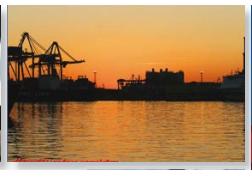
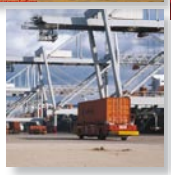
REALISE Final Report





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Foreword

Transport is crucial for our economic competitiveness and commercial exchange. However, congestion, accidents, noise, local and global changes, non-optimum use of the various transport modes, and lack of adequate infrastructure provision are penalising both transport users and the economy.

In the Common Transport Policy, set out in the 2001 White Paper, the European Commission, established new, ambitious objectives to restore the balance between modes of transport, to develop short sea shipping and intermodality, to improve the environmental impact of transport, and to provide higher quality services and safety/security standards while ensuring mobility.

As stated by Loyola de Palacio "The Transport White Paper of the EC is only the first step to the answers. To meet our objectives, it will inevitably be necessary to take additional measures..." REALISE has been targeted at analysing measures to develop short sea shipping and intermodality in line with White Paper Objectives in the area of freight transport.

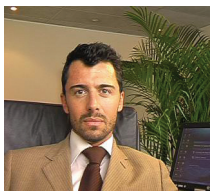
REALISE has developed methodologies and tools that are applicable both to the business community and to policy makers.

The findings of REALISE represent a stepping stone for a clearer understanding of the transport market service characteristics, requirements, and functionalities for the development of intermodal freight transport, including short sea segments, during the next decade.

The REALISE Consortium believes that the findings may be accepted as the basis for further EU policy and research development concerned with developing short sea shipping and achieving seamless integration between sea and land transport modes.

Michael Lloyd

AMRIE



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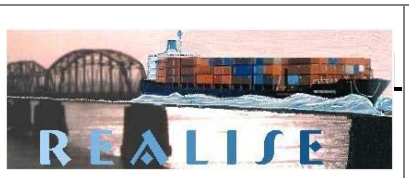

REALISE

GTC2-2000-33032

Regional Action for Logistical Integration of Shipping across Europe

Work Package	WP 1 – Coordination, Management and Methodology
Task	Task 1.4 – Synthesis and Final Report
Deliverable	D 1.7 REALISE FINAL REPORT
Partner Responsible	AMRIE
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An initiative of Members of the European Parliament

[1] Draft, Final or Approved

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PREFACE

AMRIE as the Coordinator of the REALISE Thematic Network would like to thank those members of REALISE who have contributed to the successful work of the network via their participation in the various work packages, and particularly the work package leaders who have made AMRIE's task as Coordinator easier than would otherwise been the case.

We would also like to thank the Short Sea Shipping unit in DG Tren for their efforts to ensure that the results of the work of REALISE delivered what they required. Discussions were sometimes intense and agreement on what could realistically delivered sometimes difficult to reach. But the discussions were always friendly and we believe that the final outcomes represented the best that could be achieved within the resource constraints of the project.

This Report represents a précis of the work done by the REALISE network during the past three years and recommendations on the policy initiatives and further research that may be required to secure the objective of a substantially expanded short sea network of routes carrying freight around the European seas.

1 EXECUTIVE SUMMARY

This REALISE final report draws together the three main strands of work done within the Network: the integrative studies, the workshops, the research area.

This final deliverable reports on the findings of the three integrative studies (statistics, environmental impacts, and multi-modal pricing/economic performance assessment across transport modes), and integrates the study findings with the findings of the European and regional workshops held across Europe over the three years of the Thematic Network (October 2002 to October 2005).

Finally, based on the integrated conclusions of the Network, the report offers some recommendations for policy actions by the European Commission and some suggestions for further research activity in the area of short sea shipping.

Main Achievements

In Work Package 2 – dealing with Statistics – the main integrated conclusions are that:

- Reliable statistics are required by both policy makers and market participants to enable appropriate public policy and commercial decisions to be taken
- REALISE has been able to develop a tool for use by the European Commission to enable the conversion of port-to-port sea transport statistics from tonnes into tonnes-kilometres and to assist Eurostat to streamline and increase the accuracy of the work they have been doing on the conversion matrix. Nonetheless, there have been discovered a number of errors in the underlying Eurostat database, and these have been corrected only as far as the resources available in REALISE allowed.

- A methodology has been developed by REALISE to collect and analyse feedering data.

