

ARE EVOLUTIONS OF TRANSPORT SUPPLY THROUGH MEDITERRANEAN SEA COMPATIBLE WITH GOALS OF LAND TRANSPORT POLICY IN EUROPE?

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ABSTRACT

The paper briefly describes the European transport policy in favour of modal shift and the efforts of the western Mediterranean ports to improve and secure access to their hinterlands. Railway and to some extent inland waterway play a key role in these strategies. The paper then discusses the main functions of Mediterranean ports: the crossing of a strait, an hub in a maritime container-routing network, supplying a hinterland and logistical operation area. It underlines the current trend towards relocation of logistical activities to some ports on the Mediterranean south coast. The development of Tangier's port activity is the best illustration of such a situation.

These relocated logistical activities imply that many containers arriving from Asia are emptied in Africa before the goods are shipped to Europe by a route involving a maritime link. They also imply a southward extension of the Mediterranean "European logistics space," resulting in the spread of European standard packaging: the EUR-pallet.

Basing on this finding, we firstly analyse such evolutions as a window of opportunity for the development of a specific transport supply between Mediterranean south shore and Europe that would be based on a new type of container: the 45' Palletwide, compatible – unlike the ISO shipping container – with the dimensions of the EUR-pallet.

Secondly, we assess the possible consequences on inland transport modal shift of the "45'PW containerization" of a part of European ports traffic. Concerning this point, the paper highlights that the part of traffic that is not logistically operated in the European port areas presents more favourable characteristics for inland intermodal transport. Nevertheless, logistic features, such as transit-time and reliability, continue to strongly impact modal choices.

All in all, the evolutions in Mediterranean traffic bring with them specific challenges with regard to the objectives of modal rebalancing. They provide opportunities for developing

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accessibility supply in the port hinterlands using alternative modes of transport. They also bring with them their share of risks that need to be identified and overcome.

Keywords: Mediterranean, modal shift, intermodal transport, 45' Pallet Wide containers, port logistical activities, European transport policy

INTRODUCTION

The Mediterranean basin is a maritime area that has some very specific features: this applies to its culture and ecosystem and also to its transportation network. Although the Mediterranean is an enclosed sea, the shipping lanes are very busy with a large amount of traffic transiting between the Suez Canal and the straits of Gibraltar (Laroche, 2009). A large proportion of the traffic flows are directed towards Europe, but many of these ships prefer to use the northern ports because they have a denser network serving their hinterland and therefore provide a more effective gateway to continental Europe. In the western part of the Mediterranean basin, Genoa, Marseilles or Barcelona also play a major role and serve as gateways.

Other ports such as Gioia Tauro, Algeiras or La Valette have specialised in containers and serve as hubs for container traffic. They offload goods from intercontinental ships onto feeders and re-dispatch them to other European destinations via the Mediterranean or northern ports. This article will attempt to take stock of the new prospects for developing port activities on the southern seaboard of the Mediterranean. Tangiers-Med, for example, has based its development on serving Morocco and operating as a container terminal but, at the same time, it also hosts other logistic and economic activities handling goods that will finally, at least partly, be sent to the European Union.

The goal of this article is to throw some light on these future prospects. We shall first consider the changes in the south-to-north supply that these developments are likely to induce in the Mediterranean; we will then examine whether these changes are likely to be compatible/consistent* or in conflict with the goals of European transportation policies aimed at balancing the overland flows in favour of alternatives to road haulage.

Lastly, it must also be said in passing that these developments will take place in an area in which there are still many underlying economic and geopolitical challenges. We shall not list the many covert or open disputes that strain the relationships between the different neighbouring countries around the Mediterranean basin, preferring to emphasize the more positive cooperative aspects driven by the Mediterranean Union (ME). The ME aims to reinforce partnerships between the countries of the Mediterranean basin. Transportation has been defined as one of the priorities amongst the 6 areas of action selected in 2008 by the heads of state and government. This priority was confirmed in June 2009 during a meeting of the ministers.

