Motorways of the Sea: Economic Barriers, Weaknesses and Challenges

Annex 2.2.4 to the Final Report

June 2007

Napier University
Transport Research Institute
PREFACE

This report has been written by Professor Alf Baird at Napier University’s Transport Research Institute as part of the SUTRANET project (Work Package 2: Motorways of the North Sea). SUTRANET (‘Sustainable Transport Research & Development Network in the North Sea Region’) is a project within the framework of the European Commission’s (EC’s) Interreg IIIB North Sea Programme.

The aim of the report, which was presented in May/June 2006, is to describe the barriers, weaknesses and challenges related to implementation of the Motorways of the Sea concept in the North Sea Region.

SUTRANET, June 2007

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SYNOPSIS

The last several decades have seen very substantial public sector investment in roadway and railway infrastructure throughout the EU. The seaway has tended not to be supported to anywhere near the same degree, and in most instances seaways have been ignored, in part due to the mistaken assumption by policymakers that the seaway represents some kind of free highway, and is therefore not deserving of public subsidy in the same way as roadways and railways. To a limited extent the evolving EU Sea Motorways policy appears to recognise these distortions, and mechanisms are now being put in place to enable short sea shipping to develop further. Acceptance by the European Commission that short sea shipping represents the only real hope of holding back the dramatic growth in road freight transport throughout the EU reflects the fact that policy is now beginning to move more positively in favour of maritime intermodal transport solutions. Recent EU-funded research on the subject of sea motorways as well as increased EU grant aid reflects this shift and highlights the important role of the EU in this regard. Analysis of sea motorways in practice demonstrates the substantial modal shift that can be achieved by innovative carriers using advanced ship technology supported by appropriate policies, and/or due to specific environmental circumstances. However, there continues to be a fundamental mismatch whereby transport policy throughout Europe accepts the continued state financing of roadway and railway infrastructure, but not seaway infrastructure. It is argued in this context that the seaway equivalent infrastructure of roadways and railways is in fact the deck of a ship. This argument is convincing for a number of reasons, and not least because it is relatively easily demonstrated that the sea itself is anything but a free highway (if indeed it is a highway at all), while ports simply act as nodes, not as transport platforms. The acknowledgement of what actually comprises seaway infrastructure will have far reaching implications for the future attractiveness and competitiveness of maritime transport vis-à-vis subsidised land transport alternatives in Europe, and should result in more adequate policy mechanisms being introduced to help overcome market distortions and ensure a level playing field between sea and land transport.
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1. Introduction

If nothing is done, total road freight transport in Europe is forecast to grow by about 60% by 2013. The effect would be an additional 20.5 billion tonne-kilometres per year across the EU 25 Member States (Commission of the EU, 2004). This growth in road traffic would have negative consequences in terms of accidents, congestion, reliability of the supply chain and logistics processes, and environmental damage. Such a prospect is regarded as unacceptable by the Commission, hence the desire to develop ‘Motorways of the Sea’ as an alternative to long distance road transport.

Coping with this growth therefore implies using alternative modes to road transport more intensively than hitherto. In the context of modal shift, road transport is nevertheless the yardstick against which any proposed alternative short sea shipping (SSS) service is measured. In the long-distance road haulage sector, haulage contractors using articulated vehicles carry the majority of freight (McKinnon, 1989), and if SSS is to penetrate this market the challenge (for maritime transport) will be to offer the same overall service package as road transport, which is exactly what the Commission has suggested Motorways of the Sea must achieve.

The starting point here when considering EU ‘Motorways of the Sea’ policy is an assessment of the economic fundamentals of sea transport in relation to land-based modes. The analysis takes account of the way in which provision of sea transport infrastructure differs markedly from land-based transport infrastructure, highlighting a need for policy to recognise and reflect this difference. Critical in this regard is what is actually meant by the term ‘seaway infrastructure’, and particularly in relation to roadway and railway infrastructure.

With regard to previous research in this area, the report elaborates on three particular ‘marine motorway’ research studies in which SUTRANET partners have participated. Two of these were EC funded under different research programmes, while the third was a UK Research Council/Government funded study. The outcomes of all three research projects are considered to have implications and important lessons for future ‘Motorways of the Sea’ initiatives. From an academic standpoint, this work also contributed towards development of an analytical
framework that helps determine the feasibility of a given intermodal sea transport service (Baird, 2004).

Through the use of case studies the report illustrates how a number of Sea Motorway services have developed in practice. The selected case studies indicate the potential that modern, sophisticated, sea/combined transport solutions together with related policy mechanisms and/or in answer to specific environmental circumstances, have in achieving modal shift. EU Motorways of the Sea policy is considered in this context, by evaluating the approach employed by the Commission to assist and facilitate development of shipping services in bringing about road to sea modal shift via the complementary Marco Polo and TEN-T funding programmes.

2. Economics of land and sea transport

2.1 Land transport subsidy

When talking about ‘modal shift’, what is meant is the movement of traffic from road to so-called ‘less environmentally damaging modes’. Alternative modes typically referred to are rail and sea transport, although it is the contention here that railways are in fact not that very much different from roadways, at least from an economic standpoint. Let us consider the fundamental dynamics and the economic reality of this land-to-sea challenge (or indeed transformation).

First, roadways (or ‘highways’) are by and large not provided by the market as such, they are provided by the public sector. Furthermore, public finance that is used to build roadways has in the main not been recovered from user charges. This is slowly changing now as road user charging (i.e. tolls) is introduced in more and more EU countries, Germany being the most recent example. However, even where road user charging has subsequently been introduced, it is still the case that in most instances it is the public sector that finances roadways, not the market. Even today, in many EU and neighbouring countries, roadways are still provided free
of charge to the user. A fundamental starting point when considering the question of modal shift, therefore, is the infrastructure cost of alternative modes, and who actually pays for this. Thus, it is relatively easy to explain why roadways have become so popular for freight; this is largely due to the fact that the market has had very little to do with the provision and financing of road infrastructure, these aspects being taken care of by state entities, for the most part using public sector finance.

Secondly, railways, considered once again from an economic viewpoint, are more or less the same as roadways. Railway infrastructure throughout the EU tends to be provided, owned, maintained and operated, by state-owned/controlled entities. This means that investment in railway infrastructure, as with roadways, is mostly the responsibility of the public sector. Of course attempts are made, in some instances, to pass some of the costs of railway infrastructure to users. But by and large it has proven very difficult, if not impossible, to recover the very high costs of providing railway infrastructure from user charges. Indeed, to the transport economist, railways are essentially ‘non-economic’, although in this context it is important to differentiate between infrastructure and operations. Inevitably, what all of this ultimately means is that railways, like roadways, are not provided by any market as such, they are provided by the state.

Railways nevertheless tend to be regarded by many transport commentators and policy-makers as a practical alternative to road transport, yet in fact railways demonstrate a number of characteristics and weaknesses rather similar to highways, for example:

a) Railways have finite capacity;
b) Competition between freight and passenger trains for track space is acute and can lead to conflict, with the outcome usually being priority for the latter;
c) Railways are uneconomic and depend on substantial government subsidies;
d) The cost of new rail infrastructure is prohibitively expensive;
e) The gauge in some countries (e.g. the UK) often prevents the carriage of road trailers or high-cube containers across much of the network;
f) Connectivity across national borders can be problematic, and;
g) Scope for developing new railway capacity is very limited, mainly due to environmental, legislative and public sector financial constraints.

