

Success factors for developing viable Motorways of the Sea projects in Europe

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Abstract Motorways of the Sea (MoS) projects, that is, the development of integrated maritime-based intermodal transport infrastructure and service networks at European scale, have been the vision of the European Commission (EC) under the European Transport Policy White Paper 2001. Although these projects have been prioritised under the Trans European transport (TEN-T) networks, they have met with limited success. Establishing MoS is complex because of its international scope and involvement of a large number of public and private stakeholders that often have conflicting objectives and goals. Presently, there is a need for EC to set clear, fair and attractive conditions to engage private stakeholders in the realisation of these projects. The paper will attempt to identify these conditions and recommend a way forward. The paper reviews the evolution of the MoS concept and existing barriers in the delivery of intermodal services to understand the expectations and concerns of the important stakeholders. Case studies of European Short Sea Shipping experiences in the different maritime corridors and elsewhere around the

world are analysed to identify critical success factors and recommend a suitable framework for the realisation of European MoS projects.

Keywords Motorways of the Sea · Short Sea Shipping · Intermodality · Freight transport · Freight Transport Policy

1 Introduction

According to European Union's Transport Policy White Paper, European road freight transport expanded exponentially in the past few decades causing high congestion levels on about 10% of the European road network [1]. If nothing is done, total road freight transport in European Union (EU) is forecasted to grow by about 60% until 2013 from the 2004 basis effectively adding an additional 20.5 billion tonne-kilometres per year across the EU 25 Member States [2]. By comparison, market shares of European rail freight declined since 1995 while Short Sea Shipping [3] has been able to keep pace with road transport for intra-European goods transport mainly due to feeder traffic flows.

One of the proposed measures is the desire to develop maritime-based door-door intermodal services as an alternative to long-distance road transport. The performance of road transport is the yardstick against which any proposed alternative is measured. For SSS to penetrate this market segment, the challenge is to offer the same overall service quality as road transport [4]. To realise this, the European Commission (EC) proposed the Motorways of the Sea (MoS) concept.

The starting point when considering EU's modal shift policy is to acknowledge the obstacles of SSS, viz. poor integration with supply chain, image as "old-fashioned" and "slow" transport mode, complex administrative

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procedures, etc., to compete with road transport mode. After many failed attempts to make SSS competitive, EC reinvented the SSS under the MoS concept and was first introduced in the 2001 Transport Policy White Paper [1]. Even so, MoS concept has met with limited success in sustaining such projects.

Section 2 analyses the evolution of the MoS concept and attempts to define the concept. It also indicates supporting plans and programmes and analyses the proposed implementation process. In the next section, the major challenges in planning and delivering a MoS projects are empirically outlined from literature. In Sect. 4, SSS case studies are analysed and classified separately for three different maritime regions to identify success factors specific to each region. The paper concludes with a set of recommendations for achieving the desired modal shift through realisation of MoS projects.

From an academic perspective, the paper contributes towards the development of a framework of analysis to help analyse and address potential barriers and propose a way forward in realising such ambitious projects.

2 Evolution of the Motorways of the Sea concept

Defining MoS has been a difficult task right from its introduction in the Transport Policy White Paper in 2001. Depending on the definition, the related traffic flows, geographical scope, stakeholder interest and policy interventions considerably vary. The lack of clarity in its definition has contributed to difficulties in framing appropriate policies, engaging stakeholders and carrying out market analysis and research.

The maritime-based intermodal services, on which the MoS concept is based, are not new but go back to June 1992 when Viamare S.p.A. started the first road-to-sea initiative between Genoa and Immeresi in Sicily [5]. Similar private ventures witnessed the modal shift of goods from road to sea in the Mediterranean, Atlantic, North Sea, Baltic and Adriatic maritime corridors. The most advanced maritime-based intermodal services in operation are seen in the east and west Mediterranean, and they have been performed by Grimaldi Group, Superfast Ferries and UN RoRo, even though the Baltic offers examples of innovative logistics solutions, particularly developed by DFDS TorLine with Volvo and Stora Enso [5]. This environment is also promoting the emergence of the Black Sea MoS and the extension of the MoS to link non-Member States with the European Union in the Mediterranean through the MEDA project.