The European trend to encourage alternative modes of transport

For the past 15 years at least the European Union has set out policies aimed at creating an environment to encourage the development of alternative transportation modes to move

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goods around its domestic market in replacement of road haulage. This policy was strongly confirmed in 2001 when the “white paper” setting out the main trends in transportation policy made modal shift one of its highest priorities (European Commission, 2001). The white paper was subsequently revised in 2006 and the implementation of this policy in the middle of the economic crisis showed how vulnerable this trend was. Nonetheless, environmental concerns and in almost all cases systematic opposition from the local population has made any policy in favour of road haulage for dispatching goods over long distances difficult to implement.

Because of this, and in addition to a wide research on intermodal transport (Bontekoning et al., 2004, Tsamboulas et al., 2007), the EU encourages and funds the development of alternative transportation supplies – the highways of the sea, cross-border rail connections, etc. with several programs to support intermodal transport (Marco Polo, Transeuropean Network of Transport – TEN-T – and there are also projects on the regional level with the INTERREG programme). Although there are sometimes marked differences, these policies are also those of the states around the Mediterranean (Tsamboulas & Kapros, 2000). Italy, for example adapted to the changes in the production system in the nineties (relocation) and logistics (integrated logistics) by developing a network of multimodal platforms or hubs, the *interporti*, to encourage concentrated flows of goods and use the most suitable means of transport (Dalla Chiara, 2002)¹. Since 2007, Italy has also subsidised the use of the *autostrade del mare* (motorways of the sea), with the support of an “ecobonus” system. In France, the policy to apply the conclusions of the “Grenelle Environmental Talks” (2008) – an exceptional consultation procedure defining environmental goals – is now gradually being implemented in the transport sector. This policy justifies the subsidies recently awarded to rail freight and the highways of the sea; they have just been increased in the case of maritime transport through the “Grenelle Talks on the Sea” (2009/2010), which are supposed to complete the Grenelle Environmental Talks for maritime issues and the coastline and lead to the definition of a new maritime policy in France. In Spain a new, ten-year investment plan, the PEIT (*Plan Estratégico de Infraestructuras y Transporte*), is a milestone in the new orientations to promote rail transport. This plan includes revamping the existing rail network and gradually converting it to the standard European gauge. It should also encourage the development of rail freight, which remains weak, especially for the purposes of trade with the rest of Europe.

Europe’s transportation policy in favour of alternative modes to replace road haulage is obviously based on addressing environmental concerns. However, it also explicitly seeks to achieve objectives in terms of the competitiveness of the European economy. Because in actual fact, if public initiatives in favour of road haulage are considered to be unrealistic, the only way to improve the effectiveness of our transportation system is to develop rail, sea and river alternatives. This is particularly true for the main transportation corridors with volumes large enough to benefit from the substantial savings that can be made with higher-yield

¹ The 1986 Italian PGT (Piano Generale dei Trasporti) was the first example of a plan for intermodal transport hubs in Europe. In 1990 law N° 240 defined the “interporto” as an “organic complex of integrated structures and services that ended when goods were transferred from one mode of transport to another, the interporto necessarily includes a railway station/marshalling yard connected to at least one port, an airport and the main axes of the road network”. From 1993-98, the *interporti* developed thanks to a substantial investment programme.

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transportation modes which are generally the alternatives to road haulage. This means that the ports will necessarily be in the front line and the first concerned by the development of an alternative mass supply to replace road haulage.

The challenge for the ports on the northern seaboard of the Mediterranean is ensuring that they have secure overland access to their ports

All of the Spanish, French and Italian ports are now served by a dense motorway network as a result of the major investments made over the past thirty years, especially in Spain and Portugal. However, even in terms of their road network, the position of the best placed ports in the western part of the Mediterranean remains vulnerable.

The ports on the coast of Liguria in Italy (Genoa, Savona, La Spezia) are handicapped by the fact that there is a range of mountains just behind them, restricting their extension and their access to the Po valley, their natural hinterland. The existing motorways therefore include a number of very long bridges and viaducts with long, steep, slip-roads limiting the speed of HGVs and the flows of traffic. As a consequence the traffic is highly congested, including around the Genoa conurbation and on the roads that provide access to the ports on the coast of Liguria. The cost of running HGVs is also higher than elsewhere.

