of imperative reasons. Islands require a dedicated aid system which should be much limited in terms of time or minimum amounts (e.g. TEN-T procedures) either in time or regarding the amounts that are required and ascribed. Consequently, it is recommended that a MoS strategic study is launched concerning particular requirements for islands and specially U.P.R.

5.3. Neighbouring and Third Countries

Relations with third countries are important for international trade which is fundamental for the economic development of Europe. Therefore the transport connections serving this trade are fundamental. Furthermore and particularly concerning neighbouring countries, borders should not stop smart solutions for the transport services that would be beneficial for both sides.

The situation in geo-strategic terms is very complex. Europe has to cope with many different factors and situations: cooperation with Russia in both the Baltic and Black Seas; the increase of Far-Eastern trade via the Suez canal; the impacts of the widening of the Panama Canal; good neighbourhood policies developing the "l'Union pour la Méditerranée"; the fostering of improved connections with Western Africa and South America. Each and every one of these has large impacts and repercussions on maritime transport in general and on Motorways of the Sea in particular. Consequently, all have to be carefully analysed.

Relations with neighbour countries were already briefly addressed in the Baltic and Black Sea areas and the "round the world" trade covers the global trade relations. One should now focus on neighbour continent Africa.

Transport cooperation with Africa is fundamental. Trade and transport between the two continents have a millenary tradition. Cooperation must now bring the quality of the transport links (systems and technologies) well into the 21st century, thereby promoting economic exchange and welfare in both continents.

In the framework of the Motorways of the sea, two important areas should be covered: the Mediterranean and the Sub-Saharan coasts.

Firstly, ports policy and maritime transportation in the Mediterranean must be seen in the framework of the ongoing "Union pour la Méditerranée". Under this pro-active policy, the further development of ports and shipping services across the Mediterranean are probably the most tangible and effective tools and the first priority for cooperation policies in this field. Spanish, French and Italian ports particularly, are in a good position to materialise a political framework of cooperation with North African countries (e.g. Libya, Tunisia, Algeria and Morocco). Particular attention should be paid to the hinterland links on the European side.

Secondly, in the African continent, the sub-saharian coastal areas extend for many thousands of kilometres and are equipped with ports and logistic lines which were mostly planned to guarantee connections to the innermost areas where raw materials and commodities were abundant.

In this context, it is particularly important to reinforce cooperation and assure better connections with the West and East Coasts of Africa. Some of the most interesting Western ports in Africa are Abidjan, Lagos, Luanda, Lobito, Namibe and Walvis Bay. For instance, for the timber trade Pointe Noire is a particularly important port. In the Southern and Eastern coasts of Africa, the ports of Cape Town, Durban, Beira, and Mombasa are examples of good avenues to explore.

Finally, Cape-Vert (Praia and Mindelo) can be an interesting "en route" port of the North-South routes and an efficient transshipment platform to feed western Africa ports. As there is freight coming from China to West Africa and Brazil, the connections to

South America should also be mentioned. Two of the most important ports in South America for this trade are Santos and Suape. The connection between the East-West routes with the North – South routes will mostly impact on the ports and hinterland of the south-western part of Europe.

6. Administrative Framework

The sector would benefit from an increased coordination between the different funding schemes supporting Motorways of the Sea. In fact, not only TEN-T funds finance MoS infrastructure, but Member States, Regions, European Investment Bank (EIB) and particularly the Structural Funds play a key role on that. The same applies for the services financed under the Marco Polo scheme where the role of private funds and of investment entities such as the EIB will be fundamental for the continued success of endeavours once the public subventions can no longer be used. Accordingly, fostering the development of Public Private Partnerships (PPPs) to support this type of projects is an avenue that is worth pursuing, in particular for large dimension projects that can be implemented in a short time.

Finally, it should be underlined that for the development of Large Infrastructure Projects - clear and unwavering political support is central. The coordinated dissemination of good practices on the management of Large Infrastructure Projects (LIPs) is an important task to be guaranteed by the Commission as it will help identify the projects which stand the best chance of successful completion. This will also be a key guidance factor for any candidates to implement a new PPP.

