Final report

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I – ABSTRACT

MEDA TEN-T is a project of the INCO MED Programme of the European Commission elaborated during a period of 27 months, from 1-3-2003 until 31-5-2005. The main goal of the project was the development of a common approach for transport infrastructure in the MEDA area and its contribution to a better integration of transport networks in the Mediterranean area, within the policy context of the Barcelona Process of the Euro-Mediterranean Partnership.

MEDA TEN-T objectives concentrate on the improvement of the transport operations with special focus on Mediterranean interoperability, the analysis of the strategic planning process both at national and international level to end up with a proposal of action plan to improve decision making process at European and Mediterranean scale.

Over the past two years MEDA TEN-T has succeeded, through the excellent co-operation of the partners amongst the consortium, in implementing the following objectives:

- The production of a panorama of the Transport Infrastructure and Services System in the Mediterranean with emphasis on the integrated transport infrastructures development in the Mediterranean region;
- The improvement of interconnectivity and interoperability between the Mediterranean countries and between the Mediterranean and the rest of the EU, in order to facilitate interaction and networking towards the establishment of a Euro-Mediterranean Free Trade Area;
- The extension of the TEN-T network to MEDA countries through the enhancement of maritime connections – and, in particular, the introduction of sea-motorways – and the integration of the air network.

These issues have been addressed considering the specificities of the Mediterranean countries involved in MEDA TEN-T:

- The specificity of the Mediterranean transport system, particularly with regard to the intermodal transport chain including maritime and air transport
- The exploitation of existing Mediterranean and European expertise in decision-making for the planning of transport infrastructure and the development of strategies for achieving integrated infrastructure planning and interoperability of transport systems in the Mediterranean region and between the EU and the Mediterranean – this includes the definition of assessment criteria, including for environmental impact;
• The facilitation and promotion of a dialogue among the Mediterranean partner countries and between the latter and the EU Member States;
• The dissemination of information on transport sector issues.

Additionally, the developments of Geographic Information System (GIS) techniques for description of Mediterranean corridors are applied in a way, which is consistent with the presentation made for TEN-T priority projects by the Commission, extending the use of such tools to maritime links in the Mediterranean area.

More analytically, the project has focused on the analysis of the integration of intermodal transport chain within demonstration corridors as well as on the definition and application of a methodology for evaluation of transport projects within demonstration corridors.

This analysis was based on an important collection of data which has included data concerning trade between countries (from COMEXT), characterisation of a Mediterranean network of ports positioned as regards road and rail networks, as well as collection of information relative to services including distinction between type of services. In other words the assessment of performances is based on economic development context as well as on a segmentation of market for a more appropriate analysis of the intermodal transport chain integration.

The context of the project is also characterized by the launching of the High Level Group II chaired by Mrs. de Palaccio and the definition of a neighbourhood policy by the Commission where transport should play an important role. The objective is the selection of priority corridors and priority projects in particular for relations between European countries and neighbouring countries; regional corridors between third countries are also considered, a concept which MEDA TEN-T adapts.

**Overall Methodological Approach of the Project**

Deliverable 1 of the MEDA TEN-T project had two main objectives: a) to provide a general overview of the existing transport infrastructure situation in the Mediterranean countries, and b) to report on the first outputs of the workshops, which constituted a significant part of the production of results.

The focus of Deliverable 1 was put on the “corridor” approach and the selection of “demonstration” corridors, which were the basic concept of the methodology developed by MEDA TEN-T. The methodology was based on work performed through the different work packages, in order to reach objectives of network integration between Mediterranean and European countries. Also, Deliverable 1 described the work achieved in order to
consolidate the development of a methodology in consultation with all partners involved. This methodology was supported by the collection of a wide range of informations, based on specific surveys as well as on existing data, in order to develop a “Mediterranean transport office”.

The aim of Deliverable 2 was to map out national and cross-border transport that would be needed to create a 'common transport space' that spans at both sides of the Mediterranean sea. For this purpose the report analyses the demonstration corridors selected during the workshops. These Corridors create the transport network of infrastructure and services in the Mediterranean region, through which the requirements of transport users can be identified, as well the analyses of sector national plans and the performance of each transport sector in the countries concerned. The first questionnaire, titled “A-Z Typology”, which consisted of 9 groups of criterions, addressed different dimensions of the demonstration corridor. It is acknowledged that all dimensions have not the same relevance for a given corridor, and that information required at this stage assists in: (i) pointing which type of corridor would be adapted for a given facet of the project, as well as (ii) providing an overall review of these possibilities for the first selection of demonstration corridors (MEDA TEN-T, D1).

The work presented in this Deliverable 2 was an overview of the transport system in the region, regarding all issues, and it focused on technical, operational or administrative issues. Therefore, as such, it has set the basis for the more analytical work that was performed in the other Deliverables, the elaboration of which followed.

The assessment of these corridors was based on the analysis of the modes that were dominant in the area. Importance was therefore attached to maritime and air transport services. Short-sea shipping was also particularly important given the distances involved and the fact that, in some cases, land links are non-existent in practice.

It must be noted here, that one of the most difficult challenges throughout the MEDA TEN-T work was to obtain reliable and consistent data that could be properly compared on a like for like basis. To achieve this, a number of adjustments took place, in order to make the data comparable. It was also necessary to verify the understanding that each participant had regarding data definitions. As a result of the above, the completeness of the information collected throughout the project could be considered rather moderate.

The analysis of the integration of Mediterranean transport and intermodal chain in Euro-Mediterranean area from a demand and supply side was the key objective of Deliverable 3. The demand approach stressed the transport needs in terms of volume and type of services for each country concerned. At this stage it was important to show the diversity of situations between Mediterranean countries; from North to South, from East to West. Specificities
between the western part and eastern part of the Mediterranean were identified, although the Mediterranean area was considered as one area.

In Deliverable 3, the political objectives and the actions initiated by national and international organisations to create a free trade zone, between Europe and Mediterranean partners, were also considered. This was necessitated due to their impact on the economic relations and on the organisation and facilitation of transport.

For the supply approach, Deliverable 3 focused on the organisation of transport chains and addressed the role of transport actors, shippers and transport operators of different modes. The analysis was conducted at a micro level. Once this context was set, attention was put on the intermodal network of services within the area with differentiation between types of services. It is noted that distinction was made between containers services and ro-ro services with an emphasis on road land connections, although rail/sea intermodal combination was also be discussed.

Following this, the demonstration corridors were introduced within the network in order to benchmark the performances of corridors as part of an intermodal network in the Mediterranean with concrete examples. Based on the analysis and comparisons between global context and concrete examples of transport chains, recommendations for the improvement of integration of transport chain were made. They are based on infrastructure transport technologies, organisation and administrative problems.

Finally, Deliverable 4 of the MEDA TEN-T Project reviewed the methods of assessment and evaluation in use in the Mediterranean countries as well as those at EU level. On this basis it develops an assessment framework that was acceptable to all relevant stakeholders. This framework could be used for the prioritization – at the strategic level- of projects and corridors in the MEDA-TENT network. MEDA TEN-T developed a multi-criteria assessment framework applied to demonstration corridors that can be used to identify priority projects. This was the result of a thorough analysis of the methods for strategic assessment and evaluation in use in the Mediterranean and European Union countries.

The criteria used were related to those adopted for projects prioritization, as they have been applied for the identification of TEN-T projects and for other multi-national projects.

The Deliverable 4 outlined the main principles followed by methodologies used at EU level and by international organizations for prioritising infrastructure investments, recorded the expertise developed with regard to evaluation in previous studies on the Mediterranean region, reviewed the state-of-the-art in transport assessment in Mediterranean countries. Based on these, it
is proposed a set of evaluation criteria and an assessment method to be applied in prioritization exercises involving cross-national investments. This work constituted the basis on which the use of these criteria on a sub-set of transport corridors in the Mediterranean region could be demonstrated. Concluding, Deliverable 4 presented the lessons learned and orientations for future research and transport policy analysis.

The definition of criteria for priority investment and policy plans represents the first step towards the creation and subsequent consolidation of a Mediterranean Master Plan. Deliverable 5 elaborates a strategy in two phases and makes recommendations to launch a dynamic process which should become a permanent process of analysis and dialogue at Mediterranean scale in relation with the Euro-Mediterranean policy. The generalization of criteria and the definition of a global reference scenario will be part of this report.

Additionally, trends are estimated based on a common methodology for the whole region. These objectives concern transport policy and priority transport links and will include the major projects analyzed in MEDA TEN-T. Therefore, a strategy for achieving integrated infrastructure planning, interconnectivity and interoperability of transport systems in the Mediterranean region and between the EU and the Mediterranean will be elaborated, incorporating the relevant concepts produced by the TINA process for the Accession countries.

**II – INTRODUCTION**

MEDA TEN-T has a status of accompanying measure and is expected to provide results in terms of benchmarking, assessment of the present transport situation, implementation of common information system, as well as a proposal for evaluation procedures in the Mediterranean area.

However, MEDA TEN-T also functions as a thematic network, with representatives of fifteen countries around the Mediterranean, including Cyprus and Malta: this gives much importance in the work plan to workshops and conferences organisation, which are privileged periods where all partners meet, and also to the structuring of a common reference database using internet communication.

The objectives addressed by MEDA TEN-T are related to the following issues:

- The production of a panorama of the Transport Infrastructure and Services System in the Mediterranean with an emphasis on integrated transport infrastructures development in the Mediterranean region;
- The interconnectivity and interoperability between the Mediterranean countries and between the Mediterranean and the rest of the EU, in order to
facilitate interaction and networking towards the establishment of a Euro-Mediterranean Free Trade Area;

- The extension of the TEN-T to MEDA countries through the enhancement of maritime connections – and, in particular, the introduction of Motorways of the Sea – and the integration of the air network.

These issues should be addressed considering the specificities of Mediterranean countries. Such specificities include:

- The specificity of the Mediterranean transport system, particularly with regard to the intermodal transport chain including maritime and air transport;
- The exploitation of both existing Mediterranean and European expertise in decision-making for the planning of transport infrastructure: it concerns the development of strategies for achieving integrated infrastructure planning and interoperability of transport systems in the Mediterranean region as well as between the EU and the Mediterranean – this includes in particular the definition of assessment criteria, for environmental impact;
- The facilitation and promotion of a dialogue among the Mediterranean partner countries and between the latter and the EU Member States;
- The dissemination of information on transport sector issues.

More specifically, MEDA TEN-T objectives consider the improvement of transport operations, with special focus on Mediterranean interoperability, in parallel with an analysis on strategic planning process both at national and international level to conclude with a proposal of an action plan to improve decision making process at European and Mediterranean scale, including definition of an adequate information system.

MEDA TEN-T established and operated on a long term basis a network of Transport experts of Mediterranean area, representing countries of the Western and the Eastern part of Mediterranean; the objective followed was the enhancement of the common understanding of transport evolution and the promotion of a better integration of transport networks in the area.

The work plan presented throughout MEDA TEN-T reflects the important effort made on conceptual and methodological approaches with constant reference to information available, past results of researches, as well as on the context of the EU Mediterranean policy, including reference to the work achieved by the High Level Group (HLG), chaired by Mrs de Palaccio, the work achieved in different regional organisations on transport such as UMA and obviously national plans: national representatives have participated to all MEDA TEN-T workshops and partners in different countries have been in permanent contact with their administration.
II – MEDA TEN-T METHODOLOGY: CONCEPTS OF DEMONSTRATION CORRIDOR AND TOOLBOX

1. Concept of demonstration corridor

The MEDA TEN-T objective required to set up new methods adapted to the analysis of the Mediterranean transport situation, the assessment of the policy, the cooperation of research institutions with policy makers and the use of the available data.

More specifically, the integration of MEDA and TEN networks required:

- A “global” approach with representatives of all MEDA countries
- An “integration” of sea and land transport
- The definition of “harmonised” methods and data sets applied to all countries/policies
- A “concerted” analysis which is reflected by the importance given to workshops including research institutes and national representatives.
- And finally “operational” approach with, at the end, clear recommendation for an Action Plan in the region.

Therefore, an important effort on definition of methods has been made, benefiting from past experience of cooperation with region, using the concepts of “demonstration” corridors and “toolbox”.

The concept of “demonstration” corridor is a new concept: a corridor is selected as a kind of “laboratory” to assess the performances of transport and test evaluation methods. In doing so the “demonstration” corridor provides a concrete and real framework which will guarantee the consistency of the overall MEDA TEN methodology.

The concept of toolbox is then certainly not a new concept. But is has been used in MEDA TEN-T all along the project in order to harmonise and progressively enrich data available and useful for the project objectives. To do this the GIS technique has proven to be particularly adapted, showing the way for improvement of Mediterranean database.

This concept of corridor is not a new concept in Mediterranean area. In the eighties the United Nations (Economic Commission for Europe) has conducted three major corridor studies within corridors which ended up in Mediterranean area; these corridors analysis have pointed out the necessity to develop Mediterranean transport observatories, with, in particular, CETMO for the West part and TRANSCEM for the East part of the region.
Later on, Mediterranean countries have been associated to Pan European priority corridor definition and CORRIMED results have been presented at Helsinki conference, for identification of priority corridors in Mediterranean area.

However, all these analysis have been conducted in different contexts, with different approaches: the UN corridors were large “bands” covering most of the countries network along the corridor and were aiming more at promotion of international cooperation than at the selection of priority projects, eligible for co-financing.

The CORRIMED corridors were defined in a way more comparable to the ten CEEC priority corridors with an effort made to identify precise routes; for the Western part UMA projects provided already a detailed analysis.

The REDWEG corridors were defined in the context of “peace process” in Middle East and had to be described with much details: an important objective was to combine “fast track” projects with long term projects, in a scenario of peace in the Middle East.

In most of these initiatives the corridors helped to develop a multimodal approach and to mobilise countries and stakeholders on specific projects, combining infrastructure investments with regulation measures, for a better use of networks and intermodal solutions.

In the MEDA TEN-T project the concept of corridor is central in the development of the methodology along the whole project: it has been adapted to the objective of the project with the qualification of “demonstration corridor” in order to, concretely, “benchmark” Mediterranean transport performances (chain performances, interoperability performances), and “validate” evaluation criteria proposed for projects and policy measures.

A first characteristic of the demonstration corridor is that it is a “tool concept” and not necessarily a “priority” corridor helping to define prioritisation process in the planning of transport.

A second characteristic of the demonstration corridor is that all analysis of the demonstration corridors have to be conducted with full knowledge of national transport policy context concerning infrastructures description, transport regulations and transport operations; the demonstration corridor analysis must be deeply “anchored” to national policy references (including eventually international agreements of national policies).

1 See ECMT conference, 27/28 October 2003 organised in cooperation with the Commission and countries members of ECMT, about networks and corridors (keynote paper C. Reynaud)
2 However REDWEG corridors proposals have not been presented at the Helsinki conference
It is indeed necessary to make sure that strategic planning proposals will result from a good coordination between “national plans” of countries situated within the corridor, as well as between “national plans” and “euro Mediterranean initiatives”.

The definition of a corridor has already been presented in Crete and Helsinki conferences, in studies conducted by UN and UMA as well as in the recent report presented in Karel Van Miert for revision of TEN-T guidelines.

But the definition has also to be adapted to Mediterranean context with importance of maritime routes which are major links between countries bearing in mind that Mediterranean regions can provide interesting experience for implementation of motorways of the sea within transport networks.

A proposal has been made in Athens workshop for an adaptation of a definition of a corridor to Mediterranean context, where maritime links are completely integrated to major connections between countries in a way which is relevant for the objective of the study.

The adaptations of the definition of a corridor were the following:

- A corridor is first a “couloir” or a major axis of international exchanges between countries and regions: this means in particular that corridor can integrate several routes for the same mode (and sometimes parts of local networks, which are capillarity networks as in the REDWEG study)
- The corridor is multimodal and in Mediterranean area, most of the time, “quadrimodal” which means in particular that it will include intermodal nodal points (ports, airports, intermodal centres) but also that it will include more systematically maritime alternative routes and air services: this should avoid distinction made often between land corridors, maritime corridors and air services.
- the “Motorways of the Sea” are parts of a corridor and will no be considered independently of land corridors; they will be included in Mediterranean corridors as a specific route, which is an alternative route or a complementarity link to other modes relations.
- The corridor definition has to be accompanied with identification of precise routes and nodes; this is necessary for network assignment as well as for project identification within corridors. The relation between prioritisation of corridor and project has been stressed within TINA work and more recently in the Van Miert report and is an important aspect of the role of a corridor plays in assessment of transport, and definition of transport policy including infrastructure planning.
- Eventually there is definition of “branches” in a corridor as it was the case for the definition of the “Helsinki” corridors.
With such adaptation of corridor definition, it becomes possible to develop a more operational approach in Mediterranean than the one proposed at the end of Helsinki conference with the so-called “PETRA” (Priority Transport Area).

Based on this adaptation of the general definition of corridor “demonstration” corridor had to satisfy 5 conditions:

a) To concern at least two MED-countries
b) A minimum length superior to 1000 km
c) A compatibility with national plan/transport policy
d) A relevance for transport “benchmarking” which means in particular availability of information:
   - Existence of major existing or potential flows
   - Possibility of identification of actors
   - Possibility of identification of type of flows: travelling purposes, type of products
e) Relevance for transport evaluation definition: corridor includes projects and in particular cross-border projects on which focus will be put.

This fiche addresses different dimensions of the demonstration corridor being aware that all dimensions have not the same relevance for a given corridor, and that information required at this stage only help to point which type of corridor will be more adapted for a given facet of MEDA TEN-T project, as well as to provide an overall review of these possibilities for the first selection of demonstration corridors.

The candidate demonstration corridors have been selected and characterised according to 9 major dimensions:

- geographic scope
- type of connections
- type of routes
- demand on supply volumes
- institutional framework
- relevance as regard expected benefits
- environmental aspects
- implementation conditions
- knowledge base requirements.

Their presentation is detailed in chapter III of this present report.
2. The toolbox of MEDA TEN-T

The concept of a toolbox for integration of MEDA and TEN networks was developed in parallel with the other work packages to end up with a proposal on the structure and the use of a toolbox in particular for implementation of an action plan (WP5).

During the life of the project MEDA TEN-T an important effort was indeed made on the type of data which can be used in the models necessary to help the decision process. Most of the work was presented in the website of MEDA TEN-T which was also used as a privileged way to cooperate between partners when exchange of information was necessary.

But in the same time, it is also necessary to recall the limits of this exercise within MEDA TEN-T project which concentrated very much on methods, decision processes, concertation with intensive cooperation of experts during MEDA TEN-T workshops.

Therefore the scope of D6 is limited as far as data collection is concerned to what was necessary to support the other work packages development and production of previous deliverables: from this point of view D6 formalises and goes beyond whas was initiated with the launching of the website of NESTEAR which has been implemented with this objective of building a common tool for the project, beyond dissemination of the results. This website was used as a kind of first version of a toolbox with both an open access and closed access for internal exchanges within the consortium reinforcing a dynamic within MEDA TEN-T network of experts. This first experience showed how it would be interesting to keep such initiative alive and even to develop it once the project is ended, if proper resources become available for in order to promote common assessment methods, and to stimulate harmonised collection of data.

2.1. The data

Several projects have already addressed the problem of data collection throughout Mediterranean countries and MEDSTAT programme has made important progresses in the recent years, to harmonise data across Mediterranean countries.

These data are usually split between socio economic data and transport data.

In this deliverable the objective is not to collect data to build a relevant Mediterranean network database as it has been done for example in the ETIS project for European Union, although such exercise will be very useful: this
was not the objective of MEDA TEN-T, and will go, in any case, well beyond the resources of the project.

The objective is focused on the conception of a toolbox based on the experience of a network of experts concerning the availability, relevance, reliability and accessibility of data and models, experience acquired during the project as well as during other former projects. In this approach the choice was made to extend GIS tools as general framework for the development of such tool boxes in order to reinforce the relations between socio economic information, transport performances and description of networks. Such methodological options have been made within ESPON programme for EU territory and MEDA TEN-T project can be presented, from this point of view, as a first attempt made for Mediterranean region, in this direction.

The main points concerning the collection of data are the following:

2.1.1. Importance of definition of the zoning in Mediterranean area

The first level is the country level which is, in general, not a problem since geocoding of border lines are usually available (except for few contested areas which must not be neglected).

A second level, which corresponds to the European NUTS II level, is also very important to define the structure of the toolbox when work on networks must be achieved: this zoning will be composed of administrative units, which can be defined at a very detailed level. However the reference to an administrative level is necessary, for the availability of information per zone concerning, for example, population, and economic activity.

A third level corresponding to NUTS III level in EUROSTAT is also very useful, however the information is most of the time limited to populations and in best cases to physical description of networks and natural resources.

Therefore the toolbox must first include a definition of a zoning system corresponding at least to NUTS II level, or when possible, at NUTS III level. MEDA TEN-T and DESTIN projects have completed such work for Mediterranean region and countries of Maghreb, often based on work previously done at NESTEAR or CETMO.

2.1.2. Information available at different zones levels

Detailed information is generally available at national level: socio economic and transport information. They are already included in EUROSTAT as part of MEDSTAT.
But at regional or local level, the type of information available, depends upon the country considered: only the population and, sometimes, the revenue per capita are in general available.

This is where a work of geocoding can be also very useful: this has been done currently by NESTEAR to estimate population per zone, whatever is the definition of the zone which can be at very detailed raster level when relevant\(^3\), from detailed cities databases or populations.

Once major industrial activities are located such technique can be used also for location of production, or distribution sites, in a way which is consistent for regional and national aggregation.

\(2.1.3. \textit{Segmentation of the transport market for freight (and passengers)}\)

It is now accepted that the segmentation of the market is a prerequisite for any relevant analysis of transport and in particular when it is necessary to assess the needs of transport for industries.

However, in the same time, it appears also clear that existing NSTR nomenclature is not adapted anymore to describe the evolution of economic exchanges and address the problem of choice of mode.

Furthermore exchanges between non-EU countries, which must be considered here are often not available in NSTR nomenclature however, only in SH (Harmonised System) nomenclature used by United Nations.

Different groupings have been made by NESTEAR which have also been adapted to CETMO database in DESTIN project and as well as to SH nomenclature in the NEW OPERA project, concerning dedicated freight networks in Europe. This is an improvement as regard to what was profound in first tables of D3.

The following table refers to the last grouping proposed by NESTEAR in NEW OPERA which have been detailed in D6, as an example for relations between EU25 countries and Mediterranean countries to support the analyse upon needs of transport.

The source is COMEXT database, taken for the most recent year available and showing how the structures of trade pattern have rapidly changed over the recent period 95 – 2000 – 2004.

The analysis is also made per mode showing the importance of maritime transport in the Mediterranean area, the contribution of road which is limited to

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\(^3\) A raster is a small square of 10 km or even less
some relations, in particular between Northern Mediterranean countries, and the weak position of rail.

However, investigations have also been made for exchanges between non-EU countries using COMTRADE of United Nations and presented already in D3 at a more aggregated level.

2.1.4. Description of the physical network

The description of networks is done most of the time at national level: therefore there is a problem of consistency and interconnectivity when networks are considered at multinational level.

In the description of networks all the modes and nodes, and in particular intermodal nodes must be considered such as ports, airports, intermodal terminals, stations which are entry points in the rail network, logistics centres, when the information is available.

Here again the geocoding is very useful to check the consistency of the database and to use, later on, the network description for assignment on routes and simulation of transport operations4

- interconnectivity between countries and modal networks can be rigorously checked with a common identification of “geographic codes” of the interface points
- distances from networks to population basins or industrial activities can be exactly measured
- and consequently more homogenous description of the network can be achieved as regards the density of the zones; index of infrastructure endowment per zone can also be measured as well as indexes of interconnectivity between zones
- raster cells technique can also be applied to measure accessibility index of population to the networks: raster cells of 25 km have been defined as a test by NESTEAR over the whole area.

However in MEDA TEN-T project, NESTEAR has focused on description and geocoding of demonstration corridors based on description of national networks, as a common reference framework between partners in order to assess transport performances, and identify major projects along a corridor.

In D6 only one example of such description of corridor is provided, however, all corridors description were available on the NESTEAR website and reproduced in D2 deliverable.

4 the so called « navigability » on a network which is rarely achieved at a very detailed level.
2.1.5. Attributes of physical networks

This is a fairly new aspect of a toolbox closely related to the choice of development of a GIS framework particularly useful for the use of this toolbox including assessment of operating policy and benchmarking of performances.

The attributes of these networks are not only physical characteristics describing the number of lines, the width or the gauge or eventually the infrastructure projects, however, information on speeds, costs (tolls for example) for operations on each link and node, including ports. Such evolutions in data collection are necessary if we want to consider not only road “door to door” transport however, also alternative modes (for which references to services are essential) or intermodal transport including maritime links. So far the concept of toolbox has been very much influenced by exclusive road application and they are not adapted to integration of intermodal networks including, in particular, maritime links.

Concerning speed it is not only the maximum speed allowed however, might depend on capacity constraints and volume of traffic for road as well as on physical characteristics such as gradients and curves (which are very important for rail).

Nodes attributes should include transfer time and waiting time.

The costs are often determined by utilisation of cost models applied in the assignment phase of the simulation of transports (see next chapter), but specific costs can also be applied to a particular link (toll for example) or nodes (transfer cost). Cost models have been defined in SPIN project for road, rail and intermodal transport with a distinction between cost/day, cost/hour, and cost/km. They must be adapted to data of Mediterranean countries, for different modes. For road introduction of driving/resting cycles is essential for assessing performances and competition with other modes. Adaptation of maritime cost models must also be made with distinction between types of services, roro or feeder services.

Such attributes of networks are then fairly difficult to obtain at a national and international scale on homogenous basis.

In a first step averages can be used giving even more importance to the validation phase of the results after the use of the assignment models: at this stage the intervention of a network of contact points is essential with experts who have become familiar with this type of exercise.

2.1.6. Database of services
It has already been stressed how important is the integration of a database in services when alternative modes to road have to be considered with, in particular, maritime transport.

For an alternative mode the responses to the needs are not necessarily construction of infrastructures: more adequate services can be provided.

First developments of services database have been tested in MEDA TEN-T with distinction between ro-ro and feeder services for maritime transport presented in D3: the presentation of this services database has been made using a MEDA TEN-T infrastructure network for ports.

2.2. Implementation of model in the toolbox

Models are not only used for evaluation of transport policy for an improved level of service when a policy action is tested.

Models are also used to define reference basis, as it is for example the case for the definition of a traffic flows database between zones: such statistics do not exist except for international trade between countries as mentioned earlier.

Reviews of existing models have been made in several EU research projects such as SCENES or THINK UP; in DESTIN, NESTEAR has adapted such review for an application in western Mediterranean. Models available have also been discussed in MEDA TEN-T workshops.

Usually four steps are differentiated: generation, distribution, modal split, assignment. However, recent development with use of new tools such as the GIS tools, tend to aggregate the two first and two last steps.

2.2.1. Generation, distribution

The most adequate solution for Mediterranean countries would be gravity models with socio economic data per zone as input variable and traffic between zones, per type of products as output.

However, in such models special attention must be given to the international trade dynamics, taking into account the opening of economies and the fact that international transport is growing faster than national transport: import and export development must be treated specifically and not only considered as having an incidental effect on traffic volumes of intermodal networks.

5 DESTIN WP7 and 8
6 See for example MODEM research project of French programme PREDIT (2005) where presentations of new development of national models have been made
Such approach has been applied in DESTIN by NESTEAR and could applied at a wider scale for all Mediterranean countries with socio economic data available; in doing so, generation and distribution steps will be treated simultaneously and the spatial aggregation should be the NUTS II level as it has been achieved in TEN STAC or UN ECE projects.

The toolbox defined in MEDA TEN-T should allow to build and calibrate such model.

### 2.2.2. Model split and assignment

These two steps can be also aggregated in particular when possible combination of modes multiplies as it is the case in Mediterranean area: many of the transport chains considered are indeed intermodal transport chain combining road, rail, maritime transport and eventually inland waterways transport.

Therefore it is not possible to define a modal split model including single modes and all sorts of combinations of modes which have to be considered also as a specific mode/or solution: the calibration would be impossible, the results not relevant, with no adapted database facilitation.

Therefore the solution relies more in new approaches which have been developed with application to intermodal transport and motorways of the sea\(^7\) models.

Using GIS tools, O/D transport chains are described in detail, point to point with their own performances in terms of cost, time and eventually reliability: the search of “minimal path” through GIS algorithms identifies the best solutions according to criteria of time and cost (and eventually reliability) for door to door transport performances.

The goal of this deliverable is certainly not to enter into detail of such models but just to point that adapted solutions are available and can be implemented in a consistent way with the structure of the toolbox described for MEDA TEN-T.

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\(^7\) See NESTEAR model in INTEGRATION project, and AMT project (Transgascogne autoroute de la mer)
2.3. Benchmarking of transport chain performances

Benchmarking has been applied along demonstration corridors in D3; the toolbox should allow to generate benchmarking exercise along Mediterranean corridors and to capitalise the results.

At this stage performances of different alternative solutions are described in terms:

- total time of transport with distinction between
  - access time to port or intermodal terminal
  - transit time in port (or nodal point), including, eventually, waiting time which is related to frequency of services
  - maritime time of transport

- total cost of transport with the same type of desegregation

A special attention has been given to competition between door to door road transport and intermodal maritime transport when alternative solution exists: examples have been provided for several routes using the NESTEAR assignment model.

In the toolbox benchmarking exercise along corridor helps to identify best practice and shows what are the necessary improvements to trigger modal shift, along the transport chain.
2.4. 

**Network of contact points**

The existence of network of contact points across Mediterranean area, preferably in each of the countries concerned cannot be dissociated from the conception of the toolbox for different reasons

- the network collects the national data available
- the network harmonises the information, being aware of the methods used to produce the data: statistical methods and eventually estimation using models; this is essential to assess the reliability of a “figure”
- the network validates the data and the model
- the network makes the toolbox “live”, by regular use of it and permanent check of its relevance.

In the past, this aspect has been neglected, leaving toolbox to exclusive use of one or few companies and condemning it to a quick disappearance, with no possibility of capitalisation; MEDA TEN-T and its network strove after a more continuous and durable process with permanent enrichment, based on strong cooperation structure.

In conclusion three main tasks should be achieved by a network of contact points

- collection of data for the toolbox
- consolidation of data according to the common framework described (and using compatible software for GIS)

maintaining and development of the toolbox in parallel with the use of it.
Figure 1

TOOL BOX CONCEPT OF MEDA TEN T

TRANSPORT PERFORMANCES

DATA GIS FRAMEWORK

ACTION PLAN INTEGRATION

TOOLBOX

NETWORK OF CONTACT POINTS

MODELS
III - INTERCONNECTIVITY AND INTER OPERABILITY OF THE MEDITERRANEAN AND TRANS-EUROPEAN NETWORKS FOR TRANSPORT

1. Introduction

The smooth flow of goods, people and investments across the emerging Euro-Mediterranean free trade area necessitates a well-functioning multimodal transport system. More efficient transport would help the southern Mediterranean countries to attract foreign direct investment, encourage exports and participate in increasingly complex cross-border supply-chains. It would also facilitate regional integration and permit the countries of North Africa and the Middle East to more effectively 'plug into' the European Single Market.

The thematic network MEDA TEN-T, falling under the Euro-Mediterranean Partnership, aims to establish a strategic overview of transport in the Mediterranean area and operate a network of Transport Experts on a long-term basis. This is expected to enhance the common understanding of transport issues and promote safety, efficiency, interoperability and interconnectivity of transport networks in the Mediterranean area.

The aim of this part of the study is to map out national and cross-border transport that would be needed to create a 'common transport space' that spans both sides of the Mediterranean Sea. For this purpose it identifies corridors that will create the transport network of infrastructure and services in the Mediterranean region, through which it reviews the requirements of transport users, analyses sector national plans and sector performance in the countries concerned.

The assessment of these corridors is based on the analysis of the modes that are dominant in the area. Importance is therefore attached to shipping and air transport services. Short-sea shipping is also particularly important given the distances involved and that in some cases, practicable inland links are non-existent.

