RELEVANCE AND POTENTIAL OF INTERMODAL TRANSPORT IN THE MEDITERRANEAN AND BLACK SEA REGION

FINAL DOCUMENT

This study commissioned by the ECMT aims to provide a comprehensive and detailed inventory of reserve capacity and intermodal potential in the Mediterranean and Black Sea region through the construction of a dedicated information system. This system incorporates data and information relating to supply and demand for services with a view to obtaining an overview of the current situation and the prospects for development in the region.

Presented and drafted by Vesselin Siarov
Ph.D in Development
(NESTEAR, France)
siarov@nestear.net

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I. Context

Against a background of increasingly rapid globalisation and growing volumes of trade between Europe and Asia, the overall development of transport (in the broad sense of the term) as well as the prospects for intermodal transport services in the Mediterranean area (Mediterranean and Black Sea) are driven by relatively new sets of forces (both external and internal) which are still at a formative stage:

- **Globalisation and growth in intercontinental trade:** By virtue of its position at the crossroads between Europe and Asia, the Mediterranean is increasingly used for international feeder services. Its integration into the world economy through deep-sea connections has strengthened and consolidated the international standing of a large number of regional ports, which have become established collection and distribution hubs within the Mediterranean area.

- **Opening up Eastern Europe and the rerouting of intra-European trade flows:** Following the opening-up of Eastern Europe and the countries in the Black Sea region to the global economy, in which Russia and Turkey are both outposts, the higher rate of growth in consumption of manufactured products and the massive relocation of economic activities to Asia and certain countries in the Mediterranean basin have led to the realignment of trade flows in the direction West to East for exports (finished products) and East to West for imports (raw materials and basic products with low value added) in order to generate sufficient volumes to justify the introduction of a large number of new intermodal services (cargo, Ro-Ro and containerised freight services).

- **Integration of short-sea shipping into supply chains:** In view of the variety of the services offered by suppliers, and despite the differences in both the nature and size of demand between the western and eastern sides of the region (notably the South and the Near East), the integration of short sea shipping into intermodal (supply) chains is already the main multimodal alternative for a large number of Mediterranean countries.

In order to identify the intermodal development capacity of the region, it is possible to adopt a three-fold spatial and dynamic approach, governed by a geographical information system (SIG), that can provide the following general and detailed breakdown of overall demand, supply of services and regional priorities in the Mediterranean and Black Sea region:

- Overall demand (current and future);
- Supply of intermodal services (current);
- Intermodal development priorities and plans (current and future).

This experimental approach will attempt to address the dynamics of flow generation, distribution and interaction between the locations for flow consolidation and inter-linkage in the maritime chain in the Mediterranean area in order to make an admittedly very general assessment of the overall potential for intermodal transport at the level of the Mediterranean and Black Sea area.

This very large-scale macro approach will make it possible to quantify and spatially locate the major trade flows in the enlarged Mediterranean area.

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1 According to Containerisation International (2004 yearbook), in 2002, 13 ports in the region were ranked in the top 100 container ports worldwide: Gioia Tauro (18th), Valencia (34th), Genoa (41st), Pireus (49th) and Marsaxlokk (57th), La Spezia (70th), Haifa (73rd), Marseille (76th), Damiette (81st), Izmir (88th), Leghorn (94th), Ashdod (96th) and Alexandria (101st in 2002 and 100th in 2001).

2 The method which was developed for this study (and which is still under development) may well incorporate other studies or projects relating to similar contexts or issues.

3 The concept of an enlarged Mediterranean area refers to all Mediterranean, Black Sea and Near Eastern countries considered as part of an enlarged European area.
It will subsequently be possible to use the structuring effects of the intra-Mediterranean flows thereby identified to insert the values and tonnages trade flows (total and/or finished products) in relation to the overall distribution of the supply of intermodal services. By way of example, the potential supply of services can be illustrated by type of intermodal service, frequency (daily, weekly, etc.) and capacity (gross tonnage, TEU, etc.) as of the situation in 2003 and 2004.

The aim is to be able to relate the size, concentration and distribution of trade flows to the main intermodal services in order to identify the routes along which the current and future intermodal system in the Mediterranean could develop.

II. Potential demand

Identifying the spatial distribution of intra-Mediterranean trade flows is a prerequisite for the detailed quantification of intermodal potential.

In view of the specific geographical context of the Mediterranean and Black Sea region, a major share of trade flows is accounted for by intermodal transport and in particular maritime links. Maritime shipping is currently not only the main alternative mode of transport (50% to 70% of the value of flows and over two thirds of the tonnages transported), but also an efficient and low-cost intermodal solution for all the countries in the South and East of the Mediterranean and Black Sea region.