Under the 2001 White Paper, the MoS services were introduced as a service that would target markets with long-distance, consolidated, unitised intra-European trade flows

that suffered from severe congestion along the land transport corridors [1]. In a 2003 working group chaired by Karel van Miert, MoS concept was defined as floating infrastructures that move goods by sea from one Member State to the other to avoid congested land corridors, give access to islands separated from European mainland and facilitate integration of maritime links with the land transport networks [5]. The working group's recommendations were to develop MoS concept on a commercial basis rather than on a public service concept philosophy, stressing the importance of cooperative relationships between public authorities and private sector for its realisation. Four maritime corridors (MoS of the Baltic Sea, western Europe, south-east Europe and south-west Europe) were identified for setting up these projects, and a 2010 deadline was agreed [6].

The definition and scope of MoS concept evolved after many deliberations although there was no clarity from the EC on its exact definition. From official documents [7–11], we understand MoS concept as high frequency, regular door-to-door intermodal services where the main haulage is done by SSS and last mile connectivity by road transport. These services would link ports and markets located in at least 2 European Member States. The ambiguity lies in understanding whether SSS market segmentation such as intra- and inter-European trades, passengers and cargo, tramping, feeder and liner services are covered in the scope and definition of MoS [12].

2.1 EU support for MoS projects

Different EC funding programmes were devised to support MoS project implementation (See Table 1). Constructing or upgrading port hinterland connections and feasibility studies were eligible under TEN-T programme although a separate allocation of budget for MoS projects does not exist [12]. The Marco Polo I offered financial incentives to shippers and carriers that established new intermodal services aimed at transferring cargo from road to alternative transport modes (sea, rail and inland waterways). Since 2004, the EU introduced Marco Polo II programme with a much larger budget to support traffic avoidance actions and MoS projects. Public funding of the MoS is available to develop modern transshipment facilities or to contribute to start-up cost. The coverage of start-up costs is only for the initial 3 years of service operation.

Other European policies that contributed to support modal shift and thus indirectly support the development of MoS projects were as follows:

- Creation of single market in 1993 facilitated the harmonisation of administrative formalities at Member State borders for land-based transport. But maritime ports are still considered as border posts for intra-EU trades. The

Table 1 European funding programmes supporting MoS (source: [12])

Programmes	Total budget	Funding conditions
TEN-T (since 1991–1992) MoS taken in consideration since 2004	€310 million for MoS within TEN-T programme for 2007–2013 European regional development fund	Financing cannot exceed 20% of total infrastructure cost. Studies subsidised up to 50%
Marco Polo I 2003–2006	€102 million	30% for start-up aids 35% for non-road services 50% cooperative actions
Marco Polo II 2007–2013	€740 million	35% for 5 years max. for MoS

EC adopted an action plan to simplify administrative burden and simplify reporting formalities on vessels engaged in intra-European short sea trade [12].

- European Neighbourhood policy extended the geographical scope of MoS links beyond EU borders into Black Sea, Caspian Sea and even Red Sea through the Suez Canal.
- The proposed Common Maritime Policy [13], if implemented, would work in three directions—expand maritime employment to promote clustering of maritime-based industries around MoS projects, facilitate coordination between Member States for effective monitoring and enforcement of shipping activities to eliminate operation of substandard ships and mitigate ship pollution and criminal activities.

2.2 MoS project implementation approach

For implementation of MoS projects, the TEN-T guidelines were amended in which Article 12a set MoS project implementation guidelines [8, 9]. These guidelines proposed competitive bidding of MoS projects developed by public–private consortiums. Applicants were expected to define their financial and technical capacity, forecast traffic, prepare a business plan, measure impacts on competition and theoretically prove the viability of these projects on the identified maritime corridor over a short period of 3 years. MoS project bids would be evaluated on all the above criteria, and selected projects could benefit from partial EC funding to kick-start their projects.