In Work Package 3 – dealing with Environmental Impacts – the main integrated conclusions are that:

- The task of WP3, dealing with the measurement and comparison of environmental impacts across the range of surface transport modes was considerable. The main result was the production of an Intermodal Comparative Framework (ICF), including an Excel-based tool that enables the measurement of the externalities of different transport solutions along key European transport corridors. (N.B. *The ICF is backed up by a set of functional and mathematical relationships. These functional relationships are the outcome of a critical review of the results of national, EU, and international environmental and transport research undertaken by third parties*).
- The main results indicate that – with the exception of certain localised emissions to air (S,SOx, Particulates, and to a lesser extent NOx) – short sea shipping appears as the transport mode having the lowest environmental and external cost impact. However, in relation to emissions to air road transport appears as an increasingly low impact mode. Overall, therefore, any internalisation of external costs would reveal SSS as the preferred mode in cost and price terms.
- the ICF may be judged to be successful in enabling fair and reasonably accurate environmental impact comparisons to be made across surface transport modes. However, attention must be paid to ensuring the resolution of the problem of the environmental impacts of air emissions from ships.

In Work Package 4 – dealing with Multi-modal Pricing/economic performance assessment – the main integrated conclusions are that:

- The research actions of REALISE provided extensive coverage of actual trans-European routes in relation to price comparisons and cost analyses of door-to-door, uni-modal and multi-modal logistics chains. In the majority of cases the comparisons where pssible, showed on both quoted and contractual prices that multi-modal chains involving short sea legs were lower in price terms than uni-modal road only chains. The definitive conclusion is that, in general and on many routes, this comparison – in favour of multi-modal chains including short sea legs – is valid.
- In order to demonstrate this result in practical terms a simplified price comparison tool has been developed.
- However, it has been further demonstrated that price is not the only determinant of modal choice, and may not, in fact, be the principal factor influencing the choice of mode. In practice, though not always perceived because of the complexity of the nexus of modal choice selection, the actual decision-making process involves the (often implicit in the final decision) the weighting and scoring of a number of 'choice variables'

General Conclusions

These REALISE findings may be accepted as the basis for further EU policy and research development concerned with developing short sea shipping and achieving seamless integration between sea and land and between different transport modes.

Hence, from the above *integrated conclusions* and work of the REALISE network, (i.e. the *European and Regional Workshops* held around Europe and the work done to develop an electronic knowledge dissemination system linked to the establishment of a *Virtual Research Area*), a number of policy recommendations and a number of recommendations for further research have been developed and are indicated in the concluding section of the report.

2 REALISE OBJECTIVES

The main, overall objectives of REALISE have been:

- To discover, via three integrative studies, how best to improve the statistical, environmental, and pricing information on door to door intermodal chains and to develop appropriate tools for both policy-makers and market participants.
- To report to market participants and policy-makers on the work of the integrative studies, at a series/cycles of European and regional level workshops, and to feed back into the study work the views of the workshop participants.
- To identify the potential for establishing a pan-European virtual research area/platform for short sea shipping.
- To draw together the above three areas of work in a final report that is addressed both to policy-makers and to market participants and establishes a platform from which new policies and market innovations can be launched.

3 KEY RESULTS

3.1 General

The key results are described below in summarised form. More detailed descriptions can be found in the Final Reports and other Deliverables under the five substantive work packages of REALISE (from WP2 to WP6). The references to these are to be found in Annex3.

3.2 Statistics

3.2.1 General

Statistics form the quantified basis on which policy may be formulated and monitored; they also are required by market participants for other reasons, mainly commercial. To fulfil these roles the statistics must be as accurate and reliable as possible. This is true of short sea shipping as in other policy areas. The REALISE outputs and results under the heading of statistics have attempted to

improve the statistical base on which policy-makers can base their policy prescriptions and can monitor their success and to provide statistical tools to work with. Within WP2, work has also been done to provide statistics of value to commercial players; to discover their requirements, and to indicate how even more value may be obtained from further investments in practical research. It is important to acknowledge that the work of REALISE in respect of statistics could not have been accomplished without the cooperation of EUROSTAT. We hope also that in return we have contributed to the work of EUROSTAT and have indicated where the basic statistics were either inadequate or misleading. (***N.B.*** *In respect of the ultimate sources of statistics, i.e. industry, it is of considerable importance that there should be a perceived value to the statistics made available to market participants. If not, then they will regard requests for statistical data as a cost burden imposed on them that is without benefit to themselves*).

3.2.2 Results

The results/outcomes have been the following:

- A *conversion tool*, made available to the European Commission that enables the statistics on short sea shipping, available in tonnes, to be converted to tonne-kilometres for general surface transport mode comparisons.

- An *inventory of statistical needs* indicating that business actors focus primarily on statistics that help them analyse the demand side of SSS, while policymakers are more interested in assessing the infrastructure supply side implications.

- *Door-to-door intermodal statistics*. REALISE analysed and evaluated the three alternatives for establishing door-to-door / intermodal statistics:
    - Using cargo / transport documents;
    - Using surveys;
    - Linking statistics form existing sources.