Given this reality, it is perhaps not surprising when major pan-European logistics companies express a high degree of skepticism when talking about major modal shift from road to rail ever being achieved (Rice, 1999). The EU and member states have nevertheless committed substantial resources to assist rail infrastructure and associated freight operations. In the UK, for example, support for rail has taken a number of forms, including Freight Facilities Grants, Track Access Grants, and even direct operating subsidy paid to intermodal operators (e.g. Freightliner), with recent support schemes generally directed at establishing new freight operating services to use the existing railway infrastructure, the latter already funded and provided by the state. Many of the EU TEN-T (Trans European Transport Network) projects up till now have also been heavily oriented towards railway infrastructure enhancements. An important distinction needs to be made between financing of service operations and related terminal facilities, and other essential railway infrastructure, and in relation to the latter particularly costs associated with providing the railway line that runs between nodes.

From a political standpoint, for a very long time there has clearly tended to be a good deal of interest in roadways and railways, but rather less interest in seaways. To some extent this is understandable because elements of land transport infrastructure are not only used for freight, but are also used by a great many people. Indeed, the importance given towards transport of people might be said to be far greater than freight, relatively speaking, with such emphasis often reflected in speeches made by leading politicians. For instance, according to the UK Secretary of State for Transport, the UK Government is ‘investing’ considerable public sector resources in railways and roadways (as successive government’s have consistently done over the past several decades), yet the notion of any public expenditure directed towards sea transport is regarded as ‘subsidy’, and considered not to be a good idea on the basis that this leads to market distortions, and inefficiencies etc. (Darling, 2004).

Of course, the economic outcome of this is that public sector expenditure directed towards roadway and railway infrastructure, but not equally applied to parallel seaways, and this is
evident throughout the EU, must by implication heavily distort the freight logistics market in favour of land transport. For example, consider the 400 miles of roadway between central Scotland and London, which is built, financed and maintained by the state, and is free to trucks at the point of use. The railway is more or less the same, as rail freight operating companies payments for track access come nowhere near the cost of building, financing and maintaining railway infrastructure, such costs being mainly for the government’s account via the agency Network Rail. The parallel seaway option is a coastal North Sea route running from the Firth of Forth to the Thames, and this is the subject of other research noted elsewhere in this paper (United Kingdom Marine Motorways Study, EPSRC/Napier University & Partners, 2002). However, there is no equivalent state funding for the seaway as there is for the roadway and railway on this route. The key question, therefore, is why roadways and railways are provided by the state, yet ‘the market’ must provide seaways? This raises a further question, and that is, what is the seaway equivalent infrastructure of the roadway and railway?

2.2 Advantages of sea transport

Land transport vehicles (i.e. trucks and trains) are basically unable to function without roadway and railway infrastructure or, for want of a better term, the platforms upon which these vehicles might move or be moved. In what way does sea transport differ from this? To begin with, the sea (and therefore maritime transport) offers a number of distinct advantages when compared with land-based modes (Baird, 1998). For example:

a) The sea is free, or virtually free, it already exists, and does not require ongoing maintenance (though this does not mean the sea is a natural highway!);

b) Seas tend to comprise very large and spacious areas which are for the most part unaffected by traffic congestion, unlike roadways and railways;

c) Sea transport capacity may be increased, substantially and speedily, through the addition of more ships, or larger ships, or faster ships, whereas to expand roadway or
railway capacity requires very expensive adjustments to infrastructure, new legislation, etc.

These virtues should, all things being equal, give sea transport at least some degree of economic advantage (over land-based modes), but it also means that sea transport is a fundamentally different mode conceptually from land-based modes. Given the advantages of sea transport relative to land-based modes, this further suggests that, in a transport-policy/planning context, decision-makers should always give due consideration to possible sea transport options, especially when considering major new investments in trunk roadway and railway capacity.

Policy makers, and for that matter some maritime economists, maintain that sea transport is different (from land transport) in that the sea represents a kind of ‘free highway’. But is the sea really a free highway? To better illustrate this point, if an intermodal freight unit were to be driven into the sea, it would most likely sink. Even if it did not sink, it would not go anywhere, other than where wind and tide might take it (for proof of this, see Figure 1). In the case of land-based modes a somewhat similar outcome would prevail in the absence of roadway or railway infrastructure platforms; place a truck or a train and its wagons on any hillside, valley, or plain, and without adequate roadway or railway infrastructure acting as a platform it cannot go far, if it can move at all. In a transport infrastructure sense the only
difference between land and sea is the basic natural surface, the latter being wet and the former, at least for the most part, being dry. Yet, in the case of both land and sea, the ‘way’, or infrastructure platform, must still be created; land and sea are therefore the very same in that both require a physical infrastructure platform in order to function as transport modes.

Any discussion of what exactly sea transport is, conceptually, vis-à-vis land transport, therefore requires a more precise definition of what is meant by the term ‘seaway infrastructure’ (Baird, 2004a). Some may say this means seaports, but a seaport functions in much the same way as a railway terminal, or a roadway intersection. The seaport is not itself the infrastructure platform equivalent of the roadway or railway. By itself a seaport does not actually permit the movement of an intermodal freight unit from point A to point B; it is simply an interchange serving one end of a given route, an interface between sea and land-based modes (or between sea and sea in the case of transhipment). To actually enable the movement of an intermodal freight unit from one seaport to another seaport by sea requires a further element of ‘transport infrastructure’, or in other words, the seaway platform.

2.3 Need for intervention

The seaway-equivalent infrastructure platform of the roadway and the railway is the deck of a ship. The seaway is not the sea, as such, which on its own is rather useless as a transport mode, as illustrated in Figure 1, and not dissimilar to land in that sense (i.e. if one visualises land as it is in its raw state, in the absence of a roadway or railway infrastructure platform). As the seaway platform is the deck of a ship, and most vividly the garage deck of a RoRo ship, upon which trucks, trailers, and other intermodal units may be driven on and off, rather similar to a roadway, it seems indefensible for decision-makers (or transport economists, for that matter) to maintain that somehow or other roadways and railways are deserving of public ‘investment’, whereas seaways are not. Clearly, heavy ongoing subsidisation of land transport but not sea transport must weaken the relative competitiveness of the latter.
Today’s ‘institutionalised’ economic and policy bias in favour of subsidy applied towards land transport infrastructure, which has strengthened throughout Europe over the last several decades, has therefore served to weaken the relative competitiveness of sea transport over the same period. Given the reality of the present situation, it seems logical that if sea transport is to become an effective ‘alternative’ to long-distance land transport (e.g. on parallel corridors), and therefore an alternative to publicly financed roadways and railways, then that will require some form of public sector intervention in order to counteract ongoing market distortions. Rather obvious policy mechanisms that would be necessary to effect such a change would involve:

a) Raising the user costs of roadways and railways;
b) Subsidising the seaway (i.e. the deck of a ship); or,
c) A combination of both a) and b) together.

3. Sea Motorways research

3.1 European Marine Motorways (EMMA) Project (EC 4th Framework Programme)

This section of the report presents and discusses the main findings from three different projects that investigated the feasibility of specific sea motorway services. These three studies are modal shift research projects in which the author has participated, and is therefore most familiar with. The findings from these studies offer a useful insight into key factors associated with starting a new sea motorway.