In order to facilitate the public understanding of the full range of possibilities and opportunities offered to financially support Motorways of the Sea, a central information desk (one stop shop, as proposed in the MoS reports 2008/09) was created. This helpdesk, will advise candidates (both Member States and private applicants) on how best and where best to apply for support for their specific project. The team staffing the help desk (TEN-T Executive Agency and the Innovation Agency) will help the candidates to sail clean between the different regulations and procedures and their specific timings.[www.mos-helpdesk.eu]

Concerning the coordination of different funding schemes, it is important to note that the articulation between TEN-T and Marco Polo's "common learning actions" should be pursued. Marco Polo, in particular, should be object of a great publicity and clarification of details. In the stakeholder's community, there is a general feeling that candidacies to Marco Polo are very complex. Whilst, Marco Polo has seen a steady growth of candidacies for other modes of transport (railways based projects are still dominant), candidacies for MoS are still very small in numbers. Within Marco Polo, the financial dimension of the contribution requested by each individual project is ten times larger in the maritime or MoS type of projects than for other modes. The one Marco Polo MoS project (selected in the 2007 Call) consists on the operation of a new and regular Ro-Ro service with three roundtrips per week between Zeebrugge (Belgium) and Bilbao (Spain), further increasing to 6 roundtrips per week, receiving 6.8 M€ of EU contribution and delivering an expected 1.36 Billion Ton/Km of modal shift. In 2009, a project connecting the ports of Nantes and Gijon was selected and will soon be implemented.

The weaknesses of Marco Polo program, referring to MoS, should be comprehensively listed and a new way of tackling the constraints of the present version should be developed. Better clarifications should be addressed to potential candidates, as apparently the main weaknesses of candidacies which have failed in the past are related to market analysis, credibility of modal-shift and the level of commitment of the operators. These points must be elaborated in detail in order to explain what is really required.

Given the insufficiency of results, the Marco Polo support to MoS should be fully revised. Two types of actions seem worthwhile to be pursued in the future: the "common learning" actions (expanded in time duration) and demand targeted support actions e.g. the "Ecobonus" type of financial engineering.

Finally, it should be noted that the European Investment Bank has shown great interest in this type of increased and closer cooperation. The same type of interest was detected among the main MoS stakeholders whom the European Coordinator has addressed.

7. List of Development Priorities

It is necessary to improve the definition of criteria allowing the identification of funding priorities for projects labelled as Motorways of the Sea. As it was clearly stated in all relevant meetings held throughout the year, priorities shall consist on funding both infrastructure (hinterland connections and within Ports) and intelligent infrastructure (procedures, vehicles, cargoes).

Concerning operations and whilst those are of great relevance and constitute the ultimate goal, those are not the primary objective of TEN-T funding as first and foremost there are funding schemes better adapted to fund private sector operations (maritime, ports or other) such as the "Marco Polo scheme, secondly because before any operations may start the infrastructure needs to be in place. Accordingly, TEN-T concentrates on the development of infrastructure which also is highly time consuming in average it takes 10 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 all key actors together and interacting, 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:

7.1. Within Port Areas

- Railways connections to the Quays and Piers;
- Superstructures, construction works and equipments that allow for a better coordination of administrative procedures (one stop shop/guichet unique) e.g. customs, health and sanitary, veterinary police, emigration, port operations' services;
- Superstructures, construction works and equipments aiming at an efficient management of the 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,
- Intelligent infrastructure;
- Alternative re-fuelling facilities for ships (e.g. LNG bunkering).
- Promotion of the role of European ports and of the MoS network. Once the new TEN-T network is defined, the core network of ports and MoS should be promoted in a book or a booklet which should be produced giving their operational characteristics and potential, based on common indicators (such as on the UNCTAD example provided in Annex 9).

7.2. Hinterland Connections

- Connections to the hinterland for – railways, inland waterways and motorways – and, especially to logistic platforms located in the interior;
- Building of logistic platforms and dry ports;
- Junctions, bridges, tunnels and other elements of access to the ports that could improve connections to the hinterland;
- New railway lines or sections of railway lines, by-passes and other upgrading which can help to lower time of travel and to increase punctuality;
- Integrated MoS systems connecting shipper and receiver and facilitating the development of door to door operations and services.