- *Feedering in relation to SSS*. REALISE examined, via a case study at Rotterdam, alternative statistical methods to distinguish between feeder shipping and *real* SSS (i.e. where the origin and destination are within the SSS area). As this distinction is most relevant for container shipping, REALISE limited itself to this sector of shipping. The results suggest a preference for a bottom-up approach, utilising documentation to provide the relevant statistics.

- *Analysis of times series on SSS of unitised cargo*, based on Eurostat statistics. Between 2000 and 2003 the growth of SSS was approximately 25 %, between 1997 and 2003 around 50%. The Mediterranean corridor is an important corridor on which 2.1 million TEUs was transported in 2003. On the Atlantic corridor this amounted to 299 thousand TEUs. The growth on the two selected corridors lags slightly behind the EU average. Hence it can be seen that a large part of SSS is concentrated in North-western Europe, specifically between the Netherlands and the United Kingdom. Besides, there is a significant amount of intra-country transport (25 %).

3.3 Environmental Impacts

3.3.1 General

There is little disagreement that the principal drivers of the policies to shift freight carriage from road to other transport modes are environmental factors and sustainability objectives. However, there are major problems of quantification and comparison in relation to assessing and evaluating the impacts of the various surface transport modes. The task of WP3, dealing with the measurement and comparison of environmental impacts across the range of surface transport modes was considerable. A substantial body of work exists in this area of research (and, indeed, is still continuing). The problem was that it was necessary to review this considerable amount of work critically and to establish a credible basis on which to construct the comparisons.

This is not to say that the Intermodal Comparative Framework eventually produced may not be challenged, but that it should be sufficiently robust to enable the European Commission to use its results as the basis for policy prescriptions and for market participants to make valid comparisons between selected routes in terms of the relative environmental impacts.

Moreover, in the last analysis the ability to compare differing emission and other impacts will require the use of a numeraire. The only practicable one available is money, but problems of valuation will lead inevitably to challenges. However, the point should be made – and this is the real justification for the valuation exercise carried out in the work package – that unless some attempt is made to empirically assess the comparative impacts then policy makers and transport operators will have no basis on which to establish their consideration, actions, and investments.

3.3.2 Results

The results/outcomes of WP3 have been the following:

Evaluation of Previous Work. In WP3.1, an assessment was made of key EU and national work done to 2004 on comparisons of environmental impacts, and external costs (accidents and congestion). Then metrics were established for comparison purposes, together with a set of functional relationships representing the underpinning formulae of the Intermodal Comparative Framework (ICF).

Development of Empirical Foundations for Comparing the Environmental Impacts of Surface Transport Modes. In WP3.2, there was developed and tested an operational, comparative framework for the measurement of the environmental impacts of alternative uni- and multi-modal transport chains across specific origin-destination pairs.

Creation of an Excel-based ICF Tool. In WP3.3, the production of an Excel tool that is capable of comparing a variety of environmental impacts across surface transport modes and along identified transport corridors. Certain parameters have been built into the Framework, e.g. traffic, fleet, and engine specificities, for ease of use of the tool.

The accounting framework has been developed to perform environmental impact calculations (both in qualitative and monetary terms) for any given origin-destination relationship, and for any transport mode selected. As categories of

external impacts of transport, the ICF distinguishes between: local air pollution, global warming, noise pollution, accidents and congestion (external costs).

The ICF is backed up by a set of functional and mathematical relationships. These functional relationships are the outcome of a scrutinization and critical review of results of and assumptions adopted by environmental and transport research undertaken by third parties.

Results of Comparisons. The main results indicate that - with the exception of certain emissions to air (not including CO2)[2]– short sea shipping appears as the transport mode having the lowest environmental impact. Hence, any process of internalizing external costs would see SSS as the preferred mode in cost and price terms.

There is, however, one significant problem for SSS in relation to localized air emissions of S, Sox, and Particulates, and to a lesser extent NOx (where road transport is making up ground rapidly). Currently this is the 'weak point' of SSS. It is in the process of being addressed at EU level via the Directive proposing reductions in the sulphur content of marine fuel oils. The problem is also being addressed by industry via ship-based abatement techniques.

Assuming this problem is addressed adequately by these measures, on a continuous basis over the next decade, then the current – and expected future – negative comparison on these emission factors with road transport may be ameliorated. The problem is that the short sea shipping sector is trying to catch up with the road sector and the regulations applicable to the road sector up to Euro V are in place. Moreover, the amortization period of road vehicles is far shorter than sea-going vessels and innovations to improve environmental performance can be more rapidly implemented by the road sector.