On the French side the Mediterranean can be accessed from the north via a natural corridor in the Rhône valley. The main obstacle here is the relative congestion along this corridor. However, the geographical situation of Marseilles or Sète is the best on the western seaboard. There are no mountains barring access to the Spanish ports but the long overland distances that have to be covered are compounded by chronic congestion on the coastal motorway and then in the Rhône valley, which is the main itinerary giving access to northern Europe.

With all these difficulties to contend with, the ports are obviously lobbying for an improvement in the motorway networks that serve them. But the general background of overland transportation policy leaves them little hope of any new motorway project being implemented in the near future. In the longer term, the ports also feel that will be necessary to protect their overland access from the fluctuation in oil prices to reduce their dependency on road haulage.

But one thing that is clearer and more open than public policy in overland transportation is that the choice in developing port services will be driven by competitive issues. The relative attractiveness of all the major ports in Europe is based on three inter-dependant variables: the performance and the cost of port operations on one hand, the shipping supply and variables related to services available in the hinterland on the other (van Klink & van den Berg, 1998, Van der Horst, M.R., De Langen, P.W., 2008, Garcia-Alonso & Sanchez-Soriano, 2009). Ports are naturally places where the overland flows are concentrated in large volumes for which rail, river and coasting services are particularly relevant. Because of this and the increasing trend to concentrate volumes, developing a supply in these services will become one of the most strategic parts of the competition between these ports. The issue of competition between the major ports is especially acute for container traffic, whereas the geographical parameters involved in forwarding bulk goods are based on the underlying logic of local availability.

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These are the facts that explain why the European ports of the western Mediterranean seaboard are all striving to achieve ambitious goals in the area of alternative overland services to road haulage. For example, in Genoa road accesses are particularly difficult (Parola & Sciomachen, 2009). The “Terzo Valico” project aims at building a new, high performance railway line across the Apennines into the Po valley. This portion of rail-track will complete the civil engineering project to cross the Alps (through the Lötschberg and Saint-Gothard tunnels) carried out in Switzerland to provide an access to northern Europe for heavy, high-performance (goods?) trains. The new Terzo Valico line should also give access to the dry port project in Alessandria, at the Genoa end in the Po valley.



Figure 1 – Terzo Valico project's map
(source: <http://www.trail.liguria.it>)

The railway lines providing access to Marseille (and Sète), are of fairly good quality, however their development has been burdened by the bottleneck at the railway hub in Lyons which was the subject of a by-pass project included as a priority in the most recent government plan in favour of rail freight (September 2009). Despite the excellent geographical location of the port, the rail service to Marseilles also suffers from the mediocre performance of the railway companies operating in France, in particular the heritage operator. Lastly, the French ports on the Mediterranean coast are the only ones that have river services. The Rhône-Saone corridor, with its wide river-bed serves the Lyons conurbation at 300 km from the

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coast, then 200 km further on stops and becomes a dead-end, far from any major economic centre. However, this corridor's vocation is to participate in irrigating the hinterland of Marseilles as witnessed by MedLink's integrated supply set up by all the seaports and river ports of the basin. Despite its handicap Marseilles' ambition, according to the forecasts set out for the Public Debate on the extension plan for the dedicated terminal container installations at Fos 2XL, is a 30% market share for rail (versus 13.7% in 2008) and 10% for the river (3% in 2005) and this should completely absorb the ports' growth in traffic. The Supervisory Board of the Greater Sea Port of Marseilles (GPMM) has approved the trends set out by the Directors for developing the railway services to the port that will feed the GPMM project. Marseilles is also the only French port connected to the Trans-European network, RTE-T. The attention paid by the Spanish port authorities to rail facilities is illustrated by their commitment to the FERRMED association. In a context in which the upgrading of the Spanish rail network seems assured, and in which goods from Spanish ports destined for northern Europe are principally forwarded by marine transshipment, the Spanish port operators stress the capacity of the European rail network to carry long-distance traffic under even more economical conditions. Thus the FERRMED association defends the idea of a network organized along a backbone linking the Mediterranean coast of Spain to Scandinavia, on which new technical standards will be implemented to achieve significant improvements in rail productivity (in particular, long, heavy trains).



