

EDVARD ROŠKAR, B.Eng.  
E-mail: edvard.roskar@siol.net  
JELENKO ŠVETAK, Ph.D.  
E-mail: jelenko.svetak@fpp.edu  
University of Ljubljana,  
Faculty of Maritime Studies and Transportation  
Pot pomorščakov 4, SI-6320 Portorož, Republic of Slovenia

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## SYNERGISTIC INTEGRATION OF LINER SHIPPING AND ECONOMIC DEVELOPMENT

### ABSTRACT

*Liner shipping with all its specific features plays an important role in the economic development of a country whose ports are involved. In the strategic goals of maritime policy for the period 2005-2009 the European Commission stresses the need for a sustainable environmental development and economic growth. Besides, it points out the necessity for the fulfilment of all maritime potentials. Yet, individual EU member states frequently create the environment, which discourages the development of their own national maritime economy. Unfortunately, this applies also to the Republic of Slovenia. The current paper offers a detailed analysis of the weaknesses and benefits of the classical liner shipping in present day.*

### KEY WORDS

*ports, short sea liner shipping, motorways of the sea, economic development*

### 1. INTRODUCTION

Shipping is still one of those fields which do not easily change the established and generally accepted rules. These give shipping a patina, special attraction and perhaps also particular safety. Only those who are born for maritime profession can live the Sisyphus life and survive. In Europe we are experiencing the time of great political and economic changes. The barriers represented by state frontiers are falling and the possibilities of new economic development are opening. All this requires conforming of shipping and maritime economy broadly. Timely conformity to economic changes is crucial. Classical liner shipping with all its peculiarities still remains one of the three basic types of shipping. However, the changes in European economy pointed to new understanding of the development of liner shipping.

### 2. LINER SHIPPING IN THE LIGHT OF NEW POSSIBILITIES

Classical liner shipping is based on the following presumptions:

1. The voyage of a liner ship is predetermined, i.e. the ports of call are known in advance, so is the schedule. Liner ships are different from bulk carriers by construction and equipment.
2. Liner ships generally do not offer the whole cargo space but only a part of it in the port of shipment. The cargo loaded in the port of shipment is usually different. The same line mainly employs several liner ships.
3. Cargo holds are rarely 100% utilised and cargo is loaded and discharged in the same ports.
4. The relation between supply and demand of cargo space and the oscillation of this relation does not have such impact on freight rates as is the case in tramp shipping.
5. More than on the relation between the supply and demand is liner shipping susceptible to the changes in the expenses of liner shipping operation. The organisation of liner shipping companies is complex and more expensive than the organisation of tramp shipping companies.

Each country having free exit to the open sea via its own sea port has a natural advantage over the countries which do not have it. Unlike land traffic infrastructure which has to be built, sea routes are already there, only the access to them, i.e. ports, has to be built and equipped. Certainly, the possibilities of exploitation of sea ports are different, which depends on the natural circumstances.

#### 2.1 Seaport in the light of economic attraction

Given the above one can conclude that the countries with free access to the open sea are always in an advantageous position compared to those that do not have it. However, is it always so, and if not, what is the reason?

In order to answer this question we should first define the conditions required for successful operation of a seaport. In doing so we should see how the existing or designed ports meet the said conditions. The re-



sults of such analysis must show the justification of investments in the existing seaports, including all the facilities. This would then be an indication whether to build new ports or not. The necessary conditions for a successful seaport may be condensed in a short definition: A seaport is successful when it permanently contributes to a positive GDP of a country. However, the necessary condition should not be the only condition of assessment, for the development component is missing. A permanent development component based on realistic evaluation is essential, as the capital entry is also multiple.

As a matter of fact, the development of a seaport is not based on the port infrastructure but also on the hinterland traffic. The produced GP of a seaport should not be limited only to its contribution in the state GDP, for such data can be misleading as to the importance of a seaport. The overall GP, produced by a seaport, should be supplemented by the contribution of accompanying activities and the activities in the transport chain. This is the so-called multiple effect, which might reach the value  $M=15$ . [1, 2]. The said multiple effect considering environment pollution requirements seems to be sufficient condition for a successful operation of a seaport and its realistic positive development. Environmental pollution requirements set forth by the Kyoto Protocol should involve the transport of goods from the port to the consumer. As a matter of fact, land transport pollutes environment incomparably more than sea transport. Thus, if we consider both conditions necessary for successful operation of a seaport the definition can be the following:

A seaport is successful when it permanently contributes to a positive GDP of a state and its basic product enables additional positive effect to the state GDP and at the same time preserves the required clean environment.