The first of these was the EC 4th Framework Programme-funded European Marine Motorways (EMMA) project (Napier University & Partners, 1998) undertaken between 1996-1998, and which investigated the commercial viability of three different categories of RoRo ferry:

a) Conventional (<24 knots)
b) Fast-conventional (24-30 knots), and
c) High-speed RoRo (>30 knots)

All three ferry service options were investigated as alternatives to trunk road transport on a number of long-distance routes in Europe. Specific routes assessed were:

a) Gothenburg-Zeebrugge (504 nm)

b) Plymouth-Bilbao (428 nm)

c) Genoa-Barcelona (345 nm)

Each sea route was selected on the basis of identified traffic flows, the presence of congested road connections, and land transport traffic bottlenecks. While there were different outcomes with respect to all three, on the route between Genoa and Barcelona market research results indicated that a fast-conventional type of ferry service (i.e. ship speed of about 24 knots) could be viable for the following reasons:

a) A significant volume of trailer traffic was identified;

b) The fast conventional RoRo offered a competitive transit time to road;

c) Intolerable levels of road congestion were being encountered by trucks;

d) A French lorry driving ban at weekends/public holidays meant trucks could only travel all the way by road 4 days/week on average;

e) Expensive road tolls, and;

f) Major transport operators and shippers expressed interest in supporting an alternative coastal RoRo link.

An attitudinal survey of shippers was carried out in order to establish the willingness of potential customers to switch from road to sea for the trunk transport leg of the journey. Through such an exercise it was possible to isolate the essential service attributes that would be necessary before shippers and road transport companies would consider transfer of trailer traffic from road to SSS. These essential service attributes were:

\[1 \text{ NM = nautical miles}\]
a) **Price** – The rate charged for the sea crossing, when combined with the cost of road transport at the beginning and end of the journey, would need to be competitive with the current total door-door transport charge. That is, shippers would only consider using SSS provided transport costs did not increase. The hypothesis that the SSS cost element of the trip (i.e. port-port leg) should not exceed half the total door-door price was also validated;

b) **Departure/arrival schedule** – A minimum requirement is a daily sailing in each direction. The ship should sail at the same time each day, and arrive at the time scheduled. Shippers preferred a late afternoon/evening departure time, offering the potential for next day (i.e. Day B) or Day C delivery of goods;

c) **Reliability** – The ship must be able to adhere to the departure/arrival schedule consistently as frequent disruption of the schedule by bad weather or any other reason would not be acceptable;

d) **Transit time** – The SSS option should enable users to maintain existing by-road door-door transit times, which range from 24-48 hours. A RoRo ferry offering a service speed of 24 knots or above would ensure present transit times were maintained;

e) **Efficiency in port** – Speed of loading/unloading, cargo security, absence of bureaucracy, low port charges, 24-hour working, and fast access to the road network, were all viewed as further essential service attributes;

f) **On-board facilities** – Drivers accompanying trailers required restaurant, shower and cabin facilities, with the cabin and preferably meals included in the price.

Operating costs were modelled for the SSS service on this basis. Based on a 24-knot vessel offering a trip time of around 16 hours, the service was found to make a small loss. This was mainly due to the rather depressed trucking rates on the route, plus high port fees and handling charge, and higher costs per km of local haulage. Interestingly the cost of the ship per km was competitive with trucking rates per km; thus, it is the port and intermodal costs that tended to inflate the cost for the seaway alternative. The research identified a range of other factors that needed to be addressed before a fast RoRo service could realistically begin, including:
a) Traffic congestion in and around the ports of Barcelona and Genoa was an constraint – use of Genoa Voltri Terminal on the edge of Genoa would be a better alternative than the old port area, however, there did not seem to be any such alternative in Barcelona (at that time);
b) Availability of adequate terminal areas and lack of parking space for trucks was an issue in both ports;
c) Significant differences in the levels of port charges, with particularly high charges prevailing in Barcelona, plus also discriminatory cargo dues levied on by-sea imports through Spanish ports (illegal under the Treaty), created an uneven playing field with road transport as the latter does not incur any cargo dues.

Consequently, the main barriers to visualising a sustainable coastal fast-conventional ferry service between Genoa-Barcelona related to the issues of port access, port facilities, and port and intermodal handling charges, plus losses that would be incurred during the start-up period as cargo volumes were built up. These factors combined to hinder prospects for SSS on this and other corridors, and that was unfortunate given the demonstrable pent-up demand for the service identified during the market survey. Nevertheless, a new Ropax\(^2\) ferry service commenced on the Genoa-Barcelona route in 1999 operated by GNV (Grandi Navi Veloce), with the company itself absorbing start-up costs. Eventually the service did progress to a daily frequency using two ships of between 23-24 knots service speed offering a competitive transit time. This service continues to operate successfully today by providing a high quality seaway alternative to what is a very problematic and high cost (i.e. tolls, congestion, etc.) highway.

3.2 ZEE-SCOT Project (PACT Programme, DG TREN)

The ZEELAND-SCOTLAND (ZEE-SCOT) Project (Napier University & Partners, 2000) was co-funded by the European Commission DG TREN under the PACT (Pilot Actions for Combined Transport) Programme. The aim of the ZEE-SCOT project was to investigate the feasibility of introducing a fast intermodal maritime (RoRo/Ropax) combined transport

\(^2\) A Ropax ferry is considered to be a vessel offering a substantial freight trailer carrying capacity coupled with moderate passenger/cabin accommodation.
service between Scotland and Zeeland (The Netherlands) as an alternative to long-distance road transport via England. The feasibility study commenced in January 1999 and was completed in January 2000.

Official UK Origins & Destinations statistical data for the Scotland-continent freight market was considered unreliable so further data collection was undertaken. A postal questionnaire directed at shippers was used to help estimate trailer volumes and routing preferences. Responses indicated the market to be concentrated, with approximately 20 logistics companies accounting for 90% of the trailer market, most of which required fast door-door transit times of between 24-48 hours. The main export markets for Scottish trailer traffic were found to be Benelux (27%), Germany (20%), France (19%), Iberia (13%) and Italy (8%). Combined, these markets accounted for around 90% of all trailer exports from Scotland. The majority of trailer imports to Scotland originated in these same markets.

An extensive logistics supplier interview programme permitted the researchers to further investigate traffic volumes at 1998 levels, and at the same time assess likely demand for a RoRo combined transport service between Scotland and the continent. Results indicated that logistics companies interviewed (88 operators) collectively transported almost 196,000 freight units (i.e. trailers and containers) between Scotland and the continent during 1998. This was estimated to be equivalent to approximately 81% of the overall Scotland-continent market (estimated market size 241,000 units in 1996).

Confirming earlier findings, three markets (i.e. Benelux, Germany and France) accounted for approximately 75% of total Scotland-continent unitised traffic. The survey revealed that logistics companies used Channel services (including the Channel Tunnel) for approximately half of Scotland-Continent unitised traffic, with North Sea ports (e.g. Humber) accounting for the other half. Accompanied traffic was routed mainly via Channel services, with mostly unaccompanied trailers shipped via North Sea ports. The conclusion from this survey work was that the trailer market was significant and certainly sufficient to sustain a direct ferry service between Scotland and the continent, and that the market was at that time being served
almost entirely by remote ports in the north and south of England, the latter depending on long distance road transport (and hence on free roadways financed by the state) through England and Scotland.