In the Western part of the region, although a third of transport movements by value and half by tonnage of EU Member States (France, Italy, Spain, Portugal) are made by sea, the volumes observed are nonetheless sufficient to ensure the level of consolidation required for at least partial integration into the regional intermodal chain (land networks/maritime routes).

In order to obtain a detailed and spatially accurate overview which would make it possible to rank and identify the routes of the main trade flows that might offer potential for the long-term development of intra-Mediterranean trade, the initial approach consisted in estimating overall demand on the basis of trade between countries in the region and those referenced in the COMTRADE 2004 database. The capitalised results, plotted in an origin/destination (O/D) matrix used in association with the Geographical Information System (GIS) specially developed for this purpose offer a means of inserting national flows into overall intra-Mediterranean demand.

Once trade volumes have been identified and spatially dissociated by O/D (at the national level), and also by type of flow (exports and imports), the dedicated GIS can be used to assign finished products to the intermodal chain in order to illustrate, in the most relevant way possible, the size, directions and type of flows that are likely to be incorporated into the intermodal transport system in the Mediterranean and Black Sea area.

Distribution of current trade flows in the Mediterranean area

The definition of the intermodal potential of the countries within the Mediterranean area to a large extent depends not only on national export and import capacities, but also on the degree to which these countries are involved in the trade flows within the region (Mediterranean and Black Sea).

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1 The NEASTEAR team consulted and drew on a wide variety of public sources (port authorities, operators and forwarding agents, specialist periodicals, etc.) to calculate the supply of intermodal transport services (2004).
2 See national sources (available in 2004) and the COMMEX 2001 base.
3 The COMTRADE database compiled and maintained by the United Nations Statistics Division (UNSD) since 1962 contains annual trade statistics for around 120 countries (over 90% of world trade) as well as over 5,000 groups of different products classified by value and quantity (including tonnage). This site has recently been made available online and free of charge on the UNSD website (http://instats.un.org/unsd).
4 Considered by definition as unitised and packaged.
In 2002, despite the preponderance of intra-EU trade in the countries on the Latin Arc, dominated by France, the spatial projection of intra-Mediterranean\(^1\), compared with total trade with the world, showed that the countries most involved in this trend tend to be located in the Southern or Eastern parts of the Mediterranean and in the Balkans and the Black Sea basin.

**Figure 1: Size and distribution of intra-Mediterranean trade flows (Intra-MED)\(^2\)**

![Map of intra-Mediterranean trade flows](image)

In view of the fact that the four EU Member States in the Western Mediterranean trade two thirds of goods by value between themselves, the share dedicated to the rest of the region is perfectly comparable to that of Russia, Turkey, Ukraine and, to a lesser extent Greece or Romania.

Ukraine, the three Maghreb countries, Libya, Cyprus, Syria and Bulgaria are among the countries which are strongly involved in Mediterranean trade (over 50%) and which also account for a relatively high share of trade by value.

The low volumes they generate mean that Israel and Jordan are not involved to any significant extent in Mediterranean trade.

The overall spatial distribution of trade flows also makes it possible to identify not only countries which have a high trading potential with the region, but also those regions which might become major flow consolidation points for exports or imports.

\(^1\) COMTRADE database, data for 2002.

\(^2\) The term “Intra-MED” refers to the “enlarged” Mediterranean area (Mediterranean and Black Sea).
Figure 2: Spatial distribution of Intra-MED trade 1 by O/D of major national flows

Given the spatial distribution by value of goods graded in 2002 (total exports and imports), Italy, Spain and France together comprise a trading system of major importance not only for the Western Mediterranean but also for the region as a whole.

It should also be noted that the Maghreb countries, Turkey and Russia maintain strong links with Italy, Spain and France.

Driven by the particularly close trade links between EU Member States, the triangle formed by the three countries in the Latin Arc to some extent acts as a centre of gravity for the concentration and orientation of exports flows by value throughout the region.

The recent opening-up of Libya has generated major export flows to Italy, while Russia and Greece have become major customers for Italian and French exports.

Given the volumes observed, the emerging trade pairing of Russia and Turkey (importer) is expected to play an increasingly important role in the Eastern part of the region.

It should also be noted that outside the four EU Member States (which benefit from Intra-EU trade), the other Mediterranean countries still largely pursue a bilateral trading policy in which Italy is in many cases the main partner.

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1 COMTRADE 2004 databases, 2002 data, for all goods and Mediterranean countries (+Black Sea) combined (in USD thousands).
Forecast trend in trade in the Mediterranean area by 2020

The overall increase in annual growth rates (Intra-MED trade flows by value) observed during the period 1998-2004 provided a basis for projecting the trend in trade flows to the time horizon 2020 and to identify the countries and regions which are likely to become development hubs with high growth potential.