## 2.2 Geographic position of a seaport

The geographic position of a seaport, its economic power and the political system of its hinterland represent the decisive impact on the development of liner shipping. It can be anticipated that the choice of liner shipping ports is wider than is commonly believed. So far the main factor in the choice of these ports has been the amount of liner cargo handled. However, the latter factor itself has been the limiting factor for small countries with a relatively minor economic power. In such countries the way the liner ship operates should be taken into account. Considering the necessary amount of liner cargo the paper further confines itself to the importance of the geographic position of the Mediterranean ports, particularly to the ports of the Adriatic Sea.

The Mediterranean area is considered to be the South door of the EU, expanding to 19.5 million km<sup>2</sup> with more than 400 million consumers. The area includes the countries, which will in the near future become members of the great European and also world economic integration. Already now, they export and import annually more than 1030 billion euro of various goods. They have high rates of economic growth and rapid rise of the living standard. The Adriatic ports are located along the shortest transport route, connecting the Central and Eastern Europe with the Mediterranean countries and those beyond the Suez Canal. The sea route is more than 2000 nautical miles shorter compared to the North European ports, and the land route to the main Central European market centres is on the average 500 km shorter. Already, the above said points to the important goods flow, which, however, have yet to be directed and organised. Still, the first several conditions have to be fulfilled. The minimum conditions to reach the economic justification are as follows:

1. It is necessary to direct and augment the goods flow through ports.
2. The ports should be organised, so as to speed up the cargo transshipment. In other words, not to keep cargo in ports for too long. Fast and environmentally friendly infrastructure should be provided from sea ports to consumers.
3. Fast and modern information system should be introduced.
4. Simplified and unified customs procedure should be achieved.
5. More efficient standardisation of cargo transport should be developed.

## 3. INCREASE OF GOODS FLOW THROUGH PORTS

While speaking about the increase of goods flow through seaports we mostly think about new contracts of carriage with ship-carriers. This is a classical approach with its particularities and limitations. The amount of the expected cargo to be handled and the port fees are certainly one of them. Further, we shall focus on the expected amount of cargo handled.

As mentioned in the previous chapter, one of the characteristics of liner shipping is susceptibility to the costs of liner ship. And this is frequently crucial for the liner ship carrier in selecting the seaport. Consequently, small countries with relatively poorly developed economy will have fewer chances for their port to be chosen for the liner ship call. Therefore, such solutions should be sought to develop liner shipping in order to be useful also where so far, for the mentioned reasons, these have not been employed.



### 3.1 Employment of liner ships not to call at port

More and more large liner ships decrease the number of ports of call. The reason for this trend can be accounted for in the costs of liner ship operation. The second reason is the size of liner ships. Container ships, for example, are already so large that they cannot call at all ports. The third reason is the incapability of certain ports to meet the modern lay day standards, in other words, they cannot tranship cargo in the acceptable loading or discharging time. The question arises how to provide conditions for minor ports to take part in the distribution of such cargo.

Before answering this question, two types of cargo should be distinguished. The first type is ship cargo waiting in collecting ports to be shipped to port of destination. This cargo is not delivered to the port of destination due to one of the mentioned reasons in the first paragraph of this chapter. The second type of cargo is available in the port of shipment, but its amount is so small that it is not worth carrying by a tramp vessel. Both types of cargo can be delivered in the port of destination by a smaller liner vessel.

In the first case, cargo is most frequently carried by an alternative means of transport to the buyer, either road or rail. In both cases, the »door-to-door« delivery is applied. The time factor is often favourable. In the second case there are two options. When the use of land infrastructure is impossible and considering that between the shipper and the consignee there is the sea, cargo is carried by sea, but only as far as the appropriate seaport, from where the land infrastructure is used again. The time factor of such transport is frequently unfavourable. However, when the use of land infrastructure is possible, considering that between the shipper and the consignee there is no sea, the option offered by land infrastructure is used.

Therefore, we should aim at the following goals:

1. Sea transport should be used to the user's nearest point.
2. Land transport from the seaport to the user should be carried out by means which are the least environmental polluters.