Figure 2 – FERRMED project's map
(source: <http://www.ferrmed.com/>)

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Lastly, Genoa, Barcelona and Marseilles have embarked on projects for massified inland transport proposals – by rail or waterway – to provide access to their hinterland at lower cost. This begs the question of the coherency of these objectives as regards the landward access of ports and developments affecting maritime activity.

Typology of port functions in the Mediterranean

At the centre of east-west maritime links passing through Suez, the Mediterranean basin is the arena for strong growth in container traffic (Nespola, 2009). Despite the severe effects of the crisis on the economics of this activity since 2008 (Deiss, 2009), the use of containers for the carriage of an expanding range of products is unlikely to collapse in the future (Lacoste, 2006, Rodrigue & Notteboom, 2009).

In the Mediterranean, port traffic functions in different ways. First, it engenders considerable transit traffic between the Suez Canal and the Straits of Gibraltar. With specific regard to port activity in the western Mediterranean, it is possible to put forward a typology distinguishing four functions that seem quite different and that shape the characteristics of the ports:

- In first place, the crossing of a strait, the result of a geographical discontinuity, involving a short-distance sea journey. In the western Mediterranean, this activity is of course found in the vicinity of the Straits of Gibraltar, and to a lesser extent between southern Italy and Tunisia. In this segment, ro-ro activity is predominant.
- The second type distinguished is the function of hub in a maritime container-routing network. In this zone, primarily devoted to the importation of goods from the Far East, this consists mainly in docking container ships, which are in strong growth as regards both size and productivity, and in transshipping the containers onto feeder ships which serve the different Mediterranean ports. These ports, (Gioia Tauro, La Valette, etc.) operate with no hinterland, and their role is simply to redistribute container flows. This function is restricted to handling the containers themselves. It involves no operations on the contents, that is to say the actual merchandise.
- The third identifiable type of function is supplying a hinterland. In this case, the ports constitute a technical interface between the maritime link and the land link of the transport chain. Here again, this function involves no operations on the merchandise, which is simply transferred from one means of transport to another. If exports of raw materials, which obey different rules, are excluded from the field of analysis, the ports of Algeria are representative of this devolved situation of the supply of a hinterland (sometimes very close, as in the case of Algiers).
- The last type of port function identified is that of logistical operation area. In this case, the interface is not technical only, but extends beyond the transport function to include operations on the merchandise itself. The container is then "warehoused" (unloaded), and the merchandise is processed: most usually repacked, often redistributed through consolidation and break-bulk operations, sometimes transformed by operations in which the limits between logistics and industrial services become indefinite. The port zones then perform a function of point of entry into a

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logistical zone in which coherent standards and practices shape the organizations and technical resources that are brought to bear.

Like any typology, this tends to separate port functions which in reality appear to be linked. First, geographically, as existing port zones often exercise more than one function. Algeciras is at the same time a port for the crossing of the Straits of Gibraltar and a hub vital to the European distribution of containers. Valencia combines such a hub function with the function of serving its hinterland of Madrid. Marseilles, Barcelona and Genoa serve their hinterlands both as a simple technical interface for the transfer of containers from ships onto trains or road vehicles and as the logistical stage of a point of entry into the European sphere. Then, on the functional side, the capacity of a port city to supply logistical services is an element in its overall appeal which also strengthens its role as a technical interface. All facets of the port area are involved in the change from a classic function of gateway to a more sophisticated one of logistical port (Pettit, 2009). Lastly, this typology does not prejudge the structuring of the port network of the entry gates to the European zone, not the emergence in the Mediterranean of regional multi-port systems such as can be observed on the European North Range (Notteboom, 2010).