Figure 3: Projected trend in Intra-MED trade – Horizon 2020

The trend for 2020 indicates a dominant role for Italy at the expense of France, and the overtaking of the latter by Russia in terms of exports.

The spatial projections would seem to predict the emergence of two major axes with strong development potential (growth < 400%):

a) the first and relatively clearly delineated trade flow (North-East – South-East) is between Russia and Ukraine, and between the Balkans, Maghreb countries and the Iberian peninsula;

b) the second, running South-East/North West is a less clearly delineated trade flow between the Maghreb or Iberian countries and the Black Sea region.

Plotting the spatial location of national projections based on the average annual growth rates observed in the countries concerned reveals the changes that are most relevant to the development of transport services and intermodality in the Mediterranean and Black Sea region.

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1 The technique used consists in constructing a trend matrix (country/country) based on the average annual growth rates observed (see COMTRADE 2004, 1998-2002 data) by country of origin and destination. To adjust certain annual fluctuations (2 or 3 figures), the average annual growth rates of some groups of countries have been arbitrarily divided by 4 for the countries whose economies are stabilizing (Maghreb, Caucasus, Balkans, CIS), by 3 for countries that are candidates for accession to the EU and by 2 for the New Member States.
By time horizon 2020, Russia, driven by its exports, should integrate the EU trade corridor in the Western part of the region. Besides major links with EU Member States, Turkey, Greece and Ukraine will probably remain major partners.

Given the projected growth rates, Turkey has the capacity to become a major hub and automatic partner in the Mediterranean area.

Besides traditional North-South relations (France/Algeria, Italy/Libya, Turkey/Israel), the orientation of Mediterranean export flows will become increasingly structured and dominated by East-West relations.

The traditional exporting countries in the EU (Italy, France, Spain) may well become net importers in terms of intra-Mediterranean trade. Italy will continue to play a central role for Turkish exports to Spain, Portugal and France.

Spain has the potential to overtake Italy as the main importer of French products and thereby constitute with France the most important axis for trade by value in the region.

Turkey should probably be able to accommodate a large share of Russian and Italian exports.

In the Southern part of the Mediterranean, Libya should also have the potential to generate major flows towards Italy, Spain or Turkey.

In order to identify demand for transport and in particular the share of intermodal traffic within an even more detailed framework, in which bulk goods (liquid/dry bulk, crude oil, etc.) can be separately identified, the best approach is to forecast the volume of trade in finished products (by value and tonnages) that can be directly assigned to the intermodal chain.
Spatial/territorial quantification of the intermodal potential of unitised product flows

Detailed quantification of unitised products not only confirmed some of the earlier findings but also identified the countries and regions which were likely to have relevant potential for intermodal transport services (relevant tonnages, low-value cargos, etc.).

**Figure 5: Spatial distribution of potential for exporting finished products compared with the total**

The distribution of average values by tonne (all countries combined) shows the strong export potential of high value added products (>USD 1000/tonne) of the Latin Arc countries, whereas the Eastern Mediterranean is within the average range (USD 300-1 000/tonne).

Apart from Russia and Albania, finished products account for at least 50% of the total (value or volume) in the Northern part of the region.

Because of the scale of some high-volume export shipments, the frequency at which some countries send shipments (Russia, Algeria, Libya, Ukraine) is falling although tonnages per shipment are increasing.

Since Russia, Ukraine, the Maghreb and the Near East are major hubs for the consolidation of low-value products, it flows from these countries will probably be routed by sea.

The high concentration of flows of low-value products is an additional argument in favour of maritime shipping on North-East/South-East or North-West/South-East axes. However, because less than 40% of Mediterranean tonnages exports from Latin Arc countries are transported by sea, whereas movements in the South or the Eastern part of the area are assumed to account for over 90% of total tonnages traded, it is very likely that by 2020 the estimated share for the Eastern seaboard will be capable of rivalling with or even overtaking the tonnages shipped from the Western seaboard.

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1 The COMTRADE 2004 database (2000 data, Mediterranean countries and/or all countries and products combined) provided the essential basis for the quantification of unitised products (finished products). Some relevant ratios also incorporate the ratio of finished products to total trade.

2 By way of example, Russia has a very high export potential. Its tonnages are among the highest in the region (all products and countries combined). Even in terms of finished products, Russia is ranked second immediately after France (COMTRADE database, 2000 and 2002).
The predominantly North/South-West and North-West/South-East orientation for export flows of finished products reflects the preponderant share of French exports to the Maghreb, while Italy is the leading supplier to the Balkans and the Eastern Mediterranean.