In 2004, EC sought views from interested parties (e.g. Member States, Regional and local Authorities, European and National Associations, Ports, Consultants, carriers) on these guidelines through two stakeholder consultations. The response to EC's 1st Consultation on MoS showed that there was widespread interest in the concept, but ambiguity in certain aspects of the selection guidelines caused concerns from the potential stakeholders [8].

On the rationale for developing MoS projects, stakeholders cautioned of excessive concentration of port activity

in few large ports, would create its attendant problems of congestion and pressure on local environment and hinterland infrastructure. There was also a strong emphasis to avoid the distortion of competition from newly developed MoS projects on existing SSS links.

Regarding MoS project selection process, many stakeholders complained that existing port selection criteria obliged applicants to select category “A” ports. This unfairly excluded medium- and small-sized ports from participating in the MoS projects [5]. Transparency in selection process was asserted unequivocally by all.

On EC funding to selected MoS proposals, clarity on the maximum budget allocation for each project was considered important. Some stakeholders sought public funds to support new vessel acquisition as it was argued to be a part of infrastructure over the water.

The TEN-T guidelines [8, 9] fell short of a framework for existing SSS to participate in the MoS projects. Therefore, the 2nd Consultation in 2007 sought opinions on the possibility of developing Key Performance Indicators (KPIs) to be applied for ships and ports [14], as well as to develop a benchmark scheme to compare the performance of different transport modes, while it also built on the idea of public endorsement for quality MoS links. Stakeholder opinion was mixed regarding the proposed application of benchmarking and KPI to ships and ports. Terminal operators, carriers and intermediate organisations were not in favour of KPIs and benchmarking, arguing that markets always penalised low-quality services. Moreover, they would increase the burden of data collection on the service providers. However, shippers, public authorities and Short Sea Promotion Centres favoured KPIs and benchmarking because this would provide a tool to compare different transport solutions and different companies on a given transport corridor.

So far, there has not been any EC decision about selecting and enforcing KPIs and the benchmarking schemes. Also, the clarity in the scope of the MoS concept and genuine concerns of stakeholders in the consultations has not been officially addressed by the EC to date.

3 Challenges to developing Motorways of the Sea projects

There are multiple challenges in the planning and implementation of competitive MoS projects that create barriers in its execution. These challenges are classified based on commercial, legal and regulatory, technical and environmental considerations. All these barriers are interrelated and can negatively affect the overall performance of MoS projects.

3.1 Legal and regulatory

Addressing the maritime security threat, EC increased reporting and inspection norms on goods, personnel and vessels in port [15]. However, the lack of uniformity in the methods, standards and interpretation by different European ports has increased transaction costs and delays to shipping and port activities. These added security checks could easily increase ship freight costs between 5 and 10% [16].

Duplication of ship and cargo reporting procedures in many European ports significantly increase the administrative burden on ship personnel [17]. Similar security or administrative checks are not enforced when freight travels by land transport modes that ultimately reflect on the competitive efficiency of maritime-based transport services.

3.2 Technical

The European freight distribution system is operated by different standards of loading units that are mutually incompatible with loading vehicles and handling systems—swap bodies, ISO containers, 45 feet ISO containers and the EC proposed European Intermodal Loading Units (EILU) [18, 19]. So far, no consensus on adopting common loading unit and vehicle standards has evolved from the market [20]. Therefore, EC proposed the use of Roll On/Off (Ro–Ro) ships as the preferred vessel types for MoS projects.

3.3 Commercial

Although Ro–Ro ships were proposed for MoS projects, no formal study has yet been conducted by EC to illustrate the capacity and trade patterns of existing Ro–Ro markets. The Ro–Ro shipping market is relatively small and serves captive markets that require services to connect islands to mainland or cross straits. The pure Ro–Ro fleet stands at 1.2 million lane-metres in October 2007, spreads on 1,660 ships [21] and is mostly focussed in North European regions [12, 22]. Most of the Ro–Ro vessel fleet are owned

and operated by large, established shipping companies that engage these vessels along established links. In the prevailing economic conditions, further addition of new Ro–Ro fleet seems unlikely [23]. In this scenario, Ro–Ro industry imposes a challenge to start new MoS services along new routes.