7.3. Telecommunications

- Port information systems, vessel traffic management and information services, River information services (when interfaces occur);
- Port Community Systems interfacing with logistics information systems;
- Tracking and Tracing systems and services for goods and vehicles (Ships, Port and Inland Vessels, Ports, hinterland);
- MoS information systems, integrating Vessel, VTS, Port Community, interfaces with other modes (e.g. ITS, ERTMS and RIS) and with intermodal platforms and business information interfaces.

7.4. Ships

- There are several suggestions to consider ships as a kind of "infrastructure";
- 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 should be considered as a funding priority.

The problem of emissions (CO₂, SO₂ and NO_x) from vessels is a serious one: on one

side we must assure that ships are less pollutant than lorries; on the other side we cannot impose limits of emissions that make maritime transports not competitive. New combustibles have to be analysed before introduction in practice. One of the most promising is LNG (liquefied natural gas). Along the history of ships, the means of propulsion have varied, specially after the introduction of steam (coal, mazout, etc). Recent operational results for vessels using LNG, show a practical elimination of soot, SOx and NOx as well as a 20% reduction of GHGs (greenhouse gases)

7.5. Human Resources⁶

- Priority should be given for the training of the entire staff involved in maritime operations, this ranges from seagoing seamen to pilots, VTS operators, dockers and crane operators;

*Valencia Port Administration has a foundation (called *Fundación del Puerto de Valencia*) which is in charge of promoting research and transferring results into the services of the port in order to keep abreast of developments. The widening of this benchmarking example to other ports and sectors of MoS should be pursued.*

- Training on the efficiency of processes in the transport chain needs to be provided to both operational and administrative staff;
- Training in logistics for all the actors in the MoS chain. A MoS-Erasmus needs to be fostered.

7.6. The impact of "2020" priorities on MoS

On the "Europe 2020 – A strategy for smart, sustainable and inclusive growth" policy lines, we can find guidance and support for many necessary developments most of which are referred to in this report or have already been referred to in the two previous annual reports (2008 and 2009):⁷

- 1) On the need to coordinate the mobilization of public funding: structural funds, cohesion fund, R&D framework program, TENs and EIB in order to achieve our goals. As a result of those proposals, a Motorways of the Sea helpdesk has been created in 2010 and is now available to give advice to the public and stakeholders on the best source of support for their practical project (www.mos-helpdesk.eu).
- 2) To modernize and de-carbonize the transport sector. Past reports have proposed new research on the field of fuels. This report puts emphasis on pursuing research on efficient engines, catalysts and scrubbers as well as on efficient hull and propeller design.

⁶ For the most of these cases the funding of training should use the possibilities opened by the "Social Fund".

⁷ [COM(2010) 2020 final]

- 3) To improve and foster intelligent traffic management systems and services. Ranging from the "single window" up to the interface of road and railways systems with the port systems.
- 4) To promote better logistics. From the construction of logistic platforms to the training of the numerous professions in the field. The importance of this field has been systematically underlined.
- 5) The reports illustrate how to give impulse to "a good mix of research, the setting of common standards and developing the necessary infrastructure support" to achieve the deployment of innovation in practical cases.
- 6) "To accelerate the implementation of strategic projects with high European value added". Addressing critical bottlenecks, in particular cross border sections and inter modal nodes (cities, ports, logistic platforms). "All this has been referred to. Particularly important are the safety devices for ships (see E.M.S.A. – European Maritime Safety Agency) and the "chips" for containers. Also the banning of "convenience flags" for European companies or companies wanting to call on European ports (this measure must be gradually implemented).
- 7) "To develop smart, upgraded and fully interconnected transport [...] infrastructures and make full use of ICT". The consideration of transport chains which has been recommended is a practical example of this proposal.
- 8) "To ensure a coordinated implementation of infrastructure projects, within the EU core network, that critically contributes 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"; the location of new transshipment ports in the Mediterranean Sea; the railway corridors between North and South; the "articulation" of a bunch of ports; a deeper knowledge of the flows which cross Suez and Panama canals.
- 9) In order "To reduce the transaction costs of doing business in Europe". The improvement of logistic chains has been a repeated recommendation.
- 10) "To ensure that transport and logistic networks enable industry throughout the union to have objective access to the single market and the international market beyond". This is the main purpose of the geo-strategic considerations regarding the connection with Far-East, South and North America and Africa which have been produced.
- 11) "To develop an effective space policy to provide the tools to address some of the key global challenger and in particular to deliver Galileo and GMES". The suggestion regarding "chips" (tags) either for vessels or for containers comes under this umbrella.