2. Characteristics of Euro-Mediterranean Transport

MEDA TEN-T scope is to contribute to the development of a Euro-Mediterranean transport network, with both south-south links (between the Mediterranean Partners themselves) and north-south links (with the trans-European transport network). To accomplish this, it identifies and records transport networks and connections between and within the Mediterranean
countries by providing an overview of existing infrastructure and service conditions of Euro-Mediterranean transport, as well as any future plans.

This part of the study provides an overview of the Mediterranean transport. Issues such as the Euro-Mediterranean objectives, statistical analysis of the existing transport situation in the Mediterranean region, and regulatory and political changes (Directives) in all modes of transport, are presented in order to appreciate the importance of transport in the area and identify the main sections / links, which are considered essential to be included in the MEDA TEN-T Demonstration Corridors.

3. Euro-Mediterranean Demonstration Corridors

The selection of demonstration corridors has been made in two steps considering the methodological objectives of MEDA TEN-T which requires in particular availability of data, but taking also into consideration previous work realised on corridors in Mediterranean area as well as geographic extension of major exchange axis of EU, as they have been identified in recent EU studies for revision of TEN guidelines.

The regional focus is on the reform of the transport sector at national level, the definition and promotion of an efficient regional transport infrastructure network, with national transport systems linked to each other and with Trans-European Networks.

In the proposed corridors certain sea motorways were included, since the Mediterranean basin is clearly a priority for the development of these sea motorways. In view of the sea motorway concept it was also be possible to study interconnectivity issues for all modes, with a particular focus on maritime connections. Priority was to be given to several sea motorways in the Mediterranean linking Malta and Cyprus to the rest of the European Union and to the southern and eastern coasts of the Mediterranean.

3.1. Validation of selected corridors

The definition, identification and selection of the MEDA TEN-T Demonstation Corridors are analytically presented in Deliverable 1 of the MEDA TEN-T project. However, it worth mentioning certain important issues, such as the approach to be followed.

The proposed demonstration corridors comprise a multi-geographical level approach:

a. North / Central Europe – South Mediterranean countries
b. Mediterranean countries connection
c. Within Mediterranean countries (South-South)

Based on this the Demonstration Corridors must satisfy 5 conditions:

f) Concern at least two MED-countries

g) Minimum length superior to 1000 km

h) Compatibility with national plan/transport policy

i) Relevance for transport “benchmarking” which means in particular availability of information:
   - Existence of major existing or potential flows
   - Possibility of identification of actors
   - Possibility of identification of type of flows: travelling purposes, type of products

j) Relevance for transport evaluation definition: corridor includes projects and in particular cross-border projects on which focus will be put.

This definition is in line with the use of this concept for the development of the methodology of MEDA TEN-T in the different work packages, from benchmarking transport performances to interoperability assessment and priority criteria definition.

The selected corridors are divided into three main groups, as presented below and illustrated in Figure 3.1:

**West Mediterranean demonstration corridors**
Paris – Bordeaux – Madrid – Rabat (concentrate on passenger transport)
Paris – Marseille – Algiers (Djhen – Djhen) – Transahara (freight / passenger)
Paris – Marseille / Genoa – Tunis / Sfax (freight / passenger)
Berlin – Munich – Verona – Napoli (Palermo) – Tunis (freight / passenger)

**East Mediterranean demonstration corridors**
Marseille / Italy – Malta – Limassol – Beirut / Tartous – Damascus – Bagdad
Trieste – Igoumenitsa – (Volos) – Limassol – Izmir – Tartous / Beirut
Alexandria / Port Said / Cairo – Aqaba – Amman (Bagdad / Gulf) Damascus
/Aleppo or Beirut – Ankara / Izmir – Istanbul (with branches from Izmir to Antalaya through Konya and Mercin
Alexandria / Port Said – Beirut / Limassol – Piraeus / Thessaloniki – Izmir – Istanbul

**West-East Mediterranean demonstration corridor**
Rabat – Algiers – Tunis – Tripoli – Alexandria – Cairo
3.2. Methodological Approach

The approach followed for the analysis of the demonstration corridors is in harmony with the one of the Van Miert High Level Group, which is the basis of EC Communication on TEN-T (October 2003). This constitutes a crucial point in the MEDA TEN-T project since it refers to importance of the introduction of the “sea motorways” in the region. The approach followed is also in harmony with the “TINA” process, from which the criteria were based on:

1. Maintenance of existing and development of new transport infrastructure
2. Encouragement for the participation of the private sector and the liberalisation of the transport sector
3. Reinforcement of the safety systems and modernization of the equipment
4. Environmental protection
5. Harmonisation and facilitation of the administrative and custom procedures
6. Meet the proposed performance corridors

Figure 2: MEDA TEN-T Demonstration Corridors
7. Reinforcement for the formation of national competences
8. To have an international Mediterranean-wide perspective as well
9. Have direct or indirect bearing on all countries involved
10. The corridor must take full use of existing facilities
11. The selection should not be biased to a mode itself (maritime, road, etc.)
12. Optimise resources by the introduction of a multi-mode corridor
13. Some impact on adjacent non-Mediterranean countries will be of value

The methodology followed, concerned at the first step the definition of an initial two-dimensional network (comprising the physical dimension as well as the time dimension for implementation) and subsequently covered among other things data collection, description of existing “national networks” and their problems, forecasting and assessment, and finally the needed project identification. The implementation of the methodology was divided in four phases:

PHASE A – Identification
PHASE B – Forecasting
PHASE C – Evaluation
PHASE D – Prioritisation

Identification -according to generic criteria- of the projects that worth further analysis and evaluation; forecasting the future conditions of the identified network; evaluation of the selected projects, with respect to specific evaluation criteria; prioritisation of the projects -based on the evaluation results- in order to classify them into four priority levels.

To determine the functionality of the selected Demonstration Corridors and identify the respective flows of each corridor, two questionnaires were developed, the A-Z Typology and the Fiches. Both are described in the following sections.

3.2.1. A-Z Typology

The first questionnaire, titled “A-Z Typology” addresses different dimensions of the demonstration corridor being aware that all dimensions have not the same relevance for a given corridor, and that information required at this stage only help to point which type of corridor will be more adapted for a given facet of MEDA TEN-T project, as well as to provide an overall review of these possibilities for the first selection of demonstration corridors (MEDA TEN-T, D1). It is consisted of 9 groups of criterions:
The “G1 - Geographical Criterion” containing two sub-groups for the countries directly involved are those, which the corridor directly passes by and/or crosses and for the countries indirectly involved are those which have direct borders with directly involved countries.

The “G2 - Connectivity Criterion” containing the connection type of the corridor among the Mediterranean countries and between the Mediterranean countries with non-Mediterranean countries.

The “G3 - Route Characteristics Criterion” containing the established and constructed links and routes of each specific corridor, as well as the operational status of each of the above.

The “G4 - Demand and Supply Criterion” containing the multi-nation transport agreements, namely any bilateral agreements on transport facilities between two or more countries.

The “G5 - Institutional Criterion” containing the expected number of agencies to be involved in construction responsibilities and the expected number of agencies to be involved in operation responsibilities.

The “G6 - Benefits Criterion” containing the benefits to be produced by the development of each corridor.

The “G7 - Ecological Criterion” containing the expected area of land needed for the corridor and facilities (eg. Harbor, terminal, stations etc.).

Finally the “G8 - Possibility of Implementation/Expansion Criterion” indicating whether it would be possible to expand the selected corridors out of the region, and the “G9 - Know How Criterion” proposing methods to achieve the above.

The above “A - Z Typology” is presented in Annex C.

3.2.2 Fiches
The second questionnaire consisted of several sub-questionnaires, each one concerning one transport mode, namely maritime, air, rail and road transport.

The objective of these fiches were to identify the project’s prioritization/categorization, in order to support the elaboration of a medium and long-term investment strategy in the region concerned and encourage the realization of links that have good chances of implementation and fall within the MEDA TEN-T objectives.

The fiches developed are included in Annex D.
3.3. Physical description, functionality and respective flows of corridors

3.3.1. Paris – Bordeaux – Madrid - Rabat

This corridor concentrates on passenger transport and is on the West Mediterranean.

The “France - Iberian Peninsula - Morocco - West Africa” couloir has been included in the MEDA-TEN-T framework because it is a multimodal couloir (integrating land, maritime and air transport) that already exists, drains important flows and is rapidly developing in order to respond to the dynamics of exchanges between the two shores of the Mediterranean. The couloir is clearly of regional interest, linking several countries, of which the southern ones are situated in the extension of the Trans-European Transport Network.

In Europe, the couloir is composed of two principal land routes. The first route leads to the Mediterranean coastline and opens at the Strait of Gibraltar; the second route follows the Atlantic coastline and also opens at the Strait of Gibraltar, branching off towards Lisbon in Portugal.

The Mediterranean crossing is carried out by means of several maritime relations, either through the Strait of Gibraltar or with other transmediterranean or transatlantic links. The Mediterranean crossing through the Strait of Gibraltar (of an average distance between the two shores of around thirty kilometres) makes the aim of studies - under the framework of a co-operation agreement between Morocco and Spain - for the construction of a rail tunnel, constituting the missing link for an integrated Euro-Maghreb land transport network.

In the southern part of the Mediterranean, the land route begins in the Strait of Gibraltar and is composed of two large branches. The first one links all the West African countries along the Atlantic coast. A second branch runs parallel with the Mediterranean side, serving the Maghreb countries.

The couloir also includes air transport through the airport network of the countries in the two shores of the Mediterranean.

Under the “France - Iberian Peninsula - Morocco - West Africa” couloir, the following demonstration corridors have been selected for MEDA-TEN-T, always limiting the analysis for the case of travellers and for the countries where there are the most remarkable international flows (France, Spain and Morocco).

Two land-maritime demonstration corridors are selected:
The corridor that links the north of France (île-de-France) with Morocco, descending along the French Atlantic coast (Bordeaux) by land, which crosses the Pyrenees on the west side (Bayonne/Irún), crosses diametrically the north to the south of the Iberian Peninsula (Madrid) and arrives in Morocco (Rabat) via the Strait of Gibraltar (Algeciras/Tanger). This corridor continues on Moroccan territory towards the south (Casablanca/Agadir) and onwards to the east (Tétouan-Saïda /Rabat-Oujda); towards Northern Europe, this corridor extends to the Benelux countries.

A second corridor, which enters the Iberian Peninsula from France across the east side of the Pyrenees (Perpignan/La Jonquera), descends by land following the Mediterranean coastline (Barcelona/Valence) until the Strait of Gibraltar, where it crosses to Morocco. In the north this corridor extends to Europe, towards the north, in the direction of Lyon and Paris and, towards the east, in direction of the northern Italy following the Mediterranean arc (Milan).

These two corridors are completed, to cross the Mediterranean, by diverse maritime relations between other south-east Spanish ports (Málaga, Almería, Alicante) and North African ports (Cueta, Melilla, Nador, Oran).

The land-maritime corridors mentioned above are completed by the airport network which makes possible the international flows of travellers by air between both shores of the area that is being analysed. These airports also form part of the demonstration corridors included under the MEDA-TEN-T framework.

At present, the main bottlenecks that exist in the land-maritime corridors are situated - at an infrastructural level as well as at an operational level - around the Strait of Gibraltar and in the Moroccan inland side.

The short and medium term infrastructure projects within the demonstration corridors include, in Morocco, the construction of the new port of Tanger Méditerranée and the completion of its motorway network and of the Rocade Méditerranéen. With regard to air transport, it is forecasted that a considerable effort will be made to maintain an adequate airport capacity for the foreseen strong increase of air traffic demand (with projects in Tanger, Al Hoceima, Casablanca or Marrakech).

The more ambitious long term project in the demonstration corridor is with no doubt the construction of a fix rail link of near 40 km connecting Spain and Morocco through the Strait of Gibraltar. The studies of this project are expected to be finished by 2006.
3.3.2. Paris – Marseille – Algiers (Djhen – Djhen) – Transahara

This corridor concentrates on both freight and passenger transport and is on the West Mediterranean. The countries covered by the corridor are: France, Algeria, Mali, Niger, Nigeria, Tunisia and Tchad.

The proposed corridor is stretching over more than 8000 km, from the Paris region to the Nigerian capital, passing through the Lyon region, Algiers, Hassi Messaoud (the most important pole of the oil extractive activities), Tamanrasset, Lagos, and with branch lines towards Tunisia and Morocco through the trans maghrebin corridor.

Concerning the maritime component, on the northern shore there are the Ports of Marseille-Fos, Toulon, Sete and on the southern shore, there are the Ports of Algiers, Bejaia and Djen Djen. Currently, the most part of the maritime traffic is passing through the port of Algiers (about 9 millions tons of goods and 2.6 millions tons of containerized merhandises in 2002).

The port of Djen Djen, located 350 km east of Algiers, in the wilaya of Jijel, is called to be a very important node in the trade exchange chain between Africa and Europe as it constitute a junction between the transafrican and transmaghrebin corridors.

The Trans-African Road is the key element of the Transafrican Corridor. This ambitious project, has been adopted by the concerned countries and its construction re-launched. The Project is about 9000 km length, of which the 2000 km Algiers-Tamanrasset part is the axial section. A branch (2170 km) starting at 45 km north of Tamanrasset is linking it to Bamako. The connection with Niger is made by a section crossing the city of In Guezzam, located 410 km south of Tamanrasset and joining Niamey (1932 km) and Lagos (1300 km). An other branch start in the border between Tchad and Niger and ends at N’djamena. A third branch of 295 km, finally, is linking Algeria to Tunisia.

In its algerian part, the corridor has important airport facilities, spread all along the central part of the country and from the North (Algiers) to South (Tamanrasset). These facilities are comprising 15 airports; The most important are those of Algiers, Hassi Messaoud, Tamanrasset, Ghardaia, In Amenas, El-Oued, which convey about 65% of the whole air traffic.

The air transport in this corridor is expected to be developed due to the recovery of the Saharian tourism, the encouragement of air freight (in particular for farm products) and the new discoveries of oil deposits.

The other airports located within the corridor are:
- in Africa: airports of Niamey, Bamako and Lagos.
- In Europe: airports of Paris Lyon and Marseille. In 2002 43% of the international traffic was carried out through these 3 airports.

3.3.3. *Paris – Marseille /Genoa – Tunis / Sfax*

This corridor concentrates on both freight and passenger transport and is on the West Mediterranean. The main nodes are Paris, Lyon, Marseilles –Tunis, Milan, Genova. This corridor is multimodal and is made of several important segments.

1) Paris-Lyon
The segment links two main towns of Ile de France and Rhone Alps regions, these two regions are strongly industrialised and inhabited. Paris-Lyon is the main artery of French geography.

Concerning the transports, it has several rail itineraries and in particular a high speed line; the alternative itineraries go to Dijon (motorway and rail) but it exists another way from Paris to Chalon and Lyon.

2) Lyon Marseilles
This segment, situated in the Rhone Vallee is enclosed between the Alps and the Massif Central. It has of a motorway from Lyon to Marseilles and 3 railway lines, two on the left bank of the Rhone (High Speed line and mixed line), one on the right bank (with a strong traffic of freight).

We can also mention the Rhone which is a waterway link from Marseilles to Lyon and which goes to the North in the Macon and Chalon area along the Saone.

3) The Port of Marseilles
The Port of Marseilles is the second French port for the traffic of bulk and general cargo. It has two main establishments in Fos and Marseilles. Marseilles is connected with several intercontinental ports and Mediterranean ports. Historically, Marseilles is connected with the 3 North African countries and the ports of the Eastern part of the Mediterranean. The other ports situated on the south side of France (Sète, Toulon for example) are not so important even if they offer some relations in Mediterranean.

4) Port of Tunis
The Port of Tunis is the main port of Tunisia and has an important number of North South but also East West connections. On the Northern coast there is also the port of Bizerte which has less connections and, on the Eastern coast of Tunisia, there are several ports as Sousse, Gabes, Sfax and Zarzis. These ports are more or less specialised in certain types of traffic.

5) The alternative itinerary of Genova
If Marseilles is the main French port for the servicing of the Maghreb, the port of Genova, in Italy, can, on a long north south corridor offer an alternative: Genova is also a very important European port with a strong activity in the general cargo (and also for the bulk traffic), it has intercontinental and Mediterranean connections. It has also many national connections (important Italian short sea shipping).

This alternative corridor suppose from French point of view to use the Lyon Turin corridor, serviced by a motorway (Frejus Tunnel and eventually Mont Blanc Tunnel), by the rail (Tunnel of Modane); in Italy there are also motorways linking Genova and a railway line.

6) Tunis-Sfax link
This link is partly a motorway road, work in progress is interrupted near Sousse where the motorway becomes a 2 x 2 lanes road to the South. This link is also a railway link with a small traffic due to the fact that the larger part of this line is a single line. The short sea shipping traffic between Tunis and Sfax is weak.

An alternative direct link between Marseilles/Genova and Sfax. This link will also be studied but it has not, at present, regular services.

Regarding air links, Paris, Marseille and Tunis are the main airports of the corridor, Paris and Tunis playing also a role of hub. Lyon, Sfax, Milan and other secondary airports can be also considered as alternative hubs on the corridor.

The link Paris-Marseilles is a major European corridor and identified as such in major European studies because of its connections to the south towards Italy, Spain, but also towards major Mediterranean ports which are Marseilles and Genova.

In the latest identification of European priority projects, connections towards Italy from Lyon to Tunis and Milan, as well as connections towards Spain have been selected, feeding the corridor of the Rhone Valley served by 2 conventional rail lines, a HST line, a 2 x 3 lines motorway and a waterway. From Lyon to the north this connection Rhin Rhone, from Dijon to Mulhouse is also selected as a TEN T priority project for rail.

The alternative branch considered which links the Milan area with the port of Genova is also a TEN-T priority.

3.3.4 Berlin – Munich – Verona – Napoli (Palermo) – Tunis

This corridor concentrates on both freight and passenger transport and is on the West Mediterranean. It is composed by one main ground axis that follows the same route of the TEN priority Project no. 5 (Mixed railway line Berlin-
Verona-Naples/Milan-Bologna – even if the branch to Milan is not included in the MEDA TEN-T corridor) up to Naples, continues up to Sicily by crossing the Strait of Messina and ends in Palermo. The ground axis of this corridor has a maritime extension that arrives at Tunis crossing the Mediterranean Sea.

The maritime link virtually starts at Palermo, but any port of South Italy on the Tyrrenian Sea can be considered as feasible alternative (i.e. Naples, Salerno, Gioia Tauro, etc.).

Two main TEN priority projects are placed along the Corridor 4 route:

- The above mentioned TEN priority Project no. 5 (Mixed railway line Berlin-Verona-Naples/Milan-Bologna)
- The Project N° 13 (Bridge over the Strait of Messina)

Moreover, it is useful to remind that the Corridor 4 crosses in Verona the route of the TEN Project no. 4: (Mixed railway line Lyon-Trieste/Koper-Ljubljana-Budapest) and that the List 3 of the High-Level group report includes also the high speed railway line between Naples, Reggio Calabria and Palermo as a possible future TEN priority project.

The present transport network along the Italian side of the Corridor 4 includes:

- The existing conventional rail axis Brennero – Verona – Rome – Naples – Reggio Calabria – Messina – Palermo that is completely electrified and almost all double track (some single track sections are still operating between Verona and Bologna and Messina and Palermo)\(^8\).
- The high speed rail lines that are in operation between Florence and Rome and under construction between Bologna and Florence and between Rome and Naples.
- The existing motorway axis that includes:
  - the A22 motorway between Brennero and Modena;
  - the A1 motorway between Modena and Caserta;
  - the A30 motorway between Caserta and Salerno;
  - the A3 motorway between Salerno and Reggio Calabria);
  - the A20 motorway between Messina and Palermo (with a short link still under construction);
  - the ferry crossing system on the Messina Strait.
- The freight villages of Verona, Bologna and Nola (in the neighbourhood of Naples) and the ports of Naples, Salerno, Gioia Tauro and Palermo.

The length of the Corridor 4 between Brennero and Palermo is approximately 1650 / 1700 Km (depending on the route).

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\(^8\) Rolling stock is presently moved between Sicily and Italy’s mainland by means of a ferry service between the stations of Villa San Giovanni (nearby Reggio Calabria) and Messina Marittima.
3.3.5. Marselle / Italy – Malta - Limassol – Beirut / Tartous – Damascus – Bagdad

This corridor serves as an East / West and East / East Mediterranean link and concerns both passengers and freight, by using various modes of transport, mainly maritime and air transports, but also multi-modal. The selected corridor starts at the south of Europe Marseille/Goia and reaches Bagdad through Malta, Cyprus, Lebanon and Syria. This is one of the oldest corridors in the Mediterranean space.

Seven countries are directly involved in the corridor namely France, Italy, Malta, Cyprus, Lebanon, Syria, Irak, with a total of 148.000.000 inhabitants, and 15 indirectly involved, with a total of 204.000.000 inhabitants. More than twenty large cities are served by this corridor.

The maritime route starts from Marseille or Goia Tauro and reaches Malta, then Limassol and finally the ports of Beirut/Tripoli or Tartous / Lattakia. Goods and passengers can use several destinations, mainly between West of Europe and the Middle East, but also in a regional perspective. The hinterlands of this corridor are quite wide.


Several air transport companies operate into this corridor, but some of the links are not connected with the appropriate level of service (example: Beirut/Marseille, Damascus/Marseille, Malta/Beirut).

3.3.6. Trieste – Igoumenitsa – (Volos) – Limassol – Izmir – Tartous / Beirut

This corridor is on the East Mediterranean. As it concerns the geographical criterion, the countries, which are directly involved are 6 namely Italy, Greece, Cyprus, Turkey, Syria and Lebanon. The corridor covers a total area of 1.418.000 sq km with 148.000.000 inhabitants, whereas it links indirectly 14 countries covering a total area of 3.155.000 sq km with a population of 204.000.000. The connections of these countries are extended towards the Mediterranean and Europe.
The Corridor could serve as a pathway to the movement of freight and passengers between various places that are within its wider zone of influence. More specifically, it influences each country in a different way as based on the development of transportation and the economic status.

Moreover, more movements from the Mediterranean and European countries to several destinations can be served. Transport needs from North Europe to the Middle East can be distributed from Corridor 2 – East’s ports to these destinations, and vice versa. The links to Greece can serve the adjacent to Turkey and Cyprus. The networks described in the link to Greece in addition to the sea link between Greece and Italy, create a pathway where mainly freight can be transported to and from these areas.

The connections between Greece and Italy are primarily maritime. Igoumenitsa is primarily connected with Italy. Services from/to Italy are on a daily basis, which proves the excellent interconnection between the two countries. To the “traditional” links from the port of Trieste to the port of Igoumenitsa, several others were induced, mainly from other ports of Greece (Piraeus, Corfu) not only to the above ports but to other destinations as well (Venezia, Bari, Ancona). Concerning the accessibility of the Greek ports that are concerned to Italian ports, there are also several projects under implementation in order to create the appropriate multi-modal network to cover the demand.

The main links of Greece for Corridor 2-East are the ports of Igoumenitsa and Volos with a road link between them. On the other hand, there is a poor link between Volos and Izmir, since there are no itineraries between these two ports, apart from freight cargo.

Concerning the links of Italy and Greece to the East, at the moment these are practically limited to the sea routes between Greece and the Middle East to Syria and Cyprus, and the land route to Turkey. The Egnatia - Volos branch also serves the purpose of connecting Greece to Syria and to Turkey via the sea route. Volos, having a large port and increasingly attracting growing attention, is becoming a combined transport center. The linkage with the Middle East does not concern randomly approaching commercial ships, but a permanent RO-RO or even RA-RA link.

From Syria, the main routes, consisting of a number of narrow and normal gauge lines, connect Damascus, Aleppo, Deir ez-Zour and Qamishly. Lebanon and Syria have an agreement for co-operation in land transport that promises to resurrect an old railway line between Tripoli and Tartous, and also re-open another defunct track running from Beirut to Iraq via Damascus. Also, Syria's port of Tartous is primarily connected with Lebanon.
This corridor is a north south corridor on the eastern front of the Mediterranean, that also spins off to connect those countries with Iraq and the rest of the Gulf States.

The proposed corridor is shared by five countries; Egypt, Jordan, Syria, Lebanon, and Turkey. This Corridor mainly consists of two axes; an E-W axis that connects Alexandria, Egypt to Aqaba, Jordan, and a N-S axis that connects Aqaba, Jordan to the various Turkish hubs, and other corridors thereof. An important aspect of this corridor is that the Jordanian and Syrian portions of it branches off to link this corridor to Iraq and the rest of the Gulf States. Another important feature of the corridor is that it connects the Mediterranean port of Alexandria to two Red Sea Ports, which also provide a connection to the Gulf, and eventually Southeast Asia.

As can be seen in the schematic below above, the Corridor mainly connects the following major cities:

- Alexandria (Egypt)
- Cairo (Egypt)
- Aqaba (Jordan)
- Amman (Jordan)
- Damascus (Syria)
- Beirut (Lebanon)
- Ankara (Turkey)

Furthermore, the corridor encompasses all major modes of transportation; land transport, air transport, rail transport, and maritime transport.

A highway that traverses the corridor starts in Alexandria and travels southeast to Cairo and then continues on to Nuwaibah on the Red Sea (ESCWA highways M75, M50, and M55). At this point maritime transport connects Egypt to Jordan through the ports of Nuwaibah (Egypt) and Aqaba (Jordan). From Aqaba, ESCWA highway M45/M47 continues north passing through the Jordanian cities of Maan, Amman (the capital) and Jaber on the Syrian border. From there the highway continues north through Damascus, Homs, Aleppo and continues north to the Turkish border, where it continues along the Turkish Highway system to Ankara. It should be mentioned that the highway branches from Amman and from Damascus, through ESCWA highways M40 and M30, respectively, towards the east to Iraq. The two highways meet in Rotbah (Iraq) and continue to Baghdad via ESCWA highway M40. Also, another ESCWA highway M30 branches from Damascus towards the west to provide access to Beirut (Lebanon).
Additionally, there are 6 main ports, two of which are on the Red Sea and the remaining are on the Mediterranean. Those ports are Alexandria (Mediterranean), Nuwaibah and Aqaba (Red Sea), Beirut, (Mediterranean), Tartous (Mediterranean), Lattakia (Mediterranean).

Finally, ESCWA railway R40 starts from Alexandria and travels southeast toward Cairo and continues south. There is a connection between Cairo and Tanta to the north of it that ties into the corridor under study. The railway traverses through Ismailiah and then to Nuwaibah (ESCWA railway R50). As with the highway links, the two ports are connected via maritime transport in the Red Sea. The Jordanian portion of the railway (R25) starts at Aqaba and travels through Jordan all the way to the Syrian border traveling through Maan, Amman, and Jaber. In Syria, the same railway continues to the Turkish border passing through Homs and Aleppo. From Damascus, there is a railway that travels west to Beirut (ESCWA railway R30), which is not operational and continues to Tripoli port in Lebanon. Just north of Damascus, the railway branches to the northeast, where it eventually leads to Baghdad through ESCWA railways R20 and R10. From the Turkish border in the north, the railway continues to Ankara.

3.3.8. Alexandria / Port Said – Beirut / Limassol – Piraeus / Thessaloniki – Izmir – Istanbul

This corridor is on the East Mediterranean. Although Corridor 4 is basically a maritime corridor, it has strong connections with the neighbouring routes / corridors. Therefore, taking it in this broader sense of the word, we can analyse its interrelationships with the rest.

The ports within the coverage of the narrow sense of the corridor are
- Beirut and Tripoli in Lebanon.
- Latakia and Tartous in Syria.
- Limassol and Larnaca, as well as Vassiliko, Dhekelia and Moni in Cyprus.
- Izmir and Istanbul in the first place, and Mersin, Antalya and Iskenderun in the second, as well as a variety of other ports in the vicinity of Izmir and Istanbul, though in varying sizes, in Turkey.
- Piraeous, Thessaloniki, Volos, Patra in the first place, and Igoumenitsa, Kipi, Heraklion and many others in Greece.

As indicated above, while the corridor is described as a maritime route, it is served by a network of other modes (basically road and rail) and vice versa. The first point to be indicated here is the appearance of road transport as the
dominant mode in almost all countries in and around the corridor. Though this is not unconventional in other parts of the world, this fact reaches to levels of sheer distortion in our case. The dominance of road transport in this region is to the detriment of rail transport, a trait which is mentioned in the separate country reports.

Highways network is developed in almost all countries sharing the corridor. In some countries (Turkey, Greece) a developing network of motorways support the system.

Rail network is absent in Lebanon and Cyprus, though not at competitive levels in others either. However, there appears a will on the part of countries to improve the situation of railways. This appears more than a will in Greece as part of modernization program which aims at both upgrading the network as well as the rolling stock. In Turkey too where the railways have been the stepchild of the sector in the last fifty years after the initial decades of the Turkish Republic when the approach was completely contrarywise. Today the construction of the Tube Tunnel to cross the Bosphorus connecting the rail networks of the Asiatic and European sides is gaining a start and the efforts to build new lines among which Ankara – Istanbul high-speed railway project is to be payed a new attention after 30 years of dereliction.

Air transport appears to be, perhaps, the most-favoured sector as far as transport policy objectives in Eastern Mediterranean context. Privatisation efforts, either building new airports (“Eleftherios Venizelos” in Attica, Greece, “Sabiha Gökçen” in Istanbul, Turkey) or developing the old ones are all to be considered within a development policy format for air transport.

3.3.9. Rabat – Alger – Tunis – Tripoli – Alexandria – Cairo

This corridor is a West-East Mediterranean corridor and is an extensive towards the East of the Transmaghrébin corridor, including maritime and air links.

The multimodal Corridor of Rabat / Cairo integrates two mains components, a railway (in previous the transmaghrèbin train) and motorway component (the motorway of the Maghreb unit with a possible connection with Libya and Egypt), as well as the flat shapes of harbours and airports necessary to exchanges Euro - Mediterranean.

The location of this Corridor and its branching with the other corridors is multiple. Firstly, this is a fundamental part of the big Mediterranean bypass and at the regional level, it joins almost all the big cities of the region (as an example; Rabat, Algiers, Tunis, Sfax, Tripoli, Alexandria, Cairo) permitting to facilitate the commercial exchanges on the one hand, and the free circulation
of hindrance of passengers inside every country, and between the different countries implied in this corridor on the other hand.

It is a multimodal corridor, including eventually the logistical platforms of freight and travelers permitting thereafter, a better interconnection between the different modes of transport. It also includes railway and road services permitting relatively easy access in harbours of the region.

The realization of this corridor finds its justification, seen its contribution in the backing of exchanges with countries of the region and possibly with the European union so, by the major tourist poles services, permitting the fluidity of tourists, the improvement of the tourist attracted and the possible installation of new sites of production due to fluxes of Foreign Direct Investment (FDI).

**Figure 3:** Corridor Paris – Bordeaux – Madrid – Rabat

**Figure 4:** Corridor Paris – Marseille – Alger – Trans-Sahara
**Figure 5:** Corridor Paris – Marseille/Genoa – Tunis/Sfax

**Figure 6:** Corridor Berlin – Munich – Verona – Napoli (Palermo) – Tunis

**Figure 7:** Corridor Marselle / Italy – Malta - Limassol – Beirut / Tartous – Damascus – Bagdad

**Figure 8:** Corridor Trieste – Igoumenitsa – (Volos) – Limassol – Izmir – Tartous / Beirut
Figure 9: Corridor Alexandria / Port Said / Cairo – Aqaba – Amman (Bagdad /Gulf) - Damascus /Alepo or Beirut – Ankara / Izmir – Istanbul (with branches from Izmir to Antalaya through Konya and Mercin)

Figure 10: Corridor Alexandria / Port Said – Beirut / Limassol – Piraeus / Thessaloniki – Izmir – Istanbul
Figure 11: Corridor Rabat – Alger – Tunis – Tripoli – Alexandria – Cairo

3.4. Importance to the respective regions

All MEDA TEN-T countries, are viable and apt, to offer the most advantageous routes of freight and passenger transport in the Mediterranean Region. The corridors selected present a variety of direct and indirect benefits to

- The countries sharing the corridor(s)
- The Mediterranean Region

Paris – Bordeaux – Madrid - Rabat

The importance of this corridor is based on its great intermodal nature. In fact, both ground axes have been thought not only to provide more supply to an increasing demand but also to join the main Freight Villages and Cargo airports of the whole network. The specific corridor will give the opportunity to investigate on a large scale of interoperability and interconnectivity matters. From one side there are the UMA Countries that are trying to harmonize technical and regulatory issues, on the other side there is a main European South-North backbone.