Transport contract conventions for freight are largely mode specific and definitions, liability limits, time thresholds for filing complaints and so on are incompatible across modes [24]. Even though intermodal transport rules exist since 1975 under the UN Convention, it is not endorsed by many Member States. The lack of harmonisation in contract conventions imposes additional transaction costs and creates ambiguities for cargo owners, thus discouraging them to use intermodal transport services [24].

The present pricing policies in European seaports demonstrate that there is substantial diversity in port financing and charging practices [25]. Ships calling European ports are forced to pay port charges that are arbitrarily fixed and vary from one port to the other. Moreover, ancillary services (such as pilotage, towage and mooring) are imposed on vessels calling their ports even though they are not required or are inefficient.

Truck driver wages and fuel rates constitute the two major cost factors in road transport operations averaging 33% and 21% of total operating costs [26]. Over the last decade, gradual removal of cabotage regulations combined with lack of harmonisation in fuel taxation and minimum wage policies across Member States has resulted in intense competition in the European road freight transport sector. Although the EC had set minimum level for fuel excise duties, most Member States set levels arbitrarily through national legislation. Average truck driver wages differ up to 8 times from one Member State to the other [26].

Intense competition within the road haulage sector and between other transport modes has raised questions of fair competition amongst the different players. Issues concerning flouting of truck drivers' working hours, environmental standards of the trucks and even indirect subsidies to preferred modes in certain markets have surfaced [27, 28].

3.4 Environmental

The vulnerability of shipping on nature is a barrier for guaranteeing reliable and timely shipping services. This is especially true for high-speed vessels (including Ro–Ro) that operate in the Atlantic corridor [29]. As MoS services are dependent on Ro–Ro shipping for main haul, risk of delays and damage during adverse sea weather conditions would have to be considered by potential users of this service.

Many believe that shipping sector is more environmentally friendly than competing land transport modes. However, a ship emits 30–50 times more sulphur oxides per tonne-km than trucks and releases twice as much nitrogen oxides per tonne-km than a truck [30].

Environmental legislation has had a significant impact on the development and maintenance of seaport infrastructure. Public support for port improvement and expansion work is weakening dramatically in many of the larger European seaports. In some cases, new port expansion plans have stirred up opposition from residents and environmentalists often leading to long and costly litigation procedures, ultimately delaying port expansion plans indefinitely and triggering port congestion.

In summary, although many stakeholders are interested in the MoS projects, the above challenges are creating considerable barriers in the planning and implementation of MoS services in the market.

4 Success factors for MoS projects

An analysis of MoS-type projects that had been developed in Japan and maritime regions surrounding EU (North Sea, Atlantic and Mediterranean) provides valuable learning to understand the influence of various internal and external factors on MoS projects. From this case study analysis, it is expected to identify effective business strategies and policy actions in different market settings that support MoS initiatives. This would provide a sound basis for developing suitable recommendations for MoS implementation.

4.1 Japanese ferry service system

Japanese ferry services are arguably the world's most comprehensive Ro–Ro ferry seaway system that connect three main islands and directly compete against long-distance trucking [31]. Most long-distance ferry routes in Japan ran a daily service using a pair of fast (24–30 knots) Ro–Ro vessels. Fast ferries not only make the service competitive but also improve efficiencies as operators need to employ fewer vessels to maintain a daily frequency. In terms of market share, 25% of goods movement was captured by Japanese ferry services in 1996 [31]. Though the services suffer from certain disadvantages (e.g. relatively high crew costs, inadequate enforcement of trucking regulations, etc.), success factors include higher driver wages and growing shortage of truck drivers.

The Japanese case study reveals the importance of cohesive and consistent design, planning and operation strategies in such projects. At the design phase, ferry terminals and logistics parks were planned in close proximity of each other. To develop maritime infrastructure and

attract the private sector in these projects, low-interest finance was made available by the Japanese government for building new ships through a maritime credit fund. Terminal infrastructure capital costs were financed by the Transport Ministry and local governments [31]. At the operational level, port charges for ferries were kept to the minimum, and special laws permitted self-handling of ferries by trucking companies. This is a good example of how authorities could plan and involve private stakeholders in European MoS projects.