These have been some examples of the importance of Motorways of the Sea, in the wider perspective of the achievement of the goals referred to in the document "Europe 2020".

- 12) The program insists on "Education, Training and Lifelong-Learning". We have indicated that a special action, concerning people on board must be carried out namely aiming at merchant marine officers' level. In addition that new training for the numerous professions linked to maritime transportation, logistics and operations in harbors, must be implemented. This is fundamental in order to provide a good level of initial training that those professions require instead of the training in the job that is currently used today.
- 13) "To promote student mobility and trainers' mobility, and improve the employment situation of young people". We have suggested to set up an Erasmus type of program to the maritime professions by articulating mercantile marine schools within Europe. Eventually the formation of a council of those schools at European level. The ones without apparent problems (Greece, Romania, Latvia and Norway) could induce a more dynamic action on the others.
- 14) "The EU has prospered through trade, exporting round the world and importing inputs as well as finished goods". That is the reason why it is not enough to look at MoS at internal European level but it is necessary to consider the external dimension of what still is the most important trade block in the world (EU): transshipment ports; Suez and Panama Canals; connections to Africa and South America; round-the-world trip in the Mediterranean Sea; port hubs; new transshipment ports in the Mediterranean (besides Marsaxlokk, Gioia Tauro, Algeciras and Tangiers-Med).
- 15) "... creating innovative instruments to finance the needed investments, including public-private partnerships (PPPs)". This will be particularly adequate for logistic platforms, "dry ports" (like the one in Zaragoza) or even port terminals.
- 16) "... to foster European growth through our participation in open and fair markets world wide". This will be achieved only if a system of efficient ports is in place, assuring good external connections.
- 17) "We have a particularly close relationship with Africa and will need to invest further in the future in developing that close partnership". For that, ports are essential. Ports in Europe and ports in Africa must cooperate. And everything else which comes as a result of MoS and of its dynamic connection of ports with their hinterland and thus connecting markets and fostering trade.
- 18) Europe needs to develop a deeper knowledge of the implications of the different types of fuels which can be used, particularly on their environmental impacts (NO_x, SO_x, CO₂ and particulates). There is a great

hope that Liquefied Natural Gas (LNG) may drastically improve the current situation. Nevertheless LNG sets a number of challenges: safety requirements, distribution networking, shipping economics, etc. This new field deserves an additional knowledge effort 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.

As already mentioned in chapter 3 (page 17) and as it was repeatedly stated in the Coordinator's activities in 2009, it is important to underline that an advisory unit should exist to play the single interface between the public candidates for funding and all EU financial instruments used to support the development of MoS related activities.

Finally, good financial engineering products such as the "Eco-bonus" should be promoted. The Eco-bonus is a promising system as it targets the support of demand instead of the supply services thereby avoiding distortions of competition. However, Member States concerned by such scheme, must first agree on common terms of support. Governments of countries which will benefit from the relief of road traffic should, all of them, agree and sign a memorandum of understanding reflecting a common engagement (e.g.: Italy, France and Spain). Alternatively, the Commission could integrate this financial engineering product in a financing scheme such as Marco Polo or "start-up" operations in MoS /TEN-T, in which case the applicants, e.g. a port, would for instance request financial support to apply an "eco-bonus" type of compensation (the same for every lorry volunteering embarkment on that given port for a given destination). Such a system entails punctuality of payments as it addresses small companies without large financial reserves. Its main advantage would relate to the emergence of multimodal logistic companies building on a network of small shippers and logistic services providers. This would pave the way to the emergence of a single maritime European market.

8. Studies and New Activities

The rekindling of the MoS flame requires, inter alia, some studies to be carried out in 2010 and 2011 to help identify key issues for MoS: e.g. benchmarking, articulation, intelligent infrastructure, flow of goods and a conference on MoS. Better knowledge on these issues will help precise better the targets and the audiences as well as to improve the value added of European support. These areas are the following:

- The benchmarking of MoS related activities, study aiming at:

1. Providing didactic examples to conceptual and project engineering MoS developments
2. Highlighting indicators that will better define Motorways of the Sea criteria,
3. Supporting the activity of the European Coordinator for the Motorways of the sea.
4. Producing a MoS ports' Atlas which would display all MoS key characteristics for each port.