Paris – Marseille – Algiers (Djhen – Djhen) – Transahara

The direct area of influence of the corridor is covering a geographical strip stretching over about 2 millions km² and concerning a population of about one hundred millions persons.

In its African part, this area has a lot of potentialities in mining, agriculture and livestock farming, as, for instance in Niger there are uranium, coal, copper, ovine livestock farming and in Tchad and Nigeria there is oil.

The direct economic advantages concern three categories of traffic:

- The current users of trails who will benefit from the improvement of the traffic conditions. The operating cost of the vehicles will be brought down (tear and wear of parts, fuel, reduction of time journey)
The new road infrastructure will attract the users of the costly and restrictive current itineraries. A study carried out in 1997 for the Arlit (Niger) - Ain Guezzam (Algeria) section had shown that an average of 65 days is needed to transport goods from Europe to north Niger, via the Guinea Gulf, instead of 14 days through the port of Algiers, provided that the road is improved.

The third beneficiary of this infrastructure would be a potential market, not yet assessed but, to be generated by the project, when achieved.

Paris – Marseille / Genoa – Tunis / Sfax

From UMA point of view the relation between Tunis and Sfax extended towards Libya border in the south, and towards Algeria in the west side, is a priority section, part of transmaghrebian corridor for road and rail.

This transmaghrebian corridor, which has been stressed for a long time as a major link between southern countries, was also included in the CORRIMED priorities presented at the Helsinki Conference.

From national point of view, the French Schema of Service has identified major international and transit corridors on the French territory: the northern part of the MEDA TEN-T demonstration corridor is one of these with the inclusion of Marseilles which has always been considered in France as the major Mediterranean gateway, not only for France but also for Europe.

In the Tunisian master plan, the north south axis from Tunis to Sfax is obviously the major transport corridor where rail and motorway projects are considered as priority. Major ports such as Sousse, Gabes, in addition to Tunis and Sfax ports are also along this corridor and can bring an interesting diversification of maritime services for Tunisia.

Berlin – Munich – Verona – Napoli (Palermo) – Tunis

This corridor is the natural extension towards the northbound side of Africa. Its importance is mainly due to the possibility to assign to Italy the role of a “virtual bridge” between the two sides of the Mediterranean Sea. By implementing this corridor, Tunisia and its neighbouring countries could have a quick and reliable access to the entire European ground transport network thus achieving a significant incentive for their import/export.

Marseille / Italy – Malta - Limassol – Beirut / Tartous – Damascus – Bagdad

The importance of this corridor is due to its potential for combined traffic: sea-rail or sea-road. Furthermore, throughout the Adriatic routes, the middle East Countries can trade with the European market bypassing the Balkan area as well as its many borders and customs operations.
The corridor will also give the opportunity to investigate the Ro-Ro traffic in the region and the relationship between international maritime traffic and short sea shipping. Both these topics have great relevance into the Commission policy and predictably will have more weight in the next years.

**Trieste – Igoumenitsa – (Volos) – Limassol – Izmir – Tartous / Beirut**

This corridor is intended to provide a common ground for the development of a multi-modal transport infrastructure network of each country, adjusted to the expected requirements of passenger and goods transport in the areas it connects.

The Corridor can serve several transport movements covering the East Mediterranean Area. In a more detailed analysis, transport needs from Europe mainly in oil and/or other freight can be served from the Corridor either via maritime or combined transport. The ports identified in the Corridor can accept the freight, which is coming either directly from the East or from other ports of the Mediterranean. In these cases the Corridor can play a major role as the center of these movements in the Mediterranean basin.

As a result, the proposed corridor influences each country in a different way as it concerns the development of transportation and the economy of each country, being compatible with both Mediterranean and European priorities.

**Alexandria / Port Said / Cairo – Aqaba – Amman (Bagdad /Gulf) Damaskus /Alepo or Beirut – Ankara / Izmir – Istanbul**

The corridor as a road link would be very useful for goods and passenger movements in between the five countries. It is a gateway to/from each of the five countries sharing the corridor to/from Iraq and the Arabian Gulf States (Saudi Arabia, Kuwait, UAE, Qatar, Bahrain, Oman and Yemen) from the northern end of the corridor via Turkey and from its southern part via Jordan. The corridor is important to the five countries as it provides another road access to East Europe, Balkan and Central Asia countries through Turkey.

In the Mediterranean region as a whole, the corridor is important since it is a link to Iraq and the Arabian Gulf States (Saudi Arabia, Kuwait, UAE, Qatar, Bahrain, Oman and Yemen) from Aqaba and Amman. In other words, cargo unloaded in Alexandria or any other Egyptian Mediterranean ports (El Dekhila/Dammietta/Port Said/East Port Said) can be transported to those flourishing economy countries by trucks. This would provide a complementary land route to the Suez Canal maritime route and can be suitable for certain types of commodity.

The corridor is important as it provides access to central Asia countries through Ankara by road where commodities unloaded in any of west Turkey ports
(Istanbul and Izmir) can be transported by trucks to central Asia via Ankara. Furthermore, this corridor can give access by road to East Europe and the Balkan countries via Istanbul. The corridor also provides a road access to Iraq via Turkey for any future exchange between Europe and Iraq. Furthermore, for passenger transport the corridor has importance to some of the Hajj (Pilgrimages) of Maghreb countries who prefer to get in to Saudi Arabia by road through Cairo, Nowibaa and Aqaba.

**Alexandria / Port Said – Beirut / Limassol – Piraeus / Thessaloniki – Izmir – Istanbul**

This corridor will be useful for the transport of goods and passenger movements in between the six countries. It is a gateway to/from each of the six countries sharing the corridor from/to the Arabian Gulf States, east and southern Africa and Asia, from the Egyptian ports in the south end of the corridor. In addition, the corridor provides good access to/from East Europe, Balkan and Central Asia countries through Turkish, Greek and/or Cypriots ports on the corridor as applicable. Through Beirut and Latakia it would also be possible to link to Jordan and Iraq. The corridor would also encourage tourist transport between the six countries thus it will have positive impact on cultural ties and exchange between the countries sharing the corridor.

For the Mediterranean region as a whole, the corridor is important to link to the Arabian Gulf states, East and Southern Africa and Asia from any of the Egyptian ports on the corridor (Alexandria / El Dekhila / Dammietta / Port Said / East Port Said), utilizing afterwards the Suez Canal, the Port of Suez on the Red Sea. It also provides access to central Asia countries through any of the Turkish ports on the corridor (Izmir/Istanbul). Furthermore, it can give access by road to East European countries and the Balkan countries via Greece and/or Turkey. The corridor also provides a road access to Iraq via Turkey from the north or via Egypt from the south through Corridor 3 East for any future exchange between Europe and Iraq. Finally, this corridor serves as a “Trans East Mediterranean Corridor” and can later in the future be linked with the “Trans Maghrab Corridor” and also to the nearest “Motorway of the Sea” proposed by the EU.

**Rabat – Algiers – Tunis – Sfax - Tripoli – Cairo**

The development of this corridor may pave the way of developing and promoting the trade between the countries of the region, which is lagging behind other trading nations.

This corridor is also important for the countries sharing it as it is a connection point for the south countries to reach trading routes in other parts of the Eurasian area, namely, the Black Sea countries, Caucasus and Central Asia. It will also provide the means of developing trade between the two largest economies of the Mediterranean Region, Algeria and Egypt.
Knowing that the integration backing and the transport interconnection sector, thanks to the planning of international transport corridors in the occurrence the corridor (Rabat / Cairo), will permit to road, maritime and aerial infrastructures to offer conditions of a narrower cooperation in the domain of transport between countries concerned by this corridor.

4.1. Introduction

Harmonisation of transport policies is of crucial importance in the Mediterranean region. Corridor identification and analysis have to be related to definition of national plans or policies in order to be able to stimulate national activity and promote international cooperation between countries in order to relate Mediterranean priority actions with national priorities.

This interrelation will be of particular importance when work packages address transport policies for improvement of interoperability or transport infrastructure planning including definition of priority criteria.

All Mediterranean countries participating in the MEDA TEN-T have provided an analysis of the National Plans of their countries. Reforms and new projects are described, as well as the objectives of each respective Ministry to support and develop transport within the country and the Euro-Mediterranean region.

4.2. Overview of the National Plans

To facilitate the smooth international flow of goods and passengers in the region, any set up shall take into consideration bilateral and multilateral relations into consideration; both regulatory and other forms, and should treat operators from all MEDA countries in a similar manner. The transport set up should also take into consideration sustainability of the sector in terms of environment protection and the protection of transport users, workers and the public at large against risks in safety matters, and improvement of social conditions. What the current set up lacks today is cooperation at all levels and between all parties in the transport field. This could be found at the country, regional, and international levels, especially in terms of resolving border crossing problems, the development of common data collection strategies, project evaluation capabilities, and the transport needs assessments on a regional basis.

The governments of the MEDA region (non-EU especially) must develop clearer and more efficient strategies to lead the user of the infrastructure to make an appropriate contribution to investment and maintenance costs and contribute to the coverage of cost elements of transport. This would enable such governments to expand their projects with a wider regional perspective. Finally, the international transport set-up in the region must take into consideration methods to optimise the efficiency in the use of infrastructure,
vehicles and equipment, taking account of alternatives to new investment in physical infrastructure and maximizing the benefits secured from new technology.

5. **Needs and Barriers of Infrastructure Development in the Mediterranean Region**

Transport infrastructure development in the Mediterranean region is expected to contribute to improving economic / trade relations within the Mediterranean region, with the EU as well as with neighbouring non-Mediterranean countries. Additional strategic socio-economic goals associated with the upgrading of transport infrastructure in the Mediterranean region is the opening of the market for transport operators and the improvement of employment opportunities.

Quality of service and technological improvements are also rated highly as key expectations associated with infrastructure development.

This section refers to the identification of the user needs and barriers for the better integration of the Demonstration corridors in the Euro-Mediterranean transport network.

5.1. *Questionnaire*

The main purpose of the developed questionnaire was to identify needs and barriers as portrayed by the various players in the transport chain.

The questionnaire used for the study was based on the analytical framework elaborated by the TENASSESS project on barriers to the implementation of the Common Transport Policy and TEN-T projects (*TENASSESS, 1998*). It comprised three main parts, of which Part 1 included a set of background questions on the respondent and his/her function / occupation as well as involvement in the transport policy / project planning process, whereas Part 2 inquired into the needs and expectations associated with the implementation of specific transport infrastructure projects in the country of the respondent. The needs and expectations were classified into five categories:

- **Socio-economic**: these related to the improvement of economic / trade relations with the EU, MEDA countries, other non-MEDA neighbouring countries, regions within own country, the opening of the transport market and the creation of new employment opportunities.
- **Service quality and technological improvements**: these related to direct transport impacts like the decrease of travel time and of transport cost, the reliability of service, the upgrading of transport infrastructures or transport operations / logistic chains, safety as well as the diffusion of information technologies.
• Multimodality / intermodality related needs concerned the upgrading of road, rail, port, terminal and air transport infrastructure, the development of intermodal technology, the capacity of road / rail systems connecting to nodes like ports, the number of modal choices and the frequency of related services.

• Environmental needs / expectations concerned the reduction of environmental degradation due to transport, the protection of environmentally sensitive areas, the reduction of traffic congestion as well as of noise levels.

• The final socio-political category tapped on frequent high-level objectives associated with transport infrastructure, like the improvement of regional stability, the promotion of socio-cultural and economic exchanges as well as military forms of collaboration and the better coordination of transport policy at trans-national / trans-regional level.

Part 3 inquired into the barriers associated with the implementation of specific transport infrastructure projects in the area under consideration. Actual or potential barriers were classified into seven categories: technical, financing, environmental, (regional) responsibility, geo-political, socio-economic and ‘other’ barriers.

All items on needs / expectations and barriers were assessed by the respondents on a 1-5 scale where ‘1’ indicated low importance and ‘5’ indicated high importance.

The respondents were furthermore given the opportunity to specify their answers to part 2 and part 3 with reference to one of the MEDA TEN-T corridors under study by the MEDA-TENT project.

5.1.1. Presentation of responses

Answers to the questionnaire were provided by 57 respondents.
Table 1: Responses by country

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordan</td>
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<tr>
<td>Lebanon</td>
<td>10</td>
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<tr>
<td>Egypt</td>
<td>8</td>
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<tr>
<td>Algeria</td>
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<tr>
<td>Tunisia</td>
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<tr>
<td>Italy</td>
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<td>Malta</td>
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<td>Cyprus</td>
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</tr>
<tr>
<td>Turkey</td>
<td>1</td>
</tr>
<tr>
<td>Marocco</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2: Responses by position of respondent

<table>
<thead>
<tr>
<th>Position of respondent</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator / Forwarder</td>
<td>16</td>
</tr>
<tr>
<td>Government / civil servant</td>
<td>16</td>
</tr>
<tr>
<td>Shipper</td>
<td>10</td>
</tr>
<tr>
<td>Consultant / RTD</td>
<td>9</td>
</tr>
<tr>
<td>Infrastructure / Industry</td>
<td>6</td>
</tr>
</tbody>
</table>

It must be noted that the sample of respondents cannot be considered representative of any particular country, occupational group or demonstration corridor. The results of the survey as such must therefore treated with caution. A comprehensive analysis of user needs and barriers related to the MEDA TEN-T corridors must therefore consider additional information and NOT rely alone on the replies to the questionnaire. However, based on the existing responses the following sections highlight the main issues that have arisen.

5.2. Review of responses

Overall, the dispersion of answers is rather low both within countries and within corridors. This means that there is no major variation with regard to the assessment of needs and barriers of Mediterranean transport corridors among different actors. This again implies that at this stage of development no major conflicts of interests between participating actors can be expected. This is encouraging but also surprising considering the little degree of sub regional cooperation in the countries concerned. This could however also indicate that the problems with the implementation of coordinated transport plans within the region have little to do with transport per se.

The most important barriers that are of unanimous agreement among the respondents are:
The above result is rather logical, as customs regulations and procedures are tedious and time consuming necessitating many procedures and verifications that make it a real barrier that needs effort for improvement. Also lack of national funding is a realistic barrier that calls for untraditional financing by encouraging private investors, public private financing and other channels. Perhaps also in some areas there exists a kind of lack of understanding of the real spirit of work and needs of the private sector requirements from transport facilities and port services particularly those related to the need for respecting delivery times and reducing cost of the unnecessary procedures. This indicates the need for capacity building and institutional development in that respect.

The second most important barriers that are indicated by respondents are:

- Customs clearance.
- Few incentives for coordinated planning and decision-making.
- Lack and inadequacy of external funding.
- Deregulation and organizational changes.
- Difficulties of verifying the qualifications of other operators.

Again the respondents emphasized the barrier of customs clearance and this time with respect to lack of appropriate technologies for this activity such as the use of EDI and other electronic management of information and procedures related to custom clearance. It is important to observe that the second, the fourth and the fifth barriers in the latter list and the third barrier in the former list are all related to institutional development and capacity building. This emphasizes the need for such effort that would certainly rationalize the use of existing and future transport infrastructure and facilities. As for the third barrier related to lack and inadequacy of external funding, it also confirms the above conclusion on the need for untraditional financing of transport infrastructure so as to reduce the burden on the national budget.

6. Conclusions

Modern, efficient transport networks are essential for the economic and social development of the Union's Mediterranean partners and for strengthening their ties with the Union. Traffic across the Mediterranean is particularly dense. The European Union is by far the leading maritime partner for a large number of Mediterranean countries, in particular the Maghreb, and most of the trade between the two shores of the Mediterranean is carried by sea. Thanks to tourism, the EU is also the most important partner for most Mediterranean
countries for air travel, while the cruise industry is expanding, with high levels of activity in the Mediterranean region.

The selection and development of the multimodal (comprising all modes) corridors, as presented in this report was based on the analysis of the modes that are dominant in international transport between EU and the rest of the MEDA countries. Importance was especially given to shipping and air transport services, given their key role in a transport system, and to the inland links, which are essential for the development of the south-south trade. Short sea shipping and the introduction of the sea motorways through the selected Demonstration Corridors, was also particularly important given the distances involved and that in some cases, practicable inland links are non-existent.

From the above presented analysis and recent developments, one could agree with the conclusion that the Euro-Mediterranean region intends to upgrade its role as an important transport and communications node in the world. What needs to be done is to create the best possible infrastructure and adequate service facilities for transporters. This means that programmes for the development of commercial transport centers (freight villages), service facilities networks, motorways, bridges, railways and ports have to be issued, completed and expanded. Furthermore, more attention should be paid to combined transports (especially sea terminals), telecommunications and generally to transport telematics, supporting the transports sector. In parallel, administration of each country dealing with international transport should secure a smooth, fast and less-bureaucratic operation, which will lead to a coherent transport system in the region. Another important issue is to guarantee a stable and secure political environment in a troubled region of the world.

Further analysis and development of the MEDA TEN-T Demonstration Corridors, is likely to promote regional integration and coherence between the networks of the Mediterranean Partners and the trans-European network. However, due consideration will be given to administrative, logistic/operational and infrastructure barriers.
IV – INTEGRATION OF MEDITERRANEAN TRANSPORT AND INTERMODAL CHAIN IN EURO-MEDITERRANEAN AREA

1. Introduction

The analysis of the integration of Mediterranean transport and intermodal chain in Euro-Mediterranean area will be first considered from a demand and a supply point of view.

The demand approach stresses the transport needs in terms of volume and type of services for each country concerned. At this stage it will be important to show the diversity of situations between Mediterranean countries; from North to South, from East to West.

Distinction will be made between western part and eastern part of Mediterranean but the Mediterranean area will be also considered as a whole.

In this presentation, political objectives and the actions initiated by national and international organisations to create a free trade zone, between Europe and Mediterranean partners, have also to be considered because they have an impact, not only on the economic relations but also on the organisation and facilitation of transport.

The opening of the market in Mediterranean area implies for many southern Mediterranean countries deep structural changes of their administration and economic situation; these structural changes have direct consequences on transport.

For the supply approach focus is put on organisation of transport chains and addresses the role of actors of transport, shippers and transport operators of different modes. The analysis is conducted at a micro level.

In Mediterranean area most of international chains are intermodal transport chains combining land transports and maritime transports. Land connections are in general limited to relations between neighbouring countries, which are developed only between EU countries: in southern and eastern parts of Mediterranean the commercial relations between neighbouring countries are often at a very low level, as it will be shown in the part relative to Mediterranean trade.

Once this context is set, attention is put on the intermodal network of services within the area with differentiation between types of services with, in
particular, the distinction between containers services and ro-ro services; rail/sea intermodal combination will also be discussed.

In the next stage the demonstration corridors are introduced within network in order to benchmark with concrete examples the performances of intermodal network in Mediterranean.

From this confrontation between global context and concrete examples of transport chains, recommendations for the improvement of integration of transport chain will be made; these recommendations will address infrastructure transport technologies, organisation and administrative problems.
2. Trade and economic integration

The economic context of integration in Mediterranean area is first characterised by the opening of the European market to Mediterranean area with the objective of a free trade zone in 2010. Bilateral agreements are signed with Mediterranean partners in order to reach this goal in parallel with a renewal of multilateral initiatives for a Euromed policy development which also CONCERN in the transport sector.

- EU bilateral agreements for Euro Med free trade zone

Bilateral agreements are now signed between Europe and most of Mediterranean countries; they are the basic reference for progress in depth towards the goal assigned of a free trade zone but beyond this objective they also include consideration about structural changes, cooperation and political evolution, in a process which sometimes recall the development of cooperation between EU and CEEC countries during the transition period.

- Regional agreements between Arab countries

However these initiatives between EU, which is the strongest economic partner, with other Mediterranean countries are not the sole regional initiative to take place within Mediterranean area. Regional initiatives develop between Arab countries of the southern part of Mediterranean, at different levels, stressing different types of goals, political and economic goals with in particular:

- the UMA initiative between Maghreb countries
- initiative between Arab countries to promote free trade zone: the GAZALE Grande Zone Arabe de Libre Echange, created in 1997 and the Cairo Convention including countries from Middle East and Arab Peninsula to Maghreb.
- the Agadir agreement for free trade zone between Jordan, Egypt, Morocco, Tunisia; this agreement commits the parties to substantially remove all tariffs on trade between these countries by 1st January 2006, and to intensify economic cooperation with harmonisation of their legislation with regard to standards and customs procedures.


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9 Cf. in particular transport report of UMA presented to MEDA TEN-TMEDA TEN-Tat the first Conference
In the Eastern part of Mediterranean ESCWA, a regional UN organisation contributes also to facilitate transport and promote international exchanges.

However these regional initiatives have not yet much developed the trade between Arab countries during the last decade; despite progresses in absolute and relative terms, this trade remain at a low level.

- Impact of opening to the east

A third aspect of the development of socio economic integration in the Mediterranean area is the consequence of the opening to the East in direction of Central Europe and CIS countries: this affects flows of trade in Eastern part of Mediterranean from north to south and from east to west placing Turkey and Greece in a central position. The recent figures of trade between these countries point out that such changes have accelerated during the recent period and in particular since 1999 and 2000.

- Fast integration in world trade

The last important factor taken into consideration to characterise this evolution of exchanges in Mediterranean area is the fast development of world trade which impacts on economies of Mediterranean countries as well as their transport: this shows why the Mediterranean corridors must be analysed in a wider perspective of corridors between continents. All the Mediterranean countries are concerned but for some of them and, in particular in Eastern part, the non Mediterranean trade takes a dominant share with growing exchanges with Central Asia, sub-Asian and Far East countries.

The transport needs and the integration of transport chain must adapt to this fast changing economic context. In MEDA TEN-T special attention is given to the integration of European and Mediterranean networks but the extensions of connection towards other continents are also considered so that continuity of networks brings the adequate infrastructure support for the continuity of transport operations.

In order to characterise more concretely the transport flows concerned, the analyse of several databases have been required in this WP3:

- detailed analysis of COMEXT database which inform about trade between EU countries\textsuperscript{10} and other countries of the world
- detailed analysis of COMTRADE which is the UN database and provides complementary information on trade between the countries which do not belong to EU in eastern and southern part of Mediterranean.

\textsuperscript{10} the introduction of new entrants is not yet finished in COMEXT
However COMTRADE database is only available in value of goods\textsuperscript{11}, and is not available in the NST nomenclature so that both analyse cannot always easily be matched.

In doing so different zones of Mediterranean area have been distinguished as it has been done in previous WP since it is still difficult to consider Mediterranean area as a homogenous zone:

- Western Mediterranean area with its strong relations with southern European countries
- Eastern Mediterranean area under strong influence of rapid changes between Europe, Black Sea, Central Asian countries, and to some extend, African continent
- And the southern part of Mediterranean area, from Atlantic to Middle East, with weak exchanges between countries.

Therefore the global appraisal of Mediterranean exchanges has been completed with specific analysis per zone in a way which underlines more precisely the role of the different demonstration corridors.

The economic integration in Mediterranean is also analysed through trade statistics, per type of products using these two major international sources which can be combined with national statistics.

\textsuperscript{11} Sometimes there are tons of exchanges or number of units
### Table 3: COMEXT 2001_Sea+Road_General Cargo (thousand t/year)

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**Table 4 : COMEXT 2001_Sea+Road_General Cargo (thousand t/year)**

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The analysis shows a diversity of situation between Mediterranean countries first appears for import as well as for exports.

- Western Mediterranean countries of the Maghreb are still very much related to EU countries and among them to southern European countries.

The first results of DESTIN confirm these close relationships which have justified the development of a Western Mediterranean transport model.

In the past ten or twenty years these relationships have even strengthened, even for exchange of energy (oil) products and basic products; growth of agricultural product exchanges between Southern and Northern countries have strengthened also these economic relationships.

However the very recent period reveals also, from this point of view, new tendencies. First agricultural products are also exchanged more and more often with North European countries even though the transport logistic organization remains strongly dominated by southern European operators. But there is also the opening of new market between Maghreb countries and central European countries as well as CEI countries in both direction: new exports for Maghreb products and new possibility of import for basic agricultural products such as cereals.

Furthermore, after a trend of relative reduction of the share of exchange with the rest of the world, this trend might be reversed in the coming years with more opening of Maghreb economies to the Asian and American countries, opening which is facilitated by the development of intercontinental maritime services in Maghreb ports as it will be shown in the next chapter.

- Eastern Mediterranean countries trade is strongly related to EU with, however, bid differences between countries.

Turkey, Cyprus, Lebanon exchange more than 50% of the foreign trade with EU but this is not the case of Egypt, Jordan, or Syria: exports of Lebanon toward EU are also at a low 24% level.

In these countries the EU trade is sometimes becoming relatively more important but this is not always very clear and the trade of Eastern Mediterranean countries is growing with all the partners at a comparable rate.

- an increase of intra-Mediterranean trade

The level of intra-Mediterranean trade is starting from a very low level with almost no trade between Maghreb countries and between neighbouring Middle East countries, if we exclude the case of Northern Mediterranean countries and Turkey is below 5% where such rate is between 30 to 50% with EU.
The exchanges with all the PPM (non European Mediterranean countries) is very low for Maghreb countries (with a high 13% for Algeria exports due to petroleum) and low for all the others, rarely above 10% except in the case of Syria, because of relations with Lebanon and Jordan, and with the exception of Cyprus which seems to have a kind of redistribution role in the area (16% of exports of Cyprus).

However exchanges of intra-Mediterranean trade have grown over the 92-2000 period, especially for Turkey with a faster rate than the exchanges with other countries as well as for Algeria. Egypt which was more turned towards the extra Mediterranean trade appears also to have a more dynamic participation with Mediterranean trade.

Another characteristic of Mediterranean trade is provided by the intra/inter-branch index. This index is very important because it stresses the nature of the exchanges and has a direct influence on the organization of the transport chain which is the central point of this deliverable focusing on integration of transport chain.

An important intra-branch component in the exchanges points out that exchanges take place within industrial sector with higher degree of specialization of units which will take part in a specific production process; from a transport point of view intra-branch exchanges will mean more logistics integration between production units situated in different countries with logistics requirements which are different from distribution requirement of final products.

From this point of view it appears that trade between western and CEEC European countries is much more influenced by intra-branch exchanges than trade between EU and Mediterranean countries (30 to 40% of total trade as compared to 5 to 20% for Mediterranean countries with fairly high level for Tunisia). However this situation is also likely to change in the coming years and examples with textile are always well-known; in the recent period intra-branch exchanges in electronic components and automobile tend also to growth between EU and Mediterranean countries, in particular with delocalization which now concerns also services production.
3. Transport chain integration

From a micro economic point of view area the integration of transport chain is a first requirement of the shipper in order to improve his competitive position on the market. In this section the analysis will shift from a macro economic level to this micro economic level.

The main objective is to make a diagnosis of the integration of transport chain in the context of Mediterranean trade and, to stress the dynamics at work, in order to improve this integration of transport chain.

The diversity of economic situation stressed before has obviously consequences in the functioning of the transport chain between Mediterranean countries, being aware that they are more and more directly in competition with international transport chain between Europe, Asia an America: very often the proximity between countries does not necessarily imply the existence of integrated transport chain, when such integration progresses very rapidly over long distance, in the world trade.

The possibility offered by maritime transport to link different Mediterranean countries, has obviously played an important role in the past to facilitate and integrate transport in Mediterranean area, but this has not been always the case in the more recent years and this aspect of integration of maritime transport within transport chain is of particular importance and will be addressed more specifically in the next section.

The focus here is put more on the general condition of exchanges and trade and their consequences on the organisation of transport, independently of the choice of a particular route or a mode.

Special attention must also be given to recent deep changes which affect the region as far as reorganisation of economy and transport sector are concerned in order to better “contextualise” the problem of integration of transport chain and to explore perspectives of the evolution of the situation.

From this last point of view, it can be stated that the context has been changing in depth in the recent years, and that most countries are presently applying new rules affecting the structure of economy and transport sector; although very critical situations and conflicts remain in some parts of the region, significant progresses can be expected in the year to come.
In the facilitation of trade and transport operations there are indeed four major aspects which have been analysed in detail in REGMED:

- customs operations for taxation and control
- transport operations with related transport document exchanges along the chain of transport
- banking operations for financial settlement and authorisation of transfer
- movement of persons and attribution of visa which must not be underestimated for mobility of personnel accompanying the transport of goods (for example truck drivers).

In this context it is also important to stress that introduction of new information technology and use of electronic data interchanges are penetrating in most of the Mediterranean countries, and important benefits are still to come:

- this introduction of new technologies becomes easier when there is simplification of procedures which accompanies the implementation of free trade zone
- and the new control requirement will probably require new step in harmonisation of documents and traceability of transport chain, with negative and positive aspects: this can create more costs, but it probably speeds up a modernisation process which becomes an “obligation”.

The gradual diminution of customs taxes in the implementation of a free trade zone has to go in parallel with profound reorganisation of the whole economic system of these countries and in particular with the profound reorganisation of the transport sector.

The point which is made here in this report on integration of transport chain is that often this process has started in the eighties and accelerated in the nineties but that all the consequences and impacts of these reorganisation are sometimes just appearing in the last years: there are obviously differences between countries, but in several Mediterranean countries and in particular Maghreb countries new laws relative to transport have just been applied in the recent years and in particular laws relative to road freight transport.

The second point which is made is that the integration of transport chain across Mediterranean will be easier to achieve in such a liberalised and open context, so that the integration process can progress and be initiated from both side of the transport chain whether it is in a country from the north or the south of the Mediterranean.

So far the integration of the chain was mostly due to initiative of European transport operators or large industrial shippers. Most of international trucks haulage in Morocco, for example, is made by companies from European Union.
In this general context, it is clear that a country such as Turkey must be considered apart: Turkish companies and in particular Turkish road hauler have been able for a long time to build a strong road industry which master complete transport chain in the exchanges with EU countries but also with other central Asia countries. These first developments took place more than 30 years ago when Turkey benefited from its position of transit country to Middle East. Furthermore Turkey has customs and trade agreements with EU for a long time.

In Turkey, the existence of professional associations helped Turkish trucking company to use the TIR permits for transit; the support of such association is lacking for the promotion of use of such permit in Maghreb countries as well as in most Maschrek countries. Furthermore the international trucking association (UND) of Turkey ha created integrated ro-ro services from several ports of Turkey to Trieste in order to transport goods to EU countries which shows that “integrated ro-ro transport chain” do require some kinds of organisation for trucking industries if we want such integration not to be limited to the biggest trucking companies and to diffuse in a country.

Therefore professionalism of transport sector, which accompanies the liberalisation process and the creation of private enterprises, is an important step to guarantee the integration of transport chain in the Mediterranean area, a successful use of new facilitation opportunities with penetration of new information technologies and quality of training as well as development of transport associations goes in parallel with professionalism.

In this evolution port activities have also been liberalised in Mediterranean with introduction of private operators and in many countries development of private ports. The movement of liberalisation has made great progresses in the nineties and port performances in many Mediterranean ports have increased significantly.

But these general progresses are not uniform all around Mediterranean area and the ESCWA benchmarking of ports in the Middle East shows that administrative procedures in the ports of this area remain very complex which is reflected in the importance in their clearing cost.

There is also a “side effect” to the liberalisation of maritime transport which is that some smaller national maritime companies cannot survive to international competition and are obliged to stop some short distance regional services.
4. Integration of intermodal network

The integration of intermodal networks in Mediterranean can be analysed from different points of view

- Integration of Mediterranean networks within the intercontinental maritime services networks in parallel with the development of world trade; Mediterranean countries are taking an active part in the expansion of world trade.
- Integration of intermodal networks between Mediterranean countries and EU countries which concerns combination of different modes sea, road, rail and, in few cases, inland waterways.
- Integration of intermodal networks at regional level within Mediterranean area with distinction again between western Mediterranean, eastern Mediterranean and east-west links in Mediterranean, a differentiation which has also been used within MEDATEN T for definition of demonstration corridors.

In the recent years Mediterranean area has become a major zone for organisation of intercontinental maritime services, between Asia, Europe, American and Africa: before it was more a transit area for intercontinental maritime transport.