During the interviews, logistics companies were asked detailed questions regarding the likelihood of their using a direct RoRo seaway service between Scotland and the continent as an alternative to current long distance road transport via remote UK ports (e.g. Humber and Dover). Around 90% of logistics companies considered a daily service offering a port-port transit time of 16-17 hours would be acceptable, this requiring a fast-conventional ferry link offering service speeds of 24-knots or above. Almost 90% of logistics companies preferred a Scottish terminal location on the Firth of Forth (in between Edinburgh and Glasgow). Over 80% were in favour of a continental terminal location in the Benelux area. Approximately 33% of logistics companies stated that they were certain to use the new direct fast RoRo service, with a further 33% stating they were very likely to use it, and 21% fairly likely to.

Whereas findings in relation to market size and the propensity of users to support a direct fast RoRo service appeared positive, logistics companies stated they would be unlikely to put all their traffic onto the new service. Moreover, user loyalty would need to be built up over the first 2-3 years of operation, suggesting that only moderate traffic flows might be committed initially. The ferry service would therefore need to prove its reliability over the start-up period, and particularly during the winter months when the weather becomes more of an issue, in order to attract thereafter a greater share of traffic.

![Superfast ferry service](image)
Following this research, an innovative international tender process was devised by Scottish Enterprise (the national economic development agency for Scotland) and in due course the Greek company Superfast Ferries was selected as the best operator to provide the service, the latter choosing the ports of Rosyth in Scotland and Zeebrugge in Belgium (Figure 2). Additional though very limited PACT funding was secured to assist the ‘operational measure’. The fast (28-knot) daily Ropax service commenced on 17th May 2002 using two ships. While freight traffic built up slowly, as suggested by the feasibility study, by 2004 the service was transporting in excess of 40,000 freight units a year (plus over 200,000 passengers and 41,000 cars) thereby providing an effective example of road-to-sea modal shift within a relatively short timescale.

Nevertheless, the primary competition to the Superfast Rosyth-Zeebrugge service still comes from long distance trucking and, as a consequence of this, even by 2005 the two-ship service retained some unfilled capacity. Partly in response to downward pressure on freight rates, Superfast Ferries removed one ship from service in late 2005, with the result that frequency reduced to 3 sailings per week. The reality of the market is that UK motorways are still provided free for trucks to use, and low-cost East European truck drivers (generally 2 drivers per truck) are still carrying the majority of the freight, driving all the way to Scotland through the full length of England from Channel ports, aided by cheaper fuel purchased on the continent. Conversely, the parallel seaway infrastructure ‘platform’ (i.e. the ships’ deck) is not offered free by the state, as roads are; the seaway platform is provided by a private company and that company must generate an acceptable return on its investment and the only way to do that is to charge users the full cost for the service provided. Ultimately, as this example illustrates, there is still significant market distortion in favour of the roadway (and railway), and against the seaway. Policymakers, at EU as well as at member state level, have yet to fully appreciate and effectively deal with this anomaly, and until such time as they do, the long-term competitiveness of private-financed parallel seaway initiatives is always going to be in doubt.
3.3 UK Marine Motorways Project (UK Department for Transport/EPSRC)

The aim of the EPSRC/DfT\(^3\) funded UK Marine Motorways (UKMM) project (Napier University & Partners, 2002) was to establish the operational and commercial viability of fast freight ferry services on UK coastal routes as an alternative to parallel long-distance roadways (i.e. focus on domestic services, within the UK). This study established key requirements of the road transport logistics sector vis-à-vis a coastal shipping combined transport alternative for trailers. Given the fast transit times of road haulage using the state-provided free at the point of use UK trunk road network, the study concluded that a conventional RoRo service (i.e. <24 knots) would not be attractive to the freight market. Consequently only relatively fast RoRo services offering speeds >24 knots would have any chance of penetrating the long-distance trucking market. Two particular routes were found to have substantial road freight traffic, these being: a) a 3-port schedule between Thames-Tees-Forth, and b) a shorter route between Mersey-Clyde (Figure 3). Hence these routes offered the possibility for alternative successful seaway solutions to achieve sufficient traffic volumes even based on rather limited market penetration levels.

However, the study found that door-door costs per trailer for a UK fast-conventional sea motorway service would be at least 20% more expensive than all-road transport. A breakdown of average RoRo door-door cost per trailer-slot showed that total costs were made up of: 42% for local road haulage, 8% for cargo handling, and 50% for the sea leg. In other words, the actual cost of the seaway leg (i.e. port-to-port) works out at approximately half of the total door-door trailer costs for this option. By implication, some 50% of door-door coastal shipping costs actually relate to the intermodal aspects of seaway service delivery (i.e. local road haulage connections to and from the ports at either end of the journey, plus handling costs in port).

\(^3\) Engineering and Physical Sciences Research Council (EPSRC) and the then Department for Transport (DfT), the latter now known as Department of Transport (DoT).
An important conclusion to be drawn from the UKMM project was that modal shift in significant measure was unlikely to occur if this was left entirely to market forces. Some form of public sector intervention was essential to enable the seaway to compete effectively and overcome market distortions caused by subsidised/free roadways presently used by trucks. The UKMM study proposed that government would need to assist development of coastal seaway RoRo services by:

a) Introducing measures to help reduce short-distance road haulage costs for trailers moving to/from local ports to connect with the coastal RoRo service (perhaps combined with measures to increase long-distance road haulage costs on roadways running parallel to the seaway in question);

b) Introducing measures to assist with finance and provision of adequate port infrastructure and intermodal handling equipment;

Figure 3: UK Marine Motorway Routes (EPSRC/DfT, 2002)
c) Introducing measures to share some of the risk with the private sector for investments in the right type of ships (i.e. fast-conventional RoRo/Ropax), and to assist with service start-up costs.

In order to achieve best outcomes, a new technologically advanced system of coastal fast-conventional RoRo seaway services (within the UK) would require modern purpose built vessels. To enable such a fundamental change to take place, in a market already heavily distorted in favour of road (and to a lesser extent rail) transport, with the state actually providing most of the infrastructure, there would clearly be a need for substantial government measures to facilitate such a transformation.

In 2005 the UK government introduced what it termed a Waterborne Freight Grant (WFG). WFG is intended to assist start-up costs associated for new coastal shipping services, albeit the annual budget for this is very limited and wholly inadequate to assist start-up of sophisticated, large capacity, fast-conventional RoRo services and related port infrastructure/equipment as highlighted by the UKMM research. Moreover, generating interest from potential service providers is another matter. In this respect government could consider the option of highlighting potential routes and related funding opportunities to the transport sector, possibly through a competitive tender exercise similar to that successfully employed by Scottish Enterprise in the case of the Rosyth-Zeebrugge Superfast Ferries Ropax service. The latter tender process was successful in finding an operator even without subsidy, though as noted above the service is understandably struggling to compete against state funded roadways.

4. Sea Motorways in practice

4.1 Viamare’s ‘Autostrade del Mare’

The innovative state-owned Viamare S.p.A. (“Sea-Road”) service between Genoa Voltri and Termini Imeresi in Sicily was one of the earliest road-to-sea RoRo ferry initiatives. The
fundamental objective of Viamare was to transfer heavy goods traffic from road to sea, with the service designed to offer freight transport operators an attractive and economical alternative to the motorway trip across Italy. As pressure was considered to be too great on the Italian roads infrastructure, Viamare’s service was consistent with Italy’s General Transport Plan (Piano Generale dei Transporti – DPCM 10/4/1986), which outlined specific guidelines for expansion of maritime transport. Moreover, the Viamare project constituted an important instrument in the development of the Sicilian economy, which was considered to be in a delicate phase. Other important factors that made the seaway more attractive included the poor condition of roads in the south of Italy, and the high incidence of truck hijackings.