Russia also has substantial export flows (less in terms of value and more in terms of tonnage) to Ukraine, Turkey, France and Italy.

The tonnages of finished products traded in the Mediterranean exhibit a far more uniform distribution of flows throughout the region as well as the creation of a reciprocal axis between Turkey and Spain.

Besides the above, Egypt and Algeria would appear to be increasingly involved in trade with the two opposite sides of the Mediterranean.

After evaluating potential overall demand for the Mediterranean area as a whole on the basis of the spatial distribution of the main trade flows, the next step is to see how these flows are matched to the supply of intermodal transport services and the relevance of this supply in a global and regional (Mediterranean and Black Sea) context.

III. Potential supply of services

Used for many years primarily for international transit traffic with virtually no major links to land networks, the Mediterranean and the Black Sea have remained isolated from major intercontinental trade flows. As a result, the major port hinterlands have been concentrated in the North-Western part of the Mediterranean (Valencia, Marseille, Genoa) where a large share of intermodal chains are already combined with land and maritime interconnections. However, in the entire Southern part (North Africa or Near East) land links to major ports as well as links to neighbouring countries are still either non-existent or relatively undeveloped.
Following growth in trade over the past few years between European countries and South-East Asia and China, a number of Mediterranean ports have proved to be important links in the intermodal chain serving the Mediterranean.

This new maritime organisation has undoubtedly been affected by the opening-up of countries in the Black Sea region to European and international trade as well as by the increasingly close links between Mediterranean ports and the Northern Range.

Against a background of opening-up to the global market and growth in European and intra-Mediterranean cabotage, the supply of intermodal services in the region studied (Mediterranean and Black Sea) is to a large extent governed not only by specific regional or national demand generating a sufficient level of flow consolidation, but also by the port facilities and services proposed by specialist operators.

**Development of regional and intercontinental intermodality in the Mediterranean and the Black Sea**

Aided by being located at the half-way house for intercontinental services between Europe and Asia and regional scheduled lines (Mediterranean and Black Sea), intra-Mediterranean intermodal services, both containerised and mixed, are practically dominated by the worldwide feeder network.

The gradual consolidation of maritime flows throughout the Mediterranean (see below), the introduction of new equipment and the structuring of unitised services (both inside and outside the region) have allowed the overall number of ports of call and the formation of several strategic or paired hubs for collection, dispatching or regional transshipment. Here are the main general examples based on the services observed (in 2003) and integrated by the dedicated GIS spatial model:

- **Hubs of strategic or intercontinental importance:**
  - Algeciras: a unique position as a gateway into and out of the Mediterranean area for intercontinental (Atlantic) flows;
  - Istanbul/Haydarpasa/Ambarli: multi terminal and gateway into and out of the Black Sea area;
  - Port Said: key position as a gateway for intercontinental flows into and out of the Mediterranean area (Persian Gulf, Indian Ocean, Asia, Pacific, etc.) through the Suez canal;

- **Paired Hubs (either competing with or working in partnership with each other) of intercontinental and regional importance:**
  - Gioia Tauro – Marsaxlokk: spatially differentiated competing intercontinental hubs (without a hinterland) offering similar functions in similar markets;
  - Valencia - Barcelona: regional and intercontinental hubs with an extensive shared hinterland (complementary functions);
  - Piraeus – Izmir: spatially differentiated regional hubs offering similar services in similar markets (major hinterlands);
  - Damiette/Alexandria – Ashdod/Haifa: twin paired hubs for transit, collection and dispatching (complementary functions).

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1. Although it would undoubtedly be of interest, in view of the complexity (heterogenous data) and variability of supply and the strategies pursued by feeder operators working in the region (global carriers and various other types of carrier: independent, subsidiaries, integrated), it will not be possible to go into greater detail regarding the main actors in the Mediterranean market.

2. To identify and evaluate the potential of the Mediterranean intermodal system, it was necessary to integrate all the data and information collected (port data, maritime periodicals, national sources, etc.) into a maritime model specially designed for that purpose by the NESTEAR team (GIS support and design: V. Siarov, assignment; C. Decoupigny, base generation and distribution; COMTRADE, 2000 data).

3. Some Italian ports (Genoa - La Spezia – Leghorn or Tarento – Naples) have relatively similar functional, spatial and multimodal configurations.
According to the information available in 2004\(^1\), the global containerised traffic observed (2002 data)\(^2\) in Mediterranean countries grew at an annual rate of 11\(^{\circ}\)\(^3\) (+3\% compared with annual growth worldwide, all ports combined).