4.2 North Sea region

Between 1996 and 1998, the EC funded the “European Marine Motorways” project investigated the commercial viability of Ro–Ro ferry services on three corridors—Gothenburg-Zeebrugge, Plymouth-Bilbao and Genoa-Barcelona [2]. Results indicated that a significant volume of traffic along the routes, intolerable levels of road congestion and competitive Ro–Ro transit times provided favourable conditions for its success. Additionally, favourable policies such as the French lorry driving ban at weekends/public holidays and expensive road tolls prompted shippers to express interest in alternative coastal Ro–Ro link. Even so, Ro–Ro services were not sustainable because issues of poor port access, inefficient port facilities and high handling costs in ports created start-up losses of these services and hindered progress.

The ZEELAND-SCOTLAND (ZEE-SCOT) project identified that the trailer market was significant to sustain a direct Ro–Ro service between Scotland and continental Europe [4]. From the survey, it was discerned that logistics companies would gradually commit their full traffic to the new Ro–Ro services only after service reliability was ensured in the initial years of operation. When SuperFast Ferries commenced a daily Ro–Ro service between Rosyth-Zeebrugge, traffic gradually increased but faced stiff price competition from road hauliers that forced the company to reduce service frequency from daily to three sailings a week. Access to toll-free UK motorways, hiring of drivers from East European countries at low wages and refuelling fuel at cheaper rates in continental European countries allowed road hauliers to compete on price by offering up to 20% cheaper for a door-to-door service per trailer without any State aid [2]. A breakdown of Ro–Ro cost showed that almost 50% costs were attributed to pre-/end-haulage and port handling costs.

From the above case studies, cargo handling inefficiencies in port, high port charges and high costs of pre-/post-haulage need to be addressed through policy interventions especially in UK and Scottish ports. On the other hand, cost differential in road haulage operating costs (road tolls on UK motorways, truck driver wages and fuel duties)

across Member States needs to be harmonised to offer a level playing ground for MoS services to compete with all road transport. Thirdly, funding support is essential to cover start-up operational costs of MoS ventures until a steady market is developed over a period of time. We suggest that the duration of the Marco Polo II subsidies to cover initial operational costs should be dependent on mutually agreed revenue levels instead of a fixed 3 years as is existent.

4.3 Mediterranean region

One of the first Ro–Ro ferry initiatives was attempted by the state-owned Viamare S.p.A service between Genoa Voltri and Termini Imeresi in Sicily in June 1992. External factors that favoured Viamare were that road transport faced operational and safety risks. Poor road conditions coupled with high congestion in South Italy and high incidence of truck hijackings [5]. The Ro–Ro service took many innovative measures such as fast paperwork for trucks at terminal gate, round-the-clock port administrative services and sailings timed to the convenience of truck drivers. In this way, it succeeded in a significant modal shift from road to sea. In spite of this, the service was financially unviable and eventually was absorbed into a sister company Tirrenia. High ship capital costs, devaluation of the Lira and high interest rates were considered to be the main factors that caused financial hardship in the above case. New Ro–Ro services by Grimaldi lines operated in direct competition to Viamare services. Grimaldi offered faster (24.5 knot) flexible (RoPax) ferries and daily services in each direction that captured a third of the road market share for goods and passengers on that corridor.

In another case, SuperFast ferries successfully introduced a daily service in the Patras-Ancona route between Greece and Italy in 1995 [2]. The Balkan conflict and poor road conditions favoured modal shift to sea mode. On the other hand, innovations in the port sector facilitated fast completion of ship reporting formalities and efficient cargo handling in those ports. The service was successful in diverting virtually all road freight. Presently, SuperFast operates 28 knot ships on a twice-daily service frequency in both directions. Similar ventures between Sodertalje and Rostock started by SuperFast ferries closed down due to the lack of support from truckers that benefitted from free access to UK motorways and intense pressure on freight rates [4].