Viamare believed that for a coastal operation to successfully take traffic from roads, the shipowner would have to place the boat at the disposal of the truck, and that it was necessary for truckers “to discover the warm water”. This meant that the service had to be as comfortable and convenient as possible for truckers to use. Viamare had to create a system which was as fast as the highway, and a key to its success was to find out the right time of arrival and departure at the terminals. Viamare established that the factories in Milan and Torino stopped work between 5.30 and 6.30 p.m. and this was the time loaded trucks would leave from the industrial areas. The trucks required about 3 hours to get to the port of Genoa so this meant an ideal sailing time would be 2400 hours. Viamare was under no illusions: the company had to “create a chain of movement” as any broken links would render the service uncompetitive.

From conception to start-up, it took Viamare only 18 months to build its RoRo ships, arrange suitable terminals, and put skilled people in place, with the service starting in June 1992. The ships employed were custom-built RoRo vessels each with a capacity of 136x12m trailers, plus cars, and with accommodation for up to 50 truck drivers in 25 cabins. The ships, which were owned by Viamare, had a commercial speed of 18 knots, allowing for a trip time of 24 hours, and were built for a quick turnaround of 3-4 hours. The fundamental essentials of the Viamare service were considered to be:
a) Very fast paperwork issued at terminal gate;
b) Safe and secure RoRo terminals located outside congested cities;
c) 24-hour working;
d) Respect of time and punctuality;
e) Quality of service;
f) Service sailings timed for truckers.

The latter was regarded as the most important factor, and with trailers discharging from the ships around midnight, this enabled truckers to deliver to consignees by 7.00 a.m. in the morning. Moreover, it was important to ensure that when a trucker delivered a load to the terminal, the driver was able to uplift a full load for delivery, thereby avoiding any empty running.

Whilst Viamare succeeded in moving freight from road to sea, the company was not financially viable and, although the Genoa-Sicily service is still operating today, the operation was subsequently absorbed into sister company Tirrenia. Viamare encountered a number of difficulties, including the entry of a competing higher-quality and faster coastal ferry service by Grimaldi Line, added to very substantial ship capital costs resulting from high interest rates and devaluation of the Lire (the ships were bought in Dutch Guilders), plus lack of enforcement of driving regulations, and the relatively slow 18-knot speed of the vessels.

In 1993, Grimaldi Line introduced, under its Grandi Navi Veloce (“Big Fast Ships”) banner, the first in its “Lucky” series of 24.5 knot ferries, each capable of carrying up to 180 trailers, on the 425 nm Genoa-Palermo route, and operating in direct competition with the slower Viamare service that began the year before. In addition to offering a faster transit time of 20 hours, which was more competitive with the road journey, GNV’s two ships were able to maintain a daily frequency in each direction whereas Viamare needed three of its slower vessels to maintain a daily schedule.

GNV’s faster vessels, which could also carry large numbers of passengers and cars during summer months, quickly attracted traffic from the slower Viamare ships and also succeeded in
greatly expanding the overall road-to-sea market. By early 1997, GNV were reported to be carrying approximately 1,000 trailers per week (16% of the total market), much of which formerly went by road or was carried by Viamare. As well as fast transits, truckers benefited from reduced wear and tear on trucks and trailers, avoidance of road tolls, reduced fuel costs, plus giving drivers’ a rest period on comfortable ships. Reflecting the ongoing success of the Genoa-Palermo route, the GNV service carried an estimated 80,000 trailers in 2002 (ShipPax Statistics, 2003). Adding in Tirrenia’s traffic on the route, which is estimated to be 30,000 trailers per annum (ShipPax Statistics, 2005 indicate this volume on the Genoa-Termini Imerese route), suggests that more than one third of the former road market is now moving by sea.

4.2 Superfast Ferries

In 1995, Superfast Ferries, a newly established Greek company, introduced a pair of 27-knot Ropax ships on the 504 nm Patras-Ancona route between Greece and Italy. Capable of carrying up to 120 trucks each, like GNV these ships were also able to complete a single trip in 20 hours, which meant a regular daily service could be maintained employing just two ships. Within a year of start-up, Superfast was carrying approximately 1,000 trucks a week. While the attractiveness of the fast sea route was due in part to the war in former Yugoslavia, as well as the numerous border crossings and poor condition of the roadway, which made the road journey highly problematic, virtually all freight traffic diverted from road has been retained since the Balkan conflict ended.

From this humble beginning Superfast developed very quickly, introducing a further six fast vessels into service, four 28-knot ships on the Adriatic, and two similar ships on the Baltic Sea between Hanko and Rostock, the latter service starting in 2001. Four vessels now operate the Patras-Ancona route all-year-round, providing an increased service frequency of twice daily in both directions (and via a third port, Igoumenitsa, daily). Although both Superfast and GNV services also offer passenger and car capacity, all-year-round freight is regarded as the core market.
A further four vessels were subsequently delivered to Superfast, deployed to open up two more coastal long-distance ferry routes, between Sodertalje (Sweden)-Rostock (Germany) and Rosyth (Scotland)-Zeebrugge (Belgium). The former service was suspended after only a few months due to lack of support from truckers and intense pressure on freight rates from the heavily concentrated long-distance trucking sector in Sweden, the latter benefiting from free highways to/from ferry ports in the south of the country. The opening of the state-funded Great Belt Link between Sweden and Denmark, the latter offering rapid and low cost roadway and railway connections, was also a contributory factor in the demise of the Superfast seaway service between Sodertalje and Rostock. However, the Rosyth-Zeebrugge service has developed relatively well and, as noted earlier, carried 40,000 freight units in 2005, albeit the link has not yet provided a satisfactory financial return due to intense competition from long-distance truckers (mostly East European) who also benefit from free road access in the UK.

4.3 UN RoRo

The International Association of Turkish road haulage companies (UND) developed a new combined transport concept in 1992, also as a result of conflict in the former Yugoslavia, the problematic border crossings in the region, plus poorly maintained roads (Torbianelli, 2000). UN began with the leasing of two vessels from a state-owned Ro-Ro company, which was successful due to a 70% ship utilization guarantee given by its trucker owners. The UN Ro-Ro company (then UND) was formed in 1993 with Turkish international road transport operators as sole shareholders, providing a weekly service between Istanbul and Trieste. The initial success of the service prompted the company, in 1994, to purchase four further vessels each with capacity for around 140 trailers. In 1996/7 two 160-trailer ships were bought, and between 2000-2002 six more ships offering capacity of between 165-200 trailers and speeds of 22-23 knots were purchased.

Most of the recent ships are of the highly efficient Flensburger RoRo type. These are standard ‘production line’ units that can be constructed relatively quickly and at low cost. Flensburger Shipyards built 28 of this RoRo type between 1998 and 2005. Aside from low capital cost and
fast delivery, other benefits of such ships include high payload, attractive service speeds (22-24 knots), and low fuel consumption. Recent innovations have seen Flensburger add a fourth trailer deck to its design, increasing capacity to 3,214 lane metres, an increase of 22% and without any extra fuel consumption.