A closer look at the overall regional performance of Mediterranean ports, again on the basis of annual results (2001 et 2002) aggregated by country and by region, shows that it is the Black Sea region which has the highest rate of growth (+25\%), dominated by Ukraine (+47\%), Bulgaria\(^4\) (+25\%) and Russia (+24\%).

The Eastern Mediterranean countries together with the Adriatic are ranked in second place (+13\%), while the Western Mediterranean (both South and North) had a rate of growth below the regional average observed (+11\% for the Maghreb plus Malta and +9\% for the countries in the Latin Arc respectively).

Moreover, the gradual increased in Mediterranean containerised freight\(^5\) compared with the worldwide total (11.3\% in 2001 and 11.5\% in 2002) is an equally symptomatic indicator of growth in intermodal containerised transport in the region.

**Figure 7: Breakdown of containerised freight by major countries in the region (2002/2001 data)**\(^6\)

The overall breakdown of the main intermodal services observed in 2003 (on a weekly basis) in terms of capacities and frequency of services clearly shows the predominance of two spatial rationales defined not only in terms of the intermodal typology of the main services (cargos, containers and Ro-Ro), but also in terms of distances between links or the geographical location of the main Mediterranean ports.

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\(^2\) Classified by number of TEU (Twenty-Foot Equivalent) loading units transshipped.

\(^3\) Based on the 20 main countries in the region referenced in the “Containerisation international 2004 Yearbook”.

\(^4\) The data relating to recent containerisation in Bulgaria, taken from “Containerisation international” refer solely to the port of Varna. Due to the lack of harmonised data for the port of Burgas, which has similar capacity, no account could be taken of the latter.

\(^5\) The 20 main countries in the Mediterranean and Black Sea region.

ECMT/UNECE Seminar: Intermodal transport between Europe and Asia -- Relevance and potential
Vesselin Siarov, Relevance and potential of intermodal transport in the Mediterranean and Black Sea region, NESTEAR

Figure 8: Breakdown of main intermodal services and maritime links (estimated)

Based on daily or weekly services, the supply of container services is the dominant intermodal mode for ports with intercontinental links (feeder links).

Ro-Ro services, when used over short distances (Adriatic, Aegean Sea, straits of Messina and Gibraltar), are far more frequent and direct.

Despite the large extent to which services are combined and the lack of large-scale harmonised data, it is nonetheless possible to make an overall estimate of the breakdown of the main intermodal services on the basis of the physical presence, or movements recorded, of the main types of vessel, referenced in relation to the main ports in the region (Mediterranean and Black Sea) in 2003 and 2004.

Figure 9: Supply of services in the Mediterranean and Black Sea (share as % of the total number)

A detailed analysis of the overall supply of services in the region would suggest that at least two thirds of the proposed supply would be dedicated to freight (unitised and bulk).

Container-ship and cargo services together account for at least 50% of total supply.

Furthermore, cargo ship general freight services (usually packaged) are ranked in first place with 33% of the supply, whereas container services are estimated to amount to 17%.

Ro-Ro services, often combined with passenger or cargo ships, account for 20% of the entire supply in the Mediterranean.

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1 Author’s estimate based on all vessels (all types, flag and capacity combined) present in the region during a given period of time (<1 month).
The spatial assignment of intermodal services proposed in early 2004 in relation to the main trade flows modelled\(^1\) (base: physical supply, theoretical network, port facilities and intermodal services) made it possible to identify both the main consolidation points and the main shipping routes likely to constitute the intermodal system in the Mediterranean area.

Besides the North-South links observed in the Western Mediterranean, the Adriatic and the Black Sea, most intra-Mediterranean trade flows are routed West-East starting from the Straits of Gibraltar towards either the Bosphorus and the Black Sea or the Near East and the Suez Canal.

Given the service frequencies observed\(^2\), the main ports in the Western Mediterranean, the Italian and Greek ports in the Southern Adriatic as well as certain Moroccan and Tunisian ports provide a substantial and relatively uniform share of the supply of services, in which Ro-Ro and containers freight dominate.

Despite the lack of certain information\(^3\), the services observed in the Western part of the Black Sea would seem to indicate that the region still remains largely dominated by cargo services (procurement of basic products and exports of packaged or unitised raw materials). This activity is also associated with the continual growth in containerisation in the region (see Figures 7 and 8 above).

There is an abundant supply of intermodal services in the Near East, although these services are still being organised. Because the regional market is dominated by a large number of independent operators, the services proposed vary considerably both in terms of type (cargo, containers and Ro-Ro) and in terms of the links and frequency of services offered (direct country/country links or large numbers of ports of call).

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\(^{1}\) Values traded (USD millions) all freight combined (COMTRADE base, 2002 data).

\(^{2}\) Weekly services, all vessels, operators, flags and capacities combined (first quarter 2004).