This phenomenon is playing a major role in the overall organisation of services in Mediterranean area and influences the organisation of maritime services between Mediterranean countries themselves. Major maritime hubs have appeared in the central part of Mediterranean as well as at both extremities close to Gibraltar strait or to Suez canal: the increase of transhipment of containers in these hubs has been particularly higher since the beginning of the nineties, at a rate superior to the increase rate of transhipments in the northern Europe.

The analyse of the integration of Mediterranean intermodal services shows that the development of Mediterranean hubs and feeder services associated has increased the number of services between Mediterranean ports: increase of frequency between Mediterranean ports and increase of the number of ports which can be connected, through hubs to other Mediterranean ports and major ports of the world.

This reorganisation of maritime services has also affected connections of Mediterranean ports with northern European ports, offering new services when ships all in northern and southern range, ports of the southern Mediterranean countries have benefited very much from this evolution and in particular ports of Maghreb as well as ports of eastern Mediterranean.
But once this evolution and its consequences are assessed one might wonder if other types of services are not needed between Mediterranean ports, independently of the world container services organisation:

- conventional services such as transport iron and steel products, chemical products, cereals, building material
- general ro-ro services which are often used for exchanges of manufactured goods and consumption products.

The ro-ro services are in general more rapid and can be very well adapted to specific logistic chain between Mediterranean countries.

However these services do not always reach the same efficiency in terms of maritime transport productivity (use of the capacity of the vessel) and costs.

Therefore it is also very important to investigate how such ro-ro services can be properly adapted to the needs of integration of transport between Mediterranean countries or between EU countries and Mediterranean countries. From this point of view the concept of maritime motorways of the “White Paper” can be particularly relevant and find a concrete illustration in Mediterranean countries.

These different points will be developed with distinction made at regional level between western, eastern Mediterranean, and relation between east and west.

To achieve this, a basic network of ports and maritime links has to be built for Mediterranean, in a way which is compatible with the description of land networks and in particular TEN networks for Europe.

In this network nodes and links are geocoded so that transport operation along the transport chain can be described in detailed in the next section, and refer to the maritime services integration presented here.

The network of Mediterranean ports will then be essential since ports are the strategic nodes of intermodal maritime chain in the Mediterranean.

- **A basic network of ports, within an Euromed network**

For the purpose of MEDA TEN-T, more than 100 ports have been individualised with services attached to these ports: for the maritime services and identification of ports the international services have been privileged, as well as the total volume of traffic of the ports when the information is available: ports with more than 1 million tons are systematically introduced and new information available relative to activity of ports can always induce an adaptation of the port network.
This choice implies that the database of port can be understood as a flexible tool focussing on international connections, which does not necessarily include all national maritime services serving islands.

The analysis of the services available in the ports will help to understand their role in Euromed transport networks.

Most of these ports are now equipped with transhipment facilities for maritime containers although it might be sometimes some light equipment such as wheel cranes.

For ro-ro services port equipment can be very limited, with just a ramp to accede to the vessels and therefore some important maritime routes might sometimes be developed from fairly small ports or in the vicinity of big ports when land connection is appropriate : for the MEDA TEN-T project this only stress that the list of ports has to remain open and flexible in relation with a monitoring of the evolution of maritime services, container services or ro-ro lines which might change very quickly, from one year to another, as well as within a year period, with difference of services between winter and summer services.
Figure 12: Port network in Mediterranean

Figure 13: Port Service network in Eastern Mediterranean

Figure 14: Port service network in Western Mediterranean
The integrated network of container services

In the nineties the position of the Mediterranean area has completely changed in the world organisation of maritime container transport. The large shipping companies have incorporated the Mediterranean ports in the oceanic routes.

Before Mediterranean ports were considered more as secondary ports or transit ports with most of transhipments, loading and unloading taking place in ports of northern Europe.

In this evolution Mediterranean ports became major hubs, second by dense network of feeder lines, for connection with Mediterranean area but also for connection with northern Europe, Africa or Black Sea.

Feeder lines can be associated to major maritime hubs, company, or to a specific important hub; they can be also independent and independent feeder companies have joined their efforts to rationalise feeder services across Mediterranean.

The results are a rapid increase of services available and a multiplication of connections between ports: direct services port to ports as well as indirect services through hubs (hub and spoke).

With the generalisation of hub system the number of indirect services has often increased more rapidly that the number of direct services.

Direct services can be implemented between two ports or more along feeder routes with frequency ran from one per day (or more) to one per week (or less) according to the number of vessels operating along the route and to the number of calls along this route.

In order to illustrate this system of organisation from world scale maritime transport to service in Mediterranean area some examples of major maritime companies have been described p.34: The Maersk Sealand network services with hubs in Algesiras and Goia Tauro. The MSC network services with hubs in Pyraeus and Valencia.

Other maritime companies network can also be presented with often not only one hub in Mediterranean area, but two hubs situated either in the west part (Algesiras, Valencia), in the east part (Damietta, Port Said, Piraeus) or in the centre where the major Mediterranean hubs develop more rapidly: Goia Tauro, Marsaxxlo and also Tarente.

This central part of Mediterranean seems to be particularly privileged for implementation of such as Cagliari (Sardinia) as en ports in Tunisia are eager to attract hub services. In the western part the new port of Tangiers might be
also a candidate. However important port such as Barcelona, Marseilles, Genoa, Livorno, La Spezia in general considered as being too far away from the Oceanic routes crossing Mediterranean. The case of Valencia and recently Naples might be at the limit of a northern range where transhipments location might be considered by maritime operators.

In any case the reorganisation of functions of ports in Mediterranean area, where hubs ports are chosen by major companies does not necessarily hamper the development of major south European ports where connections with hubs and therefore number of services around the Mediterranean.

The results for different parts of Mediterranean area are produced showing significant improvement over the recent years mainly due to increase in number and quality of indirect services: indirect services in 2001 or 2002 have often reached a better quality of service then direct services 2 or 3 years ago.

Furthermore indirect services have allowed serving a greater number of ports all across Mediterranean with particular significant improvement of services in Maghreb ports and most eastern Mediterranean ports.

A service database port to port and country to country across Mediterranean region has been established by NESTEAR using different sources available and web sites of companies. This database needs certainly to be updated regularly since the services proposed are changing regularly; consultation of professional review is in general the only way to achieve this updating.

In the table p.35 which summarises the results on a country to country basis it appears:

- the prominent role of Italy with 1 538 (with 420 external services from Mediterranean to the rest of the world) out of often 8 020 services which have been registered: half of these services are indeed services between Italian ports.

The important role of Italy is explained:

- by the number of Italian ports served along the Italian coast which play an important role in national and international trades
- by the central role of Italy in the middle of Mediterranean area servicing both west Mediterranean, Adriatic Sea and sometime eastern part of Mediterranean for the ports situated in south Italy
- the proximity of northern Italian ports to economic centre of Europe and mainly industrial centre of Germany, France, Austria as well as from the new economic centre of CEEC countries.

The second country after Italy is Spain which also have very long coast in Mediterranean with ports servicing national and international trade.
But Spain is located in the western part of Mediterranean area and has a privileged location for external connection to Atlantic, western African coast and, often, northern Europe services.

The following countries are Turkey and Egypt:

- Turkey because of its central role in eastern Mediterranean and also a significant number of national services: the connections are established with all major parts of eastern Mediterranean as well as with ports of Black Sea.
- Egypt because of the number of external services, due to its position at the entrance/exit of Suez Canal and to the important number of links with Italy and Italian hubs.
Figure 15: Maersk Sealand network services

Maersk Sealand Network services

Source: NESTEAR

Figure 16: MSC Network services

MSC Network services
This phenomenon of hub organisation in Mediterranean, which has considerably increased the number of connections in recent years for most of Mediterranean parts can be analysed more in detail with the description:

- of Mediterranean connections of the different hubs in different zones of Mediterranean
- of external connections of each of the hubs to different parts of the world.

**Ro-Ro services adapted to Mediterranean trade**

In parallel with container services a database for Ro-Ro services in Mediterranean area has also been established by NESTEAR using different sources available, Shipax, Transport Actualités, and companies’ information available on the web (Cf. p.44).

The advantage of Ro-Ro services as compared to the container services can be quickly recalled:

- more adaptability from the logistic point of view so that Europallets dimension can fit better to the transport units (trailer or euro box)
- easier transhipment in ports and consequently lower transit time from origin to destination.

But, on the other hand Ro-Ro services will be in general more expensive.

All these comparative advantages will be more detailed in the section relative to transport benchmarking in demonstration corridors.

In the analysis of Ro-Ro services throughout Mediterranean area the situation appears more contrasted than for maritime container services for which a kind of unification of the zone is taking place with implementation of hubs.

When considering Ro-Ro services more differences appear between different zones mainly because of the differences of trade relations between countries concerned.

- **The western Mediterranean**

In western Mediterranean north south Ro-Ro lines have been in service for a long time with connections between major ports of European and Maghreb coasts. In contrast east-west services in the western part of the Mediterranean are much more limited, between Spain, France and Italy, although there are high volumes of trade between countries. The competition of road transport explains this situation and the perspective of increased congestion of road along the European Mediterranean coast, as well as the problem raised by the
crossing of Pyrenees and the Alps which are “sensitive” areas stimulates the search for new maritime competitive services. A priority for Europe and the three countries concerned, France, Italy and Spain, is to generalise the few initiatives which are taking place between Barcelona and Genoa, Valencia and Naples.

For the crossing of Gibraltar strait high frequency ferry services are proposed:

- between Algesiras, Ceuta and Tangiers
- but also on longer distances between Cadiz and Casablanca on the Atlantic side, and between Almeria, Alicante and Nador or even Oran on the Mediterranean side.

For all these relations the traffic is often mixed traffic with passengers and freight.

The existence of high frequency ferry lines in the western part of the area creates competition between routes with shorter or longer sea leg: the routes through Gibraltar and ports of the South of Spain will enter in competition with Ro-Ro lines on longer distances:

- from/ to Valencia, Barcelona, Marseilles, Sete or even Genoa
- to Casablanca, Tangiers, Oran, Algiers, Bejaia, Annaba, Tunis or even other north African ports.

In the benchmarking of the performances the different combinations of road-sea relations will be assessed.

In the eastern part of this area, the same type of alternative choice, with shorter or longer maritime links although there is no such a concentration of ferry services between southern Italy and Tunisia: the competitive routes develop from ports along the Italian coast as well as from ports of France: Marseilles, Genoa, Livorno, La Spezia, Naples, Salerno, Palermo are the major ports concerned and they are all connected with the transeuropean motorway network.

- The Adriatic zone

The Adriatic zone is probably the zone where the most efficient Ro-Ro services are taking place not only to serve the Adriatic ports but also to serve relations between Adriatic ports and ports of eastern Mediterranean. Very high frequency services exist in particular between Greece and Italy (with connection between

- Patras, Igoumenitsa and Piraeus
- Trieste, Venice, Ancona, Bari.
- **The eastern Mediterranean zone**

For the eastern Mediterranean zone the direct Ro-Ro services are rarely supplied between ports of the area and round services are more often organised from different ports which play a role of “central node” : the port of Piraeus and Limassol are the ports from which Ro-ro services are frequently organised.

As for container services the low volume of trade between these countries explains this type of organisation in order to provide a service with a minimum of frequency.

The transit time of Ro-Ro services in this area will then be in general longer than for western area.

- **The east west relations in Mediterranean area**

Ro-ro services are also supplied for east-west relations. In this organisation Malta is a central node : many east west services stop in Malta

  - Piraeus is a privileged calling port for all services touching Adriatic ports and ports in Aegean Sea up to Istanbul
  - Limassol is a privileged calling port for all the services to ports of Syria, southern Turkey, Lebanon, Israel and Egypt.
Ro/Ro

Figure 17: Transit time for the North-South lines in the Mediterranean area

Source: Nestear

Figure 18: Transit time for the East-West lines in the Mediterranean area
• Connections with north Europe

Ro-ro connection between Mediterranean area and north Europe also exists. In northern Europe the ports connected are ports of UK, and ports of the continent with the important role played by Antwerp.

These ports are connected directly with main Maghreb ports as well as with other important western and eastern ports of the Mediterranean, including the three ports mentioned earlier: Malta, Piraeus, Limassol. These connections are in fact in direct competition with other Ro-ro connections supplied in the ports of southern Europe and in particular Genoa, Marseilles and Barcelona, which are close to the industrial centres of Europe.

In this general schema it is important to notice that Libya is in general served through Malta ports.

In conclusion there are combinations of direct services (or sometimes triangular services), mostly in western part of Mediterranean with more complex system of organisation for East – West relations and relations between countries of eastern Mediterranean.

The result in terms of transport time is in general satisfactory for direct services: Mediterranean sea offers direct routes with often are much shorter than land routes, which imply competition time of transport with 20 knots speed vessels. A very good example is also provided by ro-ro services between Turkey and Italy, for which maritime route is not a direct route, service is adapted in order to optimise rotation of rolling stock, vessels and trailer along a week of activity.

When the route is not direct the result can also be acceptable when the time spent in ports is limited, with trip from east to west which rarely exceeds 3 to 4 days.

It must also be stressed that more complex organisations have pointed the central role of nodes such as Malta, Piraeus and Limassol.

For these observations a question can then be raised: can such ports play a role more important with transhipment between Ro-Ro services so that they become hubs of ro-ro services and not only “central” nodes of such services.

Form existing situation it is also important to analyse what type of initiative can be proposed so that “motorways of the sea” can be implemented in Mediterranean area

- will “motorways of the sea” be direct ro-ro services between main ports of Mediterranean?
- what advantages motorways of the sea will bring:
• in terms of increase of performance in terms of time and cost of transport for the integration of Euro-Med trade
• in terms of alternative to road mode when road competition exists in a limited or more extended segment of the door to door relation.

From this point of view the motorways of the sea will have certainly to bring a quality of service which is different from other quality provided by container services mainly in terms of time of transport and adaptability of units so that more “proximity can be retrieved in Mediterranean trade relation as regards world trade relations.

In any case the debate about “motorways” of the sea cannot be set in a radical way which oppose road and maritime routes but in a relative approach which compare route with different maritime legs.

Furthermore the debate must also be open to new transport techniques. In Mediterranean area container services have improved accessibility of ports. Combined solution with adapted vessels is also an interesting track of investigation which is developed in the project INTEGRATION.

- Rail in intermodal services

The contribution of rail in Mediterranean intermodal service is in general limited:

- because of the low modal share of rail in countries of southern Europe which have faced problem of gauge between Spain and France
- because of the fact that rail does not really for a network in southern countries of the Mediterranean.

In addition to problem of gauge just mentioned there are also problem of gauge for tunnels and narrow track lines are still in service in many Mediterranean countries.

However there are segments of markets for which rail intermodal services have developed in Mediterranean, and if there is no real network in southern point of the Mediterranean, many of the rail lines have been built to serve Mediterranean ports.

Among these rail market segments it is possible to point:

- Rail transport of basic products:
This is the traditional market. Products transported are basic materials or intermediate products adapted to specific industrial logistics: this is the case for example for chemical basic products, petroleum products, cereals and products of iron and steel industry in France, Spain, Italy as well as in Maghreb countries.

The rail connection for these transport exists in most port of Mediterranean area with possibility of transshipment on specialized vessels.

- Rail transport of maritime containers:

This is a privileged market for rail in southern Europe as well as in other Mediterranean countries.

In northern Europe an effort has been made to connect rail to containers terminal in most important ports and rail services of containers have been particularly developed

- in Spain with TECO services which have been a priority for several years
- in France to serve in particular Marseilles along the Rhone Valley
- in Italy where rail service of containers has been improved to most of the ports and in particular Genoa, La Spezia, Livorno, Naples as well as main Adriatic ports and even Goia Tauro in southern Italy when regular services have been offered for transport of containers as an extension of rail north – south corridor.

In southern Mediterranean countries efforts are made to improve port services by rail

- in Tunisia when a general policy of promotion of intermodal transport has been launched in the eighties with implementation of a network of inland terminal, but with limited success due to the low capacity of rail network across the country and the fact that distance from ports to most economic centres are fairly short
- in Algeria with development of rail “Tougourt pénétrante” from Djendjen to the south.
- In Lebanon and Syria from Beirut to Lattaquie to major intense populated centers such as Damascus or Baghdad.

But there are often projects and rail transport of containers is in general fairly limited and inland transport of containers by truck certainly develops faster in these countries than rail transport of containers.

A major difficulty for promotion of rail services of containers in Mediterranean area is the absence of inland intermodal terminals and in particular in non EU countries. Such terminals are necessary to consolidate containers traffic flows
in the hinterland, in order to provide performing rail services as well as to improve the management of boxes and to provide associated logistic services.

This lack of inland intermodal terminal reflects in fact a more general weakness of logistic services in most of these countries, which must be associated to the absence of “logistic center” whatever is the mode considered.

In contrast such centers have been well developed in European Mediterranean countries and in particular in Italy with the implementation of a network of “interporti” which associate the supply of logistic services with transshipment services: such centers really appear as inland extension of ports connected by rail (and also by inland waterways in the Rhone Valley), which contribute to the promotion of intermodality and integration of transport chain, including security control of the chain.

Such centers have also been developed in France and in Spain but were not introduced in such a systematic way in the transport master plan as Italy did in the PGT (General Plan of Transport); Greece is now introducing such center in the Greek National plan.

- Rail land bridges?

The example of United States has shown how rail land bridges between eastern and western coasts can improve the performances of circulation of containers.

At the scale of a Euro-Mediterranean space, such rail land bridge can be envisaged and in particular rail land bridge connecting Mediterranean Sea and North Sea.

With such perspective a company rail link, subsidiary of the maritime company CMA-CGM has proposed multimodal services from Antwerp or Le Havre to Algeria via Marseille. This company also organises a rail transport in Algeria: from the port of Algiers to an inland dry port of Rouiba in cooperation with the Algerian rail company SNTF. Other companies such as MSC, Maersk or SNCM could propose such services.

As far as maritime transport container are concerned it has to be stressed that such land bridge

- might bring a significant gain of time of 5 to 6 days as compared to maritime services through Gibraltar and the Channel, for products coming from Mediterranean countries or in transit through Mediterranean Sea

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might allow a more efficient equilibrium in the management of containers, including empty containers, which is often the key of profitability for large maritime operators. Other land bridges can be imagined and in particular from Adriatic to North Sea or Baltic Sea.

From this point of view it can be recalled that Turkish ro-ro lines have proposed to the truck companies the opportunity to bring, with the maritime transport, a rail transit across Austria using rolling road services.

Although this commercial policy can be explained by the difficulty to cross the Alps, and to obtain a truck transit permit across Austria, this is nevertheless an interesting case of combination of ro-ro services with maritime services.

- A ro-ro rail transport?

If we exclude the case just mentioned before, there are probably few cases of ro-ro/rail transport in Mediterranean area.

However if we explore the advantages of ro-ro transport in Mediterranean area, and in doing so, the development of sea motorways in Mediterranean as might wonder why such solution cannot be combined with rail transport for the inland part of the chain.

In the case of units which are semi-trailers and full trucks the rail service would be intermodal service of semi-trailer or rolling road as mentioned before for the crossing of the Alps; however such solution will probably imply the transport of a “dead weight” (the empty trailer with eventually the tractor) on a large part of the transport chain.

Therefore the solution for such combination will probably only emerge when ro-ro maritime services in Mediterranean will develop with other type of units such as the eurobox: the direct transfer of eurobox, with more adequate logistic characteristics, from ship to train could then meet the same type of interest which appeared with the generalization of transfer from ship to rail of maritime containers.

- Development of “combined” transport

In the case of combined transport, reference is made to combination of rail and road techniques without intervention of sea transport\(^{13}\).

Once the transport market between southern European countries is excluded as well as national transport of the scope of the analysis, the geography of Mediterranean area does not give much opportunity for combined transport between countries except in the two extremities of the area in the corridor

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\(^{13}\) with eventually the exception of ferry links in the transport chain
between France, Spain and Morocco in the corridor from France, Germany to Turkey across the Balkans.

Along the first corridor there is not much combined transport services proposed, at least for transport chain with origin or destination in Morocco.

One reason of the difficulty to propose such service is the different gauge existing between France and Spain which is a well-known problem for development of combined transport across the Pyrenees; once this difficulty is solved with rail transfer or with change of axles at the border, it is not a priori more difficult to propose a service from southern Spain to France or central Europe than from any other place in Spain, so that truck companies from Morocco could use such service when they have crossed the Gibraltar Strait.

However the solution which is developed today is not this one and a large volume of imports from Morocco are transported through Spain by truck, up to Perpignan in a terminal closed to the Franco-Spanish border (the Saint Charles terminal): more than 1,3 Ml tons of fresh products from Morocco and Spain transit through this terminal.

From this terminal transfer is organized to France and other European countries by road and rail: although road has a dominating share, there are some very good rail services provided to Paris (9 hours regular service), Lille and Germany for which the combined transport solution is chosen.

In conclusion there are combined transport solution on north–south Mediterranean corridors with a road leg which is not just a "terminal" transport and a transfer in a centre which can be called on a "gateway" close to the Alps or even more in the south in centres such as Bologna.

In the eastern north–south corridor from Germany to Balkans and Turkey direct rail connections have been established for a long time with connection across the Bosphorus to Middle East countries and Iraq.

In recent years combined transport services from Germany to Turkey have been improved; the problem is now more a problem of interoperability between rail network of Balkans countries. A recent experience of DB shows that rail service can be provided in less than 80 hours, in three days, with facilitation of border crossing administration formalities. Other recent experiences show that reliable intermodal services of direct trains can also be provided for intercontinental transport of car industry between northern Europe and Istanbul.

Therefore the problem seems to be a more classical problem of implementation of performing combined transport service which might develop as an alternative to the road solution or to the ro-ro solution from Istanbul to Trieste.
Figure 19: Mediterranean and Trans-European networks for transport (MEDA TEN-T)
5. Benchmarking in corridors

In MEDA TEN-T project 9 demonstration corridors have been identified.

The objective of this section is to benchmark transport performances within this corridor, in terms of time, costs and quality of transport.

In this transport benchmarking focus is also put on comparison of alternative transport chains, with benchmark of different intermodal solutions and in particular between road and maritime solutions, between Ro-Ro technique and intermodal transport of maritime containers.

In order to remain pragmatic, concrete examples of transport chains are selected, concerning products which are representative of the international trade along the corridors.

Therefore the approach for benchmarking will be conducted at two levels:

- a general approach through cost and time for different modes and techniques of the transport chain
- a specific approach through observed prices when these information are available for precise product

In doing so, comparison can be made with observation of transport performances between European countries, or even, between Europe and other parts of the world, in Asia or America.

5.1. The question of costs in Mediterranean area

This general framework is constructed from individual costs of different modes as well as cost of transhipments between modes.

Several European projects have addressed this problem of transport costs, and have proposed cost models for road, rail, maritime and intermodal transports (EUFRANET, RECORD IT, SPIN, TEN STAC).

They usually distinguished between road transport, rail transport, intermodal transport (combined transport and transport of maritime containers), inland waterways (which is not much relevant here) and maritime transport.

For road transport a classical distinction is made between cost per km (eventually cost per hour and per day) and cost per kilometre.
For rail transport a first distinction is made between “direct train” with sometimes a further segmentation for “shuttle train” and simple wagon: the idea behind is that rail transport for high volume of traffic with more simple rail operations and better use of rolling stock is much more performing than simple wagon transport with slow and complex bundling and unbundling operations: concentrated traffic flows to major ports register often the best rail performances.

For intermodal transport collection and distribution of units, transhipments costs must also be taken into account whether they take place in ports or in intermodal terminals.

In MEDA TEN-T the objective is not to review in detail all these models but just to provide benchmark

- for road transport in Mediterranean countries. In EU some order of magnitude are available with distinction between countries (see for example SOFTICE project).

However the observed prices are often lower than the theoretical cost produced by professional organisation pointing the different items to be introduced on road costs. In our approach the application of driving time and working hour regulation must be considered.

Order of magnitude of cost per kilometre for trucks must be provided for different countries: in this order of magnitude the salary of drivers represents an important percentage from 20 to 30% for long distance haulage. But this does not mean necessarily that country with lower salary will have the lowest road transport cost per kilometre; the number of km per year for truck, the cost of the truck, the quality of the road network and eventually the financial costs for investment will also intervene.

In order to simplify the overall scheme on can take as reference a value of 1 € per truck km for heavy truck (38-40 t) on long distance and try to position each country as regards this reference. It is obvious that smaller trucks are often used and in particular in southern Mediterranean countries; but the transport considered here is more international transport for heavy truck and all the countries tend to invest in this kind of vehicles which are more performing for long distance.

- for rail transport it is in general more difficult to estimate the costs since conditions of operations, network profile, and the type of equipment differ very much from one country to another

However for EU some estimation of intermodal train costs has been made, as for example in SPIN study. A reference can be provided for Europe for different port
destination, northern range ports and southern range ports. In the case of southern Mediterranean countries tariffs can be considered in countries where liberalisation of rail transport has just started; rail costs for example have been provided in the contribution from Algeria.

- the maritime transport cost is probably the most difficult to establish because of the variety of ships and also differences in operations of these ships

NESTEAR has established a list of published tariffs, looking at web site of Mediterranean companies and tried to analyse this structure of tariff for the different zones.

For ro-ro services it appears then clearly that price for trailer varies from 0,5 € per km to 2 € per km with some higher value for ferry services or some services on short distance: the lower values are observed in the Adriatic zone when the competition is strong the traffic volume is high and the resulting quality of service particularly good in terms of frequency and reliability.

For the north – south relation within western Mediterranean area between southern European countries and Maghreb countries the price per km is higher, between 1 € and 1,5 € for distance between 500 and 2000 km.

The price level is comparable for ferry service in Eastern Mediterranean as well as for service between west and east Mediterranean.

A transit cost in ports must be added to these prices.

In order to obtain a final assessment of ro-ro transport chain cost a fourth distinction must then be made between accompanied and non accompanied transport:

- in the accompanied transport the working hours of the driver must be taken into account even though this working time is not considered as equivalent to driving time according to national regulation
- in the non accompanied transport only the trailer is in general transported which means:
  
  - a lower maritime fare
  - no working hours expenses
  - and probably a better use of the tractor for rotation on the country of origin or destination.

Most of the ro-ro services become interesting only when the trailer is transported alone, not because of maritime fares which are not much different (tariff per metre of length) but because of saving realised on the two other items.
The case of maritime containers is significantly different:

- observed prices are in general much lower than for trailer but a double distinction must be made between:

  - between short or medium distances and long distances intercontinental price
  - on long distance high capacity container ships: the biggest ships have the lowest fare, which reflects differences in economic performances (see next table and graph).
  - on short and medium distance the price is more a “feeder” price, even where there is transhipment in a hub such as Algesiras, Goia Tauro, Malta for transport between Mediterranean area and northern Europe. These feeder prices are not always fixed according to operating costs of feeder vessels since global strategies of maritime operators must also be taken into account: however the feeder price is in general between 200 and 500 Euros for 20’ container and this price is often less correlated with distance than with volume of traffic handled in different ports.

  - Transhipment cost must also be considered and their estimation for Mediterranean ports is reported in the next table.

- between 20’ container and 40’ container.

The question of choice between 20’ container and 40’ container will often depend upon the density of goods transported. For final products the use of 40’ container tends to generalise and the 40’ container is often the most relevant reference for assessment of competitiveness with trailer.

However the 40’ container does not allow much flexibility to some logistics constraints such as the transport of euro pallets. The example of Morocco for transport of fruits and vegetables points on advantage of almost 50 % of productivity for the semi-trailer as regard the 40’ container.

For maritime transport the price of transport of 40’ container is usually not the double of the price of a 20’ container but only 20 to 50 % above this price.

Transhipment costs of 40’ container is close to transhipment costs of 20’ container.

  - The port clearance costs
The port clearance costs might sometimes reach an amount which is higher than the maritime transport cost. To illustrate this situation an example has been given for a transport from Italy to Lebanon.

In order to assess the port clearance cost, it is then necessary to list all the items which can be taken into consideration. Among these items many of them are indeed related to facilitation problems and customs control, once the transhipment costs (THC) have been isolated in relation with maritime transport.

At this stage the progress achieved in the country concerned as regards facilitation of procedures and limitation of customs taxes will influence very much the port clearance costs which do not really relate to “physical” port operations.

One important point to take into consideration is then to verify if the choice of transport chain, between container techniques, ro-ro techniques or road transport has an influence on such clearance costs and bring distortion in competition within transport modes.

However the total costs which have been provided for 40’ transport between Morocco, Tunisia and Europe clearly show that such clearance costs do not exist in the exchanges of western Mediterranean.

The importance of clearance costs in Lebanon reflect indeed a situation where trade and transport operations remain difficult in the Machrek area, with low commercial relations between countries and still an impressive require of administrative constraints which has been pointed the ESCWA representative in the benchmarking exercise achieved for ports in the region.

Figure 20
Tariff estimation for container manipulation in the South Range (U.S. $ per teu unloaded)

Source: Drewry Consultant 1998
5.2. The question of time in Mediterranean area

Transport time for door to door service, along the transport chain results from the addition of transport time of different segments of the chains, including time spent in the nodes with in particular transit time in ports.

Concerning the maritime leg the transit time from port to port has been estimated from time tables information collected in the service database : some maps have been produced showing the transit time along major maritime routes in the Mediterranean for different types of service.

From these results a major distinction must then be made between ro-ro service and container service.

Transport time for ro-ro services chains are in general much shorter not because of the speed of vessels but because of shorter transit time in ports.

The average speed of vessels range in general from 15 to 20 knots with sometimes higher speed up to 22 knots or more for high speed vessel or lower speed, down to 10 knots.

However the speed must not necessarily be considered in absolute value. Sometimes the speed is increased to meet a more favourable “window” for arrival or departure and improves the attractivity of productivity of service as regards regulation of working time or resting hours ; but the increase in speed implies fairly quickly a significant increase of energy cost.

For symmetric reason the speed can be reduced in order to serve cost when this does not endanger the competitive position of the service.

If there are differences of speed between vessels according to the type of vessels, with different types of cost involved the objective here is not to go in such details on this section : the remarks made have just stress that differences of transit time between services are more due to transit time in port ; when a couple of hours are needed for transit of a ro-ro unit it might take several days for a maritime container : some benchmarking, in ports have shown that average stay of container in port are 5 to 6 days.

Therefore the extra costs of ro-ro service have to be put in balance with the time of transport.

In the north south relation, such as relation between Morocco and Tunisia to northern Europe the chain is between a ro-ro chain with one day or one day and half of maritime transport to reach a southern European port versus 10 to 15 days for a maritime container to reach a northern port of Europe. At the end the door to door transport with the same destination in Europe, including road transport will
show a difference of 5 to 10 days if not more, between 10 to 15 days between a container maritime service and ro-ro transport chain of around 3 days.

When benchmarking of time is made along different routes, including road transport, the door to door transit time must take into account driving and resting regulation. This is necessary not only to give an appropriate estimation of the road transport time on the network but also to appreciate if the maritime transport time can be accounted, totally or partly, as resting time in the driving cycle, in the case of accompanied transport.

In the next tables transport times have been estimated for different ro-ro transport chain using the international network of NESTEAR made of European road infrastructure and ro-ro services.

The O/D considered are mostly north south O/D and the results show that in general the transport can be organised for most of the destinations within a weak “cycle”.