As well as the core Turkey-Trieste connections (one from Istanbul and the other from Cesme), UN also maintains three routes across the Black Sea. The number of trailers carried by UN RoRo vessels to Trieste was just 12,500 units in 1993, but increased to 170,000 in 2004 and with frequency increased to daily (Shippax Statistics, 2005). Today, 65% of all Turkey’s road trailer activity destined for western Europe is moved via the UN RoRo service, with almost 100 Turkish road transport companies located in Trieste and Turkish tractor units based there under a bilateral agreement between Turkey and Italy. Mostly semi-trailers are shipped, with these then coupled to tractor units in Trieste for the onward journey to various destinations in Europe. Almost 60% of freight units are composed of semi-trailers, the remainder truck-linked. UN’s daily service from Turkey to Trieste is expected to be increased to twice-daily as demand increases. Port-port transit time is approximately 54 hours over a sea distance of 1,160 miles.

Goods are Customs cleared in advance as documentation is sent two days prior to vessel arrival. This means trailers are ready to proceed once disembarked from the ships. Vessels used are freight RoRo so they only have space for up to 12 drivers/passengers, and usually these are drivers of refrigerated vehicles. Turkish drivers are transported by air between Turkey and Ljubljana. In 2003, a total of 37,500 drivers were carried by air between Istanbul and Ljubljana and back. Drivers are taken by bus from the airport to the Port of Trieste to collect their vehicles. This process allows Turkish hauliers to spend extra days at home while their trailer is being moved by sea, and this applies to both the outbound and return legs. A significant number of Turkish trucks also make use of the Rolling Railways through Austria.

UN RoRo opened a new freight terminal at Pendik, Istanbul in 2005. The terminal offers 170,000 square metres storage space, a 30,000 square metre Customs Bonded Warehouse, and parking for 1,000 trailers, plus railway connections. It is defined as a Category 1 Customs
area, and also offers office facilities for transporters and forwarders, banks and insurance companies, gas oil, spare parts and maintenance services. Total cost of the terminal including land purchase was US$35 million, paid for by UN itself. The terminal is located on the outskirts of Istanbul city so avoids dense traffic congestion. A key advantage in terms of efficiency is that the trucking company’s themselves (as opposed to expensive dock workers) are responsible for loading and discharging the ships. As shareholders, the road transport company’s benefit further through receiving dividends at the end of the year. Freight rates per trailer are the same for all transporters/shareholders as there are no volume discounts given to bigger operators, with all shareholder customers receiving equal treatment. This involvement of the road transport companies as investors, shareholders and operators of the RoRo link, in addition to being the primary clients, demonstrates how effective such cooperation can be, and offers an excellent example of the way in which difficulties associated with long-distance road transport can be tackled and overcome based on a sophisticated and well planned seaway solution. According to Torbianelli (2000), UN RoRo represents a valid role model for trucking interests and associations elsewhere on how to operate an effective RoRo seaway alternative to roadways. However, he contends that in the absence of economic stimuli, routes which begin and end in continental Europe would require fiscal measures.

4.4 Japan coastal highway

Long-distance (i.e. >300 km) coastal RoRo ferry services have been the norm in Japan since the 1960’s. By the 1990’s there were 13 long-distance ferry lines operating who between them maintained 27 routes along both the Pacific and Sea of Japan coasts (Baird, 1999). While Japan is normally regarded as a group of islands, coastal ferry services there actually compete directly against long-distance trucking as the expressway system is well developed with all four main islands in Japan now connected by fixed links.

In 1997, the Japanese coastal ferry fleet consisted of 66 so-called ‘car ferries’ (‘car’ meaning truck), offering an aggregate loading capacity of over 8,000 trailers. Most long-distance ferry routes in Japan are maintained using a pair of vessels, thereby ensuring a regular (i.e. at least
daily) service in each direction. A significant number of long-distance RoRo vessels have a fast service speed of between 24-30 knots, and virtually all operators have now replaced older vessels of 22 knots or less with faster ones. Higher speeds are necessary in order to compete with road transport, as sea voyages are not much shorter than land transport alternatives in Japan. In addition, using faster ships enables operators to maintain a daily service with just two vessels instead of three as previously.

An example of this is the 564 nm Tokyo-Tomakomai (Hokkaido) route, previously maintained by 3 ships each with a service speed of around 20 knots and offering a transit time of 30 hours. These have now been replaced by 2 x 30-knot vessels each capable of carrying 150 trailers, and offering a faster transit time of 20 hours, which is more attractive for truck traffic (RINA, 2000). On the west coast of Japan, the 573 nm route between Maiduru and Otaru is now also maintained by a pair of 30.5 knot, 224m long Ropax vessels giving a trip time of 20 hours (Woodyard, 2005); this route was likewise previously a 3-ship operation with a single voyage time of nearer 30 hours at service speeds of around 20 knots.

In 1996, 2.3 million trucks were carried by long-distance coastal ferry services in Japan, this amounting to almost 11 billion tonne kilometres. In terms of goods movement, this is equivalent to one in four freight vehicles travelling over long distances in Japan, giving the coastal ferry system a significant 25% market share overall. This is far greater than the 4% share of the freight market achieved by rail services in Japan.

While Japanese ferry services do suffer from certain disadvantages (e.g. relatively high crew costs, inadequate enforcement of trucking regulations), factors influencing the success and competitiveness of what is arguably the world’s most comprehensive coastal RoRo ferry seaway system include (Baird, 2000):

(a) Use of fast, modern, large freight capacity, reliable Ropax ships, with passenger traffic ensuring important additional seasonal revenues;

(b) High labour cost of truck drivers and a growing shortage of truck drivers with fewer people willing to enter the industry;
(c) Low-cost finance for new ships made available through the government’s Maritime Credit Corporation;

(d) Terminal infrastructure capital costs financed by the public sector (i.e. Ministry of Transport, and local government) and/or through schemes such as non-interest-bearing loans, with port leases and charges for ferry lines kept to a minimum;

(e) A special law permitting truck drivers to load and unload ferries (i.e. self-handling) which means that cargo handling is far cheaper and faster than would be the case if regular dock labour was used;

(f) The Japanese Ports and Harbors Bureau policy of establishing intermodal ferry terminals and freight distribution centres (logistics parcs) at strategically located ports in each prefecture.

4.5 Sea motorway lessons

The practical examples noted above serve to illustrate the complex reality and challenges surrounding development of new ‘motorways of the sea’ (i.e. seaways). The Balkans conflict coupled with poor road quality/access and problematic border crossings inevitably helped the UN RoRo and Superfast Ferries services to develop. Japan’s extensive coastal seaways reflect other advantages such as public sector support for coastal shipping and ports, and the high cost and shortage of truck drivers. In Italy the road tolls and inadequate road system in the south of the country played a part in helping to move freight from road to sea. In all cases, however, the application of modern ship technology, and in particular the fast-conventional RoRo/Ropax ferry, has had a large part to play in the success of seaway services competing against parallel roadways.