- The organisation of a Conference to consolidate a common European vision on MoS. The conference will support the development of a European common vision on MoS, build a solid MoS network and develop a consistent corporate image for MoS.
- Launching a prospective study on the development of a new methodology to establish an origin/destination matrix of cargo/trade flows between EU regions. This will enhance the quality of the image of the cargo flows intra-EU that is currently being hampered by the lack of "customs' trade information". In addition, its results will be useful for regional development planning purposes.
- Development of a study on the use of Vehicles/Cargo tracking and tracing technologies to facilitate the MoS transport procedures, make an inventory of the "permanent tracking & tracing" tools and devices and undertake the full scale demonstration of a streamlined process including the analysis of its efficiency and safety performance
- Promote the benchmarking of MoS activities in the Northern Adriatic Range. Help identifying key hinterland connections as well as an articulation strategy enabling the development of a consistent interoperability approach among the ports of the North Adriatic range whilst stimulating competition in the same area.

As a result of previous MoS reports, the TEN-T work programme and Call for 2010 was re-calibrated and new objectives identified e.g. pilot actions and wider benefit actions. Given the demonstrations of interest received so far a successful Call both in terms of quality and quantity is expected. Such success will be instrumental for the actual development of MoS and for the deployment of the MoS related infrastructure and later of MoS services. The studies, Pilot actions and projects resulting from this call will need constant monitoring in order to further develop the concept and accelerate change and lead to effective deployment.

In 2010, new opportunities have been opened under the TEN-T framework: the Call 2010 with a forecasted MoS dedicated budget of 85 million € For 2011 and in the subsequent years, as well as under Marco Polo (where a general call of €60 million is foreseen for 2010), further calls will be organised. Furthermore, additional funding opportunities exist under the Structural funds or as European Investment Bank funded actions. The challenge for Europe and for the MoS stakeholders is to achieve a match of minds that guarantees a perfect use of the resources made available thereby guaranteeing an important role of MoS on the European economic recovery.

9. 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 not only define the type of eligible actions but embody as well the financial support dedicated to MoS in the TEN-T programming period 2007-2013 where an overall indicative amount of 310 M€ was flagged.

The TEN-T budget is, by far, the largest dedicated budget made available for MoS development so far and should be supported by actions perfectly connected to the market's needs and to the stakeholders, in order to be able to play its expected role and help trigger development. It is important to underline that the impact of the global EU

contribution in the market is rather large as it may entail a global investment of, approximately 2€billion for MoS infrastructure and activities across Europe.

Whilst this level of investment can only be met by institutional partners, either alone or through Public Private Partnerships (PPPs), it will create an over-arching infrastructure which will constitute a level playing field for maritime logistics operations where different private transport operators may evolve and will be able to integrate their own maritime transport operations in a coherent European wide door-to-door transport chain.

Given its key role, the TEN-T guidelines should be further improved during the current revision period expected to start in 2010.

The new guidelines should better clarify the type of indicators and performance levels that are adequate for an infrastructure development type of action. It should also reaffirm its vocation to support studies, both the master plan type and preliminary or final design type of studies which are common to all infrastructure projects. In addition, schemes such as Pilot actions, the integration of intelligent infrastructure, and the support to start up services and the deployment of ships are all different but common elements of a coherent MoS development programme.

Finally, the limits and the type of incentives for the combined use of different sources of funding to implement one single MoS global project should also be made clear in order to allow for an optimised use of all the available and different sources of funding.

Conclusions and recommendations

What is the progress so far?

The framework of Motorways of the sea constitutes a strong platform for the implementation of technical concepts aimed at improving the quality of maritime operations while also improving their integration in the global transport chain. The promotion of Motorways of the Sea has further boosted the development of many small actions that improved port infrastructure, the information systems and, the efficiency of maritime operations or the development of better infrastructure connections between ports.

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

Motorways of the Sea may smartly use different implementation tools, taking advantage of the array of financial schemes and funding tools available such as TEN-T, Marco Polo, Structural Funds and EIB each one of them specialised in a specific field of activity. In general, Marco Polo finances services whilst TEN-T focuses on integrated infrastructure development (both physical and information systems) for ports and their hinterland connections (e.g. logistic centres). TEN-T has a dedicated budget of approximately €300 million to Motorways of the sea for the programming period 2007-2013.