The case of ro-ro relation for east o west, from Spain or France to Middle East will certainly take more time with at least 4 to 5 days of maritime transport as shown in the former map with benchmarking of ro-ro services across Mediterranean.
Table 5: Transport time benchmarking with Ro/Ro services

<table>
<thead>
<tr>
<th>Origin via</th>
<th>Destination</th>
<th>Road Time (h)</th>
<th>Maritime time (h)</th>
<th>Total Time (h)</th>
<th>Total Time (day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BERLIN</td>
<td>GENOVA</td>
<td>27</td>
<td>22</td>
<td>49</td>
<td>2.0</td>
</tr>
<tr>
<td>BERLIN</td>
<td>ANCONA</td>
<td>30</td>
<td>20</td>
<td>50</td>
<td>2.1</td>
</tr>
<tr>
<td>BERLIN</td>
<td>TRIESTE</td>
<td>25</td>
<td>48</td>
<td>73</td>
<td>3.0</td>
</tr>
<tr>
<td>BERLIN</td>
<td>-</td>
<td>63</td>
<td>0</td>
<td>63</td>
<td>2.6</td>
</tr>
<tr>
<td>PARIS</td>
<td>ALGECIRAS</td>
<td>58</td>
<td>2.3</td>
<td>61</td>
<td>2.5</td>
</tr>
<tr>
<td>PARIS</td>
<td>ALICANTE</td>
<td>42</td>
<td>10</td>
<td>52</td>
<td>2.2</td>
</tr>
<tr>
<td>PARIS</td>
<td>BARCELONA</td>
<td>26</td>
<td>16</td>
<td>42</td>
<td>1.7</td>
</tr>
<tr>
<td>PARIS</td>
<td>MARSEILLE</td>
<td>22</td>
<td>24</td>
<td>46</td>
<td>1.9</td>
</tr>
<tr>
<td>PARIS</td>
<td>BARCELONA</td>
<td>26</td>
<td>16</td>
<td>42</td>
<td>1.8</td>
</tr>
<tr>
<td>PARIS</td>
<td>MARSEILLE</td>
<td>22</td>
<td>24</td>
<td>46</td>
<td>1.9</td>
</tr>
<tr>
<td>PARIS</td>
<td>GENOVA</td>
<td>24</td>
<td>16.3</td>
<td>41</td>
<td>1.7</td>
</tr>
<tr>
<td>PARIS</td>
<td>ANCONA</td>
<td>30</td>
<td>20</td>
<td>50</td>
<td>2.1</td>
</tr>
<tr>
<td>PARIS</td>
<td>TRIESTE</td>
<td>30</td>
<td>48</td>
<td>78</td>
<td>3.2</td>
</tr>
<tr>
<td>PARIS</td>
<td>-</td>
<td>82</td>
<td>0</td>
<td>82</td>
<td>3.4</td>
</tr>
<tr>
<td>MADRID</td>
<td>ALGECIRAS</td>
<td>11</td>
<td>2.3</td>
<td>14</td>
<td>0.6</td>
</tr>
<tr>
<td>MADRID</td>
<td>ALICANTE</td>
<td>7</td>
<td>10</td>
<td>17</td>
<td>0.7</td>
</tr>
<tr>
<td>MILANO</td>
<td>GENOVA</td>
<td>2</td>
<td>16.3</td>
<td>18</td>
<td>0.8</td>
</tr>
<tr>
<td>MILANO</td>
<td>ANCONA</td>
<td>6.3</td>
<td>20</td>
<td>26</td>
<td>1.1</td>
</tr>
<tr>
<td>MILANO</td>
<td>TRIESTE</td>
<td>6</td>
<td>48</td>
<td>54</td>
<td>2.3</td>
</tr>
</tbody>
</table>

* without border waiting time

Source: Nestear

The same method can be applied for combination of maritime service with rail service when maritime transit time is added to rail transit time, using intermodal rail services database.

5.2. Examples of benchmarking in corridors

Examples of benchmarking in corridors have been provided by partners focusing on maritime container chain and on ro-ro transport chain.

A common methodology has been established for reporting time and cost.

- Transport chain from Sfax to Marseilles through Rades
This chain is from Sfax in south of Tunisia, to Marseilles, through the port of Rades close to Tunis, where most of intermodal port facilities of Tunisia are presently situated.

In Tunisia intermodal international transport is growing very fast in particular for exchanges with European partners. Technical and commercial cooperation develops between Tunisian operators and European operators specialized in intermodal transport, but, as it has been stressed in the former chapter of this deliverable, Tunisian operators do not master the European hinterland part of the transport: for the European leg of transport price is in general imposed to Tunisian operators.

Two chains have been analysed:

- a container chain with 20’ and 40’ containers
- a trailer transport chain.

These examples apply to “non” perishable and “non” dangerous goods.

Frequency in each case is 3 times a week with some incertitude for transit time in France due to customs clearance procedures which depend upon the type of goods imported.

For the 20’ and 40’ maritime containers the results are the following\(^\text{14}\):

**Table 6** : Cost of a 20’ and 40’ maritime containers

<table>
<thead>
<tr>
<th></th>
<th>Container 20’</th>
<th>%</th>
<th>Container 40’</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road transport in Tunisia</td>
<td>177 Euro</td>
<td>10,5</td>
<td>252 Euro</td>
<td>11,5</td>
</tr>
<tr>
<td>Passage portuaire en Tunisie</td>
<td>265 Euro</td>
<td>15,5</td>
<td>265 Euro</td>
<td>12</td>
</tr>
<tr>
<td>Maritime Transport</td>
<td>224 Euro</td>
<td>13</td>
<td>538 Euro</td>
<td>24,5</td>
</tr>
<tr>
<td>Passage portuaire en France</td>
<td>310 Euro</td>
<td>18</td>
<td>310 Euro</td>
<td>14</td>
</tr>
<tr>
<td>Road transport in France</td>
<td>738 Euro</td>
<td>43</td>
<td>800 Euro</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>1714 Euro</td>
<td>100</td>
<td>2165 Euro</td>
<td>100</td>
</tr>
</tbody>
</table>

For road transport we have the following details:

- **Sfax-Rades (250 km)**

  - For a container 20’ (< 15 Tons): **0,044 Euro**
  - For a container 40’ (< 30 Tons): **0,031 Euro**

  - **Marseilles – Paris (800 km)**

---

\(^{14}\) provided by ARDES
- For a container 20’ (< 15 Tons) : **0.061 Euro**
- For a container 40’ : (< 30 Tons) **0.033 Euro**

The price per t/k mis almost the same in France and Tunisia for a 40’ container but it is apparently much higher for a 20’ container : 38% higher which would mean that in France the price of a 20’ container is almost the same as 40’ container, which is not in general the case.

Operations in ports are detailed as follows

Table 7 : Cost sample for Sfax-Paris via (Radès & Marseille)

<table>
<thead>
<tr>
<th></th>
<th>20’</th>
<th>40’</th>
<th>semi-remorque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pré-acheminement routier</td>
<td>Frais de chargement</td>
<td>12</td>
<td>16,5</td>
</tr>
<tr>
<td></td>
<td>Trajet terrestre</td>
<td>165</td>
<td>236</td>
</tr>
<tr>
<td><strong>sous total</strong></td>
<td></td>
<td><strong>177</strong></td>
<td><strong>252,5</strong></td>
</tr>
<tr>
<td>Passage portuaire à Radès</td>
<td>Dédouanement</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Mise à quais</td>
<td>57</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Frais d'embarquement</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td><strong>sous total</strong></td>
<td></td>
<td><strong>265</strong></td>
<td><strong>265</strong></td>
</tr>
<tr>
<td>Transport maritime</td>
<td></td>
<td>224</td>
<td>538</td>
</tr>
<tr>
<td></td>
<td>1090</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passage portuaire à Marseille</td>
<td>Frais de débarquement</td>
<td>180</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>Frais fixe par dossier</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Dédouanement en France</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td><strong>sous total</strong></td>
<td></td>
<td><strong>310</strong></td>
<td><strong>310</strong></td>
</tr>
<tr>
<td>Post acheminement routier</td>
<td>738</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td><strong>Coût total (€)</strong></td>
<td>1714</td>
<td>2165,5</td>
<td>3500</td>
</tr>
</tbody>
</table>

Figure 21 : Cost sample for Sfax-Paris via Radès & Marseille
In the case of a semi trailer only general price information are provided for a 85 m³ semi trailer (closed)

- Customs in Tunisia 265 Euros (as for container)
- Total of other costs including customs clearance in France: 3 500 €.

Frequency is every day except Friday and Sunday.

Total transit time is 4 to 5 days except in case of special customs central procedures which is fairly fast.

- Transport chain from Cairo to Amman

This case study provided by Dar al Omran, partner of MEDA TEN-T has been conducted with much details, quantitative and qualitative details in a region where international transport is difficult, transport routes have been affected by political situation, but also in a context where efforts are made by administrations to improve existing situation.

The corridor concerned extends from from Cairo to Amman (via the Red Sea) and continuous north to Syria, Lebanon, and Turkey. It also branches west to Iraq as shown in Figure 1.

The purpose of this contribution of Dar al Omram, which is reproduced in the next pages, is to present a benchmarking (and tracing) of goods and passengers movement from Cairo to Amman via the route described above. Strengths and weaknesses in the route’s infrastructure, regulations, and intermodal interaction can be used in the development/identification needed improvement projects and evaluation criteria to assess their effectiveness.

As can be seen in the Figure, a highway that traverses the corridor starts in Alexandria and travels southeast to Cairo and then continues on to Nuwaibah on the Red Sea. At this point Maritime transport connects Egypt to Jordan through the ports of Nuwaibah (Egypt) and Aqaba (Jordan). From Aqaba, the highway continues north passing through the Jordanian cities of Maan, Amman (the capital) and Jaber on the Syrian border. From there the highway continues north through Damascus, Homs, Aleppo and continues north to the Turkish border, where it continues along the Turkish Highway system to Ankara. It should be mentioned that the highway branches from Amman and from Damascus towards the east (to Iraq) where those two highways meet in Rotbah (Iraq) and continue to Baghdad. Also, another highway branches from Damascus towards the west to provide access to Beirut (Lebanon).
Jordan, Egypt, and the EU

Relations between Jordan/Egypt and the EU are dominated by the Association Agreement, which entered into force in May 2002. The creation of a regional free trade area under the "Agadir Process", also including Morocco, Tunisia, in which Jordan has played a key role, was strongly supported by EU Trade Commissioner Pascal Lamy. In 2004, Jordan signed the free trade Agadir Agreement with Egypt, Morocco and Tunisia, which commits the parties to removing substantially all tariffs on trade between them by 1 January 2006, and to intensify economic cooperation notably in the field of harmonizing their legislation with regard to standards and customs procedures. Arrangements are currently underway to launch a Technical Assistance Program in Jordan to support the Agadir Agreement.

Ports in question

The route at hand includes two ports on the Red Sea; Nuweiba in Egypt and Aqaba in Jordan. Figure 2 shows the two ports between which there is ferry service on a daily basis.

The port and town of Nuweiba are located 600 Km from Cairo on the eastern coast of Sinai, between Taba, 65 km to the north, and Dahab, 70 km to the south. The commercial port lies in the southern area, and provides regular ferry and freight services to Aqaba in Jordan.

The Port of Aqaba is located 340 Km south of the Jordanian capital Amman. It is Jordan’s only seaport, and is operated by the Ports Corporation. The Ports Corporation is publicly owned and is managed by the Ministry of Transport. The port provides various services including; importing, exporting and transit operations for passengers, vehicles and goods. The port has played over the years a major role as a transit port for goods heading to Iraq.
The main points of this case study can be summarized in the following table:

<table>
<thead>
<tr>
<th>Point</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time for a truck (on average)</td>
<td>8 hr. (drive to Nowibaa) + 2 hr. (driver rest time) + 1 hr. (Egyptian customs at Nowibaa) + 4 hr. (waiting for the ferry to Aqaba) + 1 hr. (Jordanian customs at Aqaba) + 2 hr. (Drive from Aqaba to Amman).</td>
</tr>
<tr>
<td>Some of the Egyptian trucking companies finalizes custom clearance in the Egyptian origin of the trip so as to reduce customs time in Nowibaa.</td>
<td></td>
</tr>
<tr>
<td>The fair for the private sector (individual truck drivers/operators or small companies) truck trip Cairo/Amman is between $1200 and $1700 for general cargo and between $1700 and %2200 for vegetables and fruits (and other refrigerated goods).</td>
<td></td>
</tr>
<tr>
<td>The fair for the ferry is $ 800 for both directions ($ 400 one way) including the driver and the vehicle.</td>
<td></td>
</tr>
<tr>
<td>The fair for the distance between Cairo and Nowibaa only is LE 1500 on public sector trucks, excluding the fairs of the ferry to Aqaba and the truck on the link Aqaba to Amman.</td>
<td></td>
</tr>
<tr>
<td>All the above values relate to 2004, except the value LE 1500 which relates to 1999. The public company which gave us the latter value stopped operating trucks between Cairo and Nowibaa since 1999. We unfortunately could not get the value for 2004 for the public sector trucks.</td>
<td></td>
</tr>
<tr>
<td>The axel load limits</td>
<td></td>
</tr>
<tr>
<td>For Egypt: 10 ton for single axel and 16 ton for dual axel, with 10% possibility of exceeding the limits with no extra charge. For each extra ton on the axel afterwards a charge of LE10 is to be paid.</td>
<td></td>
</tr>
<tr>
<td>For Jordan: 12 ton for single axel (we could not get the limit for dual axel) with a charge of 12 Jordanian Dinars to be paid for each additional axel ton.</td>
<td></td>
</tr>
<tr>
<td>The value of the Trip Tick obtainable for the Automobile Club is LE 270 valid for a limited number of entries. A penalty of LE 1200 is charged if the vehicle stays more than 3 months in the foreign country for a maximum of two times of committing this offense. For the third time the penalty is 20% of the price of the truck.</td>
<td></td>
</tr>
<tr>
<td>The price of the international license of the truck driver is LE 40 for one year.</td>
<td></td>
</tr>
<tr>
<td>It is allowed for drivers of another country (e.g., Jordan, Syria, Lebanon) to wait in the international truck terminal in Cairo waiting for customers so that they can return home loaded.</td>
<td></td>
</tr>
<tr>
<td>The same is for Egyptian drivers to wait in Amman for example, to come back loaded.</td>
<td></td>
</tr>
<tr>
<td>Trucks of other countries cannot compete on the local market of trucking. However, some illegal violations occur and strict enforcements are always applied.</td>
<td></td>
</tr>
</tbody>
</table>
• The case of transit through Algiers port and terminal transport in Algeria

A third case has concentrated on transit through Algiers port which is well known to be a critical point of transport chain for imports and exports in Algeria.

In relation with this detailed analysis, terminal transport in Algeria has also been investigated so that door to door information can eventually be reconstructed when necessary: the maritime transport link and inland transport segment in the partner country can be estimated from other demonstration case of MEDA TEN-T in particular for partner countries in EU where most of detailed costs have been analysed in different EU projects. Transit through Algeria ports and inland transport in Algeria are the transport segment for which information is more difficult to collect as far as trade with Algeria is concerned.

A main characteristics of the present situation is then the congestion in ports which implies extra costs charged by maritime companies for important waiting time of vessels: the Algiers terminals have been designed for 100 000 TEU with a traffic reaching today 350 000 TEU: the construction of a new terminal is expected in connection with the dry port of Rouiba, 30 km away and already operational.

Furthermore the performances of unloading of units is fairly low: 9 units/hour when the average is 20 units/hour in comparable Mediterranean ports.

Inland transport of containers is realized most of the time by road although some rail services have been recently proposed for a limited number of destinations.

Concerning roro traffic it is in Algeria is fairly limited with only 13 % of the number of ships and 7 % of the total tonnage (excluding petroleum); these share of roro traffic is not increasing, and even slightly decreasing over the past 4 years, from 1998 to 2002.

The benchmarking has been made for containers in relation with southern Europe and eastern Mediterranean countries, the two main axis of exchange considered within MEDTA TEN T demonstration corridors.

The maritime container prices have also been compared to conventional maritime transport.
Table 7: Port transit cost in Algeria

<table>
<thead>
<tr>
<th></th>
<th>20'</th>
<th>40'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unloading</td>
<td>250</td>
<td>380</td>
</tr>
<tr>
<td>Inspection</td>
<td>33</td>
<td>55</td>
</tr>
<tr>
<td>Transfer to inspection point</td>
<td>17</td>
<td>33</td>
</tr>
<tr>
<td>Handling</td>
<td>27</td>
<td>54</td>
</tr>
<tr>
<td>Scanner</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Access for truck</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Transit service</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td><strong>541</strong></td>
<td><strong>836</strong></td>
</tr>
<tr>
<td>Storage (per day)</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total cost per day container</strong></td>
<td><strong>546</strong></td>
<td><strong>841</strong></td>
</tr>
<tr>
<td><strong>Total cost for trailer (Ro/Ro)</strong></td>
<td><strong>841</strong></td>
<td><strong>841</strong></td>
</tr>
</tbody>
</table>

Source: Khan consultants

- Two precise examples of benchmarking

These examples are derived from observations published in Algeria for the transport up to the Algerian ports and then from specific investigation realised for MEDA TEN-T for the Algerian leg and port transit.
Figure 24: Time sample for Marseille-Chlef (hours)

Source: Khan Consultants

Figure 25: Cost sample for Marseille-Chlef (€)

Source: Khan Consultants
Costs and transport time for pre-haulage and other costs for loading in port are not mentioned here because the exact place of origin of the container is not known in this case.

- **Benchmarking in the Egypt/Greece/Turkey corridor**

The trade between Egypt, Greece and Turkey does not represent presently very high volume of transport.
However when looking at demographic and economic perspective of these countries and in particular for Egypt and Turkey with an expected very important population growth, this corridor should generate in the future much more traffic flows.

Furthermore Greece and eventually Cyprus as well as Egypt play in this corridor an important role of hub for redistribution of traffic along East-west corridor of the Mediterranean.

For the benchmarking in the corridor two contributions have been given from Greek (NTUA) and Egyptian (DRTPC Team) partners providing the information they have collected from the transport operators of their countries.

Their analysis has focussed on the maritime containers which is the most relevant transport intermodal technique used in this area. Only few roro services are regularly used in this area even when they formally exist on time schedule ; promotion of such services will therefore be, for the future, an interesting topic of discussion for improvement of trade relations in particular when sea routes can be much shorter than alternative land routes for North to South or South to North. The choice of road transport between Turkey and Egypt through Syria and Lebanon remains indeed an alternative which could be a competitive alternative when considering performances of Turkey and Egypt through Syria and Lebanon remains indeed an alternative which could be a competitive alternative when considering performances of Turkish road haulers up to Turkish border with Syria and Egypt make that this alternative route is not actually practised.

The information collected from Cairo companies by DRTPC point large differences between exports and imports flows : import costs are much higher than export costs for each of the different operations in the transport chain : customs formalities in both ports, handling and shipping costs. Concerning the transport time the service proposed is indeed not a direct service but gives through a hub port with one day stop, for a total of 7 days travel time, with 3 days spent at each port for preparation of the ship. Therefore the performances of the transport chain do not appear very high as compared to what is observed in Western Mediterranean or in East-West maritime service across Mediterranean, but this might be partly explained by the low volume of trade between these countries, and the absence of direct services.

The same asymmetry is reported by DRTPC for relations between Egypt and Greece for which South-North services from Alexandria to any port in Greece is only 200 $ when it is 700$ for ship fees in the North South services : the other costs are the same with a much lower travel time of 1 or 1,5 days, time which might be longer, depending upon the Greek port chosen, up to 5 days according to information obtained from Greece.
For storage of containers in Egyptian port there is a 10 days period of charge for exports and 5 days for imports; after that the daily fee is 25 LE for 20’ container and 40 LE for 40’ container.

It must be stressed that the shipping fees or “semi-fixed” fees based on several features such as distances, regulation, cargo type, weight and can vary, according to oil price for example.

Therefore many practical difficulties one still mentioned for transport in this corridor:

- Long and unclear regulations and poor execution of port logistics.
- Lack of automation almost all activities are manually driven.
- Unavailability of enough ware-housing.
- Extensive time is spent in customs (e.g. many forms must be filled and procedures are not very clear).
- Weights of containers are sometimes ignored, this happens because containers are sometimes loaded beyond their allowed capacity to save money. This causes a penalty problem when reaching the final destination.
- Others: e.g. bad weather, irregularity of flow of ships, congestion at port, technical failure of a machine, etc.

But on the other hand one might expect improvement from recent development of customs system in Egypt.

When considering information obtained by NTUA from Greece for specific relation between Alexandria and Piraeus the same asymmetry appears between South-North and North-South shipping fees which might be explained by unbalanced traffic along the corridor.

From the Greek side customs formalities in Alexandria are compatible with the information obtained in Cairo; however handling charges in Alexandria appear somehow higher which can be explained by the specificity of the transport unit. Handling charges in Piraeus are apparently lower than in the ports of Izmir or Alexandria.

Travel time is reported to be 5 days.

In conclusion the benchmarking information collected in this demonstration corridor by different partners of the area is compatible. It confirms the fairly low performances and quality of service which goes together with a low volume of exchanges although the countries concerned have important economic potential and are close from each other from a geographic point of view: transport time and transport costs do not certainly reflect this geographic proximity.

However the expected potential of exchange between neighbouring countries and along the strategic intercontinental corridor between Black Sea and Suez canal
points out more than ever the necessity to benchmark performances along the corridor.

V - AIR TRANSPORT IN THE EURO-MEDITERRANEAN

1 Introduction

Aviation is known to be one of the fastest growing segments of the transport industry. For the Mediterranean countries, aviation plays an important role for tourism and trade in high value-added and perishable goods and for the general connection to the outside world. Although, the development of air transport is at an early stage in these countries, certain reforms have been initiated at a national, bilateral and regional level and air transport appears to be a high priority issue on the Euro-Mediterranean agenda.

Firstly, a literature review was undertaken of the EU primary and secondary regulations related to the air transport sector. The review tackled all important and fundamental aspects involved in civil aviation such as liberalisation, Open Skies, single skies, safety, security, air traffic management, satellite navigation, etc. The intention of this review was to identify the best practices in the field of air transport, and based on this provide a benchmark against which the MEDA legislation in this field will be compared and contrasted.

Secondly, in parallel with the literature review, the main data and information related to the air transport sector across the MEDA Region was collected and compiled. The information collected was based on international sources, recent regional statistics, interviews with the various involved stakeholders and other reliable sources. During the collection of the data, special attention was given to providing coverage of all players involved in the air transport sector and of all relevant themes and topics.

Thirdly, based on the collected data, an analysis was performed, in order to draw a realistic profile of the current status of the air transport sector for the various Mediterranean countries. This profile would allow the understanding of the present situation of MEDA air transport among the involved countries.

2 The Regulatory Reform Agenda
Market access, frequencies, and many other important parameters in cross-border traffic continue to be governed by bilateral air service agreements (ASAs) between governments. Several Mediterranean Partners have started to relax the provisions in the ASAs they negotiate in an effort to increase flexibility and competition. The most far-reaching reforms to date took place in Lebanon, which recently adopted an open skies regime. Inside the EU Single Market, all ASAs have been abolished, and on behalf of the 15 EU countries the Commission recently negotiated the creation of a European Civil Aviation Area with ten accession candidates. This will liberalize air traffic rights and oblige all signatories to generally adopt EU rules and regulations in the air transport market.

The main competitive advantage of air transport, as compared to other modes, is in passenger traffic. Across the world, air transport reform is advancing fast. Air transport in the Mediterranean region is at an early stage. Throughout the region, aviation services are still largely provided by state-owned airlines and airports. Competition is restrained by restrictive licensing regimes and international air service agreements, as well as rent-seeking public monopolies and the cartelized markets they are prone to create.

The air transport sector comprises several interdependent market segments. These include passenger and cargo, scheduled and charter flights, airport infrastructure and services, as well as air traffic control. A comprehensive reform strategy and correct sequencing of individual measures are required to modernize the legal, regulatory and institutional framework of the sector. Licensing regimes and domestic traffic rights should be overhauled to foster competition, increase transparency and cut red tape. Bilateral air service agreements between countries need to be amended to allow for cross-border liberalization and integration of aviation markets. State-owned airlines and airports should be restructured and privatized to improve performance and attract much needed investment. Ground handling and airport charges should be regulated in a fair and transparent manner; and airport slots allocated in a way that facilitates market entry of new airlines to simulate competition. Institutional reforms should include the separation of operational and regulatory functions, the transfer of commercial activities to corporatized entities, capacity building in sector ministries and the strengthening of regulatory agencies.

A number of structural characteristics of the region’s air transport market and associated policy implications are described below:

- Despite some cyclical fluctuations, the sector is characterised by long-term growth, particularly in tourism-related passenger transport. Growth rates in the Arab Mediterranean countries, however tend to be lower than international averages. The underlying factors for this growth differential are many, but more liberal transport policies have certainly played a role. Growth has been particularly pronounced in Egypt, due to economic growth and an important tourism sector. In general, figures are lower for
cargo than for passengers. This reflects high growth rates in tourism on the one hand, but relatively low economic growth and the inability to diversify exports into higher value-added products on the other hand.

- The competitive advantage of aviation compared to other modes, lies in the transport of passengers as well as perishable and high-value goods. In terms of volume, only 1% of trade between Europe and the Mediterranean region is carried by air, while the figure in terms of value is 15%. Perishables and high-value added products are those cargo items for which speed, reliability and service quality matter most. Hence, a policy framework that encourages competition and high performance in the air transport sector would help attract more foreign direct investment and diversify the export base of the southern Mediterranean countries towards products with high-value added.

3 The MEDA Airports

Regarding the airports, there are two basic models of airport systems, which are common in all MEDA countries. The first model, called the “tourist industry” model is characterised by the presence of few major airports. These are the airports where the majority of revenues are generated and are used to support the maintenance and operational costs for the entire national air transport system, which could be up to 15 airports. In the second model, described as the “single airport economy” model, a single major airport serves either as the unique entrance to the country or as the major entrance / local hub, feeding the domestic airport system.

The top-15 MEDA airports handled annually over 2.2 million passengers each, Istanbul/Atatürk being by far busiest with 12.7 million. The list of the top-15 airports in the MEDA region includes five Turkish airports and two Egyptian airports, as shown in Table 1.
### Table 8: Major MEDA airports, 2001

<table>
<thead>
<tr>
<th>Country</th>
<th>Main Airports</th>
<th>Traffic (in thousands)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Passengers</td>
<td>Cargo</td>
</tr>
<tr>
<td>Egypt</td>
<td>Cairo, Aswan, Luxor, Alexandria, Sharm El-Sheikh, Hurghada</td>
<td>17385</td>
<td>179</td>
</tr>
<tr>
<td>Jordan</td>
<td>Amman, Aqaba</td>
<td>2254</td>
<td>78</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Beirut (BIA)</td>
<td>2444</td>
<td>62</td>
</tr>
<tr>
<td>Syria</td>
<td>Damascus, Aleppo, Bassel-Al-Assad, Deirez-Zor, Al-Kamishli</td>
<td>2272</td>
<td>33</td>
</tr>
<tr>
<td>Algeria</td>
<td>Algiers, Oran, Constantine</td>
<td>8078</td>
<td>26</td>
</tr>
<tr>
<td>Morocco</td>
<td>Casablanca, Agadir, Marrakech, Tangiers, Rabat</td>
<td>6939</td>
<td>50</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Tunis, Monastir, Djerba, Tozeur, Sfax, Tabarka, Gafsá</td>
<td>7682</td>
<td>20</td>
</tr>
<tr>
<td>Cyprus</td>
<td>Larnaca, Paphos</td>
<td>6810</td>
<td>32</td>
</tr>
<tr>
<td>Malta</td>
<td>Malta</td>
<td>2802</td>
<td>13</td>
</tr>
<tr>
<td>Turkey</td>
<td>Istanbul Atatürk, Istanbul Sabiha Gokcen (SG) International airport Ankara, Izmir, Antalya</td>
<td>35825</td>
<td>208</td>
</tr>
</tbody>
</table>

*Source: Eurostat*

In most Mediterranean countries air transport is heavily concentrated at one or two airports. This pattern is less pronounced in countries with a strong tourism industry, such as Morocco and Tunisia. These tend to have important charter airports close to key resorts. In Tunisia, 72% of scheduled passenger traffic and 90% of cargo traffic is concentrated in Tunis, whereas 89% of charter traffic is processed through Monastir and Djerba. In Syria, Damascus airport accounts for 85% of total passenger traffic, while in Egypt about 99% of international airfreight is processed through Cairo.

A peculiar feature of air traffic flows in the southern Mediterranean is the relative lack of international hub airports. In most of the region’s key airports, less than 5% of all passengers are in transit. Even though the potential for regional hub-
and-spoke structures might be limited, there seems to be potential for long-haul transit traffic.

Direct transit is a very limited phenomenon in MEDA airports and in many cases it is virtually non-existent. Turkey stands out with a close to 6% share of direct transit passengers. Although usually related to major air hubs, in countries like Jordan and Syria this passenger type is restricted to smaller airports serving tourist locations - Aqaba and Aleppo - on flights continuing to the capital city.
4 International and Domestic Air Transport

Domestic air traffic is notably less significant than throughout the Mediterranean region and in several countries is practically nonexistent. This is evident in countries with a single airport economy such as Lebanon and Malta and in smaller countries such as Cyprus (where only 2.4% of the total passengers travelled on a domestic flight in 2001) and Jordan (1.2%). Lebanon, has virtually no domestic flights, while less than 10% of passenger traffic in Tunisia and Syria takes place within national borders, specifically in Tunisia the percentage is as low as 5.2%, while in Syria it is 8.6%. There is one notable exception, Algeria, where 69% of the passenger volume handled is domestic, due to an extensive network of regional airports, which serve either southern remote cities or energy facilities.

Egyptian and Turkish airports also manage a consistent amount of internal traffic given that at least 40% of the arrivals and departures handled refer to domestic flights.

When it comes to international transport, the European Union is the major air partner for most Mediterranean countries. In 2001, passengers flying between MEDA and EU-15 airports represented an estimated 49% of the overall MEDA air turnover and 51% of the total freight and mail volume. This phenomenon can be verified in the following tables, charts and graphs.

The air passenger and freight volumes to/from the various Mediterranean countries for selected years are illustrated in the following Table. This Table also illustrates the average annual growth rates for passenger and freight traffic.

5 Tourism and Aviation in MEDA Region

The international airline industry has shown consistent average growth for passenger and freight traffic of 6 percent over the last thirty years. It has also demonstrated a remarkable resilience to the effects of economic downturns.

In the MEDA countries, some of which have a single airport economy, the international air transport flow is predominant compared to domestic traffic. The top-15 airports of the area include some favourite tourist destinations as well as airports located in the proximity of capital cities.

In these countries, aviation is mainly a matter of passenger transport rather than freight/post and an important part of this activity, as mentioned above, is related to
tourism. The number of tourists visiting the MEDA countries has been growing at an average annual growth rate of 8.3% in the last two years, increasing from about 28.7 million in 1998 to over 33.6 million in 2000, a sound recovery after 9-11 events. The share of tourists coming from the EU-15 was as high as 82.5% in Malta and 79.7% in Cyprus and well over 40% in five of the other MEDA countries. However, the EU tourist presence rated as low as 10.6% in Algeria, 15.2% in Syria, 20.0% in Jordan, and 25.6% in Lebanon, which are typical destinations for visitors coming from the Middle East and Arab countries. Although the development of the cruise industry and ferry traffic plays a role in the islands and in Morocco and Tunisia, most of the tourists travel to MEDA countries by air.

Major sources for the tourism markets are EU member states. In 2001 alone, the MEDA countries attracted an estimated 50 million passengers flying from and to the EU-15. In addition to the general economic recession, the September 11 events put the aviation industry under stress in 2001, with the number of tourists dropping and traffic volumes bending downwards. In the MEDA region, tourism and travel have also been affected since 2000 by the increased political instability in the Middle East. Nevertheless, the demand for air travel is still strong. According to ICAO (the International Civil Aviation Organisation), in the longer term, traffic growth is expected to proceed at about 5% annually, in line with pre-2001 trend projections.