\(^{3}\) It was not possible to obtain recent (reliable and harmonised) data with regard to the supply of services in the Eastern and Southern parts of the Black Sea (Russia, Georgia and Turkey).
It should also be noted that despite indisputable advantages, namely limited load breaks during transshipments and regular services, the introduction of a number of scheduled Ro-Ro lines on several direct North-South links in the Western Mediterranean, and above all the Eastern part of the region (e.g. Turkey/Italy), has required major and constant consolidation of flows as well as strong bilateral demand\(^1\).

Moreover, unlike cargo or container services, direct Ro-Ro links, particularly on North-South routes, are characterised not only by mixed loads (passengers, light vehicles and trailers), regulated service frequencies (several times a day for short distances\(^2\) and weekly for long distances), but also by the difficulty in securing appropriate differentiation\(^3\) between mixed ferries (passengers and freight) and Ro-Ro services dedicated to freight (unaccompanied or not). As a result, this type of intermodal service will not be discussed in the same depth as cargo and container services.

Identification of reserve capacity and development potential for the most relevant intermodal services (cargo and containers)

In order to identify the spatial location of reserve capacity and development potential with regard to the frequency, capacity and organisation of the services available in 2004 in the region, a detailed look must be taken at both the spatial distribution of services, by country of origin or destination, and the concentration of ports of call and unitised flows (cargos and containers) at the level of the main transshipment points.

Figure 11: Distribution of main services by O/D of the countries served

The main services grouped by country are strongly affected by the central geographical position occupied by Italy half way along the main Mediterranean routes.

Turkey and Spain have dense networks of links due to their strategic positions (gateways into and out of the interconnected Mediterranean/Black Sea systems.

Russia and Egypt also enjoy very good links to other countries in the region.

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\(^1\) The most important Ro-Ro services in the Mediterranean in terms of capacity and frequency are those to the Cyclades Islands in the Aegean Sea (Greece), the Straits of Messina (Italy), the Bosphorus Straits (Turkey), the Straits of Gibraltar (Spain/Morocco) as well as the many direct links in the Adriatic (Greece/Italy).

\(^2\) The sole exception in the region where trailers predominate, distances, and where frequencies of service are longer, is to be found between the West coast of Turkey and the Northern end of the Adriatic.

\(^3\) Although serving very different purposes, the two services are often provided by vessels of a similar or identical type, which poses problems with regard to how they should be properly identified or quantified.
Italy is similarly the sole country with uniform capacity density with regard to the Mediterranean as a whole.

Turkey, Egypt and to a lesser extent Russia retain major capacity with regard to westward flows.

The Maghreb maintains some trade capacity with the Black Sea region, while the Near East reserves a large portion of its capacity for local traffic.

In order to gain an even more detailed insight into the main service routes and their inter-linkages (cargo and container vessel services) through examination of the links used most heavily and direct port-to-port links, it was necessary to construct an O/D matrix\(^2\) to illustrate the overall compilation of all ports of call after they had been uncoupled and assigned to the ports concerned.

Dominated by a feeder-based approach, the Northern part of the Mediterranean is without doubt the region where ports of call or direct links are organised the most effectively.

A dense and relatively well-planned network of shipping routes provides access to the Black Sea.

Despite the density of services available in the Near East, ports of call still remain highly scattered.

Gioia acts as a major hub half-way between Europe and Asia, the Black Sea and the Atlantic.

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1 Available capacity has been estimated on the basis of the ‘gross volumes’ of the vessels chartered and expressed in terms of Gross Registered Tons (GRT) aggregated by country of origin and destination, all flags or operators combined (2004 data, capitalised by NESTEAR). The projections relating to the distribution of Deadweight Tonnage (DWT) are similar. Data relating to Russia and Georgia are based solely on the presence of vessels flying the national flags of the countries in the region.

2 In its final version, the O/D matrix contained over 11 000 references (direct port-to-port links) in the Mediterranean and Western Black Sea.

3 Projections based on data relating to the Mediterranean and Western Black Sea only. Because of gaps in the data regarding the Western and Southern parts of the Black Sea, it was not possible to take account of all ports of call in this region.
Integrating demand and relevant services in the Mediterranean and Black Sea area into the distribution of the major maritime flows in an enlarged Europe

The spatial and dynamic integration of the most significant aspects of service supply and demand viewed on a much large scale, namely that of an enlarged Europe, is without doubt a better guarantee of a fair assessment of overall intermodal potential in the Mediterranean region and its immediate neighbourhood.

The distribution and spatial allocation of the unitised products associated with the services in the maritime intermodal supply, extended to the scale of Europe as a whole, can provide the main components of an experimental spatial model\(^1\) applicable both within the Mediterranean context and in a broader, European perspective.