A new trend towards relocation of logistical activities to the south coast of the Mediterranean

With respect to this typology, the ambitions of Tangier Med illustrate an important development. In fact, its current and expected development of traffic results in part from its capacity to attract traffic on transshipment to other Mediterranean ports, playing the role of a transit port. It results in part, too, from Morocco's own economic growth and consequent need of supplies. But Tangier Med's development also stems from a more recent phenomenon: it attracts logistical business which will operate on the merchandise (classically for repackaging) before it is sent onwards (often to Europe).

Worldwide, this development marks the gradual integration of shipping and logistics (Heaver, 2002, Parola et al., 2006). With respect to its earlier situation, this development can be seen as an example of relocation, at the expense of the European ports, of activities that previously were more closely bound up with their proximity to the markets to be served. In complementary fashion, this development can be seen as the result of the gradual incorporation of countries on the southern shores of the Mediterranean (in this case, Morocco) into the European economic sphere. Seen from this point of view, it becomes clear that some flows already repackaged in Tangiers have in consequence no "productive" incentive for a further stopover before entering Europe: it is easy, for example, to imagine a distributor in Tangiers using consolidation/break-bulk operations to prepare consignments for recipients located within the European continent.

Of course, such practices have existed for a long time, but only as a small minority. It is obvious, too, the consolidation/break-bulk operations are only possible on the basis of a volume and variety of goods handled that are large enough to be organized into optimised batches. But it is still true that the relocation of logistical functions to the ports of the southern shore will naturally produce an increase in flows "ready for entry" into the EU via the Mediterranean. The problem that will swiftly arise then will be to adapt these flows to the

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practices of European logistics, especially subjecting them to the EU palletization standard, which is by far the dominant form of packaging inside Europe; in fact, as it were, to integrate these flows into the European transport sphere.

A window of opportunity to see the development of a transport supply based on a new type of container: the 45' Palletwide

From this strictly technical viewpoint, a considerable difficulty can be foreseen relating to incompatibility between the European standard of the EUR ou EUR1 pallet (0,80m x 1,20m) or EUR2 pallet (1,00m x 1,20m) on the one hand and the international standard ISO maritime container on the other hand. Indeed the internal dimensions of the ISO container (loading width: 2,345m) are such that it is impossible to load two EUR-pallets side by side (i.e. $2 \times 1,20\text{m} = 2,40\text{m} + \varepsilon$, ε representing the necessary spacing around each pallet) or 3 pallets EUR longwise (i.e. $3 \times 0,80\text{m} = 2,40\text{m} + \varepsilon$), as shown in the figure below. It is only a matter of a few centimetres, which implies complications when loading EUR-pallets into an ISO container, but also empty space in the container, which means lost productivity. In addition to lost space within the ISO container, this one is also less productive compared to semi-trailers or swap bodies which are normally used in Europe, with a capacity of 33 EUR-pallets.

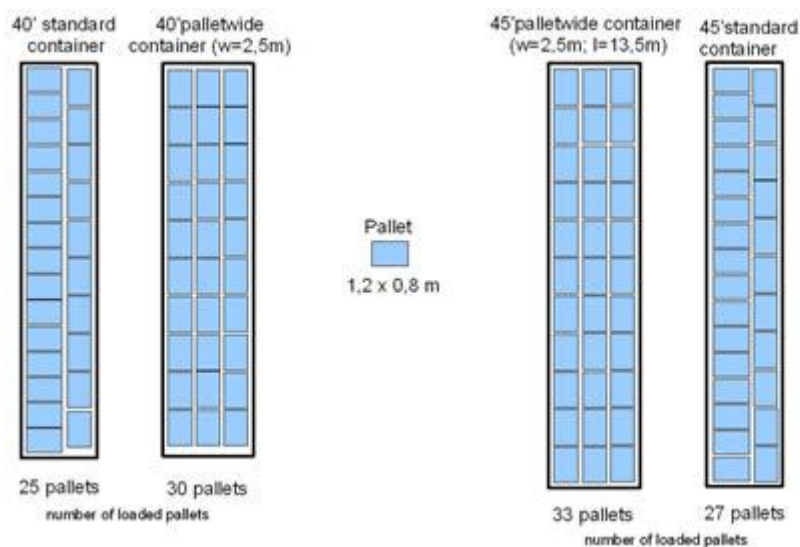


Figure 3 – Loading plan diagram for different type of container
(source: <http://www.terramar.pl>)