Air transport is particularly important for cross-border tourism. Even though ferry traffic plays a significant role for general passenger traffic in the Maghreb and road traffic in the Mashrek, most tourists arrive by air. In Egypt, the share of air transport in foreign arrivals is 74%, in Lebanon 70%, in Morocco 66% and in Turkey 69%. About 85% of international passengers to and from Tunisia are tourists. Tourism also accounts for the high market share of charter traffic in many Mediterranean countries. Another consequence is that it increases the seasonal fluctuation of air traffic.
Table 9: Passenger Transport by Air Between MEDA EU Countries, 2001

<table>
<thead>
<tr>
<th>Country</th>
<th>Thousands of Passengers to/from EU</th>
<th>% of all passengers</th>
<th>Total passengers (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>5.229</td>
<td>73,0</td>
<td>6.81</td>
</tr>
<tr>
<td>Algeria</td>
<td>2.027</td>
<td>25,1</td>
<td>8.08</td>
</tr>
<tr>
<td>Egypt</td>
<td>5.903</td>
<td>34,0</td>
<td>17.39</td>
</tr>
<tr>
<td>Jordan</td>
<td>602</td>
<td>26,1</td>
<td>2.25</td>
</tr>
<tr>
<td>Lebanon</td>
<td>185</td>
<td>7,6</td>
<td>2.44</td>
</tr>
<tr>
<td>Morocco</td>
<td>4.114</td>
<td>59,3</td>
<td>6.94</td>
</tr>
<tr>
<td>Malta</td>
<td>2.340</td>
<td>82,5</td>
<td>2.80</td>
</tr>
<tr>
<td>Syria</td>
<td>375</td>
<td>21,4</td>
<td>2.21</td>
</tr>
<tr>
<td>Tunisia</td>
<td>8.053</td>
<td>79,7</td>
<td>9.70</td>
</tr>
<tr>
<td>Turkey</td>
<td>16.487</td>
<td>46,0</td>
<td>35.83</td>
</tr>
<tr>
<td>Total</td>
<td>45.315</td>
<td>45.47</td>
<td>94.45</td>
</tr>
</tbody>
</table>

Source: Eurostat, 2003

Table 44: Passenger Transport by Air Between MEDA Countries, 2001

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of passengers to/from MEDA</th>
<th>% of all passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyprus</td>
<td>520.379</td>
<td>7,3</td>
</tr>
<tr>
<td>Jordan</td>
<td>495.519</td>
<td>21,4</td>
</tr>
<tr>
<td>Lebanon</td>
<td>408.367</td>
<td>18,4</td>
</tr>
<tr>
<td>Malta</td>
<td>115.091</td>
<td>4,1</td>
</tr>
<tr>
<td>Syria</td>
<td>268.290</td>
<td>15,3</td>
</tr>
<tr>
<td>Tunisia</td>
<td>43.961</td>
<td>4,3</td>
</tr>
<tr>
<td>Total</td>
<td>1.851.607</td>
<td>11,8</td>
</tr>
</tbody>
</table>

Source: Eurostat, 2003

6 Prospects

Most Mediterranean countries have begun to modernize their transport sectors. This is a positive development, but much work remains to be done, if transport is to fulfill its critical role as a facilitator for trade, tourism and foreign direct investment throughout the region. Moving reforms into a higher gear will require a concerted effort on behalf of governments and the private sector.

Although air connections among the region’s States could certainly be improved, major difficulties and increased costs faced by airliners are primarily attributed to
the lack of comprehensive operating agreements, differing regulations and monopolizing practices. To deal effectively with such deficiencies of the sector, a program has been laid down to open up the Arab airspace (Muller-Jentsch, 2002). This program is expected to encourage air transport for passengers and freight by enhancing mobility, tourism and exchange among the Arab States.

**Multi – lateral Agreements among Arab states**

- Agreement on the establishment of an Arab organization to classify vessels.
- Arab Carnet transit agreement.
- Draft passenger transport Arab Agreement.
- Initiation of programs for air traffic coordination and management among Arab States.
- Draft Arab Agreement to facilitate transport and logistics measures.

**Airports construction**

In Egypt: building of new terminal 3 in Cairo International airport that would increase the capacity between 10 to 20 million passengers in a time period of 30 months. Construction of a new runway in Cairo International airport. Building of a new terminal in Sharm El-Sheikh airport that would increase the capacity from 2500 to 4500 passenger per hour in a time period of 18 months. Upgrading of Luxor airport is about to be completed, increasing the capacity from 2500 to 4500 passenger per hour in a few months. Completion of the construction and starting of operation of Al-Alamain new airport. The construction of Marsa-Alam new airport is near completion.

Building new airports is proposed for some remote locations in Syria, although this suggestion is not yet supported by transport studies that would take into account the existing road and rail connections and their prospects for improvement.

New airport terminals are planned where the existing ones have reached their capacity levels (Algiers) or have been recently finished (Beirut).

In cases where the expansion of an existing airport is difficult, like in Tunis, there are proposals to move them in new locations.
CONCLUSION

The analysis of integration of Mediterranean has required an in depth investigation of the present situation.

This investigation was conducted with the support of a GIS tool which described the existing services between ports and has integrated inland networks with maritime links.

For maritime links a major distinction must be made between container services and ro-ro services. Container services across Mediterranean have changed rapidly over the recent years in relation with development of major intercontinental hubs in the area. In parallel to this ro-ro services have also been developed in more direct relation with intra Mediterranean trade.

The evolution of transport demand is then, obviously, an important factor of the recent changes of intermodal integration in the Mediterranean under the influence of world trade growth and intra Mediterranean trade growth.

For the exchanges between Mediterranean countries the enlargement of traditional market must also be stressed with strong growth of traffic in the eastern part of the Mediterranean following the opening of Eastern Europe economies as well as opening of CIS countries. Turkey is now playing a major role both in eastern and east-west trade of Mediterranean.

This context of fast evolution must then be taken into account in order to provide the relevant diagnosis for intermodal integration in the Mediterranean area.

Another important aspect of the context which was pointed out is the rapid evolution of the institutional and legal context; after few years of preparation liberalisation and facilitation of transport are now entering in an implementation phase. Several countries have changed their laws following European example and new regulations have been implemented in the recent years. The progressive reduction of customs taxes is now a reality between many of the countries and this will influence not only the competitiveness of products but also the administrative procedures.

Once this context has been carefully described, the main recommendations for improving the integration of intermodal transport have been developed along the following lines.

In the report focus is put more on freight than on passenger. For passenger transport an extensive review is also made for Mediterranean and for the first time with specific information collected by partners and in particular by partners with ambitious tourism development strategy.
In conclusion major themes for integration of intermodal transport chains are:

- The objective of implementation of a multilateral authorisation of transport at the scale of Mediterranean area (see also REGMED) in order to accelerate the harmonisation and simplification of procedures (which are set up in bilateral and multilateral agreements).

- The structuring of a Euro-Med network with identification of a “Mediterranean port network”, stressing the different functionalities: hub port, gateway port, regional port… From a technical point of view this can be done with development of Euro-Med GIS.

- The development of professionalism and training in parallel with development of transport association which facilitate dialogue and bring support to companies.

- The development of logistic inland centres for intermodal transhipment and urban distribution in the southern countries as well as a better access of southern transport operator to EU logistic centres (in ports or inland).

- The promotion of direct ro-ro services in order to limit road haulage on long distance on north south route of eastern, central and western Mediterranean.

- The development of a “hub role” concept for ro-ro services in particular on major islands (Malta, Cyprus, Sardinia; Crete..)

- The exploration of new technologies for ro-ro or mixed vessels adapted to Mediterranean in order to improve their productivity (capacity, use, transit time).

- The development of direct container rail services for access to ports in northern and southern ports of the Mediterranean from major ports (Tangiers, DjenDjen, Port Said, Alexandria, Beirut, Lattaquie, Mersin, Istanbul…) in order to serve inland dense populated area.

- The development of interface between ro-ro services and rail transport in major north south European corridor.

- The identification of “rail land bridge” between western Mediterranean, and north sea, eastern Mediterranean and North Sea, Black Sea and Baltic Sea.
VI – ASSESSMENT OF TRANSPORT IMPACTS AND
DEFINITION OF EVALUATION CRITERIA FOR THE
IDENTIFICATION OF PRIORITY CORRIDORS AND
PROJECTS IN THE MEDITERRANEAN REGION

1. Objectives and approach

The objective of WP4 was to develop an assessment framework for the prioritization of projects and corridors in the MEDA-TENT network.

Our work was based on the review of existing strategic assessment methodologies such as the:

- TINA Method on the assessment of transport infrastructure needs in the Central and East European Countries (1998-1999)
- Combined cost-benefit and multi-criteria assessment framework developed by the EUNET project, likewise of the Fourth Framework Programme project bearing the same name (1998-2002).
- TEN STAC scenarios and forecasting of transport demand on the TEN-T network.
- Balkans Transport Infrastructure Regional Study TIRS (2002).
- UNECE TEM/TER project methodology for master plans.

In addition we considered the practice of assessment in Mediterranean countries themselves as well as the situation with regard to data availability. Feedback from key stakeholders representing mainly governmental institutions from the Mediterranean countries was used for detailing the criteria and, especially, for determining national weights.
2. An Evaluation Scheme for the MEDA TENT Corridors

There are four steps in a strategic evaluation exercise:

1. Network description and identification of key projects.
2. Forecasts of transport demand under different scenarios.
4. Prioritization to select those projects to receive funding first.

The various strategic assessment methods developed at EU level, by international organizations or national administrations share more similarities than differences in procedural terms and this allows us to talk about the existence of standards or a mainstream approach in the strategic assessment of infrastructure plans. The differences between existing methods mainly relate to the specific models used for establishing forecasts of transport demand and for impact assessment. Insofar as impact assessment is concerned, a key distinction is between those methods that rely exclusively on a multi-criteria analysis, and those that attempt to build into the analysis cost-benefit analysis components. A strategic assessment method that relies exclusively or even extensively on cost-benefit is at present not available.

The MEDA TENT method builds on this state-of-the-art. We concentrate on steps 2, 3 and 4 given that the network description and identification of key projects (step 1) was completed in previous work packages. The development of forecasts of transport demand are also beyond the scope of the MEDA TENT study; these will be provided by other studies. Thus, step 2 of the strategic assessment method focuses on scenarios with which our exposition below begins.

2.1. Scenarios on external conditions

The scenarios on conditions external to the transport infrastructure system were constructed by considering critical factors (section 2.1.1) and specific country characteristics (section 2.1.2).

Five scenarios are proposed:

- A reference or baseline scenario (section 2.1.3)
- An overly optimistic scenario following the visionary model (section 2.1.4)
- An overly pessimistic scenario following the precautionary model (section 2.1.5)
- Two more realistic or plausible scenarios that are modelled around the reference scenario albeit assuming changes in specific directions (section 2.1.6)
2.1.1. Critical factors

In order to ‘write-up’ scenarios on conditions external to the transport infrastructure system it is necessary to specify, in advance, those critical factors that define these scenarios and, in that, their differences. Four critical factors are considered of particular relevance for describing change external to the transport infrastructure system yet relevant for its development. These are the economy, structural reform, institutional arrangements as well as social and political issues.

Economic outlook

In the period 2000-2004 the average economic growth in the Mediterranean region ranged between around 2 per cent (in real GDP) in Syria and Lebanon to just below 4 per cent in Egypt and Jordan and above 4 per cent in Morocco, Tunisia and Algeria. The growth rate in the new EU Member States, Cyprus and Malta, was also around 4 per cent. In Turkey the years 1999 and 2001 were characterized by deep recession but since that time the growth rate has ranged between 5 and 7 per cent. Economic analysts from the OECD think that the economic growth in this region has been suppressed due to the stagnating global economy but also the political instability in several countries. In other words, there is potential for yet even greater economic growth under more positive global (and European) socio-economic conditions. It should here be recalled that in the period 2000-2004 average economic growth in the EU did not exceed 2 per cent and was significantly lower in several countries.

Structural reform outlook

Most of the countries in the Southern Mediterranean and in the Middle East face similar problems. They are characterized by state-driven economies and over-dependence on a few resource-based sectors (especially oil and gas) and a narrow export base. This depresses economic growth and especially foreign direct investment. Structural economic reform has thus been concentrating on diversification that includes the strengthening of the service sector, including transport as one of its main components, as well as the reform of state-owned companies towards privatization or joint ownership (OECD Outlooks 2003). Algeria is the country with the strongest dependence on the resource-based sectors oil and gas, hence also the highest share of the industry. Middle Eastern countries display a stronger service economy with the exception of Syria which has a strong agricultural sector. A comparatively large agricultural sector is also displayed by Egypt and Morocco. Only in Jordan is the agriculture sector very small with 2 per cent.

The export data show that there is a potential for growth in all countries. The higher share of exports in Algeria and Libya hides that this relates to only few products. The lowest exports are displayed by Syria where there has also been a
dramatic decrease in the years 1999-2003. This is due to the political situation in the region.

Tax reform is another central objective of structural economic reform in view of the Association Agreements with the European Union which foresee a gradual dismantling of custom duties towards free trade in a transitional period of around 12 years (till 2012 or 2015). The first objective of tax reform is that of streamlining duties to a limited number of categories thus moving away from the current situation of the multiple and non-transparent system of duties and customs, a key problem especially for the transport sector (see also Deliverable 3, NESTEAR 2004).

Institutional reform outlook

For structural economic reforms to work a number of administrative and institutional reforms are called for, ranging from decentralization and local government to capacity building and training within government organizations. Without such meso-level reforms, macro-economic policy is unlikely to bring about any tangible results.

Social and political issues

Many of the Mediterranean countries are both overall poor and also displaying major economic disparities with a large share of the population living in poverty and/or unemployed. Regional disparities are also huge with rural areas lagging much behind urban centres. This, in turn, gives rise to significant internal and external migration flows. Political instability is aggravated by proximity to territories in war or violent community conflict but in most cases it is equally rooted in the high levels of inequality in conjunction with low levels of democratization.

2.1.2. Country groups

The countries covered by the MEDA TENT study ought not to be treated as a homogeneous group. At the same time it is unwise in terms of scenario-writing to ignore the similarities among them and treat each one individually. The following classification scheme is thus proposed:

- Group A: Malta, Cyprus – these two countries are already now EU Member States and have over the last decade approximated their legislation to that in the EU.

- Group B: Turkey – Turkey has enjoyed an association agreement with the EU since the late 1960s and is an accession candidate since 1999 with negotiations expected to commence in 2005.

- Group C: West Mediterranean countries: Morocco, Tunisia, Algeria
• Group D: East Mediterranean countries: Egypt, Jordan, Lebanon and Syria.

Group C and D countries display similar problems and outlooks in terms of structural economic and institutional reform as well as in terms of socio-economic characteristics. Nevertheless there are three issues that caution against treating them entirely homogeneously when exploring the pathways of the different scenarios.

The first concerns geographical proximity. The West Mediterranean countries already now form part of the Maghreb Arab Union (UMA) initiative, the East Mediterranean countries of the UN Economic and Social Committee for Western Asia (ESCWA). Both these initiatives entail transport planning components. Nevertheless, inter-regional collaboration is hampered in both cases by community or state conflicts – the Israel / Palestine conflict in the Middle East, the Morocco / Algeria Sahara conflict in the West. There are also as of yet no formal relations between the EU and Libya (that forms part of UMA) – the UN sanctions on Libya having only been lifted in September 2003. In the East the situation in Lebanon remains unclear while the relations between Turkey and Syria are gradually improving. These conflict situations represent a barrier to infrastructure planning and explain also the low level of exchanges (and traffic) among these Mediterranean countries despite their geographical proximity. At the same time, the overcoming of these frictions represents a strong motivation for the engagement of the EU in the inter-regional infrastructure planning in this region.

The second distinguishing characteristic that needs to be kept in mind is the economic basis: Morocco and, especially, Tunisia from among the West Mediterranean countries as well as Egypt and Jordan from among the East Mediterranean countries are more diversified economically than the other countries. This renders structural economic reform easier.

Finally there is the issue of democratization: Tunisia from among West Mediterranean countries and Egypt from among East Mediterranean countries have a longer tradition with democratic institutions than any of the other countries, however neither can be said to represent an advanced democracy. Most other countries are experimenting with democratic reforms, albeit gradually and at a slow pace. The low degree of democratisation appears to stand in close relation to the level of socio-economic equality in these countries, all of which display high levels of poverty and unemployment, in turn factors that impact on political stability. It is not least for this reason that the Regional Strategy elaborated under the MEDA programme to support the Association Agreements of these countries places an emphasis on the gradual openness of political institutions in conjunction with social policy reforms (Regional Strategy 2003; cf. also OECD Outlooks 2003).
2.1.3. Reference scenario

The reference scenario rests on the assumption that the contemporary trends continue into the future. In other words we continue to observe structural economic reforms, institutional reforms, political and social reforms as well as progress with regard to the implementation of the Association Agreements. However at the current pace none of these reforms can result in the implementation of the free trade area by 2012-2015, i.e. there is delay of the latter till 2018-2024. This is in part due to the slowing down of the EU integration process itself but also the persistence of structural barriers in Mediterranean countries.

The reference scenario is characterised by average GDP growth of less than 2 per cent in EU-15 and between 3.5 and 4 per cent in the New Member States, Turkey and the Southern Mediterranean countries.

2.1.4. Visionary model – optimistic scenario

The visionary scenario foresees an acceleration of reforms on all fronts and in all countries over the next couple of years. This is facilitated by high economic growth and positive geopolitical developments with regard to the community / state conflicts in the region and the fight against terrorism. In turn, these developments, support democratization as well as social and economic reform creating a virtual cycle.

The establishment of the free trade area in 2012 according to plan feeds further growth and development after this date.

Under this scenario we can observe average growth rates of 3 per cent in the EU-15, 5 per cent in the New Member States and the East Mediterranean countries and 6 per cent in Turkey and the West Mediterranean countries.

2.1.5. Precautionary model – pessimistic scenario

War and conflict in conjunction with economic slow-down and the absence of structural and institutional reforms leads to the breakdown of the process established by the Association Agreements.

This scenario is most likely in a situation of recession or very low growth of less than 1 per cent in EU-15 and between 2 to 3 per cent in all other countries.

2.1.6. Plausible alternative futures

There are two plausible alternative futures representing variations of the reference scenario.

Plausible future (A) is similar to the reference scenario except that it considers that the Association Agreements are implemented at variable times in different
countries, depending on the progress of related reforms. Thus the free trade area would be launched in 2012 but only with three to four countries and extended gradually in the years 2018 and 2024. The countries most likely to enter the free trade area already in 2012 would be Morocco, Tunisia, Egypt and Jordan, i.e. those countries which are more advanced and already cooperating under the Agdir framework.

Plausible future (B) likewise foresees a slow down of the process foreseen by the Association Agreements (till 2018) but primarily as a result of opposition to these by the Mediterranean countries themselves who think that internal reforms will first have to be consolidated prior to proceeding with a free trade agreement. This slow-down is thus paralleled by the acceleration of reforms relating to the economy, social policy and democratization.

In terms of GDP growth both plausible scenarios (A) and (B) foresee average economic growth rates similar to those of the reference scenario till the year 2012 but an increase thereafter.
## Table 10 Comparison of MEDA scenarios

<table>
<thead>
<tr>
<th>Economic outlook</th>
<th>Structural reform</th>
<th>Institutional reform</th>
<th>Social / Political</th>
<th>Implications FTA?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reference</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU15 1.5%</td>
<td>Slow fragmented</td>
<td>Slow fragmented</td>
<td>Slow fragmented</td>
<td>Delayed 2018-2024</td>
</tr>
<tr>
<td>NMS 3.5%</td>
<td>Slow fragmented</td>
<td>Fast</td>
<td>Slow fragmented</td>
<td></td>
</tr>
<tr>
<td>Turkey 4.0%</td>
<td>Slow fragmented</td>
<td>Fast</td>
<td>Slow fragmented</td>
<td></td>
</tr>
<tr>
<td>MEDA 4.0%</td>
<td>Slow fragmented</td>
<td>Fast</td>
<td>Slow fragmented</td>
<td></td>
</tr>
<tr>
<td><strong>Visionary, optimistic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU15 2.5%</td>
<td>Fast</td>
<td>Fast</td>
<td>Fast</td>
<td>2012</td>
</tr>
<tr>
<td>NMS 5.0%</td>
<td>Fast</td>
<td>Fast</td>
<td>Fast</td>
<td></td>
</tr>
<tr>
<td>Turkey 6.0%</td>
<td>Fast</td>
<td>Fast</td>
<td>Fast</td>
<td></td>
</tr>
<tr>
<td>MEDA West 6.0%</td>
<td>Fast</td>
<td>Fast</td>
<td>Fast</td>
<td></td>
</tr>
<tr>
<td>MEDA East 5.0%</td>
<td>Slow fragmented</td>
<td>Fast</td>
<td>Slow fragmented</td>
<td></td>
</tr>
<tr>
<td><strong>Precautionary, Pessimistic</strong></td>
<td></td>
<td></td>
<td></td>
<td>Delayed Indefinitely</td>
</tr>
<tr>
<td>EU15 1.0%</td>
<td>Breakdown</td>
<td>Breakdown</td>
<td>Breakdown</td>
<td></td>
</tr>
<tr>
<td>NMS 2.0%</td>
<td>Breakdown</td>
<td>Breakdown</td>
<td>Breakdown</td>
<td></td>
</tr>
<tr>
<td>Turkey 3.0%</td>
<td>Breakdown</td>
<td>Breakdown</td>
<td>Breakdown</td>
<td></td>
</tr>
<tr>
<td>MEDA 3.0%</td>
<td>Slow fragmented</td>
<td>Slow fragmented</td>
<td>Slow fragmented</td>
<td></td>
</tr>
<tr>
<td><strong>Plausible (A)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU15 1.8%</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable, Peace process restarts</td>
<td>2012 Mo, Tun, E, J, rest 2018-2028</td>
</tr>
<tr>
<td>NMS 4.0%</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable, Peace process restarts</td>
<td></td>
</tr>
<tr>
<td>Turkey 5.0%</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable, Peace process restarts</td>
<td></td>
</tr>
<tr>
<td>MEDA 4.0%</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable across countries</td>
<td>Recovers momentum but variable, Peace process restarts</td>
<td></td>
</tr>
<tr>
<td><strong>Plausible (B)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU15 1.8%</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Social reform is priority, gradual political openness</td>
<td>Delayed 2018-2014 MEDA request</td>
</tr>
<tr>
<td>NMS 4.0%</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Social reform is priority, gradual political openness</td>
<td></td>
</tr>
<tr>
<td>Turkey 5.0%</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Social reform is priority, gradual political openness</td>
<td></td>
</tr>
<tr>
<td>MEDA 4.0%</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Priority is decentralisation &amp; local government</td>
<td>Social reform is priority, gradual political openness</td>
<td></td>
</tr>
</tbody>
</table>
2.2. Evaluation

The transport data available for the Mediterranean countries varies significantly in terms of quality. Furthermore, in several countries the definition of the network and key projects is still at a preliminary stage. These constraints in conjunction with the variable and often conflicting transport policy and regional developmental objectives (among Mediterranean countries as well as between the Mediterranean countries, on the one hand, and the European Union, on the other), speak in favour of using a multi-criteria analysis framework for the evaluation. This is also the approach followed by the INFRAMED and UN TEM/TER studies which were confronted with similar situations.

2.2.1. Criteria: clusters and definition

The evaluation criteria relate to three key areas of concern. These we refer to as clusters.

**Cluster A – Strategic (transport) considerations, added value (C_A)**
- Interregional cooperation (C_A1)
- Interconnection / cooperation with EU network (C_A2)
- Interconnection with ports (C_A3)
- Interconnection with backbone network (C_A4)
- Security improvement (C_A5)
- Environmental & urban sustainability (C_A6)
- Intermodality (C_A7)

**Cluster B – Project maturity & feasibility (C_B)**
- Political commitment (C_B1)
- Congruence with national strategies (C_B2)
- Congruence with EU strategies (C_B3)
- Barriers to implementation (C_B4)

**Cluster C – Socio-economic return on investment (C_C)**
- Level of transport demand (C_C1)
- Relative investment cost (C_C2)
- Financial feasibility (C_C3)
- Cost effectiveness (C_C4)

The criteria are explained below:

Interregional cooperation refers to the extent to which the project in question advances cooperation among Mediterranean countries (excluding France, Italy, Spain and Greece), either directly in that it concerns common infrastructure in more than one country or indirectly in involving technical or other exchange of know-how or joint business activities.
Interconnection / cooperation with EU network indicates the extent to which the project promotes interconnection or cooperation with EU countries, either directly or indirectly (defined as above).

Interconnection with ports. The development of ports is key to the development of the Mediterranean transport network. This criterion taps on the extent to which the project in question is linked to port infrastructure or concerns port infrastructure. Interconnection with backbone network is an indicator of the extent to which the project meets cohesion requirements in terms of linking peripheral to central regions within one country.

Security improvement taps on the extent to which the project contributes to improving security conditions regarding the transport of freight or passengers in the region.

Environmental and urban sustainability measures the degree to which the project contributes to overcoming problems related to environmental pollution (especially in coastal areas) and hyper-concentration in metropolitan areas.

Intermodality taps on the extent to which the project advances the interconnection of rail and road in that it is multimodal or in that it involves logistic improvements.

Political commitment taps on the extent to which the regional / national government is committed to seeing the project through to completion.

Congruence with national strategies – a project is congruent with national strategies if it has been conceptualized with the long-term infrastructure plans for the country / region in question.

Congruence with EU strategies is shown when a project is considered relevant for the EU external relations but at the same time is not opposed to the high-level objectives of the EU in transport

Barriers to implementation taps on the feasibility of the project taking into account problem areas related to financing, local opposition etc.

Level of transport demand taps on the urgency of the project in view of actual and forecasted transport demand on the link associated with the project and separately for passenger and freight. It gives an indication of the relative level of traffic using the infrastructure.

Relative investment cost is a measure of the size or importance of the project in relation to a country’s GDP (and taking into account the overall investment in transport infrastructure)
Financial feasibility indicates the seriousness of the project’s cost calculation to the extent that this has considered how the project will generate the additional resources for its own operations, facilitate the reimbursement of loans or deal with risks.

Cost effectiveness gives an indication of the project’s likely internal rate of return (IRR). It is determined according to the type of investment, the importance of the demand and the relative magnitude of the advantages expected out of the project’s implementation within a specific time frame.

2.2.2. Criteria quantification

The above criteria can be quantified as follows:

**Interregional cooperation (C\textsubscript{A1})**

<table>
<thead>
<tr>
<th>A:3</th>
<th>Project represents common infrastructure / link / logistics between two or more Mediterranean countries (excluding France, Italy, Greece and Spain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B:2</td>
<td>No common infrastructure between two or more Mediterranean countries but project’s implementation will involve collaboration between two or more Mediterranean countries (in terms of technical know-how or economic investment)</td>
</tr>
<tr>
<td>C:1</td>
<td>None of the above.</td>
</tr>
</tbody>
</table>

**Interconnection / cooperation with EU network (C\textsubscript{A2})**

<table>
<thead>
<tr>
<th>A:3</th>
<th>Project represents common infrastructure / link / logistics between a Mediterranean country and an EU country</th>
</tr>
</thead>
<tbody>
<tr>
<td>B:2</td>
<td>No common infrastructure / link between a Mediterranean country and an EU country but project’s implementation will involve collaboration between Mediterranean countries and EU countries (in terms of technical know-how or economic investment)</td>
</tr>
<tr>
<td>C:1</td>
<td>None of the above.</td>
</tr>
</tbody>
</table>
**Interconnection with ports (C\textsubscript{A3})**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:3</td>
<td>Project targets mainly port infrastructure or improvements in port logistics</td>
</tr>
<tr>
<td>B:2</td>
<td>Project represents key link to a main port in a Mediterranean country</td>
</tr>
<tr>
<td>C:1</td>
<td>None of the above.</td>
</tr>
</tbody>
</table>

**Interconnection with backbone network (C\textsubscript{A4})**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:3</td>
<td>Project is a missing link of the backbone inter-urban or rural network</td>
</tr>
<tr>
<td>B:2</td>
<td>Project will improve the cohesiveness of backbone network but is not a missing link</td>
</tr>
<tr>
<td>C:1</td>
<td>Project has no influence or an averse impact on backbone network</td>
</tr>
</tbody>
</table>

**Security improvement (C\textsubscript{A5})**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:3</td>
<td>Project will significantly improve security both for freight and passengers</td>
</tr>
<tr>
<td>B:2</td>
<td>Project will improve security for either freight or passengers</td>
</tr>
<tr>
<td>C:1</td>
<td>Project entails technical / logistics specifications that are not state-of-the-art and as such will have no impact on security</td>
</tr>
</tbody>
</table>

**Environmental and urban sustainability (C\textsubscript{A6})**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:3</td>
<td>Project will significantly improve environmental situation of coastal areas and the life quality of urban populations</td>
</tr>
<tr>
<td>B:2</td>
<td>Project displays moderate improvements in the above regard</td>
</tr>
<tr>
<td>C:1</td>
<td>Project will make no contribution to environmental and urban sustainability</td>
</tr>
</tbody>
</table>

**Intermodality (C\textsubscript{A7})**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:3</td>
<td>Multi-modal project with combined transport / logistics provisions</td>
</tr>
<tr>
<td>B:2</td>
<td>Modal project but with combined transport / logistics provisions</td>
</tr>
<tr>
<td>C:1</td>
<td>None of the above.</td>
</tr>
</tbody>
</table>

**Political commitment (C\textsubscript{B1})**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A:3</td>
<td>Strong political commitment to see the project through to its completion</td>
</tr>
<tr>
<td>B:2</td>
<td>Moderate political commitment to see project through to its completion</td>
</tr>
<tr>
<td>C:1</td>
<td>Low or no political commitment to see project through to its completion</td>
</tr>
</tbody>
</table>
**Congruence with national strategies (CB2)**

| A:3 | Project is central national master plan or long-term infrastructure strategy |
| B:2 | Project is moderately important for national master plan or long-term infrastructure strategy |
| C:1 | Project is not part of the national master plan or long-term infrastructure strategy |

**Congruence with EU strategies (CB3)**

| A:3 | Project is consistent with EU Regional Strategy on Mediterranean and it is also consistent with other EU objectives like market openness, cohesion and sustainable development |
| B:2 | Project is consistent with EU Regional Strategy on Mediterranean but not fully consistent with other EU objectives like market openness, cohesion and sustainable development |
| C:1 | Project is not consistent with EU strategies |

**Barriers to implementation (CB4)**

| A:3 | Project displays no major barriers to implementation |
| B:2 | Project displays moderate barriers to implementation |
| C:1 | Project displays serious barriers to implementation |

Barriers to implementation may be financial, technical, environmental, institutional / regulatory or geopolitical. If there are one to two barriers in at least two categories, then we should speak of ‘moderate’ barriers. If there are more than two barriers across more than two categories then we speak of serious barriers to implementation.

**Level of transport demand (CC1)**

| A:3 | High level of transport demand now and in future |
| B:2 | Moderate or low levels of demand at present but expected to increase in the future |
| C:1 | Low level of transport demand now and in future |

The level of transport demand should be specified with reference to actual and forecasted data for the specific link in relation to the country’s network.

**Relative investment cost (CC2)**

| A:3 | Project is significant in size but within forecasted government expenditures for transport and without endangering the realization of other key projects |
| B:2 | Project’s size and costs within forecasted government expenditures |
| C:1 | Project is significant in size but outside forecasted government expenditures for transport over a period of time |
**Financial feasibility (C<sub>C3</sub>)**

| A:3 | Project’s cost calculation is very good: serious according to international standards and includes consideration of risks and costs likely to incur in the medium- to long-term |
| B:2 | Project’s cost calculation is good |
| C:1 | Project’s cost calculation is poor |

**Cost effectiveness (C<sub>C4</sub>)**

Where an internal rate of return (IRR) has been estimated this should be used. In the absence of this, the following quantification is proposed, taking into account the size of the project, the duration of its realization as well as the magnitude of its short-term benefits (like employment) and long-term benefits (economic etc.). For simplicity sake it is here assumed that the risk of the project (which is in any case assessed by a different criterion) is low (otherwise the assumption that high IRR is a ‘good’ thing would not necessarily hold).

| A:3 | Project will accrue benefits already in the short-term consistently over the time of its implementation and is expected to additionally have significant long-term benefits |
| B:2 | Project’s long-term benefits are significantly higher than its short-term or continuous benefits (over the time of its realization) |
| C:1 | Low short-term and long-term benefits |

A justification of the choice needs to be provided with explicit mentioning and where possible quantification (albeit not necessarily monetization) of short- and long-term benefits.

The raw project score corresponds to the sum of the project’s scores across all evaluation criteria.

- The maximum raw project score on cluster A is 21, the minimum 7
- The maximum raw project score on cluster B is 12, the minimum 4
- The maximum raw project score on cluster C is 12, the minimum 4
- The maximum total raw project score is 45, the minimum 15.

**2.2.3. Weights**

In order to proceed with the prioritization of the projects it is first important to establish a certain hierarchy among the evaluation criteria. This is done with weights.