This operational integration of trade flows and the supply of services has provided a straightforward and effective means of identifying not only the potential axes for the main shipping routes at the pan-European level but also the regions and intermodal ports with reserve capacity and potential of interest, or even sufficient, for the introduction of scheduled services (accompanied or unaccompanied intermodal transport) in the Mediterranean and Black Sea.

Figure 14: Modelled distribution of intermodal potential (packaged and unitised products)

Lastly, it is also possible to used the main export flows assigned to the maritime network to determine the overall and indicative distribution of the intermodal transshipment potential of the main national ports.

\(^1\) The experimental spatial model designed for this study (traffic generation and GIS: V. Siarov; network assignment: C. Découigny; NESTEAR, 2004) considers both the modal split (country/country OD) and the degree of national involvement in trade (at the scale of an enlarged Europe) in order to integration the flow consolidation and distribution points in the intra-European and Mediterranean maritime intermodal system. The distribution and grouping of the main intermodal services by transshipment point and country of origin made it possible to calibrate the model and orientate the charts showing the maritime network.
IV. Intermodal priorities and projects in the Mediterranean and Black Sea region

The enlargement of the European Union towards the Mediterranean (Malta and Cyprus followed by Croatia and Turkey) and the Black Sea (Bulgaria and Romania, on the one hand, and the rapid development of trade and intercontinental transit flows in the region on the other, have posed an enormous (political and economic) challenge requiring a complete overhaul of long-term priorities in order to facilitate the consolidation of intercontinental links in the transport system, notably through the integration of maritime routes into the intermodal chain between Europe and Asia.

Given the fact that development of the Mediterranean area as well as that of the Black Sea depends to a large extent on the EU opening up to this diverse and complex region, and vice versa, the integration processes currently in progress and above all the future plans for enlargement can only become a reality in a context of peace, liberalisation and opening of the economies of all the countries concerned.

Due to the key position occupied by the Mediterranean countries within the area between Europe and Asia, the region is expected to play an increasingly important role in the new organisation of the space between Europe, Asia and North Africa. Against this background, a large number of European initiatives and programmes, bilateral and multilateral agreements between EU Member States and the countries in the region have been put in place within the framework of partnerships in an enlarged Europe in order to facilitate, in the long term, the political stabilisation and economic integration of the EU’s neighbours in the South and South-East.

Outlook for the development of transport and intermodality

Given that maritime transport has remained the main mode of transport for intercontinental flows over the past few years, and the second highest mode after road (in t/km) for intra-European trade, the European Commission has put many instruments in place to promote the development of the maritime mode in the enlarged European area.

Short sea shipping has been a major priority for European transport policy since 1992. In 2001, the Marco Polo programme provided additional support for intermodal initiatives with a view to rebalancing, or simply reducing, road traffic along certain saturated corridors to other modes, include maritime, in the Mediterranean.

In accordance with the recommendations of the White Paper (2001) to promote the development of maritime cabotage, among which was the creation of the concept of “motorways of the sea”, the main corridors in the Mediterranean have been integrated into the overall review of TEN-T priority projects of European interest as number 21 (see Figure 15 below).

Treated as multimodal infrastructure, the new mechanism (motorways of the sear) aims at “… concentrating freight flows on a limited number of sea connections to ensure their financial viability while reducing road traffic2.

In this way, the maritime links concerned are expected to be granted (European and national) financial aid, thereby placing the development of motorways of the sea in a framework that is broader and more competitive than that of conventional shipping services.

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1 In a strictly Mediterranean context (North Africa and Near East), the Barcelona Convention (1995) signed by the 15 EU Member States and the 12 Southern Mediterranean partners provides for creation of a free trade zone by 2010-1012 in order to facilitate the free movement of goods within the region.

The importance of the development of Motorways of the sea is to ensure that transnational maritime links between countries isolated for geographical reasons, or affected by road congestion, will be treated with the same importance as land links. The objective is to concentrate freight transport for some key links on a limited number of ports to increase the viability of these links.

The priorities for regional and intermodal development in the Black Sea region have been integrated into the projects and initiatives undertaken since 1993 within the framework of the Asia-Caucasus-Europe transit corridor “TRACECA”\(^2\), supplemented by the Black Sea Pan-European Transport Area (PETrA) officially adopted in\(^3\), to guarantee the development of transport, efficient traffic management, safety and environmental protection of all the countries in the region (in Europe or bordering on the Black Sea).

Given the future accession of Romania and Bulgaria to the EU (forecast for 2007) and the opening of negotiations over the possible accession of Turkey (planned for 2015), the outlook for the development of projects in the Black Sea region to which a commitment has already been made as part of the PETrA initiative are more promising than ever.