The more problematic examples noted in Sweden and to a lesser extent in Scotland nevertheless suggest that where roads are still provided free to truckers by the state, in such instances the private sector provided seaway is understandably not so readily a viable proposition. Indeed, although it can be demonstrated that coastal RoRo ferry seaway solutions can be made to work in certain circumstances, policymakers need to exert great care when
designing policies intended to foster modal shift from road to sea, and especially in regard to
the need to address the impact of market distortions resulting from ongoing state provision,
maintenance and financing of roadways for trucks. In regard to the latter point, the following
section considers initiatives at EU level that are intended to help new coastal and SSS seaway
initiatives develop, in turn generating road to sea modal shift.

5. Motorways of the Sea policy

5.1 Short Sea Shipping and TEN-T

In July 2004 two EU initiatives were introduced, both designed to substantially increase the
role of short sea shipping (SSS). These were:

b) Proposal for Regulation to establish the second “Marco Polo” Programme,

Communities, 2004a) acknowledged that SSS was growing but outlined certain obstacles
hindering SSS growth in future. Although maritime transport was considered to have a higher
energy-efficiency than other modes and its expansion is in line with Community transport and
environmental policies, the main obstacles still hindering development of SSS were
considered to include:

a) It has not yet reached full integration in the intermodal door-door supply chain;
b) It has not yet fully shed its past image of an old-fashioned industry;
c) It involves complex administrative procedures; and,
d) It requires high port efficiency.
The Communication, unfortunately, did not directly mention, acknowledge or address the issue of market distortions brought about by ongoing public sector financing of roadway and railway infrastructure throughout the EU and neighbouring countries, and with no such comparable financing available for seaway infrastructure as defined in this paper (i.e. the deck of a ship). However, the Communication did state that the maritime transport mode ‘is now kept continuously high on the EU political agenda’, and while private actors, especially one-stop-shop freight integrators, are expected to have a key role to play in future SSS developments, public authorities according to the Commission have to create an appropriate framework and business environment for its further expansion. In this regard the Commission identified four specific areas where obstacles must be addressed:

a) ‘Bottlenecks’ – this includes the image of SSS, the need for door-to-door transport, administration and documentation, ports and port services, and ‘country-specific’ issues;

b) Customs Procedures for SSS – the Commission has emphasised the use of Simplified Customs Procedures for ‘Authorised Regular Shipping Services’,

c) Port Services and Security – including allowing for increased access to the port services market aimed to increase efficiency and lower costs in ports, this requiring a specific Directive; and,

d) Loading Units – promoting the harmonisation and standardisation of loading units to enhance the attractiveness of SSS.

Again, the emphasis here appears to be more towards ‘softer’ processes and administrative factors, rather than tackling the primary obstacle facing the development of sea motorways and hence seaways, which has to be the need to adequately address the issue of public subsidisation and market distortion in favour of land transport modes. The Communication nevertheless highlighted the White Paper on European Transport Policy for 2010 which strongly emphasised the concept of “Motorways of the Sea” and for Sea Motorways to become part of the Trans-European Network (TEN-T) – just like land motorways and railways – in an effort to reduce road congestion and/or improve access to peripheral and island regions
and States, with a focus in certain cases on passengers as well as freight. The Communication stated that Motorways of the Sea should:

a) Be an integral part of door-to-door logistics chains;
b) Offer efficient, regular, reliable, and frequent services that can compete in terms of transit time and price;
c) Have ports connected to the motorways and with effective hinterland connections, rapid administrative procedures and a high level of service.

In late 2003 the Commission proposed a revision of TEN-T which included 29 priority projects to be implemented by 2020 (Commission of the European Communities, 2003). Priority projects are declared to be of “European Interest” and receive priority funding from the relevant Community resources. TEN-T Project No. 21 comprises the priority project on the development of Motorways of the Sea, with four specific Motorways of the Sea areas proposed:

a) Motorway of the Baltic Sea – linking the Baltic Sea Member States with Member States in Central and Western Europe, including the route through the North Sea/Baltic Sea Canal;
b) Motorway of the Sea of western Europe – leading from Portugal and Spain via the Atlantic Arc to the North Sea and the Irish Sea;
c) Motorway of the Sea of south-east Europe – connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean, including Cyprus;
d) Motorway of the Sea of south-west Europe – western Mediterranean, connecting Spain, France, Italy and including Malta and linking with the Motorway of the Sea of south-east Europe, including links to the Black Sea.

New TEN-T Guidelines on Motorways of the Sea allows Community aid for a series of measures in the framework of the trans-European network, enabling Member States with Community assistance to support infrastructure, facilities and logistics management systems. It is also proposed that support for Motorways of the Sea should be based on criteria such as,
a) avoidance of distortions to competition and, b) viability of the project on its own after the period of Community funding has ended.

The last points are difficult to reconcile when taking into account current and ongoing public financing of roadway and railway infrastructure and reflects a somewhat confused understanding of the real challenge facing SSS infrastructure in the quest to provide a competitive road-to-sea modal shift alternative (i.e. the ‘seaway’). The Commission’s focus on distortions to competition assume subsidy applied to sea transport for a given service/route may actually distort competition with regard to competing SSS services or indeed with other transport modes. However, it is not clear how the Commission in this connection views ongoing public financing and subsidisation of roadway and railway capacity running parallel to proposed seaway services, the latter somehow expected to magically appear thanks to the workings of ‘the market’. Moreover, the viability of a supported SSS initiative must be proven, according to the Commission, after a relatively short period of 3 years during which time some limited subsidy may apply (see section 5.3 below); this assumes that the seaway must be able to pay its own way entirely after such a brief period, yet in reality this may be very difficult if not impossible given the fact that public sector financing of roadways and railways may well continue for the foreseeable future, in addition to offering major ‘sunk’ advantages to start with. In essence, the ‘rules of the game’ differ for the seaway (infrastructure) and the dice are therefore loaded (still) in favour of land-based modes. Ultimately, if Sea Motorways are to become ‘just like land motorways and railways’, as the Commission states, they will have to be similarly funded.

5.2 Marco Polo Programme

The Commission’s Marco Polo funding Programme has followed on from the earlier Pilot Actions for Combined Transport (PACT) Programme, the latter expiring at end 2001. The goal of Marco Polo is to shift 12 billion tonne-kilometres of freight a year from road to non-road modes. The Marco Polo budget for 2003-2006 was set at €100 million. The remainder of the Communication of 2nd July 2004 concentrated on promotion of short sea shipping through
the establishment of Short Sea Shipping Focal Points in national administrations, and through creation of Short Sea Promotion Centres (see www.shortsea.info).

The proposal for Regulation COM(2004) 478 dated 14th July 2004 established the second “Marco Polo II” Programme for the granting of Community financial assistance designed to “to improve the environmental performance of the freight transport system” (Commission of the European Communities, 2004b). A larger overall budget of €740 million was proposed for the period 2007-2013, equivalent to roughly €106 million per annum, and representing a significant increase in funding. The intention of Marco Polo II is to shift more than 140 billion tonne-kilometres of freight off the road (equivalent to 7 million truck journeys of 1,000 kilometres) and reduce CO2 emissions by 8,400 million kg. In terms of environmental damage avoided and reduction in accidents, less energy consumption and less infrastructure damage, the benefits are forecast to be about €5 billion. So, for every €1 subsidy given to Marco Polo II, the Commission estimate will this generate more than €6 in terms of social and environmental benefits.