Another interesting case is that of the International Association of Turkish road haulage companies [32]. In 1992, the UND Association began operations after leasing 2 Ro–Ro vessels from a state-owned company to bypass conflict regions of former Yugoslavia. The services linking Istanbul and Trieste soon became successful due to a 70%

ship utilisation guarantee given by the Association's truck owners, who were the clients of the shipping services. Early success of this venture prompted the Association to start a company UN RoRo and purchase standard, low-cost Flensburger Ro–Ro ships. The company benefitted from high ship payload, attractive service speeds (22–24 knots) and low fuel consumption. Around 65% of all Turkey's road trailer activity destined for western Europe is estimated to move via UN RoRo service [33]. In 2007, the management and majority shares of UN RoRo have been transferred to an investment fund.

Measures such as custom clearances prior to vessel arrival, driver-friendly operations (air lifting of drivers between Turkey and Ljubljana ports allowing spending of extra days at home while their trailer is being moved by sea) and opening of a dedicated freight terminal at Pendik, Istanbul, in 2005 by UN RoRo have created a win–win situation for all. A key feature in Pendik terminal is that trucking companies themselves are responsible for loading and discharging ships. As shareholders, the road transport company's benefit furthers through receiving dividends at the end of the year [34].

UN RoRo demonstrates an effective organisational framework of road hauliers acting as investors, shareholder and clients of a Ro–Ro service company that serves as a good business model for MoS projects.

In 2005, Grimaldi Group established a RoPax service (Ro–Ro ferries transporting goods and passengers) between Civitavecchia (Italy) and Toulon (France) to circumvent Alps crossing, to avoid the high tolls on French and Italian motorways and poor road infrastructure in South Italy [12]. In spite of availing EU's Marco Polo subsidies and a mixed traffic volume, the service remained unprofitable and was suspended in March 2009 after the EU subsidies were withdrawn. The high cost of employing fast vessels (28 knots and above), increasing service frequency and inadequate traffic volumes were cited as reasons for its failure by the company [35].

The Viamare case study demonstrated that clients expect at least a daily fast (28 knots above) shipping service at each port of call. Secondly, the imbalance of freight flows in freight movements can be compensated by employing RoPax vessels as it offered flexibility in diversifying into passenger and car transit markets. Thirdly, competition from other shipping lines on the same corridor would be detrimental to these services unless the market is large enough to accommodate more than one operator.

Barriers in the road segment such as the Balkan conflict and poor road conditions favoured UN RoRo and SuperFast ferry services, while high road tolls and inadequate road infrastructure in South Italy favoured Grimaldi lines to capture market share from road. However, the Grimaldi experience shows that delivering fast and frequent shipping

links is unviable without adequate EU subsidies to the clients or service providers of intermodal services and reducing competitive advantage of the road sector. The latter can come in the form of political upheavals (e.g. civil unrest, wars) or through transport policy measures, such as, regulatory (restrictions on infrastructure use) and economic (subsidies/taxation).

4.4 Atlantic region

France has almost 40% of motorways traffic occupied by transit traffic [36]. Northbound trucks destined for North European destinations such as UK, Benelux, Germany, Denmark and other countries enter France at Biritaou (Spanish–French border to the south) and cross the whole length of the country. This transit traffic estimated to be 280,000 trucks in 2004 has been partly captured by Transfennica Lines which started MoS-type services in 2007 between Bilbao and Zeebrugge.¹ The service was initially subsidised by Marco Polo I programme and has grown from 3 sailings/week initially to offer 5 sailings/week, capturing a total traffic of 61,800 semi-trailers per annum in 2008 [12]. However, Transfennica has been able to attract a small volume of traffic from road because it only offers unaccompanied vehicle services that are best suited for large road hauliers. The service takes almost double the transit time (38 h by sea compared to 20 h by road), and delays are frequent during winter months. Unbalanced trade is also a prominent feature that is affecting the profitability of the service.