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1. Idem (see [http://europa.eu.int/](http://europa.eu.int/)).
2. The TRACECA project (TRAnsport Corridor Europe Caucasus Asia), launched in May 1993 as a supplement to the European Commission’s TACIS programme, aims to develop alternative transport and trade routes through the CIS to Central Asia.
Intermodal operational development of the transport system

The future development of the intermodal system (sea/ports and inland transport) in the Mediterranean and Black Sea will require the operational integration of information systems through the deployment of new decision-making aids that will reinforce the processes of trade, forecasting and data localisation through the permanent monitoring of transports and the transport environment in the peripheral regions at the interface between Europe and Asia (Mediterranean, Near East, Black Sea, Caspian Sea, etc.).

The aim is to validate the databases that have already been harmonised and to further refine not only the instruments designed within framework of pan-European corridors\(^1\) and TEN-T projects, but also and above all the experience gained within the framework of AGR, AGD/AGTC and AGN agreements of the TEM and TER networks developed by the UNECE given that they have all been validated by a broad international consensus.

Figure 17: Operational integration of supply and demand for services and also priorities through priority multimodal corridors and/or an intra-Mediterranean intermodal

Example of “demonstration” priority corridors designed by political actors and Mediterranean researchers as part of the European MED TEN-T Project (2003-2005) for the purpose of testing the performance of the main transport corridors in the region.

While not exhaustive, these corridors are nonetheless the first links in the multimodal operational system in the Mediterranean.

In order to integrate links and essential transshipment points, it is possible to use dedicated GIS to illustrate (on an experimental basis) the main sea/land interface links that could form an integral and operational intermodal transport system in the Mediterranean and the Black Sea.

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\(^1\) Developed jointly by the European Conference of Ministers of Transport and the European Commission since 1994.
V. Conclusions

The general distribution of the main flows in the Mediterranean and Black Sea, in conjunction with overall demand and the consolidation points that have strong export and import potential, is strongly influenced by accelerated globalisation and above all the opening up of, and very high growth in, economic trade between the countries in the region and Western Europe and Asia. However, political and economic instability in the Near East, the Caucasian countries and certain Balkan countries still remains a major factor for upheaval in the normalisation, organisation and consolidation of regional and intercontinental trade.

In view of the development and typological distribution of the supply of intermodal services observed over the past two years in the region, it is possible to identify the presence of several rationales for geographical grouping or differentiation among the main connections and transshipment points in the regional intermodal chain:

- In the Northern part of the Mediterranean, the maritime chain occupies an ancillary position in the multimodal distribution of Mediterranean traffic, governed by somewhat disparate relations between forwarders (demand) and operators (service). However, well-organised ports of call and the substantial reserve capacity available allow large volumes of freight to be transferred. The services proposed at the major transshipment points are spatially ranked in terms of interconnection facilities (sea/rail and sea/road) and access to land networks, as well as in terms of intercontinental trade and the frequency of worldwide feeder services (Europe-Asia) through the Mediterranean.

- The diversity and variability of products noted in the Southern Mediterranean and Near East suggest that there is insufficient consolidation of maritime flows and an excessive number of ports of call, coupled with permanent changes in the supply of intermodal services. However, because of the high and growing density of containerised services transiting through the Suez Canal, local transshipment points (Egypt, Jordan, Israel or even Cyprus) have been able to profit from the soaring growth in intercontinental transport.

- The Black Sea basin still exhibits a pattern of supplying exports of raw materials and imports of manufacture products with low value added. Consequently, although cargo services still dominate, the gradual increase in the containerised supply recently observed in certain countries looks set to extend over the next few years to the region as a whole.

- For many years perceived as an international transit zone or a Sea dominated by short sea shipping services, the Aegean Sea and the two main centres for large-scale consolidation (Piraeus and Izmir) are starting to replace certain Ro-Ro services with an increasingly competitive containerised supply.

The reorganisation of trade in the context of European enlargement towards the Black Sea, planned for 2007, and the consolidation of intermodal links between Europe and Asia, in response to the move towards international containerisation (Europe-Asia and/or East-West, will necessarily call for the revamping of all medium and long-term priorities and projects in order to integrate the main sea links into the inland intermodal system and to extend pan-European multimodal corridors towards Asia through the Black Sea and the Near East along the routes used most commonly.

What remains to be redefined within the context of an enlarged Europe, composed not only of European countries but also of third countries (neighbouring countries in the Mediterranean, the Black Sea and the Near East) are both the concepts and the decision-making tools that allow policies, resources (national and international), operational methods and capitalised information to be updated in order to construct the priority intermodal system for the integrated region.