To take the measure of this problem, which at first sight seems trivial, it is vital to reflect that the two standards in question have established themselves very widely, each one in its own area of applicability, and that they have brought about comprehensive adaptation of transport vehicles and logistical equipment, each in its own sphere of influence. Thus, for example, the dimensions of the ISO container are rigidly fixed, first by the number of such boxes in circulation today, but also by the distance between the rails that guide the loading of ships and prevent the cargo from shifting on board container vessels, and further by the width of the actual hulls of these ships, which is a multiple (taking clearances necessary for handling into account) of the ISO width of the boxes. In contrast, the EUR-pallet predetermines the

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fork width of numerous items of handling equipment, the dimensions of storage spaces in warehouses, and above all, the width of the chassis of HGVs used for transport all over Europe and of the swap bodies used for intermodal transport. These two standards are not hegemonic,

These two standards are not hegemonic, even on their area of relevance, but they are not threatened, which shows on the other hand their strong rootedness². It is thus unthinkable that one of these standards should make way soon or even in the medium term for the other. To confirm this assertion, one need only ask what could motivate the maritime operators of the world to make the effort of adapting to a standard that they only rarely encounter, since the EUR-pallet is used essentially within Europe. Conversely, what could persuade the world of European logistics to reduce the size of its pallets, thus losing productivity and flexibility, to match the ISO container which they only meet, in general, when they empty one of its Asian merchandise (which is usually packed in directly filled bags or cardboard boxes)?

Thus there is no global economic reason likely to motivate the abandonment of either the EU standard or that of the ISO. However, in the particular situation of European flows making intensive use of maritime routes, things are very different. In this case, the EUR-pallet is dominant, but the container has great attractions in the fact that it combines several advantages: it improves the security of the goods, it greatly facilitates transshipment operations and it means that the loading of ships can be optimised. The competing mode of maritime transport, loading road vehicles (or trailers) by the Ro-Ro system (roll-on, roll-off), does not provide the benefit of all these advantages. And the low loading density in the holds of ships devoted to ro-ro transport robs the insistence of the authorities on developing the "motorways of the sea" of much of its force.

In such situations, which apply to voyages of some hundreds of kilometres, and not the simple crossing of a strait, some operators have attempted to containerize palletized flows. This is especially so in the North Sea, for access to the British Isles from the distant ports of the Pas-de-Calais and Scandinavia (the ship-owners Samskip and DFDS Container Line). They have thus been led to use containers of non-standard dimensions, adapted to loading EUR-pallets. This was the origin of the 45' Palletwide container (45'PW), which has the same capacity as the half-trailers common on the continent of Europe, or a swap-body. The 45'PW container is thus adapted both to the practices of European logistics and to the constraints of maritime transport (in particular, because it is "stackable", i.e. the containers can be piled one on top of another up to several levels in the hold of a ship or in a storage area). Similar containers are also used for journeys within the continent of Europe that include a waterway leg, where the 45'PW possesses the same advantages as at sea. Cappuccilli et Frémont (2009) give an exact description of the uses of this solution in the zone of North-West Europe.

If these experiments are repeated in the western Mediterranean, it is clear that all the factors are present to encourage development of the use of 45'PW containers in this new zone. Once the logistical activities linked to servicing the European economic zone start to develop in Tangier (and other ports on the southern shores, especially in Tunisia), the flows crossing the Mediterranean will be due for palletization. If they are sufficiently ample, they will merit

² See www.planetpal.net for different pallets-types existing in Europe and <http://www.terramar.pl> for key dimension of sea containers.