The Transfennica case study indicates that long transit times and the lack of options for small hauliers have been limiting factors to capture a larger market share. Moreover, frequent occurrences of rough seas in the Atlantic Ocean reduce service reliability and discourage employment of fast RoPax vessels. In these circumstances, it could prove difficult to start and sustain MoS projects in this corridor.

The above case studies illustrate the complex factors influencing the successful implementation of MoS-type projects. Trucking companies constitute a major set of potential clients for the MoS-type services, and MoS services need to be geared towards their expectations. It is evident that favourable market conditions (e.g. high traffic volumes and high congestion levels on parallel road infrastructure) alone are not enough to sustain modal shift to MoS projects. Equally important is the provision of efficient intermodal services that compete on price/time as well as are compatible with trucking operations, the implementation of which needs to be supported by public

funds. Trucking companies, passengers and cars constitute the main market segment of MoS services, and its services need to cater to their demands in terms of adjusting sailing schedules and provision of shipboard passenger and parking facilities.

The Japanese case study indicates the role of EC and Member States to incentivise private and public stakeholders to plan design and execute in a collaborative and mutually beneficial way. While UN RoRo case study revealed how cooperation amongst road hauliers could create a win–win situation for all the major stakeholders. EU and national policies that incentivise road haulage companies to self-organise could go a long way in ensuring success of MoS projects.

5 Conclusion

The concept of the Motorways of the Sea is a novel concept; however, there are several inconsistencies that need to be urgently addressed. Firstly, the geographical and market scope of the MoS concept is unclear:

- Whether MoS services can expand to service neighbouring countries outside the EU or are restricted to EU boundaries.
- Whether MoS services are restricted to Ro–Ro and container traffic or can be extended to other SSS market segments such as tramping, liner including feeder services and passenger cruises.

Secondly, the approach to implementation of MoS projects has many loopholes. Unlike road and rail networks, seaport and shipping links planned to be developed within TEN-T programme are not clearly identified. If public private consortiums are allowed to select links, it is bound to cause competition distortion with incumbent SSS services in high-density corridors. The length of the MoS selection process (including bidding, selection and financing of selected MoS projects) is not fixed and can extend indefinitely. In a dynamic volatile freight transport market, any changes in the global supply chains could impose unacceptable risks on the profitability of the MoS services.

Thirdly, harmonisation of inter-sectoral policies at European and national levels is essential for clarity in policy direction. Following points highlight these inconsistencies that send mixed signals to the potential stakeholders:

- EU's commitment to invest in maritime infrastructure on the one hand with national subsidies or EU grant aid for new road and rail infrastructures that directly compete with each other.

¹ Transport Working Group of the Atlantic Arc Commission-CPMR, Coimbra, September 2008.

- EU's road transport cabotage rules have been fully liberalised since 2004, but EU ports still enforce reporting and inspection formalities for intra-European shipments.
- EU's economic policies support growth in maritime trade and infrastructure capacity building, while Birds, Habitat and Water Directives within the ambit of EU's environmental policies restrict port infrastructure expansion.
- Incoherence of contract liability regimes across different transport modes adds new risks and increases transaction costs in intermodal operations. Without a framework for a fair and simple liability regime for intermodal transport, the prospect of MoS to attract medium- and high-value goods seems unlikely.
- Lack of harmonisation of driver wages and fuel excise duties across Member States create unfair competition and market distortion between competing transport services.

The above issues would require urgent attention so as to gain confidence of the private stakeholders to invest and support MoS projects.

Finally, we consider that liberalisation of MoS ports is necessary for the market to develop innovative services that best match shipping and supply chain requirements. Japanese and UNDRoRo case studies demonstrate how the right policy incentives and collaborative mindset amongst the key stakeholders can create and sustain viable MoS like services in the market. On loading unit incompatibility, we expect that market demand and supply would eventually determine the appropriate loading units, vehicle types and handling equipments for their specific needs. Governments have no role to play in such issues.

In conclusion, the need of hour is to support the EU's modal shift expectations by clear, integrated and complementary inter-sectoral policies at European and national levels to transform this interest into real projects and achieve the desired modal shift.

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