Unfortunately, so far, not very many actions have been developed with the label of Motorways of the Sea. This apparently reflects a lack of interest from the sector. Nevertheless, stakeholders re-affirm their interest and complain instead about a lack of directness and precision on the goals to achieve and on the cumbersomeness of the application rules of the existing support frameworks. Be as it may, literally dozens of individual actions that contribute to meet MoS objectives have been launched and supported by the European Investment Bank, the European structural funds, research and cooperation and enlargement programmes as well as by the industry itself and the regions. This shows the dynamics of the sector and makes the Coordinator confident that with a better focus and with the implementation of some practical recommendations the existing frameworks can be extremely useful and will become instrumental to the deployment of the Motorways of the Sea.

It is expected that the new priorities and tools proposed on the TEN-T call 2010, particularly the Pilot Actions will succeed in raising interest among the stakeholders. This type of tool by allowing for full scale testing, may represent the ideal basis to test a venture without touching on competition issues. It will enable the embracing of technical, operational and procedural issues and the emulation of the resulting transport operations, allowing for the starting up of the commercial phase immediately after the completion of the pilot action. By providing support to develop highly complex technical tools for efficient transport operations such as information systems and customs

requirements interfaced with electronic cargo manifests and logistics information systems, TEN-T MoS is bringing innovation to the real world.

Recommendations

For two years, the Coordinator has visited many European Ports and discussed with hundreds of European actors interested in Motorways of the Sea 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 different but all having a common thread – they all supported and believed in an increased role of maritime transport as a key development factor for a better Europe.

Inspired by their enthusiasm and positive criticisms, the Coordinator summarises some of their visions and ambitions in the following recommendations for European MoS support priorities:

- (1) 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 or region authorities, port master-plans, and a good networking between the port community and the cargo owners (shippers)
- (2) 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.
- (3) 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.
- (4) 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 the efficiency in transport chains and nodes and on how best to foster cooperation among ports and modal actors to facilitate the deployment of innovative technologies.
- (5) Support to 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.
- (6) MoS will 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 to 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 of network – i.e. Building on an aggregated European Knowledge to improve access to knowledge whilst keeping a sustainable diversity of training places.
- (7) Develop actions and information systems to integrate procedures and operations in a guichet unique (one stop shop) for the whole 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.

- (8) Support the launching of actions aimed at fostering research and technological development to develop ships and equipment with reduced emissions and increased safety and environmental friendliness as these measures will have a very positive impact on MoS.
- (9) Better articulate the different funding frameworks, whilst respecting their specificity in order to avoid duplication and achieve critical mass for innovation and change. The coordination of the different MoS institutional 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.
- (10) In this context, update the TEN-T guidelines, integrating the lessons of the new practical experiences and benchmarking, thereby upgrading their capacity to meet the new demands.
- (11) Simplify bureaucracy where possible; facilitate the use of benchmarked solutions such as the "Euro bonus" scheme as a priority Marco Polo type of action.
- (12) Extend our reach to our neighbours and to 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.
- (13) Develop studies and pilots on the use of different types of fuels, giving priority to LNG, addressing inter alia: shipping economics, operational strategies and LNG supply logistics. Further research may be required on retrofitting techniques, energy efficiency and ship's structural design.
- (14) Develop geo-strategic studies addressing the maritime 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 the Europe/USA traffic cannot be forgotten as it still represents about 1/3 of the total European traffic.
- (15) A strategic transport research policy with clear areas of priority, needs to be established for Maritime research in general and for MoS in particular in order to boost the sector in a similar way to what was achieved in the mid-nineties (e.g. Short Sea Shipping, Maritime Safety and competitiveness in shipping).
- (16) A MoS development policy needs to target public private partnerships for the ultimate deployment and target users or the demand side as its prime objective (e.g. a new role for Marco Polo grants).

The Coordinator expects that many of these recommendations shared with many European stakeholders of the Motorways of the Sea, will be implemented in the coming years, paving the way for a more efficient and innovative European transport system supporting trade and cohesion but also extending its reach beyond world trade to achieve better quality of life on our planet.

Annex 1.