The Marco Polo Programme, however, anticipates project participants will finance a large part – at least 65% - of the project costs themselves, and thus will create investments in the market. The three current types of actions – modal shift, catalyst, and common learning actionsiv – have several new features as follows:

a) Wider geographic scope – “EU 25” plus further candidates for enlargement, but also EFTA and EEA countries heading towards an integrated transport market;
b) New action types – ‘Motorways of the Sea’ and ‘Traffic Avoidance Actions’ are added (e.g. streamlining supply chains and reduce distribution and cost of road transport);
c) Clarifications – in particular there is now scope for infrastructure funding under Marco Polo II.

Through Article 12a of the new TEN-T Guidelines adopted on 29th April 2004 (Commission of the European Communities, 2004c), the Commission proposed ambitious goals for Motorways of the Sea services. In this regard Motorways of the Sea are defined as:
“…high-quality logistics services based on short sea shipping transport which could be compared, because of their quality features, to road motorways….”

(COM(2004) 478, paragraph 18, p. 6)

The primary focus of Marco Polo II therefore involves the setting up of intermodal combined transport services based predominantly on private investment, and intended to remove traffic from, for the most part, free and publicly subsidised roads. Here once again the Commission seems not to appreciate the obvious (and rather substantial) market challenge faced by SSS in attempting to directly compete against free public sector financed roads on parallel routes. In other words, the Commission expects the private sector to take the initiative, and also incur most of the commercial risk, in seeking to provide a seaway alternative to existing public sector financed roadways. In straightforward rational transport economics terms this has to be viewed as a naïve expectation.

The Commission is looking for large-scale set ups, with Marco Polo II expected to do more than the already existing catalyst or modal shift actions which intends to shift expected increases in road traffic to alternative modes. Projects are expected to involve large consortia including shippers, transport operators and infrastructure providers. Member States and public authorities will play a predominant role in TEN-T projects, whereas the beneficiaries of Marco Polo are undertakings striving to achieve short- and mid term commercial goals, or in other words service operators. Nevertheless, with a budget of €740 million to be spent between 2007-2013, Marco Polo II expects to achieve major results.

For Motorways of the Sea actions it is anticipated there will be a low immediate impact due to the need for infrastructure works preceding the start of the service. ‘Infrastructure’ in this regard primarily relates to ports, and road/rail access to ports. This is the point at which the Commission policy appears especially weak as it fails to appreciate or acknowledge the seaway platform (i.e. the deck of a ship) as the infrastructure-equivalent of roadway and railway. The Commission simply expects ‘the market’ to provide and take the risk of
providing the seaway infrastructure, while ignoring the fact that competing roadway and railway infrastructure is provided by public money.

6. Conclusions

Short sea shipping, according to the European Commission, is the only transport mode that has been capable of keeping up with the rapid economic growth of the EU. SSS is also regarded by the Commission as the only freight mode that offers a realistic prospect of substantial modal shift from road in future, as well as helping to improve competitiveness, reduce environmental damage, and foster cohesion in an enlarged EU. This in large part explains the strong emphasis by the EU in developing its new ‘Motorways of the Sea’ policy.

Nevertheless, it is important for policy-makers and other stakeholders to realise that the seaway is no more a natural highway than are railways or roadways. It must be recognised that ongoing subsidy combined with historic sunk investments applied to roadway and railway infrastructure heavily influences the attractiveness and competitiveness of these modes and results in a highly distorted transport marketplace. Further, this represents a fundamental disincentive for the freight/logistics market to readily make use of privately financed and full (or virtually full) cost recovery seaway services that may (or may not) be offered on corridors running parallel to publicly-financed (and for the most part free) land transport infrastructure.

The seaway-equivalent infrastructure of a roadway or railway is not a seaport, which is simply a node. The seaway is the deck of a ship, and most vividly the garage deck of a RoRo ferry. In this regard, ships are just as inseparable a part of maritime transport infrastructure as ports. Acknowledgement of this definition of seaway infrastructure, and acceptance of the ongoing market distortions favouring land transport, demands a new approach by policymakers and other stakeholders towards the issue of modal shift, and in particular the economic and fiscal consideration given to provision of sea transport infrastructure vis-à-vis land transport infrastructure.
Notwithstanding these rather fundamental economic issues, research into the sea motorway concept illustrates the importance of demand analysis and of building the essential service attributes for an effective SSS solution based closely around user needs. Sea motorway case studies demonstrate what can be achieved, with state entities often providing a facilitation and support role, though environmental conditions can have a major influence on outcomes (e.g. the Balkans conflict, problematic border crossings, inadequate roads, road tolls etc.). Technology is playing its part too, and a new breed of fast-conventional RoRo/Ropax ferry now exists, offering high payloads and hence scale economies, faster speeds, fast transit times, high efficiency, plus excellent reliability. Ongoing advances in sea transport technology may be expected to even further enhance the competitiveness of SSS in future.

EU transport policy increasingly recognises and reflects the major role that sea transport can play in helping to develop new improved transport logistics solutions. Through the inclusion of Motorways of the Sea in the TEN-T programme, coupled with operational support for innovative and modal shift actions via Marco Polo, the Commission has put in place mechanisms for an expansion of SSS in Europe. Evidence from sea motorway services elsewhere (e.g. Turkey, Italy, Scotland, Japan etc) demonstrates the different way in which such services may be introduced, the role of the public sector, and importance of private sector operations. Member States also need to push forward with their own complementary policies at national level, of which the Waterborne Freight Grant in the UK is a useful (albeit financially inadequate) example, to help facilitate and enable domestic as well as collaborative transnational Motorways of the Sea initiatives.

These schemes may well lead to some limited successes for SSS modal shift initiatives. However, they are unlikely to result in any dramatic modal shift given the current heavily distorted transport market. Effective and sustainable modal shift will require a reappraisal and redefinition of just what exactly is meant by the term ‘seaway infrastructure’ in line with the arguments proposed here that seaway infrastructure is in reality the deck of a ship, whereas a seaport is simply a node, acting in much the same way as a railway terminal or highway intersection. To develop a far more extensive seaway infrastructure (i.e. Motorways of the Sea) throughout Europe, as envisaged by the Commission, will inevitably demand that action
is taken to counteract ongoing market distortions in favour of roadway and railway infrastructure, with the aim being to provide a level playing field between transport modes. What specific economic and fiscal policy mechanisms this is likely to involve will be a most interesting topic for future research and debate, though clearly this will need to include some element of recovery of costs for freight transport vehicles using state-financed roadways and railways, or the direct subsidisation of seaways, or perhaps a combination of both.

References


Notes

i Network Rail, the UK government agency responsible for railway infrastructure, for instance, had borrowings of £16.8 billion in December 2005, and this was expected to reach £20 billion shortly thereafter. (‘Network Rail deeper in debt’, Transport Times, No. 7, 2nd December 2005, p.7.)


iii The GNV-Grimaldi Line of Genoa should not be confused with the Grimaldi Line of Naples, which are both quite separate companies. Coincidentally, the latter has also been very active in developing its own Motorways of the Sea, with Marco Polo assistance, on routes such as Civitavecchia-Barcelona and Civitavecchia-Savona using modern fast Ropax tonnage.

iv Modal shift action is not regarded as innovative, more just shifting freight off the road; Catalyst action is expected to overcome structural market barriers and be highly innovative; Common learning action should improve cooperation and sharing on know-how. See Tostmann, S. (2004) An introduction to Marco Polo, Marco Polo Information Day, 1st October 2004. Brussels: DG TREN – Unit G3, Motorways of the Sea and Intermodality.