3.4 Multi-modal Pricing/Economic performance assessment

3.4.1 General

The overall objective of this work package was to provide a definitive view of the pricing comparisons of multi-modal transport chains, including a short sea shipping leg, compared with uni-modal, road only transport chains, and to provide a prototyping of a simple tool to enable price comparisons to be made. The bottom-up approach, which characterised the REALISE selected methodology, was again used in this work package. Hence, actual segments along realistic trans-European network routes were selected for examination and analysis.

This exercise was tailored to ensure a 'level playing field' across the various transport modes, for the achievement of genuine modal choices.

In order to ensure a level playing field and to develop short sea shipping and intermodality in line with White Paper Objectives, REALISE suggested the need to analyse in practical terms which are the factors affecting the modal choices. Hence, to identify and cost the many elements – including the environmental and external costs - entering into multi-modal and uni-modal logistic supply chains.

One of the underpinning concepts was to evaluate and compare the performance of transport modes across real trajectories in practical terms (including the

[2] With regard to emissions of CO2 in g/tonkm, SSS is the best performing transport mode.

environmental impacts). The four tasks of WP4 were seen as coherent, sequential phases aimed at providing, step by step, detailed insights into the European transport system. To avoid duplicating work done by other EU and national projects WP4.1 provided a critical review of previous projects and studies relating to transport pricing and short sea shipping.

The cost-based approach to the analysis of price determination, utilising evidence from surveys of market participants, not only enabled published (and to a lesser extent contractual) price comparisons to be made, but also permitted illustration of modal choice drivers. Hence, some light could be thrown on the relative importance of price among other elements involved in modal choice decisions. Following the bottom-up methodology adopted by REALISE a large number of actual route segments, along broad European trade/transport corridors, were used as the practical basis for the price comparisons.

In WP4.4, as well as the development of the prototype tool, a number of other issues were examined. Among these were a comparison of the price impact of the use of open-hatch vessels compared to conventional container ships; the impact of the recent implementation of security measures at ports on the use of short sea shipping, and the potential impact of the use of administration one-stop shops at ports.

The REALISE efforts have been also tailored to understand the transport market service characteristics, requirements, peculiarities and functionalities.

3.4.2 Results

The results/outcomes have been the following:

Price Comparisons. The research actions of WP4.2 and WP4.3 provided extensive coverage of price comparisons and costs analysis of door to door, uni-modal and multi-modal logistics chains along actual European transport routes. In the majority of cases the comparisons showed on quoted prices and on contractual prices, where comparisons were possible, that multi-modal chains involving short sea legs were lower in price than equivalent uni-modal road-only chains. The definitive conclusion is that, in general and on many actual routes, multi-modal logistics chains, including short sea legs, are lower priced than equivalent uni-modal road-only chains.

Modal Choice Determination. The research also indicated that – not surprisingly – other non-price factors appeared to be key modal choice drivers. In particular, reliability, measured by the percentage of deliveries within the specified (by the shipper/customer) time-windows, is a crucial determinant of modal choice. Other non-price factors included quality, travel time, cultural factors, etc.

Extrinsic Factors. A number of extrinsic factors were examined in WP4.4 that likely affect the performance of short sea shipping. Among these were the type of vessel (comparison of open-hatch vessels with container vessels); the impact of port security measures recently introduced, and the impact of one-stop shop administration services.

The Price Comparison Tool. The tool was developed as a simple prototype Excel-based tool to enable price comparisons to be made along pre-selected transport routes. The tool also incorporates the outputs, again along the selected routes, of the environmental ICF tool. Hence, both price and environmental comparisons may be made by policy-makers and by market participants. The tool is not meant

to replace the more complex tools that exist, but appear not often to be used by the majority of shippers and freight forwarders.

Transport System Optimisation. The overall result of REALSE represents a valuable insight into the intermodal needs of policy makers and business actors in relation to the optimal and efficient integration between sea and land and between different transport modes.

3.5 European and Regional Workshop Clusters

3.5.1 General

There was a three-fold aim in convening the workshops. *First*, the European Workshops were structured around key themes, e.g. port and hinterland infrastructure development, and enabled the on-going work of the integrative studies to be presented to the expert audiences invited. *Second*, the Regional Workshops were intended to discover the specific characteristics and problems of a range of European regional locations, via the participation of key regional market actors. *Third*, the discussions at the workshops were intended to provide a feedback to the integrative studies and the more general work of the Network.

3.5.2 Results

In relation to the *first* of the aims of the workshop clusters, the work of the three integrative studies was reported to the four European workshops.