Both goals should meet two requirements. First, the carriage by sea is the cheapest and most environmentally friendly. Second, rail transport should have precedence over road transport. Both goals are in compliance with the implementation of the Kyoto Agreement, ratified by the EU on May 31, 2002. They also follow the directives of the European White Paper about the transport policy for 2010 [3]. Yet, the above goals require adequate organisation and newly set business regulations. Besides, they introduce new elements in the classical liner shipping operation.

### 3.2 Requirements for better protection of environment and safety of transport

European White Paper about transport policy for 2010 significantly reverses the negative trends, which are the result of current practices to transport goods from the shipper to the consignee, using land traffic infrastructure. The policy gives special priority to all water routes, sea and river. The land routes should be as short as possible and environmentally friendly.

The situation in the field of environmental protection against pollution by greenhouse gases, above all resulting from road transport, is insufficient in the EU. The research into the amount of land transport of goods shows already for the countries EU-15, a significant rise. [4] The growth index in road transport between 1990 and 1997 was over 26%, unlike rail transport, which fell in the same period by 7%. Although new statistical data for the year 2004 for the countries EU-25 is not yet available, we can anticipate even worse indicators, as the statistical data for the year 2000 show the rise in the number of road transport vehicles and the growth in CO<sub>2</sub> emissions in all European countries (an exception is only the Former Yugoslav Republic of Macedonia) [5].

Table 1 shows the rise in the number of road vehicles between 1985 and 2001 and pollution of environment with CO<sub>2</sub> for a few selected states, which, with the exception of Macedonia, border on Slovenia [6]. As seen from the table, all states, including Slovenia, should reduce the existing burdening impact of greenhouse gases on the environment.

Table 2 shows the amount of consumed fuel and the amount of greenhouse gases that burden the environment, generated by individual transport [4]. The average fuel consumption and emission of gases in the environment is calculated with g/km.

Table 2 shows that it is road transport which most severely pollutes the environment. Since it is realistically expected that road transport of goods will grow even more in the future due to the fast development of road infrastructure, the shift of the latter to railway and water routes should follow. It is believed that road transport will increase in the EU by 50% by the year 2010 unless the said shift takes place. This would then result in increased burdening of road infrastructure by 12 billion ton-kilometres per year. [7] The General Directorate for Energy and Transport of the EU finds that considering the said increase the share of CO<sub>2</sub> would rise to 84%. [3]

Consequently, the transport policy supported by the relative directives is self evident:

*In the transport of goods the traffic infrastructure which pollutes the environment the least should be used. In doing this the said transport should be redirected from roads to railway or waterways wherever possible.*



**Table 1 - The rise in the number of road transport vehicles between 1985 and 2001**

Country	The number of lorries per 1000 inhabitants		CO <sub>2</sub> emissions in million tons per year		Required reduction according to the Kyoto Agreement until 2012
	1985	2001	1990	2000	
Austria	27	41	56.9	62.8	- 13%
Italy	31	56	400.1	425.7	- 6.5%
Croatia	9	28	No data	17.8	- 5%
Hungary	14	35	70.5	55.2	- 6%
Slovenia	17	26	12.5	14.5	- 8%
Macedonia	11	10	9.2	8.4	No requirement

**Table 2 - The analysis of the amount of consumed fuel and the emission of greenhouse gases**

	Roads	Railways	Sea
Fuel consumption (g/km)	31.330	8.911	4.828
CO <sub>2</sub>	98.301	28.338	15.45
CO	0.479	0.196	0.036
HC	0.227	0.098	0.012
NO <sub>x</sub>	0.978	0.472	0.311
SO <sub>2</sub>	0.031	0.036	0.29
Solid particles	0.078	0.027	0.006

The condition of safety of lives in the field of transport is insufficient. The European Commission was presented with the following data [8]:

In EU 96% of all accidents take place on roads, causing about 40,000 fatalities. In rail traffic the loss is 115 people (information refers to the years 1990-96), and in the European part of the sea 140 people.

Considering the above data and calculated per 100 million km covered, the death toll is as follows:

- sea transport 1.4 fatalities,
- road transport 100 fatalities
- railway transport 40 fatalities.