Two types of weights are proposed by the MEDA method:

- The first taps on each criterion within a certain cluster \( W_1 \)
- The second is the weight of the cluster, i.e. \( W_A, W_B, W_C \)

The sum of cluster weights is 1, likewise the sum of individual criteria weights within a given cluster. In order to normalize or standardize the criteria and cluster weights, paired comparisons can be used.

A common set of weights can be arrived at through consultation or by using a statistical average. The former is, of course, a better option than the latter.
2.3. Prioritization

The final step of the MEDA assessment method is that of prioritization.

2.3.1. Project’s total score

The project’s total score in a particular country represents the sum of the project’s scores for each evaluation criterion which in turn is calculated by multiplying the raw score on each evaluation criterion with that criterion’s individual weight and the cluster’s weight.

Project score = SUM (Raw score * W_{Criterion} * W_{Cluster})

The project scores should be estimated separately using the consensus weights and the country weights in case these are different.

2.3.2. Corridor’s total score

The corridor’s total score can be calculated by adding the projects’ individual weighted scores corrected through spatial weights to reflect the share of the project’s length on each corridor.

Spatial Weights = project’s length / total corridor length
Corridor score = SUM (Project score * Spatial Weight)

Once again the corridor scores should be estimated separately using the consensus weights and the country weights in case these are different.

The corridor score should be estimated separately for rail and road and only consider missing links, i.e. projects that are still under planning or consideration. In other words, no projects that are under construction should be considered in the analysis.

Node projects (ports or airports) must again be considered separately. In this case the notion of a spatial weight does not apply, thus it is not possible to construct a corridor score in quantitative terms. A simple average can be used as a preliminary indication in conjunction with qualitative assessment. This is not the ideal measure thus caution is called for regarding its use.

2.3.3. Project priorities

A preliminary prioritization is established by combining the project’s and corridor’s scores as indicated in the following table.

<table>
<thead>
<tr>
<th>Corridor score</th>
<th>Project score (weighted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>HIGH MODERATE LOW</td>
</tr>
<tr>
<td>2</td>
<td>HIGH MODERATE LOW</td>
</tr>
<tr>
<td>1</td>
<td>MODERATE LOW LOW</td>
</tr>
</tbody>
</table>
The above prioritization is preliminary in that it does not take into account the scenarios. Doing this would require the use of the scenarios to forecast and assign traffic flows. Assuming this can be done, the project scores and priorities need to be compared across all different scenarios. Those projects that continue to score high under all external scenarios are those that ought to be given utmost priority as these are projects which can be described as ‘robust’ vis-à-vis external conditions.
3. Demonstration

The MEDA TENT evaluation methodology was demonstrated with reference to the following corridors:

- Middle East corridor Cairo to Amman, Damascus, Istanbul (no.7)
- Trans-Maghreb corridor (western section) (no.9)
- Paris Algiers Tamanrasset corridor (no.2)
- Eastern Mediterranean – North South corridor (no.8)

The numbers in parentheses correspond to the notation established at the onset of the MEDA TENT project for describing the extensions of the TEN-T network in the Mediterranean (Deliverable 1).

The objective of the demonstration exercise was to test the applicability of the evaluation methodology outlined in the previous section. It should be underlined that the MEDA TENT evaluation methodology is a preliminary assessment method that can at best only provide a basis for further detailed analysis and assessment.

The demonstration exercise included the following steps:

1. Identification of key projects at country level across the above corridors
2. Specification of criteria and cluster weights at country level
3. Assessment of key projects at country level using the national criteria and cluster weights
4. Comparison of corridors

Around 100 projects were evaluated across the four demonstration corridors – 30 to 35 each in corridors 7 and 9 and 10 to 20 each in corridors 2 and 8. The various projects were not compared under different scenarios as the estimation of traffic flows under different external conditions through a transport model was beyond the scope of the MEDA TENT project.

Regarding the road network, the comparison focused on corridors 7 and 9. Comparing the two corridors we found that the corridor 9 scores higher than corridor 7 yet both are close to the moderate score of 2.0. Against this background, and taking into account the distribution of scores, the projects to be given priority would be:

**Regarding corridor 7:**

- Cairo – Alexandria (Egypt)
- Damietta – Port Said (Egypt)
- Beirut – Masnaa (Lebanon)
- Tartous – Homs (Syria)
Regarding corridor 9:
- Fes – Oujda (Morocco)
- Oujda – Ouet Tlelat (Algeria)
- El Harrouch – Tunisian border (Algeria)
- Sfax – Gabes (Tunisia)

**Railway projects** were compared for corridors 7, 9 and 2. All three corridors scored moderately to high. The projects to be given priority are:

Regarding corridor 7:
- Aqaba – Jaber (Jordan)
- Istanbul – Ankara (Turkey)

Regarding corridor 9:
- Rabat – Oujda (Morocco)
- Jdaida – Gardimaou (Tunisia)
- Borj Cedria – Scusse (Tunisia)

Insofar as Algeria is concerned, a more detailed differentiation and description of the rail network on the Northern line is required prior to deciding on priority projects. This also concerns corridor 2.

Finally, across all corridors and most countries we find key maritime / port projects that deserve prioritisation. These are

Regarding corridor 7:
- the Aquaba Port in Jordan,
- the ports of Izmir and Mersin in Turkey

Regarding corridor 9:
- the port of Djen-Djen in Algeria (and also relevant for corridor 2).

Regarding corridor 8:
- The port of Alexandroupoli in Greece
- The port of Burgas in Bulgaria
- The port of Novorissysk in Russia.

The evaluation carried out in MEDA TENT confirmed the prioritization of maritime projects in Mediterranean countries as a first step towards the upgrading of their transport networks.

4. Lessons learned

The WP4 reviewed assessment methods in the EU and in the Mediterranean countries and on this basis proposed a preliminary multi-criteria method to assess corridor projects in the Mediterranean region. This method was applied to road, rail and
maritime projects on corridors no. 7 (Middle East), no.9 (trans-Maghreb), no.2 (France – Algeria) and no.8 (Eastern Mediterranean sea motorway).

The results show that the transport networks in the Mediterranean countries are advanced to a different degree across countries but also modes. Ports and maritime projects are undoubtedly the pride and driver of transport infrastructure investment in all of these countries, it is however equally important to invest into the backbone infrastructure. Cross-border projects are the most difficult to implement due to inter-state conflicts or frictions. The positive assessment of several of the projects considered by this project rests on the assumption that these conflicts can be managed. Indeed the transport development of this region will fundamentally depend on successful conflict management.
VII – TOWARDS INTEGRATION OF MEDA AND TEN NETWORKS

1. Introduction

The definition of criteria for priority investment and policy plans represents the first step towards the creation and subsequent consolidation of a Mediterranean Master Plan. Deliverable 5 elaborates a strategy in two phases and makes recommendations to launch a dynamic process which should become a permanent process of analysis and dialogue at Mediterranean scale in relation with the Euro-Mediterranean policy. The generalization of criteria and the definition of a global reference scenario will be part of this report.

Additionally, trends are estimated based on a common methodology for the whole region. These objectives concern transport policy and priority transport links and will include the major projects analyzed in MEDA TEN-T. Therefore, a strategy for achieving integrated infrastructure planning, interconnectivity and interoperability of transport systems in the Mediterranean region and between the EU and the Mediterranean will be elaborated, incorporating the relevant concepts produced by the TINA process for the Accession countries.

Respectively, this part of the study provides a summary of the application of the MEDA TEN-T evaluation methodology with reference to the selected priority corridors of the project, as well as proposals following steps for projects realisation, based on the realisation technique of decision modelling, and the MEDA TEN-T specificities and it analyses the latest EU initiatives concerning MEDA infrastructure projects, such as the High-Level Group, the interoperability of the transport systems in Mediterranean, which is primarily based on information provided by the partners throughout the different stages of the project. Finally this chapter proposes how the National Plans of the Mediterranean countries could become compatible with the TEN Planning Process.

Based on data and analyses prepared under MEDA TEN-T and the respective results of the evaluation methodology, it presents the MEDA TEN-T Master Plan procedure. This constitutes the Action Plan, which proposes measures for addressing the problems and bottlenecks identified in the project, including actions which can be taken at the regional or sub-regional level and country-specific solutions if appropriate. Finally, the Strategic Master Plan is developed, which refers to the integration of the MEDA TEN-T Corridors with the TEN-T. It includes an analysis of the most important bottlenecks and methods to alleviate them through the Master Plan, which is part of the overall Action Plan and which produces the main conclusions, the levels in which the work of the project can be implemented (funding, regulatory frameworks, investments), and recommendations for possible future steps, and recommendations for the further development of the Euro-Mediterranean Transport.
2. Evaluation Methodology: Outputs

A brief overview of the priority corridors is provided, as well as the application of the MEDA TEN-T evaluation methodology with reference to these priority corridors.

As presented in Deliverable 1, nine (9) demonstration corridors were selected for the MEDA TEN-T exercise. From these 9 demonstration corridors, four (4) were further selected for demonstration and for application of the developed evaluation methodology. Therefore, the notion “priority corridors” in this Chapter refers to these four demonstration corridors.

Once the corridors were identified and an overview was provided, the identification and prioritisation of the projects took place. The ultimate goal of the evaluation methodology was to identify in the priority corridors the projects’ prioritisation/categorisation, in order to support the elaboration of a medium and long-term network development strategy in the Mediterranean region and encourage the realization of MEDA TEN-T Master Plan.

2.1. Overview of the MEDA TEN-T Demonstration Corridors

Summarizing the overview of the priority corridors, we observe that most of the links and nodes in the corridors exist but the level of service in most of them is low or it is expected to prove insufficient in the near future since all corridors are expected to gain in importance and traffic is expected to grow.

In this respect most of the identified project concern upgrades, rehabilitations and reconstructions and less concern new construction. Nonetheless all projects are significant investments that needed evaluation and prioritization.

In total the identified projects for evaluation were 67, the majority of which are road projects, specifically 33. The rest are 15 rail projects, 11 port infrastructure projects and 8 projects concerning intermodal facilities - mainly in ports.

The considerable number of projects, the still very preliminary level of definition of most projects, the lack of precise information on the present situation of corridors, the imperfect knowledge of transport demand perspectives, the large array in types of projects, as well as the specific objectives of MEDA TEN-T, tend in favor of utilizing a Multi-Criteria Analysis, instead of any other method, to compare and evaluate the identified projects.
**Table 11** Corridor 7 Priority Projects

**Corridor**  
Middle East Corridor Cairo Amman Damascus Istanbul (no.7)

<table>
<thead>
<tr>
<th>Country</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road</strong></td>
<td><strong>Rail</strong></td>
</tr>
<tr>
<td>Egypt</td>
<td>Cairo – Alexandria Desert Road</td>
</tr>
<tr>
<td></td>
<td>Part of Cairo Ring Road leading traffic from Alexandria to Suez</td>
</tr>
<tr>
<td></td>
<td>Cairo – Suez Road</td>
</tr>
<tr>
<td></td>
<td>Ah Tunnel on Cairo – Suez to Nowibaa Road Link 3/37</td>
</tr>
<tr>
<td></td>
<td>Dammitetta to Port Said International Coastal Road</td>
</tr>
<tr>
<td></td>
<td>Part of Port Said Ring Road leading traffic from Dammitetta to Ismailia</td>
</tr>
<tr>
<td></td>
<td>Ismailia Road</td>
</tr>
<tr>
<td></td>
<td>Ismailia to Cairo Desert Road</td>
</tr>
<tr>
<td></td>
<td>Part of Cairo Ring Road leading traffic from Ismailia to Suez</td>
</tr>
<tr>
<td></td>
<td>Ismailia-Suez Road</td>
</tr>
<tr>
<td>Jordan</td>
<td>Road Link Aqaba – Syrian border</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Anti-Liban (South - North)</td>
</tr>
<tr>
<td></td>
<td>Beirut – Masnaa (East Syrian border)</td>
</tr>
<tr>
<td>Syria</td>
<td>Nasib – Bab Al Hawa (Turkish border)</td>
</tr>
<tr>
<td></td>
<td>Tartous – Homs</td>
</tr>
<tr>
<td></td>
<td>Latakia – Aleppo</td>
</tr>
<tr>
<td></td>
<td>Damascus – Jdaideh (Lebanon border)</td>
</tr>
<tr>
<td>Turkey</td>
<td>Ankara- Pozanti</td>
</tr>
<tr>
<td></td>
<td>Konya – Afyon</td>
</tr>
<tr>
<td></td>
<td>Afyon – Izmir</td>
</tr>
</tbody>
</table>
### Table 12 Corridor 9 Priority Projects

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Transmaghreb corridor extended to Libya and Egypt (no.9)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
<td><strong>Projects</strong></td>
</tr>
<tr>
<td><strong>Road</strong></td>
<td><strong>Rail</strong></td>
</tr>
<tr>
<td>Morocco</td>
<td>Rabat to Qujda</td>
</tr>
<tr>
<td></td>
<td>Port of Tangier through the city of Tetouan to Saida</td>
</tr>
<tr>
<td></td>
<td>Tangier (Asilah) and onto to Rabat</td>
</tr>
<tr>
<td></td>
<td>Casablanca – El Jadida</td>
</tr>
<tr>
<td></td>
<td>Settat – Marrakech</td>
</tr>
<tr>
<td></td>
<td>Marrakech – Aadir</td>
</tr>
<tr>
<td>Algeria</td>
<td>Qued Tlelat outside Oran to the city of Tlemcen and then</td>
</tr>
<tr>
<td></td>
<td>to Moroccan border to Qujda</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Tunisia</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>El-Harrouch to Tunisian border</td>
<td></td>
</tr>
<tr>
<td>Connection Djen Djen port with east-west motorway</td>
<td></td>
</tr>
<tr>
<td>Qued Zarga to the Algerian border</td>
<td></td>
</tr>
<tr>
<td>Borj Cedria - Sousse</td>
<td></td>
</tr>
<tr>
<td>M’Saken – Sfax</td>
<td></td>
</tr>
<tr>
<td>Borj Cedria – Gabes</td>
<td></td>
</tr>
<tr>
<td>Sfax – Gabes</td>
<td></td>
</tr>
<tr>
<td>Jdaida – Gardimaou</td>
<td></td>
</tr>
<tr>
<td>Gabes – Ras Jedir</td>
<td></td>
</tr>
<tr>
<td>Tunis – Gardimaou</td>
<td></td>
</tr>
</tbody>
</table>

Signalization, telecommunications, and buildings. Electrification of line (2000km). Reconstruction of section Oued Tlelat - Border between Algeria and Morocco, length 220 km. Reconstruction of stations of Blida, Mohammedia, Sig, Oued Tlelat, Senia and Oran. Modernization of signalling of sections El Attaf-Oued Sly (58 km) and Mohammedia Tlelat (59 km).
**Table 13** Corridor 2 Priority Projects

<table>
<thead>
<tr>
<th>Country</th>
<th>Projects</th>
<th>Road</th>
<th>Rail</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td></td>
<td>Lyon bypass (freight transport)</td>
<td></td>
<td>Multimodal (rail-road) platform at Marseille-Canet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Southern extension of high-speed line Rhin Rhône (freight transport)</td>
<td></td>
<td>Marseille-Fos; logistic centre, a container terminal, the extension of the industrial zone of Fos, development of the hydro-carbon pipeline.</td>
</tr>
<tr>
<td>Algeria</td>
<td>Trans-African Road Link to Tamanrasset</td>
<td>Modernization of the line Biskra –Touggourt: length 220 km, requires an improvement of the route and an overlay of 190 km, construction of a tunnel, enlargement of 5 km of the platform, examination of 3 stations and equipment of stations and their signalization, and the installation of 217 km of optical fibbers cables. Construction of line Touggourt-Hassi Messaoud: length 240 km, is intended to serve the petrol pole and the new city of Hassi Messaoud. It will be single line with speeds between 160 and 200 km/h. It will include 9 structures, 2 stations, signalization and modern telecommunication network. Construction of line Bou</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medfaa- Boughzoul-Ain Ousera-Djelfa: length 260 km, double line for section Bou Medfaa - Boughzoul (150 km) and single line for section Boughzoul - Djelfa (110 km). It will be totally electrified, with maximum speed 200 km/h. It will include 4 stations for passengers and 2 stations for goods. Additional construction of 60 bridges and 9 tunnels. Signalization equipment and modern telecommunications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 14 Corridor 8 Priority Projects

**Corridor Eastern Mediterranean – North South corridor (no.8)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Projects</th>
<th>Rail</th>
<th>Port</th>
<th>Intermodal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td></td>
<td></td>
<td>Port of Alexandria</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Port of Dammietta</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Port of Port Said</td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>Upgrade (electrification) of rail line: Alexandroupoli – Ormenio/Svilegrand or Thessaloniki-Promachon/Kulata</td>
<td></td>
<td>Beirut Port Terminal Container</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>Upgrade of rail line: Svilegrand – Dimitrovgrad – Mihaljovo – Stara Zagora – Karnobat – Burgas- Varna</td>
<td></td>
<td>Construction of new Freight Train Station in the Port of Alexandroupoli and extension of existing facilities in Thessaloniki</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td></td>
<td></td>
<td>Upgrade of the intermodal facilities in the Port of Burgas</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td></td>
<td></td>
<td>Upgrade of the intermodal facilities in the Port of Novorossiysk or Kafkas</td>
<td></td>
</tr>
</tbody>
</table>
2.2. Application results from the Evaluation of MEDA TEN-T Corridors

Middle East corridor Cairo Amman Beirut Damascus Istanbul (no. 7)

Overall the node projects corresponding to the upgrading of infrastructure and logistics in Egyptian ports are more likely to display high scores as compared to the road projects comprising mainly links connecting the various cities / ports along corridor 7.

Two port projects, namely those relating to the port of Alexandria and the port of Damietta are highest priority with scores close to 3. In both cases the projects are ongoing. Port of Damietta is already operating under full Electronic Data Interchange (EDI) since 2004 and few further enhancements are underway. The rehabilitation of the port of Nowibaa is outstanding and this project scores moderately to high with 2.38.

Of the road projects two are of moderate to high priority: the Cairo- Alexandria desert road and the Damietta to Port Said international coastal road. The Cairo desert road to Ismailia is of moderate priority. The two priority projects for Jordan on the other hand would be the rehabilitation of the Aqaba port and the rail link from Aqaba to the Syrian border. The intermodal facility at the Aqaba port should follow once the upgrading of the Aqaba port has been consolidated.

By far the most promising project in Lebanon is that of the container terminal at the Beirut port. This is already under construction. All of the other four projects can be considered of moderate to high priority.

Those projects delineating links with Syria receive slightly higher scores than the Anti-Liban road connection or the rail link between Beirut and Tripoli. However, the latter projects are more important in terms of social / regional cohesion within Lebanon as well as the port of Beirut.

All four corridor 7 projects in Syria display moderate to high scores. The Damascus-Jdaideh road project is receiving highest priority due to the frequent use of the Beirut port by Syria. The Latakia – Aleppo and Tartous – Homs links would strengthen the country’s own ports and regional cohesion.

Both port rehabilitation projects as well as the railway link between Istanbul and Ankara display moderate to high project scores. The three road links display lower scores. However in all cases it is necessary to revisit the financial appraisals as well as the socio-economic assessments.

The aggregated application results for the corridor, in numbers, are shown in Table 2.5.

Transmaghreb corridor extended to Libya and Egypt (no. 9)

The link between Rabat to Qujda, connecting the capital of Morocco with the Algerian border scored highly on all criteria (overall weighted score 2.98).
The project concerning the Mediterranean link from the port of Tangier through the city of Tetouan to Saidia at the border with Algeria, only scores low at 1.86 as there are many physical barriers to overcome, the area being mountainous. The project’s financial feasibility and cost effectiveness are low and financing has still to be secured. However the project is of strategic importance as representing an opportunity to develop the whole Northern region. Instead, the road link between Tangier (Asilah) and onto to Rabat on the Western coast is prioritized (score 3,00) as linking the port of Tangier to the capital Rabat.

The road projects Casablanca – El Jadida, Settat – Marrakech and Marrakech – Agadir received moderate to high scores (2,25, 2,57 and 2,43 respectively). Even though these projects are not directly relevant to corridor 9, their prioritization over the direct link between Tangier and the Algerian border suggests the intention of the Moroccan government to upgrade the salience of the capital Rabat in terms of the national transport network.

The railway link between Rabat and Ouajda, already exists in part but some section (i.e. Section between Taourirt and Nador in the East close to the Algerian border town of Oujda will be launched later on). The weighted score on this project is high at 2,92. Concerning the rail connection in the West / South between Marrakech and Agadir, the project faces financing problems; hence its score is moderate at 2,35.

The project concerning the new port under construction in Tangier scored very high at 2,94. This is because project’s IRR is estimated at 13.5% as it is expected to increase the salience of the Tangier region as a maritime node in view also of the road and rail connections available between Tangier and Rabat. The “prestige” project for Morocco, which concerns the construction of a tunnel to link Morocco to Spain (west of Gibraltar) scored at 2,38.

In Algeria the two main road projects, namely road link from Qued Tlelat outside Oran to the city of Tlemcen and from there to the Moroccan border at Ouajda and the link from El-Harrouch to the Tunisian border both receive high scores (weighted score for both 2,46) as they are strategically very important and represent at the same time missing links for the national (intermaghrébin) network as well as for the backbone network to the ports of Djen-Djen and Oran.

The several rail upgrading projects, linked to the Transmaghreb corridor in Algeria, taken together as a railway programme, displayed a weighted score of 2,32. The only one project with international (intermaghrébin dimension is in fact the new ferrovial line between Oued Tlelat and Maghnia (marroco border). The two networks are in fact connected but the existing link Oued Tlelat – Marroco border is very constricting due to the relief and need to be replaced.

As it concerns the port project for the extension and upgrading of the infrastructure of Algerian port of Djen-Djen scored is 1,84. The port already underwent some capacity upgrading over the last years.

The Tunisian road projects, all scored rather moderately. The Qued Zarga to the Algerian border project scores moderately with 1,96 mainly due to barriers anticipated
with regard to land-use that might delay its completion. The connection M’Saken – Sfax that would link the two ports of Sousse and Sfax and increase their efficiency, scored higher than the rest road projects at 2,16, since it would furthermore significantly ameliorate the safety record of this route which currently displays several black spots.

All four Tunisian rail projects score moderately to high between 2,09 (electrification Borj Cedria to Gabès), 2,24 (electrification Tunis – Gardimaou), 2,44 (double track Jdaida to Gardimaou) and 2,56 (double track Borj Cedria – Sousse).

The aggregated application results for the corridor, in numbers, are shown in Table 2.6.

*Paris Algiers Tamanrasset corridor (no.2)*

In France both railway infrastructure projects scored fairly moderate. The Lyon bypass scored is 2,03 and the branch of the high-speed railway line Rhin Rhône is although it is expected to ameliorate congestion on the existing line -as well as provide a new access to the Mediterranean coast- scored only 1,95.

The intermodal facilities projects, both concerning the port of Marseille scored fairly well. The multimodal (rail-road) platform at Marseille-Canet, which is expected to improve the combined transport capacity of the Marseille port, scored 2,21 and the “package” of components at Marseille-Fos, which is also expected to increase the capacity of the port of Marseille, scored 2,55.

In Algeria, the unique relevant project for this corridor, the road ink to Tamanrasset scored high at 2.68, reflecting like this its strategic importance for the Mediterranean network as a South-North link and also for the Algerian backbone network.

The aggregated application results for the corridor, in numbers, are shown in Table 2.7.

*Eastern Mediterranean – North South corridor (no.8)*

The development of this corridor entails improvements in the infrastructures / intermodal and logistics facilities of the ports of Novorossiysk (Russia), Burgas (Bulgaria), Alexandroupoli (Greece), Beirut (Lebanon) and Port Said, Alexandria and Damietta (Egypt) as well as upgrading/electrification in two rail links, one in Greece and one in Bulgaria.

Concerning the port projects of Greece, Bulgaria and Russia, they have all scored very high. The project of rehabilitation of the port of Alexandroupoli scored 2,9. This represents the great necessity of the project in terms of improving the port services by improving the port’s connection to the rail network. The ports of Burgas and Novorossiysk and the relevant projects scored, respectively, 2,66 and 2,76.

The two rail projects (one in Greece and one in Bulgaria) both concern electrification and technical upgrading of the lines to fully comply with European standards. The Bulgarian and Greek Railways are cooperating to this end. The electrification of the
railway lines in Greece has already begun, that in Bulgaria is expected to begin in
2005. The projects score high; that in Bulgaria 2,35 and that in Greece 2,69.

The aggregated application results for the corridor, in numbers, are shown in Table
2.8.
### Table 15 Corridor 7 Priority Projects Evaluation and Prioritisation

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Corridor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle East Corridor Cairo Amman Damascus Istanbul (no.7)</td>
<td>2,15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Description</th>
<th>Type</th>
<th>Project Score</th>
<th>Project priority no. (country level)¹⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Egypt</strong></td>
<td>Cairo – Alexandria Desert Road</td>
<td>Road</td>
<td>2.22</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Part of Cairo Ring Road leading traffic from Alexandria to Suez</td>
<td>Road</td>
<td>1.53</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Cairo – Suez Road</td>
<td>Road</td>
<td>1.52</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Ah Tunnel on Cairo – Suez to Nowibaa Road Link 3/37</td>
<td>Road</td>
<td>1.39</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Dammietta to Port Said International Coastal Road</td>
<td>Road</td>
<td>2.26</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Part of Port Said Ring Road leading traffic from Dammietta to Ismailia</td>
<td>Road</td>
<td>1.58</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Ismailia Road</td>
<td>Road</td>
<td>2.13</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Ismailia to Cairo Desert Road</td>
<td>Road</td>
<td>2.07</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Port of Alexandra</td>
<td>Port</td>
<td>2.91</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Port of Nowibaa</td>
<td>Port</td>
<td>2.38</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Port of Dammietta</td>
<td>Port</td>
<td>2.98</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Port of Port Said</td>
<td>Port</td>
<td>2.62</td>
<td>3</td>
</tr>
<tr>
<td><strong>Jordan</strong></td>
<td>Road Link Aqaba – Syrian border</td>
<td>Road</td>
<td>2.9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Rail Link Aqaba – Syrian border</td>
<td>Rail</td>
<td>2.66</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Rehabilitation of Aqaba Port</td>
<td>Port</td>
<td>1.49</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Intermodal Facility Aqaba Port</td>
<td>Intermodal</td>
<td>2.49</td>
<td>3</td>
</tr>
<tr>
<td><strong>Lebanon</strong></td>
<td>Anti-Liban (South - North)</td>
<td>Road</td>
<td>2.01</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Beirut – Masnaa (East Syrian border)</td>
<td>Road</td>
<td>2.51</td>
<td>2</td>
</tr>
</tbody>
</table>

¹⁵ The priority no. is strictly according to the evaluation scores. Apparently a more thorough “prioritisation” should be applied in the realization of evaluation results.
<table>
<thead>
<tr>
<th>Country</th>
<th>Project Description</th>
<th>Mode</th>
<th>Priority</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syria</td>
<td>Tripoli – Aboudiey (Syrian border)</td>
<td>Rail</td>
<td>2.28</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Beirut – Tripoli</td>
<td>Rail</td>
<td>2.11</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Container Terminal Beirut</td>
<td>Intermodal</td>
<td>2.67</td>
<td>1</td>
</tr>
<tr>
<td>Syria</td>
<td>Nasib – Bab Al Hawa (Turkish border)</td>
<td>Road</td>
<td>2.38</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Tartous – Homs</td>
<td>Road</td>
<td>2.38</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Latakia - Aleppo</td>
<td>Road</td>
<td>2.38</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Damascus – Jdaideh (Lebanon border)</td>
<td>Road</td>
<td>2.44</td>
<td>1</td>
</tr>
<tr>
<td>Turkey</td>
<td>Ankara- Pozanti</td>
<td>Road</td>
<td>2.04</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Konya – Afyon</td>
<td>Road</td>
<td>1.82</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Afyon - Izmir</td>
<td>Road</td>
<td>1.82</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Istanbul – Ankara railway Rehabilitation</td>
<td>Rail</td>
<td>2.37</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Rehabilitation Izmir Port</td>
<td>Port</td>
<td>2.28</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Rehabilitation Mersin Port</td>
<td>Port</td>
<td>2.29</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: The symbol (-) next to project's priority no. denotes that the project shares the same priority number with one or more projects.
Table 16 Corridor 9 Priority Projects Evaluation and Prioritisation

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Corridor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmaghreb corridor extended to Libya and Egypt (no.9)</td>
<td>2.34</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Type</th>
<th>Project Score</th>
<th>Project priority no. (country level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morocco</td>
<td>Rabat to Qujda</td>
<td>Road</td>
<td>2.98</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Port of Tangier through the city of Tetouan to Saidia</td>
<td>Road</td>
<td>1.86</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Tangier (Asilah) and onto to Rabat</td>
<td>Road</td>
<td>3.00</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Casablanca – El Jadida</td>
<td>Road</td>
<td>2.25</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Settat – Marrakech</td>
<td>Road</td>
<td>2.57</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Marrakech – Aadir</td>
<td>Road</td>
<td>2.43</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Rabat to Quida</td>
<td>Rail</td>
<td>2.92</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Marrakech to Agadir</td>
<td>Rail</td>
<td>2.45</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Port of Tangier</td>
<td>Port</td>
<td>2.94</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Tunnel linking Morocco-Spain</td>
<td>Intermodal</td>
<td>2.38</td>
<td>8</td>
</tr>
<tr>
<td>Algeria</td>
<td>Qued Tlelat outside Oran to the city of Tlemcen and then to Moroccan border to Qujda</td>
<td>Road</td>
<td>2.46</td>
<td>1 -</td>
</tr>
<tr>
<td></td>
<td>El-Harrouch to Tunisian border</td>
<td>Road</td>
<td>2.46</td>
<td>1 -</td>
</tr>
<tr>
<td></td>
<td>Railway programme</td>
<td>Rail</td>
<td>2.32</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Port of Djen-Djen</td>
<td>Port</td>
<td>1.84</td>
<td>3</td>
</tr>
<tr>
<td>Tunisia</td>
<td>Qued Zarga to the Algerian border</td>
<td>Road</td>
<td>1.96</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>M’Saken - Sfax</td>
<td>Road</td>
<td>2.16</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Sfax - Gabes</td>
<td>Road</td>
<td>2.08</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Gabes – Ras Jedir</td>
<td>Road</td>
<td>1.91</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Borj Cedria - Sousse</td>
<td>Rail</td>
<td>2.56</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Borj Cedria – Gabes</td>
<td>Rail</td>
<td>2.09</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Jdaida – Gardimaou</td>
<td>Rail</td>
<td>2.44</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Tunis – Gardimaou</td>
<td>Rail</td>
<td>2.24</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: The symbol (-) next to project’s priority no. denotes that the project shares the same priority number with one or more projects.