In relation to the *second* aim of the workshop clusters there were a number of specific issues raised across the areas where the regional workshops were held. For instance, in Greece the issue of delays at ports; the absence of return cargo problem, and the very large number of ports in the country were raised as issues. In Finland, the specific characteristics of the Baltic Sea and the constraints on the port handling of containers were stressed as key issues. In Liverpool, the importance of the size and nature of the economic hinterland was stressed as a key factor in determining the potential for short sea shipping. In Barcelona, the poor overland connections with the rest of Europe was seen as providing an opportunity for short sea shipping, particularly with the advent of sea motorways. In Barcelona, issues relating to the use of short sea shipping to link regions of Spain to the rest of the EU were raised, as was the potential for ultra-fast ships in connection with SSS. In Bremerhaven, specific logistics issues for Bremen and Bremerhaven were raised as was the issue of the value of the statistics provided by EuroStat.

In relation to the *third* aim a strong attempt was made to ensure that the reflections of the European workshops, and as far as possible the regional workshops, were fed into the next phases of the research in the integrative study work packages. This may be seen by comparing the summary results of the European workshops (for more details see the WP5 Final Report) with the results of the integrative studies.

On user requirements. Sustainable transport is an increasingly important issue for large manufacturing companies. The environment of the industries is changing, and their supply chain choices change accordingly. A general trend may be that supply chains are getting longer and more complex. However this can constantly change. Moreover, there is evidence from final consumer goods manufacturers, such as Proctor and Gamble, IKEA, and B&Q, that they are moving away from

single European distribution units and towards distribution units closer to their markets. The transport system should be sufficiently flexible so as to adapt to these evolving requirements. Shippers need an easy access to flexible transport solutions, to fit the variety in their transport needs (short lead times, long lead times, high volumes, small volumes) and to react on external factors like extreme climate circumstances; strikes etc. that can impose temporary barriers for certain transport solutions. Time, frequency, and reliability are increasingly important criteria in the decisions on logistics and transport solutions. It is not only the transport costs that are compared, but also the impact of the transport decision on costs in other parts of the shipper's organisation (inventory costs, production costs, etc.).

On technological and organisational requirements. Process engineering is a technique that may be applied for streamlining multimodal chains. Each link in the chain is broken down into sub-processes whereby improvements are sought in each sub process. Time is the main driver for improvements: if you manage to bring time down, your costs will go down. Two essential remarks were made concerning technological improvements:

- It is important to look at the question "how to share the benefits of improvements in the whole chain?
- Investments in technological solutions have to be justified by improvements, leading to cost reductions.

Improvements are also now being promoted by Member States and the European Commission. Electronic processing of the transit paperwork is being done via the "New Computerised Transit System" (NCTS) launched in 2003, which is a major first step towards a fully paperless processing. NCTS consists of a central architecture connected through a central domain in Brussels. It accelerates customs procedures and provides a better and improved quality of service, reducing time and increasing flexibility. It facilitates communication between customs authorities, thus more consistency in transit rules and growing reliability and monitoring of customs is achieved.

On Sea-Land Integration and Port Efficiency. From the infrastructure point of view what is required is: the improvement of port infrastructures; an adapted design of port infrastructures devoting greater areas for short sea shipping; the creation of efficient terminals to facilitate the shift from road freight traffic to short sea shipping, and the improvement of port hinterland connections. From the service point of view, what is required is: a high level of service with a strong customer orientation as starting point; service focused at connectivity, continuity, reliability, and flexibility; a seamless intermodal process both for cargo flow and for documentation; high frequencies and short transit times; creative use of vessels and terminals; lower operating costs and efficiency, and focus on improved environmental performance.

The Final Workshop Conclusions and Future Perspectives. REALISE has delivered some useful tools that can help policy making. These tools might be interesting for the industry as well, but perhaps more sophisticated versions are needed, for example taking into account costs of organisation of the multimodal chain or introducing the possibility of choosing between various vessel types. It is very important to have a vision of the future, perhaps up to 2020, to be able to free thinking to imagine smarter and more innovative ways of working in relation to intermodal transport and short sea shipping. Only then can one start working on aligning user requirements with services offered. It is very important to take into account that the industry, on the demand side, is constantly changing and that requirements change accordingly. On the other side social requirement are changing too. This means that the transport sector has to keep up to speed with

the changing overall environment and to adapt accordingly. With respect to environmental matters road transport is doing this already, while short sea shipping is lagging behind. With respect to market changes and other societal developments all modalities have constantly to adapt their behaviour. Nonetheless, the opportunity for short sea shipping is considerable. Road congestion and the associated cost are likely to continue to drive the public and private sectors to look for a modal shift from road freight transport, and the flexibility and low cost of short sea shipping are major advantages.

3.6 European SSS Research Area

3.6.1 General

Work Package 6 had a dual function. First, it provided an electronic knowledge dissemination system, via a portal and a web-site. Second, utilising the portal, the main aim of the work package was to establish the requirements for a European research area for short sea shipping. This latter task meant determining the *demand* requirements from potential users and participants in such an area, and identifying a profile of the *suppliers* of research and technological development activity.