Table 3 shows the number of fatalities in 2001 in road traffic accidents in Slovenia and the neighbouring countries [5]:

**Table 3 - Number of fatalities in road traffic accidents in 2001**

Country	Overall fatalities	Those under 25 years of age
Austria	958	246
Italy *	6410	1435
Croatia	647	174
Hungary	958	226
Slovenia	278	76

\* Valid for the year 2000

The White Paper about the transport policy for 2010 represents also the calculated costs structure for lorries using European motorways. Table 4 shows the structure of costs in euro per 100 km of motorways.

Considering these goals of the European transport policy for 2010 it is realistically to expect that the fees for the use of roads will increase considerably. Such policy will encourage the use of railways and waterways.

**Table 4 - Costs structure for lorries using European motorways**

Costs structure	Range (EUROS)
Air pollution (medical treatment expenses and the loss of harvest)	2.3 - 15
Consequences of climate changes (changes in precipitation and the harvest)	0.2 - 1.54
Use of infrastructure (return from investments)	2.1 - 3.3
Noise (costs of medical treatment)	0.7 - 4
Accidents (costs of medical treatment)	0.2 - 2.6
Traffic congestions (loss of time)	2.7 - 9.3
Overall	8.0 - 36.0



#### 4. SHORT SEA SHIPPING

Consequently, the understanding of the development of liner shipping should change essentially. This is particularly due to environmental protection and safety of lives. Only globalisation of the world economy made us realise that the transport of goods must also meet the requirements of environmental protection. Although liner shipping tends to preserve tradition, this time it is faced with new tasks in the transportation chain. This, on the way from the shipper to the consignee must provide the following conditions:

1. Transport means must be selected which generates least pollution on the environment.
2. Duration of transport must be short.
3. It must be safe.
4. It must be cost-efficient and competitive.

According to analyses in chapter 3.2 and considering the above four conditions the order of the choice of transport should be as follows:

1. sea or other water transport,
2. railway transport,
3. road transport.

As sea transport meets most of the required conditions, the development of short sea liner shipping should be encouraged in the future.

##### 4.1 Motorways of the sea

On July 2, 2004, in its final report about short sea shipping the European Commission reported to the European Parliament the following [9]:

The White Paper about the European traffic policy for 2010 stressed the concept of »motorways of the sea«. This should become the constituent part of the Trans-European Network (TEN-T). The sea motorways should reduce the overburdening of roads and improve the access to peripheral and island countries. Apart from reducing the number of lorries on roads, they could, in some cases also contribute to the development of the sea passenger traffic, as some vessels can simultaneously carry cargo and passengers.

The motorways of the sea should become the constituent part of the logistic »port-to-port« chain and offer efficient, regular and reliable services, which could compete with road traffic in terms of transit time and cost efficiency. Ports connected with these motorways must have good hinterland connections, fast administrative procedures and high quality short sea shipping services.

Future development of liner shipping should expand to all suitable seaports. The definition of the new term »motorways of the sea« explains more precisely the tasks of short sea shipping [10]: *“The trans-European network of motorways of the sea is intended to concentrate flows of freight on sea-based logistical inter-*

*modal routes in such ways as to improve existing maritime links or to establish new viable, regular and frequent maritime links for the transport of the goods between Member States so as to reduce road congestion and/or improve access to peripheral and island regions and States. Motorways of the sea should not exclude the combined transport of persons and goods, provided that freight is predominant”.*

The definition gives new dimensions to the classical operation of short sea liner shipping. Unlike the classical understanding of the choice of liner shipping ports, the new definition gives precedence to the geographical position of a seaport. In other words it is not crucial any more whether a seaport can receive a liner ship with respect to access circumstances or the amount of cargo. But the geographical position of a port with respect to the logistic route has become more important. Further, a principle should be applied to select such port to minimise the length of road transport in favour of railway transport.

Motorways of the sea, therefore, do not exclude criteria of the classical liner shipping but add a new important criterion. In October 2003 the European Commission suggested changes of the European Guidelines about the development of the Trans-European Transport Network (TEN-T), including the implementation of 29 priority projects, which are in the »European interest«. Accordingly, they would be preferentially financed from adequate sources of the Community. The project No. 21 is a priority project about the development of motorways of the sea. Within this priority project four motorways of the sea were recommended [9]:

- 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);
- Motorway of the Sea of Western Europe (leading from Portugal and Spain via the Atlantic Arc to the North Sea and the Irish Sea);
- Motorway of the Sea of south-east (connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean, including Cyprus);
- 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 and including links to the Black Sea).