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the allocation of dedicated resources. In these conditions, the operators are very likely to take the opportunity to capitalize on the combined advantages of the pallet and the container by developing a transport service based on the 45'PW.

The organization of specific containerized logistic chains through Mediterranean Sea shares the crucial question of the organization of boxes repositioning (Choong et al., 2002). In such a hypothesis, sea containers are emptied on the south shore, in ports which are connected with intercontinental links. The organizational problem to send back empty containers, in a context of structural imbalance with wider flows from Asia, is not specific (Rodrigue & Notteboom, 2009). For the transmediterranean 45'PW chain, it can be envisaged that South to North freight, which mainly corresponds to flows from Asia reprocessed on the South shore, is balanced in the other way with freight from Europe to North-Africa. On this route, the flows in tons are more important from South to North, but this imbalance is entirely due to raw materials and farm products. Concerning the only manufactured goods, which is the main target of a containerized logistic supply, flows from North to South are predominant (Laroche, 2009) and could seize the opportunity of a 45'PW chain.

Consequences for modal shift of port traffic

But it is not the purpose of this paper to argue the case for this development. It will happen if the necessary set of conditions arises. Our aim is to examine how far this probable development is coherent with the orientation of European policy favouring alternatives to road transport. With this in mind, it is necessary to stress that the relocation of logistical operations to the southern shores of the Mediterranean represents a risk, especially in the case of Tangiers: that operators may prefer to forward goods to Europe by road, through Spain. It might be thought that the considerable distance to be covered to reach Northern Europe would enable maritime transport to profit from the advantages it can offer in terms of cost. But for palletized goods, the difference is reduced: shipping by sea means handling the freight pallet by pallet. The development of a solution such as 45'PW thus has the potential for a powerful increase in the competitive advantage of forwarding goods by sea from the southern shore of the Mediterranean. A further benefit offered by the 45'PW solution from the point of view of a modal transfer policy is the possibility of supplying a fluvio-maritime service which could reach up the Rhône as far as Lyons.

In reality, it is in the hypothesis of overland transshipment – whether in a coastal port or a riverine one – that the question arises of whether the spread of the 45'PW container in the Mediterranean on the one hand and the policy objectives of modal shift on the other will eventually converge. By comparison with the ISO maritime container, the gains resulting from improved filling, and hence in productivity, provided by the 45'PW are profitable to all the modes of transport used in inland haulage: the same lorry or railway truck loaded with a 45'PW instead of a 40' ISO will bring an increase in yield in either case. So in this respect, neither mode possesses a decisive advantage.

One handicap with the train in relation to transport using 45'PW containers lies in the limited clearance of the European rail network and more particularly that of the Latin countries: for historical reasons, the standard clearance of the French and Italian networks, where the B+ clearance is still rare despite the efforts made in this direction, is narrower than those of the Swiss and German networks, where the UIC normalised C clearance is very much standard

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practice. It is important to note immediately that the transportation of containers in double stack mode cannot be envisaged in the European network. From this perspective, containerisation of the flows – both rail and road – in Europe does not have the same potential as in North America since the characteristic of the container as being “stackable” is of no use whatsoever. The reason being that intermodality in Europe preferentially uses swap bodies that are lighter but that cannot be piled on top of one another.