3.6.2 Results

In relation to the *first* activity of the work package, the REALISE portal, incorporating the web-site, has been a well-visited site from the outset. The web-site has averaged 1500 clicks a month.

In relation to the *second* and major activity of the work package there has been a detailed attempt to map the requirements of a virtual research area for short sea shipping and to provide an indication of the relevant data and tool providers. The aim has been to pre-figure a network of SSS suppliers and users of research which could be established as an active network/platform for the exchange of information on relevant research activities and results on SSS.

This work – which has been on-going throughout the project and has used the experience of the REALISE EKDS portal – has concluded that in respect of *demand* for research results, the form in which they should best be presented is in tailored abstracts that are found via a taxonomic search as well as the rather less targeted and more time consuming word search. However, this requires further work on taxonomic structures.

On the *supply* side a number of sources of research in the areas related to short sea shipping have been identified. Moreover, a structured approach to establishing effective provision has been established.

More detail on these issues and what a European SSS Virtual Research Area would resemble is to be found in the various WP6 reports.

4 INTEGRATED CONCLUSIONS

4.1 Introduction

Section 3 above has reported the summary findings/results of each of the five substantive work packages (WP2 to WP6). The three integrative studies (WP2, WP3, and WP4) may be considered as a single sub-set whose results have already been, to an extent, integrated with the inputs from the various European and regional workshops of WP5. However, it will be necessary to consider the integrated conclusions under the headings of statistics, environmental impacts, and multi-modal pricing, but reflecting the more generalised inputs from the workshops and to a lesser extent WP6.

To a lesser extent the work done under WP6 has also informed, and been informed, by the other activities of REALISE as a Thematic Network. Finally, the reports of each of the work packages have been subjected to the scrutiny of the REALISE Management Committee, set up under WP1 (the Management and Coordination work package). The task of this section of the final report is to integrate fully the work and outputs of the six work packages and to introduce integrated conclusions. These will then be used to inform the policy recommendations in the next and final section.

It will be important to recognise that the integrated conclusions (*taking into account the responses from the WP5 workshops and, to a lesser extent WP6*) do not invalidate the results of the integrative studies. (In fact, they are generally supportive of these results). The intention is to set these results in the context of the views of the short sea shipping 'community', including the members of the REALISE network, and hence to offer a perspective for the future that may be used to ensure that the policy recommendations in the next section have the implicit support of that 'community'.

4.2 Statistics

The discussion and interest in statistics at the workshops, and via the survey contacts of WP6, has been to ensure that accurate and reliable statistics were made available for the decision-making on policy and for commercial market decisions. It would also be useful to have statistics on 'feedering' movements.

There is satisfaction that REALISE has been able to develop a tool for use by the European Commission to enable the conversion of port-to-port sea transport statistics from tonnes into tonnes-kilometres and to assist Eurostat to streamline and increase the accuracy of the work they have been doing on the conversion matrix. Nonetheless, there have been discovered a number of errors in the underlying Eurostat database, and these have been corrected only as far as the resources available in REALISE allowed.

4.3 Environmental Impacts

There is no doubt that the environmental and external cost issues surrounding transport, and specifically road transport, are perceived by all actors public and private as the main drivers behind the desire to expand the role of short sea shipping in the transport of freight in the EU.

The REALISE investigation of this issue covered not only environmental impacts, particularly air emissions from surface transport, but also externalities such as

congestion and accidents. The aim and the final deliverable was to produce a tool – the Intermodal Comparative Framework (ICF) tool – for comparing the environmental and external cost impacts of uni-modal and multi-modal surface transport logistics chains.

The secondary research undertaken in REALISE, and discussed at the workshops, established that, in general, it could reasonably stated that short sea shipping, whether considered separately or multi-modal door-to-door, including significant short sea shipping legs, was the lowest environmental impact mode. However, it was also clear that, in one area, the environmental impact of short sea shipping did not compare favourably with road transport. This was in respect of the impact of air emissions from ships around ports and port cities (e.g. Lubeck).

The Directive 2005/33 of the European Parliament and Council modifying Directive 1999/32 on reductions in the sulphur content of marine fuels (published and coming into force on 11 August 2005, its first provisions will apply from 11 August 2006) is a recent step to move the shipping industry closer to the performance of the road transport sector. However, the tightening regulations impacting on road transport, together with the much shorter amortisation period for trucks compared to vessels, means that the current and potential future performance of the road transport sector may exceed that of short sea transport, unless the new Directive is also progressively tightened and the longer amortisation period for ships does not act to slow the application of further regulation.

The discussions at the workshops indicated a strong desire on the part of those involved in short sea shipping to have the overall negative environmental (and external costs) impacts of the road transport sector incorporated in road pricing. However, as indicated below there are likely to be limits to how far such measures can be implemented or whether this would always be effective in affecting modal choice.