The European Parliament confirmed the proposal of the Commission. So there is a possibility now for the financial assistance to the Trans-European Network (New Article 12a about the motorways of the sea).

##### 4.2 Organisation of short sea liner shipping

Organisation of short-sea liner shipping requires a completely new approach. Before setting the condi-



tions for the economical liner cargo transport, we should define the range of the operation of the whole transport chain:

1. Short-sea liner shipping should involve the coastal member states of the EU as well as other coastal candidate-members for the EU.
2. Short-sea liner shipping should be economical and more cost-effective than road or rail transport.
3. Short-sea liner vessels are usually smaller than classical liner vessels.
4. The choice of seaports must provide the shortest land transport to the users of goods.
5. The chosen seaports must have a good connection with the hinterland.
6. The chosen seaports must provide fast and safe cargo transshipment.
7. Customs operations must be simplified so as not to delay cargo delivery on its way to the receiver.
8. It is necessary to standardise loading units to enable the development of intermodal transport.

Successful short-sea transport along the motorways of the sea depends on its organisation and it involves promotion centres on the managerial and practical level [11].

The managerial level is represented by the National Focal Points. These are managed by highly qualified officials in charge of liner shipping in national administrations. Their activity is harmonised with the European Commission and the policy of the EU. On the initiative of the Commission the focal points are related on the European level, experience is exchanged and the way of encouraging short sea shipping is analysed. Their task is to reduce bottlenecks, which obstruct the development of such transport, and to provide new strategies to make liner shipping more attractive. The Maritime Industries Forum branches take part in yearly observers meetings. Thus the necessary relation is achieved between planning (National Focal Points) and implementation (Maritime Industries Forum).

Short Sea Promotion Centres are organised and operate on the national level but in accordance with the EU Commission. Their task is to promote short sea shipping and give information to potential users. Promotion includes virtual meetings, creation of electronic network, data bank etc. The sea carriers and road hauliers represent a special target group. The centres are united in the network all across Europe with customers on both sides of the short distance. Thus, they can take advantages of all the opportunities offered by their geographical locations.

The organisation of short sea liner shipping calls for the interconnection of the Mediterranean states in the field of goods flows. That is to say, the organisation of goods flow in the Mediterranean must comply with the set rules. This will enable the right choice of sea-

ports and the financial aid by the EU. The Masterplan of the Mediterranean motorways of the sea includes the basic rules for the choice of maritime seaports connected in the Mediterranean sea motorways. However, we must be aware that some goods flows have already been established in the Mediterranean Sea. Given that the Masterplan is in its initial stage such individual established flows have to be somehow incorporated in the plan. The working group, established by the Mediterranean member states, decided in June and July 2004 that the Masterplan should consider the existing sea routes. [12]. Such decision was taken on the basis of previous meetings of the said working group on Malta and in Ljubljana.

### 4.3 Masterplan of the Mediterranean motorways of the sea

The Masterplan of the Mediterranean motorways of the sea includes the conditions for the choice of those seaports which will be included in the short sea shipping. Further, the conditions and the selection criteria are shown:

#### 1. Geographical position of seaport:

The geographical position of seaport is of crucial importance. Priority is given to those ports which are related to:

- Pan-European Corridors,
- Trans-European Network-Transport,
- Specific Industrial and Agricultural Districts.

#### 2. Capacity of seaports:

Apart from the geographical criterion the choice will also depend on:

- adequacy of infrastructure,
- organisation of accompanying activities.

Thus, the chosen ports will become the constituent part of the Masterplan. However, the final choice will have to include the criterion of distance between ports, i.e. not more than 150 km, considering they are part of the European transport network. This will provide the concentration of turnover in these ports and they will operate as independent seaports within the short sea shipping Masterplan. Otherwise, given that the said criterion is not considered, such ports will operate within the integral intermodal system. However, in both cases the ports must have adequate infrastructure and organisation of accompanying activities (see point 2 above)

In order to include new short sea lines in the Masterplan, apart from those already existing, the following criteria will be given precedence:

1. possibility of Ro-Ro and Ro-Pax trade between Mediterranean member states,
2. elimination of bottlenecks in road transport,
3. reduction of accidents in land transport,



4. environmental protection from pollution and reduction of fuel consumption,
5. anticipated increase of traffic.