The priority no. is strictly according to the evaluation scores. Apparently a more thorough “prioritisation” should be applied in the realization of evaluation results.
### Table 17 Corridor 2 Priority Projects Evaluation and Prioritisation

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Type</th>
<th>Project Score</th>
<th>Project priority no. (country level)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>France</strong></td>
<td>Lyon bypass (freight transport)</td>
<td>Rail</td>
<td>2.03</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Southern extension of high-speed line Rhin Rhône (freight transport)</td>
<td>Rail</td>
<td>1.95</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Multimodal (rail-road) platform at Marseille-Canet</td>
<td>Intermodal</td>
<td>2.21</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Marseille-Fos; logistic centre, a container terminal, the extension of the industrial zone of Fos, development of the hydro-carbon pipeline.</td>
<td>Intermodal</td>
<td>2.55</td>
<td>1</td>
</tr>
<tr>
<td><strong>Algeria</strong></td>
<td>Road Link to Tamanrasset</td>
<td>Road</td>
<td>2.68</td>
<td>1</td>
</tr>
</tbody>
</table>

The priority no. is strictly according to the evaluation scores. Apparently a more thorough "prioritisation" should be applied in the realization of evaluation results.
### Table 18 Corridor 8 Priority Projects Evaluation and Prioritisation

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Corridor Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Mediterranean – North South corridor (no.8)</td>
<td>2.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Description</th>
<th>Type</th>
<th>Project Score</th>
<th>Project priority no. (country level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>Port of Alexandria</td>
<td>Port</td>
<td>2.91</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Port of Dammietta</td>
<td>Port</td>
<td>2.98</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Port of Port Said</td>
<td>Port</td>
<td>2.62</td>
<td>3</td>
</tr>
<tr>
<td>Lebanon</td>
<td>Beirut Port Terminal Container</td>
<td>Intermodal</td>
<td>2.67</td>
<td>1</td>
</tr>
<tr>
<td>Greece</td>
<td>Upgrade (electrification) of rail line: Alexandroupoli – Ormenio/Svilegrad (or Promachon/Kulata- Thessaloniki)</td>
<td>Rail</td>
<td>2.9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Construction of new Freight Train Station in the Port of Alexandroupoli</td>
<td>Intermodal</td>
<td>2.69</td>
<td>2</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>Upgrade of rail line: Svilegrad – Dimitrovgrad – Mihaljovo – Stara Zagora – Karnobat – Burgas (- Varna)</td>
<td>Rail</td>
<td>2.35</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Upgrade of the intermodal facilities in the Port of Burgas (or Varna)</td>
<td>Intermodal</td>
<td>2.66</td>
<td>1</td>
</tr>
<tr>
<td>Russia</td>
<td>Upgrade of the intermodal facilities in the Port of Novorossiysk (or Kafkas)</td>
<td>Intermodal</td>
<td>2.76</td>
<td>1</td>
</tr>
</tbody>
</table>

18 The priority no. is strictly according to the evaluation scores. Apparently a more thorough "prioritisation" should be applied in the realization of evaluation results.
3. MEDA TEN-T Strategic Master Plan: The Basis for the Required Action Plan

3.1 Description of the Strategic Master Plan

The Strategic Master Plan is a systematic procedural framework for the readjustment of transport policies by the EU and the Mediterranean countries, with the objective to overcome the barriers and enhance opportunities of transport network implementation at international, national and local levels in the Mediterranean basin. The recommended Action Plan, based on the Strategic Master Plan, will assist policymakers on rational decision-making as far as new and improved services and actors in the Euro-Mediterranean transport are concerned.

The proposed procedure for the elaboration of the Strategic Master Plan and in order to decide if a corridor has good implementation possibilities comprises the following steps: the first step is to analyse the corridor in four areas (transport market, geographical area, transport market actors and commodity types), while the second step is to examine whether transport services and actors exist in the identified corridors. Following a pilot implementation should be undertaken. If the corridor leads to the creation of new routes or the establishment of new transport services, this should be carefully monitored in order to examine its rate of success. If it is not proved to be successful, then it should be withdrawn. Finally, if the corridor or part of the corridor does not exist at all, the various barriers have to be examined (institutional, infrastructural, commercial, economic, technical/operational, social, and policy barriers). Overcoming the barriers needs several actions, which are necessary for the successful implementation of the projects in the selected corridor and for the provision of the anticipated transport services. The identified projects, which concern new infrastructure and services or upgrades and rehabilitation of links and nodes, will be evaluated. Concluding, the final step concerns the realisation of the evaluation results. The elaboration of an Action Plan (to include also the soft measures, related to overcome the institutional, regulatory and similar type barriers) is the ultimate result of the procedure. The necessary groups of people should be involved for consultation before any action is taken.

In the following tables, the key issues to be considered for the elaboration of the Action Plan are presented, per transport mode. The tables are structured into three interrelated columns. The first column presents the strategic goals, which are based on policies decisions. The second column translates them into strategic objectives (and thus the basic elements of the Action Plan). Finally, the last column converts them into actions, thus forming the basis for the Action Plan.
## MARITIME TRANSPORT

<table>
<thead>
<tr>
<th>Goals</th>
<th>Strategic Thrusts</th>
<th>Proposed Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating a more efficient and competitive regional maritime transport sector.</td>
<td>Formulating and implementing a common regional shipping policy.</td>
<td>Identification and designation of the important maritime trade corridors for regional seaborne trade that are vital for the success of the Euro-Mediterranean network.</td>
</tr>
<tr>
<td>Achieving globally-acceptable standards in maritime safety and security and protection of marine environment.</td>
<td>Improving maritime safety and security and protection of the marine environment by enhancing cooperation amongst the Mediterranean countries to facilitate the acceptance and implementation of IMO conventions.</td>
<td>Promotion of trade facilitation and gradual removal of trade barriers to boost South/South trade.</td>
</tr>
<tr>
<td>Optimizing the operation of existing infrastructure</td>
<td>Improving port operations</td>
<td>Promotion of effective and competitive intra-Mediterranean shipping in those corridors through a) rationalization/synchronization of shipping services, b) expanded shipping services linking the designated regional ports, as well as the secondary ones, c) greater cooperation within the Euro-Mediterranean sub-regions, through improved sea linkages and shipping, including the implementation of the relevant recommendations of the MEDA TEN-T project.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Significant liberalization achievement of intra-Mediterranean maritime transport services.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assess the ports needs. Implement required investments and organizational changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conduction of studies on introduction of cargo and passenger vessels and intra-regional feeder services servicing the regional gateways of the Euro-Mediterranean.</td>
</tr>
</tbody>
</table>
Enforcement of the activities of the MEDA TEN-T on IMO conventions to facilitate the accession and implementation of relevant conventions by the Mediterranean countries.

Strengthening of the institutional capacity, human resource based and cooperation linkages of the Euro-Mediterranean area for achieving improved maritime safety, security and preventing marine pollution.

Intensification of maritime transport security through capacity building.

Strengthening of maritime transport human resource capacity.

Regular exchange of information and best practices in maritime transport policy and development programs.

<table>
<thead>
<tr>
<th>LAND TRANSPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
</tr>
<tr>
<td>Establishing efficient, integrated, safe and environmentally sustainable regional road and rail transport corridors linking the Euro-Mediterranean.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Implementation of a Euro-Mediterranean regional road safety strategy.

Formulation of a regional plan to guide cross-border movements.

Enhancement of technical capacity for the development planning of more effective and functioning transport systems and facilities.


Regular exchange of best practices on public-private partnerships (PPP) in the development, construction and operation of road and rail transport infrastructure and facilities.

Conduction of development studies on intra-Mediterranean links to connect the major highways and corridors.

Formulation of regional policy framework for developing the services of the corridors.

<table>
<thead>
<tr>
<th>AIR TRANSPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
</tr>
<tr>
<td>Establishment of a regional open sky agreement to support regional economic integration.</td>
</tr>
<tr>
<td>Achieving globally acceptable standards in aviation security and safety.</td>
</tr>
</tbody>
</table>
Boosting of South/South air connections.

Development of an airline industry liberalization program for the Mediterranean region.

Enhancement of cooperation to ensure, among others, transfer of advanced civil aviation technologies.

Regular exchange of best practices on public-private partnerships in the development, construction and operation of air transport infrastructure and facilities.

Improvement of the regulatory framework of the air transport industry of the region for better efficiency and performance.

Adoption of initiatives to increase air access with dialogue among the countries involved.

<table>
<thead>
<tr>
<th>Goals</th>
<th>Strategic Thrusts</th>
<th>Proposed Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creating an integrated and efficient multi-modal transportation system, for cargo movement, within the Mediterranean and between the Mediterranean and the EU.</td>
<td>Enhancement of capacity development to further progress regional transport facilitation cooperation. Conceptual planning for an integrated intermodal network in the Euro-Mediterranean.</td>
<td>Cargo movement between the South/South Countries. Early implementation of the Euro-Mediterranean transport facilitation agreements. Simplification, harmonization of transport procedures and documentation along the corridors. Formulation of uniform guidelines and...</td>
</tr>
<tr>
<td>REVIEW OF MEDA TEN-T PRIORITIES</td>
<td>Expected Results</td>
<td></td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Proposed Action</td>
<td>Review bottlenecks, missing links and other priority transport infrastructure needs.</td>
<td>Inventory of bottlenecks, missing links and needs on transport systems of the MEDA TEN-T Network.</td>
</tr>
<tr>
<td></td>
<td>Elaboration of Strategic Master Plan aiming at covering the identified priority needs.</td>
<td>Establishment and presentation of clear and realistic plans for meeting priority infrastructure needs on transport systems of the MEDA TEN-T Network.</td>
</tr>
<tr>
<td></td>
<td>Investigation of alternative links within the Euro-Mediterranean region incorporating intermodal approach.</td>
<td>Improvement of the existing transport systems in the region.</td>
</tr>
<tr>
<td></td>
<td>Support of the implementation of EU Directives.</td>
<td>Improvement of cross-border operations within the MEDA TEN-T Network.</td>
</tr>
<tr>
<td></td>
<td>Assistance in the harmonization of legislative / administrative status of the MEDA TEN-T Network operation and the removal of obstacles to transport including border crossings.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Selection of pilot actions and support of their implementation.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Achievement of joint declaration for facilitation of border crossing in the countries concerned.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MEDA TEN-T CORRIDOR INTEGRATION INTO THE TEN-T</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposed Action</td>
<td>Establishment of regular dialogue and institutional cooperation with EU</td>
</tr>
<tr>
<td></td>
<td>Incorporation of selected MEDA TEN-T activities into EU overriding interest</td>
</tr>
<tr>
<td></td>
<td>Strengthening MEDA TEN-T as monitoring &amp; management instrument of</td>
</tr>
<tr>
<td>Proposed Action</td>
<td>Expected Results</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Euro-Mediterranean Corridor Development</td>
<td>Contribution to the European Transport Research &amp; Development efforts</td>
</tr>
<tr>
<td>Promotion of active participation of all MEDA TEN-T members at national level. Establishment of regular dialogue and co-operation with non-Governmental Organisations Involvement of MEDA TEN-T in the EU Research and Development Programs Framework</td>
<td>Active participation of all Mediterranean countries.</td>
</tr>
</tbody>
</table>

**COOPERATION OF MEDA TEN-T WITH OTHER COUNTRIES**

<table>
<thead>
<tr>
<th>Proposed Action</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop close co-operation with other related initiatives and projects. Develop co-operation with other European NGOs. Connection of MEDA TEN-T Corridors with other components of the area. Connection and extension at the possible level of MEDA TEN-T Network with neighbouring regions (Baltic, Black Sea, Euro-Asian, Trans-African) Further strengthening of MEDA TEN-T interest in the application of new technology &amp; techniques (ITS, Telematics, informatics etc.) Preparation of new maps for MEDA TEN-T Network, extensions, alignments and dynamism towards neighbouring regions, incorporating Intermodality and multimodal transfer points. Organisation of a high level meeting under Euro-Mediterranean cooperation.</td>
<td>Speedier attainment of MEDA TEN-T objectives. Creation of the most advanced Euro-Mediterranean transport cooperation and Synergy. Placement of MEDA TEN-T in the transport development in the region.</td>
</tr>
</tbody>
</table>

**MEDA TEN-T VISIBILITY**

<table>
<thead>
<tr>
<th>Proposed Action</th>
<th>Expected Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elaboration of a European Transport Press List &amp; Dispatch regularly Press Releases on MEDA TEN-T actions Regular updates of the MEDA TEN-T Website Distribution of the MEDA TEN-T Brochure Feed back members with MEDA TEN-T news Continuation and further strengthening of co-operation of the partners and the project’s subsidiary Bodies Presence in other European Transport fora Organization / Participation in regional and national events for presentation</td>
<td>Improvement of acceptance and recognition of MEDA TEN-T work Increase of high level support from country members and international community</td>
</tr>
</tbody>
</table>
3.2. Realisation of Strategic Master Plan: the first part of the Action Plan

For the realisation of the Strategic Master Plan the following steps (as the first part of the proposed Action Plan) should be realized:

1. Evaluation results presentation
2. Preliminary prioritisation of projects
3. Preliminary prioritisation of corridors
4. Intermediate prioritisation of projects
5. Form the assumptions for projects realisation
6. Form a complete database with the initiatives
7. Decide on the contribution process
8. Outcomes

3.3. Identification of Bottlenecks and Missing Links

One of the critical parameters accepted in the MEDA TEN-T process (as it was also done for the TINA) was that the technical standards of the future infrastructure should ensure consistency between the capacity of network components and their expected traffic. To achieve this, it was accepted that these standards should be in line with the recommendations of the UN/ECE Working Party on Transport Trends and Economic on the definition of transport infrastructure capacities.

The efficiency of a traffic network depends on the one hand on the structure of the network and the density of the network and on the other hand on the quality of single network elements -sections and points of interconnection. The level of service concept and the relations between capacity and quality of transport service is an indicator drawn upon in order to identify insufficient parts of a network. Analytically the inventory of bottlenecks and Solutions is presented in Tables 3 below, with slight modifications (i.e. in the category Member State specific, only the countries relevant to MEDA TEN-T project are presented).
### Table 19 Image Bottlenecks and Solutions

<table>
<thead>
<tr>
<th>FICHE REF.</th>
<th>DESCRIPTION</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>I/G.P.1</td>
<td>Though, in reality, SSS is integrated into the intermodal chain, not all shippers perceive it as an efficient and cost effective way of moving cargo.</td>
<td>Demonstrate to potential users that SSS is a flexible, reliable, cost and time efficient element of intermodality.</td>
</tr>
<tr>
<td>I/T.T.1</td>
<td>Transit time in SSS is perceived by shippers as being long.</td>
<td>Extended terminal opening hours; improved ship design; improved logistics.</td>
</tr>
<tr>
<td>I/P.1</td>
<td>Door-to-door SSS is more expensive than corresponding door-to-door road or rail.</td>
<td>• Study on comparative prices across modes; • Rebates to SSS by ports based on Port authorities frequency, volume, short port calls.</td>
</tr>
</tbody>
</table>

(*I = Image; G.P. = General Perception; T.T. = Transit Time; P= Pricing, (SSS=Short Sea Shipping*))
Table 20 Administrative Bottlenecks and Solutions

<table>
<thead>
<tr>
<th>FICHE REF.</th>
<th>DESCRIPTION</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/A.1</td>
<td>Several authorities board every ship.</td>
<td>MSs concerned are asked to consider delegation of tasks to a single authority.</td>
</tr>
<tr>
<td>A/A.2</td>
<td>Ships not allowed beginning unloading</td>
<td>MSs concerned asked to allow ship to unloading until the authorities have attended to the ship. The discharging of the ship should be completed immediately after the reporting procedures have been completed.</td>
</tr>
<tr>
<td>A/HG.3</td>
<td>Road transport requires less stringent regulations and documentation</td>
<td>Harmonisation of regulations between transport modes.</td>
</tr>
<tr>
<td>A/C.4</td>
<td>Requirement of customs procedures</td>
<td>Simplification of documents; ‘authorised regular shipping service’ status.</td>
</tr>
<tr>
<td>A/C.5</td>
<td>Despite common EU regulations, local customs officers have their own procedures and/or own individual interpretation of EU regulations.</td>
<td>• Better communication throughout customs services; • Understanding by all involved that common EU Regulations need to be strictly observed.</td>
</tr>
<tr>
<td>A/C.6</td>
<td>Linguistic difficulties with administrative documents.</td>
<td>Use English as official language for all documents.</td>
</tr>
<tr>
<td>A/C.7</td>
<td>Electronic manifests not accepted; electronic stamps not recognised in customs procedures in all MS.</td>
<td>Implementation of NCTS by all Customs offices.</td>
</tr>
<tr>
<td>A/C.8</td>
<td>‘Infected vessels’. Vessels operating a ‘regular’ service between two EU ports, but calling at a port outside of the EU en route have to go through all customs procedures for all cargo (i.e. including EU).</td>
<td>Change in customs legislation to enable the two types of cargo to be treated differently.</td>
</tr>
<tr>
<td>A/S.9</td>
<td>Lack of comparable Statistical Data on SSS in Europe.</td>
<td>Continued work on collection of reliable maritime statistics including origin/destination matrices and comparable land/sea statistics for SSS; devising reliable matrix for converting tonnes carried by SSS into tonne-kilometres performed.</td>
</tr>
</tbody>
</table>

(A= Administration; HG =Hazardous Goods; C = Customs; S = Statistics),
(SSS=Short Sea Shipping, EU=European Union)
Table 21 Door-to-Door Bottlenecks and Solutions

<table>
<thead>
<tr>
<th>FICHE REF.</th>
<th>DESCRIPTION</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-t-D/LU.1</td>
<td>Technical limitations on <strong>size of containers</strong> used in SSS.</td>
<td>Standardizing a European loading unit that could combine container stackability with the cargo space of a swap body.</td>
</tr>
<tr>
<td>D-t-D/I.L.2</td>
<td><strong>No global package of insurance cover for multi-modal transport.</strong> (Perception of risk in SSS.) <strong>Lack of an intermodal liability regime.</strong></td>
<td>Damage rates could be made public or be used in company strategies to show the reality and not give room for contradictory perceptions. An intermodal liability regime.</td>
</tr>
<tr>
<td>D-t-D/C.P.3</td>
<td><strong>Restrictive practices or excessive prices in services such as inland haulage.</strong></td>
<td>Increase co-operation between modes and between the different players in logistic management of supply chains.</td>
</tr>
<tr>
<td>D-t-D/C.P.4</td>
<td><strong>Distortion of competition by national railway companies.</strong></td>
<td>Further liberalization of European railways.</td>
</tr>
<tr>
<td>D-t-D/C.P.5</td>
<td>Each mode of transportation in the intermodal chain <strong>should cover its own share of costs</strong> including external costs. <strong>Introduction of price covering infrastructural costs/dues.</strong> Difficult for SSS to compete as road and rail are not covering their costs.</td>
<td></td>
</tr>
<tr>
<td>D-t-D/C.P.6</td>
<td><strong>Unequal distribution of incentive measures</strong> among the various modes.</td>
<td>Community and national policy should aim at creating a greater balance.</td>
</tr>
</tbody>
</table>

*(D-t-D = Door-to-Door; LU = Loading Units; IL = Insurance & Liability; C.P = Cost/Price; SSS = Short Sea Shipping)*
<table>
<thead>
<tr>
<th>Table 22</th>
<th>Ports Bottlenecks and Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FICHE REF.</td>
<td>DESCRIPTION</td>
</tr>
<tr>
<td>P/PS/H. 1</td>
<td>Lack of competition in the port services market. Existence of protective practices denying free access to other operators for restrictive practices.</td>
</tr>
<tr>
<td>P/PS/H. 2</td>
<td>Non-flexible working conditions in the ports, both as regards calculation of waiting time, ship with the resources required without idle time, over-time etc.</td>
</tr>
<tr>
<td>P/PS/H. 3</td>
<td>In some ports SSS has to compete for port facilities with priority given to ocean shipping.</td>
</tr>
<tr>
<td>P/PS/IT. 4</td>
<td>Use of EDI for transmitting data between ports is still not generalised. Lack of automated goods management systems.</td>
</tr>
<tr>
<td>P/PS/Div 5</td>
<td>Rigid Administrative Proceedings.</td>
</tr>
<tr>
<td>P/PS/Div 6</td>
<td>Imposition of the use of national language for port services, e.g. pilotage, and other burdensome requirements to receive PECs.</td>
</tr>
<tr>
<td>P/PC/CL 7</td>
<td>Costs for services not always necessary often inflicted on SSS (e.g. compulsory pilotage).</td>
</tr>
<tr>
<td>P/PC/CL 8</td>
<td>• Non-negotiable tariffs for SSS in some Member States. • Lack of competition. Port services tariffs, when based on tonnage measurement, do not fairly accurately reflect the amounts that should be paid for the port services rendered.</td>
</tr>
<tr>
<td>P/PC/Tn 9</td>
<td>Lack of port infrastructure suitable for SSS. Ports lacking: • Dedicated operational areas • Logistical and distribution platforms; • Warehousing and cargo storage • Dedicated moorings • Rail links between ports and mainline</td>
</tr>
<tr>
<td>P/PI/ 10</td>
<td>Excessive vessel load/unload time.</td>
</tr>
</tbody>
</table>
Defective access to terminals in ports.

Defective motorway and railway connections to TEN-T.

The implementation of the Master Plan showed that international trade facilitation measures and convergence of regulatory frameworks will not ensure a real increase in the involvement of the Mediterranean in mainstream trade if regional infrastructure bottlenecks are not tackled efficiently. Infrastructure problems are clearly a major trans-national economic issue facing the Mediterranean. The most obvious short-term problem is that the region lacks coherent overall regional strategies for solving in the most cost-effective and sustainable manner its regional transport.

Currently, the key transport bottlenecks more often result from inadequate sector policies and/or administrative procedures than from lack of major physical infrastructure. Analytically, the absence of harmonisation of regulations, as well as the outdated laws and institutional structures create further inefficiencies.

Policy makers in the Mediterranean should therefore concentrate on the reform of their legal, regulatory and institutional sector framework. The priorities should be to improve the functioning of ports and to encourage the interconnection of road and rail transport systems to produce a reliable regional system of transport infrastructure, interconnected with Trans-European Networks.

3.4. Border Crossing Issues for MEDA Corridors

Special attention must be paid to recognition and addressing of the border crossing problems that are a reality in the MEDA region’s network. Quality assessment of the border crossing procedures, according to the type of network, the institutional differences etc., should be performed in order to prioritize the causes of border crossing problems and recommend possible solutions.

At the national level, MEDA TEN-T has shown that the efficiency of transport networks depends on cross-border company mergers. Sufficient access to efficient logistics makes it easier for the Mediterranean countries to participate in the global trade and investment flows.

Border issues constitute major barriers to trade, tourism and transport. Long waiting times at borders cause huge disruption to logistic activities and significant increases of transport costs. Whilst transport operators’ employees
waste time at borders, it is the shippers and, ultimately, the consumers, who pay the additional costs caused by these barriers, which reduce the efficiency of the global economy and delay the much-needed economic development in less-favored regions of the world.

**Border Crossings - Road Network**

The main obstacles at border crossings of road network have their causes/origins in: (a) infrastructure, (b) procedures and (c) staff.

To solve the main problem of delays and all the consequences on transport and economy, the recommendation is to tackle border procedures, through simplification and harmonization. Authorities should anticipate future growth in trade flows by investing – in advance - in improved infrastructure, procedures and training, to prevent borders from remaining or becoming places where scarce resources are wasted. Facilitation of trade, tourism and road transport is an area where it is vital for governments to work together to reduce barriers to economic and social development.

Transport services are the life-line between economic and social players. Today, this is particularly true of road transport, since it carries the majority of traded goods moved on land routes (70% by volume, 90% by value).

**Border Crossings – Rail Network**

From the examination of the situation in most of the railway border crossings in Central, Eastern Europe and Mediterranean countries, the following problems can be identified:

- Lack of adequate technology for the handling of arrival and departure of trains at the border (delayed disposition of locomotives – late arrival of staff – insufficient coordination and management etc.);
- Lack or insufficient legal basis for establishing rules and relations between railway administrations and all other interested institutions in the harmonization of border procedures;
- Slow implementation of measures in line with the need for more adequate information on flows, transmission of data inside and outside a country;
- Inaccuracy in completing the documents, thus causing major delays;
- Inadequate cooperation due to lack of initiative at all levels.

The following recommendations were drawn to tackle border crossing problems:

- There is a need for the establishment of Railway Working Groups on a bilateral and/or multilateral basis;
- The communication among those involved in the border crossing operations should be further improved;
- All parties involved in border crossing operations should adopt and implement the best practices developed in the field;
• Border control procedures should be organized during the running train;
• The performance of non-railway procedures (such as customs formalities) should be transferred to origin and destination stations;
• For combined transport transportation, all customs and border control operations;
• Technical facilities on border crossing points should be improved;
• Performance indicators to monitor future progress on border crossing should be introduced.

**Border Crossings – Maritime Network**

Concerning maritime network, the concept of border crossing problems and issues concerns the customs at the international ports and maritime logistic centers and the procedures followed at these. In this respect there are no clear border crossing problems for maritime network but the usual problems with the procedures followed in international ports and maritime logistic centers.

### 3.5. Technical and Institutional Aspects for Master Plan Implementation

An important feature of MEDA TEN-T has been the careful and simultaneous consideration of both national and international perspectives. By trying to fulfil both perspectives, the aim has been to move towards plans that acknowledge shared international needs and goals while at the same time recognising the reality that national needs were themselves also important. These include also, the funding for implementation, since it will probably have to be secured from national sources, or at least would need the inclusion of the relevant projects in lists of identified national priorities.

The demands put on transport infrastructure planning from the perspective of environmental planning have grown out of all recognition since the original thinking that underpinned the development of the MEDA TEN-T Strategic Master Plan. It is important that these changes are understood and embedded in not only the Corridors that have been developed, but also in the detail of individual projects. Projects that generate significant national or international opposition are almost certain to be delayed by court enquiries or by direct action. Delays of this type are not only costly in the micro sense of holding up the specific project, but also from the macro, overall perspective of the development of the Euro-Mediterranean networks.

The increasingly international nature of funding and construction of major networks, such as the MEDA TEN-T Network, necessitates the conformity with state laws with respect to tendering and construction, which are appropriately harmonised with emerging European good practices. Failure to do so can restrict interest in taking on the work concerned which in turn is likely to lead to undermine cost-effectiveness and technical innovation in construction. However, such legislation, if not already in place, can take some
considerable time to be drafted for and voted/approved by parliaments. In any case, it needs to be put in place before the implementation of any plans requiring EU funds.

Ensuring the interoperability among the identified Corridors, as well as between them and the other parts of the respective networks is a major element for the successful implementation of the MEDA TEN-T Strategic Master Plan. The development of the Strategic Master Plan should follow commonly accepted standards and practices recommended for use by all the countries involved.

6. Conclusions

MEDA TEN-T carries out a comprehensive analysis of the Euro-Mediterranean transport system. The project describes the transport sector in the Mediterranean region in quantitative and qualitative terms and through the development of the MEDA TEN-T Demonstration Corridors, assesses its performance against international and regional indicators, as well as the evaluation methodology, identifies the main bottlenecks, and highlights the major issues to be addressed, as well as proposed actions for the implementation of the Strategic Master Plan in order to improve the overall efficiency of the transport sector in the region.

The project has relied on studies undertaken in recent years, at regional or national level, by the Mediterranean countries, the European Commission, other international organisations, research centres and other institutes. Focused surveys of users and relevant institutions are undertaken. Following the compilation and assessment of the information collected throughout the project, the results elaborate on the status of development in the region and prepare a forward-looking analysis.

The project covers all the relevant aspects of the transport sector, for all transport modes, including policy, institutional and regulatory issues. The study also addresses various factors such as technological and financial constraints, the role of the transport system, in particular of the infrastructure network as regards the integration of Mediterranean countries' economies, the implementation of international transport conventions, etc.

The implementation of the Strategic Master Plan, will contribute to the economic growth of the countries concerned and to the well being of their populations, as well as assist the integration and harmonization of transport within the Euro-Mediterranean area. However, this can be achieved only through close monitoring of its implementation and regular adaptations of the network outline would be required, which will require intensive follow-up
work, in close co-ordination between the Mediterranean countries and between them and the EU.

Building on the above, MEDA TEN-T plans to give a major boost to the development of the network and alert the players concerned, both public and private, to the need for active support and greater co-operation in this field. The development of a Euro-Mediterranean transport network, with both south-south links (between the Mediterranean Partners themselves) and north-south links (with the existing trans-European transport network), through MEDA TEN-T is essential. MEDA TEN-T draws the attention of the need of creating a strong South/South transport connection and facilities that can enhance and boost intra-South trade and passenger movements by sea, land and air. Mediterranean partners need to be able to benefit from an enlarged European Union, while the Union needs a stable and prosperous area on its southern and eastern fringes. Also, efficient transport networks are essential for the proper functioning of the Euro-Mediterranean free trade area which is due to be created by 2010, and are a powerful factor in regional and subregional integration between the Mediterranean Partners.

Besides regulatory reform, physical integration through connecting infrastructure is needed. Such investment decisions should be facilitated by the private sector from the EU and South Med Countries. The role of policy makers should primarily be confined to the creation of an enabling regulatory framework.

An important feature of the thinking embedded in the proposals developed for the elaboration of the MEDA TEN-T Projects’ Master Plan has been the careful and simultaneous consideration of both national and international perspectives. In order to accomplish both perspectives, the aim is to develop plans that acknowledge shared international needs and goals while at the same time recognise the reality that national needs are equally important. In addition, they have to take into consideration that at least part of the funding for implementation would probably have to be secured from national sources (public and mainly private), or at a minimum it will require the inclusion of the relevant projects in the projects of national priorities plans.

Concerning funding from sources other that the national budgets, the main identified sources – relevant to MEDA TEN-T countries- are: European Investment Bank (EIB), European Bank for Reconstruction and Development (EBRD), World Bank, African Development Bank, Islamic Development Bank (South Med Countries particularly Turkey and members of IDB), European Union, including Cohesion Fund, Structural Funds, ISPA and INTERREG frameworks.

Finally, the possibility of private participation, via Public-Private Partnership (PPP), in the implementation of MEDA TEN-T infrastructure projects should be also investigated, starting from the Green Paper on Public-Private
Partnerships on public contracts and concessions to published manuals on Concessions from financing institutions (i.e. World Bank).

Infrastructure investments are needed to address capacity constraints. The organization and management of the implementation of projects should be undertaken by the private sector, regardless the source of financing (e.g. public, private, loans). In most Mediterranean countries, the public sector has a record of poor planning and execution of investment projects.

The role of the governments in the Mediterranean countries should be confined to the provision of a transparent and stable regulatory framework, including commercial incentives for private investors. Market dynamics will then determine the type of infrastructure that is needed and whether the risk-return ratio of a particular project justifies the necessary investments.

7. Recommendations

To facilitate the smooth international flow of goods and passengers in the region, any action plan for implementation of activities should consider the bilateral and multilateral relations; both regulatory and other forms; and should treat transport operators from all MEDA countries in a similar manner.

The Strategic Master Plan should also take into consideration sustainability of the sector in terms of environment protection and the protection of transport users, workers and the public at large against risks in safety matters, and improvement of social conditions. What the current plans lack is cooperation at all levels and between all parties in the transport field. This could be found at the country, regional, and international levels, especially in terms of resolving border crossing problems, the development of common data collection strategies, project evaluation capabilities, and the transport needs assessments on a regional basis.

The governments of the MEDA region must develop clearer and more efficient strategies to lead the user of the infrastructure to make an appropriate contribution to investment and maintenance costs and contribute to the coverage of cost elements of transport. This would enable such governments to expand their projects with a wider regional perspective. Finally, the international transport set-up in the region must take into consideration methods to optimise the efficiency in the use of infrastructure, vehicles and equipment, taking account of alternatives to new investment in physical infrastructure and maximizing the benefits secured from new technology.

MEDA TEN-T draws the attention of the need of creating a strong South/South and North-South transport connection and facilities that can enhance and boost intra-South trade and passenger movements by see, land and air. The MEDA TEN-T process has been successful, but the work is still ongoing. Further work
is necessary and technical assistance is needed for monitoring progress. The completion of the missing information, that could not be provided throughout the project’s duration, could serve as a valuable information for the decision makers, concerning the future development of a complete MEDA Network.

In the future, certain actions in some main fields might be necessary:
- Any missing or insufficient data should be completed in order to support the decision making process and complete the design of the MEDA TEN-T Master Plan
- Establishment of transport sector priorities amongst possible investment measures using the criterion of sustainable mobility and an investment project pipeline for external financing should be considered
- Promotion of institutional and capacity building, and of organizational and regulatory measures favoring the Euro-Mediterranean transport network
- Monitoring of the development of the MEDA TEN-T Network and its usage, with the publication of regular information on progress
- Maintenance of the Geographical Information System (GIS) developed through the project and presented on the MEDA TEN-T website and the Experts’ Network.
- Enhancement of evaluation methodology of projects and corridors
- Creation of a Transport Observatory in the Mediterranean region to monitor transport flows, transport services, implementation of transport investments and other initiatives, as well as a list of all stakeholders for transport related activities and services.
REFERENCES

CETMO Bulletin (2003), ‘Identifying the bottlenecks in the airport infrastructure of the Maghreb’, CETMO, No.54 Dossier, April 2003


European Commission (2003b), High Level Group (van Miert) on the Trans-European Transport Network Report, European Commission, Brussels

GTMO (1999), ‘INFRAMED Executive Summary’, CETMO GTMO


MEDA TEN-T (2003), The Inception Report [Deliverable I], Paris, NESTEAR


Europe – Seminar, Session 1: Planning Infrastructure Development, European Commission, UNECE, European Investment Bank