The conclusion that may be derived from the work of REALISE in this area is that the ICF may be judged to be successful in enabling fair and reasonably accurate environmental impact comparisons to be made across surface transport modes. However, attention must be paid to ensuring the resolution of the problem of the environmental impacts of air emissions from ships. How far it may be possible to incorporate the resource-cost implications of the generally higher level cost for road transport than for short sea shipping is likely to be limited by political factors. What seems more certain is that the environmental and external cost drivers persuading the European Commission and Member States to pursue policies to shift freight carriage way from road and on to short sea shipping will continue to operate.

4.4 Multi-modal Pricing (Economic performance assessment across transport modes)

The pricing of logistics supply chains is seen as a key determinant of modal choice. Moreover, it is frequently seen by market participants as the principal determinant. This was evident in a number of the contributions at workshops. Partly this was due to the perception that the market exerted downward pressure on prices, and that this could not, and should not, be resisted.

However, price is not the only determinant of modal choice, and may not, in fact, be the principal factor. In practice, though not always perceived because of the complexity of the nexus of modal choice selection, the actual decision-making

process involves the (often implicit in the final decision) the weighting and scoring of a number of 'choice variables'.

Indeed, as the research made in REALISE indicated in a number of cases – on real trade/transport routes – uni-modal, road-only prices were actually ***higher*** than multi-modal logistics chain prices. For those seeking modal shift from road freight carriage this is both a puzzling and a problematic result.
However, as was pointed out in the theoretical review of previous studies and projects carried out in WP4.1 (See Report D4.1), this does not mean that policy efforts to influence modal shift by increasing the price of road transport (e.g. via the German Maut or the revised Eurovignette) may not be effective at all. It may mean, however, that there are limits to the modal shift impact of such measures that, in any event, are likely to be limited by other factors (e.g. the unwillingness of governments to raise road taxes, or even to shift the balance of them, for fear of a populist antagonistic reaction).

REALISE has identified – as indicated above – a number of factors influencing modal choice, besides that of price. Moreover, it has to be observed that there is substantial inertia among shippers and freight forwarders to changing from an existing road-only logistics contract to a new one involving a short sea leg. Some observers have estimated that a price reduction of 50% might be required to provoke a change. More importantly, it is clear that even if persuaded to shift – say by proof that all variables (e.g. reliability) will be the same under the new arrangements and price also will be lower – shippers/freight forwarders will demand initially higher standards from a new supplier than from an existing supplier. For instance, one failure to deliver inside the time-window by the new supplier will be sufficient for rejection of the new arrangement; whereas a more tolerant attitude may be adopted towards the existing supplier.

Notwithstanding the complexity of the issues involved, and the equivocal role of pricing (whether quoted prices or contractual prices), there are a number of examples of transport operators and logistics suppliers developing new logistics chains including short sea legs (both long and short). Some of these were presented at various of the workshops (e.g. Geest in Bremen and Grimaldi in Genoa).

Hence, the various issues were discussed in a number of the workshops and the above comments reflect the differing opinions presented and the REALISE resolution of the differences in the reports of D4.3 and D4.4. As a means to provide support, not only to policy makers, but also to market participants – and in pursuance of the 'bottom-up' methodology adopted throughout the work of REALISE – one of the deliverables of D4.4 is a simple, Excel-based tool for calculating and comparing the prices of multi-modal and unimodal logistics chain options along a number of main EU transport routes. The tool also links with the environmental ICF tool to allow environmental and external cost comparisons to be separately made

The REALISE conclusion on the pricing aspect of its work is that – though increased visibility of the opportunities presented for establishing multi-modal, door-to-door logistics chains including short sea shipping legs can be a useful contribution to achieving modal shift – whether achieved by short sea promotion centres or by the use of simple (i.e. the REALISE D4.4 tool) or more complex tools (such as the D2D tool), considerable attention needs to be paid to other factors. These include, inter alia: journey time and time at transhipment for cargo movement and handling, reliability, frequency, adaptability and innovation, and attention to the specific needs of the customers operating in different markets with different logistic requirements.

5 POLICY RECOMMENDATIONS

5.1 General

The integrated conclusions outlined above, derived from the work of the REALISE Thematic Network, are suggestive of a number of pointers towards general policy recommendations and recommendations for further research that could take the limited secondary research possible within the REALISE Network to more certain conclusions, e.g. in relation to the decisions of shippers and freight forwarders.

The next sub-section suggests a limited number of policy options that might be considered by the European Commission to advance further the expansion of short sea shipping. As well as the work of REALISE these recommendations take account of other initiatives promoted by DG Tren, e.g. the 'bottlenecks' exercise.