Considering the positive results expected by the introduction of short sea shipping, a Pilot Action for Combined Transport - PACT program was made in 1997. Most of the €55 mio. funds designed for the program were invested for the construction of railways. In 2003 the PACT program was followed by the Marco Polo program. The new program is meant for the development of short sea shipping, railways and inland waterways. The budget for the program (€75 mio.) is expected to increase in 2007.

## 5. CONCLUSION

Considering the above said the following conclusions can be made:

1. Long distance liner shipping preserves all its basic characteristics; however, the liner carrier should take into account also the smaller amount of cargo which they would normally not load or discharge in the port of call. Short sea shipping now solves these problems, provided new approach has been adopted, based on fast and accurate information. The logistics operators are faced with new challenges.
2. The geographical position of seaports in the Mediterranean is of crucial importance. Those seaports from which land transport to consumers is the shortest have the most advantageous position, considering they are also located near the main European transport routes. The possibility of fast transport by railway to the user is of utmost importance as it is the most cost-efficient one. It should be taken into account that the use of road infrastructure will become ever more expensive.
3. Seaports having good geographical position must also have enough land space so as to be able to locate and eventually process goods. The development of seaports should take into account that some goods will always have to be kept in stock. However, these trends require new technology and organisation of work resulting in the added value.
4. Successful development of short sea shipping is expected to necessitate the organisation of oligopoly in the field; however, only when the development reaches a relatively high level.
5. Logistics operators are expected to gain in importance as they will have to become part of the promotion network on the practical level. Anyway, the future role of logistics operators needs special consideration.
6. Short sea seaports will provide additional multiplicative effect on the national land transport budget.

The investment in short sea shipping should therefore, also be in the national interest of each member state.

**EDVARD ROŠKAR**, dipl. ing.

E-mail: edvard.roskar@siol.net

**Dr. JELENKO ŠVETAK**

E-mail: jelenko.svetak@fpp.edu

Univerza v Ljubljani, Fakulteta za pomorstvo in promet  
Pot pomorščakov 4, 6320 Portorož, Republika Slovenija

## POVZETEK

*Linjsko ladjarstvo ima, z vsemi svojimi posebnostmi, nesporno pozitivno vlogo v gospodarskem razvoju države, katere pristanišča na svojem potovanju tika. V svojih strateških ciljih za obdobje 2005-2009 je Komisija EU poudarila posebno potrebo po vseobsegajoči pomorski politiki, usmerjeni v okoljsko trajnostni razvoj uspešnega pomorskega gospodarstva in izrabo vseh možnosti pomorske dejavnosti. Znano je, da si namreč posamezne članice EU mnogokrat same ustvarijo okolje, ki škoduje razvoju nacionalnega pomorskega gospodarstva. To velja tudi za Republiko Slovenijo. Pričujoči članek podrobneje razčlenjuje slabosti in prednosti današnjega klasičnega linjskega ladjarstva.*

## KLJUČNE BESEDE

*pristanišča, linjsko ladjarstvo, pomorske avtoceste, gospodarstvo*

## REFERENCES

- [1] **Boris Glavan**, *Linjsko brodarstvo*, Rijeka 1981
- [2] VI<sup>th</sup> International Congress of Sea Traffic and Port Handling, Vigo, 1994
- [3] Office for Official Publications of the European Communities, 2001, ISBN 92-894-03411, White paper; European transport policy by 2010: Time to decide
- [4] Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee of the Regions, COM (1999) 317 Final, Brussels 29.06.1999
- [5] The Statistical Yearbook of the Economic Commission for Europe 2003, Chapter 8
- [6] The Statistical Yearbook of the Economic Commission for Europe 2003, Chapter 8.1, Chapter 10.3
- [7] Regulation of the European Parliament and of the Council of 22 July 2003, Official Journal of the European Union, L 196/1, 02.08.2003
- [8] *The Relative Safety of Maritime Transport*. Analysis by ARTEMIS Information Management S. arl. (Luxembourg) for Eurostat and Directorate – General for Transport (DG VII), December 1998
- [9] Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee of the Regions, on Short Sea Shipping, SEC (2004) 875, Brussels, 02.07. 2004, COM 453 Final
- [10] Decision no. 884/2004/EC of the European Parliament and of the Council of 29. April 2004, Article 12a – Motorways of the Sea