The final sub-section indicates the areas of research, linked to the work that REALISE has undertaken, where it is the view of the REALISE consortium that advantage may be gained from further research effort. This sub-section also suggests that, as well as the specific areas of research indicated, consideration should be given to a follow-up Coordination Action project under FP6 (it should be recalled that REALISE was an FP5 project) in order to continue the collaboration between the members of REALISE and the wider community already identified. The success of the REALISE Final Conference was indicative of the potential support for such an initiative.

5.2 Policy

5.2.1 Background

Notwithstanding the strong commitment of the European Commission, the European Parliament, and Member States to the expansion of short sea shipping there are few instances of specific policy recommendations to attempt to move forward the general policy agenda. There are some exceptions to this general statement: the establishment of short sea shipping promotion centres (SPCs) is one and another has been the initiation of the Marco Polo programme. The first has, partly successfully attempted to address the perceived image/marketing deficiency of short sea shipping. The second has provided pump-priming for the establishment of new intermodal services, excepting ones with road links, and to provide some funding for training services.

It is also correct to suggest that the advent of measures, including finance, to establish sea motorways should, inter alia, stimulate the expansion of short sea shipping.

Finally, two other policy initiatives may have impacts on the development of short sea shipping. The introduction of the distance-charging basis for the new Euro-vignette may well, indirectly, have a positive impact on short sea shipping, and the moves to develop a CEN standard for a European Intermodal Loading Unit may also move forward the short sea shipping agenda. Finally, a proposal that is likely to be brought forward by the European Commission – namely the establishment of a Community Common Sea Area – may also, by removing

customs barriers for goods shipped between EU ports, stimulate further short sea shipping.

5.2.2 New Policy Possibilities.

Deriving from the work of REALISE the following potential policy measures might be considered:

- Dependent of the results of the study proposed below on the practice - in EU ports, with the exception of France and Poland – of using gross tonnage as the basis of port charges, a proposal to harmonise port charging on the basis of the French and Polish practices, and hence encourage the use of open hatch container vessels.

- The establishment of specific funding support for the professional development of shipper and freight forwarder personnel. Providing a deeper understanding of not only the costs but also the ways in which modes other than road can meet the service quality criteria would be likely to mean a better appreciation of the validity of including short sea legs in multi-modal supply chains. This could be done via use of the European Social Fund or the Marco Polo funding mechanism for training might be used.

- More generally, perhaps the emphasis should move way from modal shift and the decoupling of transport growth from economic growth and towards 'modal cooperation in the context of sustainability (i.e. mitigating the negative impacts of transport)'. This would still ensure the further expansion of short sea shipping, but would be in line with the REALISE approach of setting short sea shipping in the context of the establishment of sustainable logistic supply chains.

5.3 Further Research

As REALISE discovered in its three Inception Reports, there has been a considerable volume of research conducted in the various Framework programmes, particularly FP4 and FP5 (and continued to an extent in FP6). Moreover, it is also the case that there have been a number of projects on short sea shipping commissioned under the various InterReg 3B programmes.
N.B. *There appears to be no coordination between the RTD results of the various FP projects and the InterReg programmes. If the two types of programmes were linked then the InterReg programmes and projects could act as pilot application areas for implementing the research results. Currently, InterReg projects tend to try to undertake research already accomplished under FPs. Hopefully under the new structural fund regimes and FP7 this important lacuna can be addressed.*

Research Proposals. Given the above it is suggested that – with the exception of the proposal for a Coordination Action – the research on short sea shipping issues should be specific and targeted on key issues. These are as follows:

- Investigation of the decision-making process of shippers and freight forwarders – possibly using conjoint analysis – in their consideration of modal choice options.

- A broad commodity flow analysis of trade and transport flows over the next 10 years within Europe, with especial reference to the link between the carriage of specific commodities and the corresponding

structure of logistic chains, e.g. final consumer goods and intermediate goods.

- A study to obtain 'feedering' statistics from key hub ports around the EU, utilising the pilot work done in WP2 of REALISE.

- A study on the environmental impacts of particulates' emissions from short sea shipping, with special emphasis on ro-ro vessels.

- An investigation into impact of the gross tonnage basis of port charging on the choice of ship type in relation to the use of open-hatch vessels to provide faster and safer loading and unloading of containers.

- Consideration might be given to promoting a call for a Coordinated Action, under FP6 or FP7, to continue the networking aspects of REALISE. This would also enable the further development of the virtual research area, linked to other EU initiatives, e.g. the Maritime Transport Coordination Platform.

The above list is not intended to be exhaustive and DG Tren may derive other ideas for RTD projects and research studies from the work of REALISE.

All Reports and Tools are available on-line at www.realise-sss.org