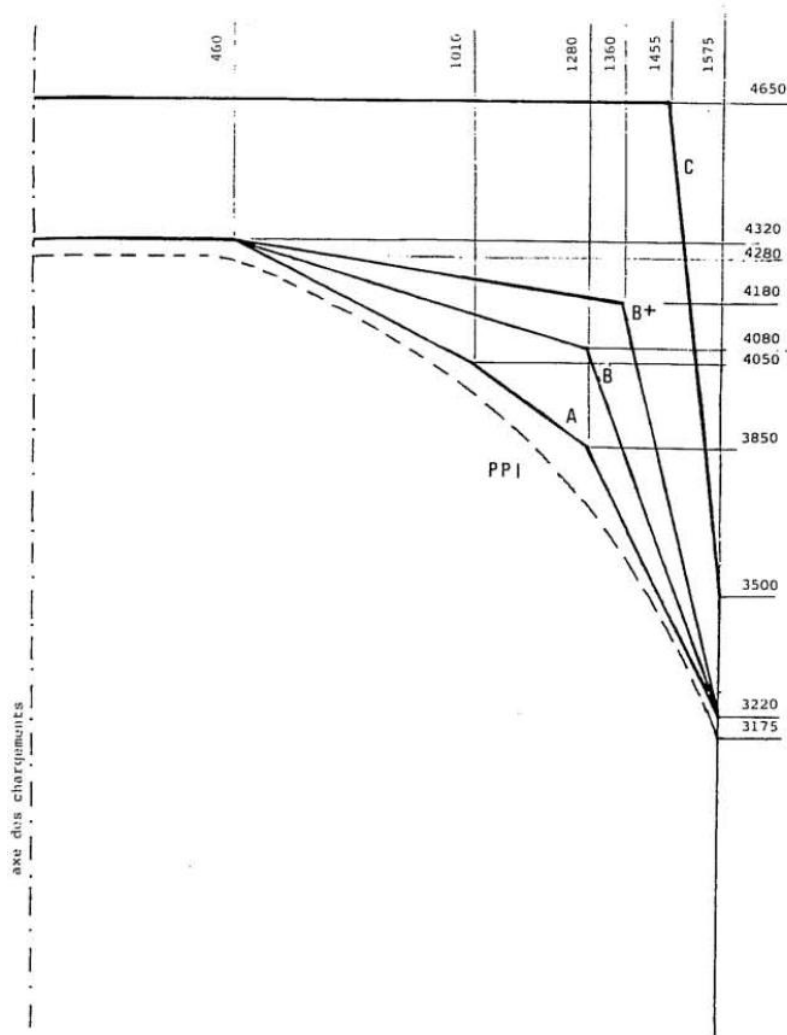


Figure 4 – railway gauge (source: RFF)

But even if used on a single row basis, the 45'PW container poses a problem in terms of clearance on the railways. Indeed, to bring it closer to the dimensions of road trailers, it adopts a height that is greater than that of the most standard ISO containers (9'6" compared with 8'6", i.e 2,90m compared with 2,60m approximately), that in fact corresponds to a format that is referred to as the “high cube” format that is spreading fast in shipping sector over an ISO length (20' or 40') and width (8', i.e. 2,40m). Transportation of “high cube” containers, that are hence higher, on the rail network leads to clearance constraints, which for example on the Lyons-Marseilles axis lead to the introduction of specific traffic procedures (those trains that contain “high cube” boxes put clearance to the test to a certain extent and must be declared as wide or abnormal loads prior to their departure and re-routing in the case of

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necessity means that the new itinerary forms the subject of a validation procedure that can bring about longer lead-times). The 45'PW containers, of the same height as the "high cube" boxes, but slightly wider, further accentuate these problems since the oval shape of the rail clearances concentrates the dimension constraints in the upper corners of the wagon outlines in movement. This being said, even when obliged to do so, evacuation by rail of "high cube" containers is already standard practice from Genoa and Marseilles. Efforts are made to gradually get rid of the obstacles, in particular along the port corridors, not in order to prepare for the arrival of the 45'PW containers, but to respond to the growing number of "high cube" ISO formats. The developments planned for the Spanish network over the coming years in order to link it with the European network take these dimensions into account. They should make it possible to quickly evacuate the "high cube" boxes from Barcelona and Valence and then the Andalusian port of Algeiras. The problem that rail clearance poses to the movement of 45'PW must therefore be relativised.

Port transit is more favourable to intermodal transport

At the opposite end of the scale, the relocation of logistics activities that make it likely that the 45'PW will be used increasingly in the Mediterranean is seemingly a factor that is favourable to the objective of alternative modes of transportation. We can explain this as follows.

The maritime containers that are currently offloaded in the European coastal ports, in so far as they account for large-scale flows, are the privileged target for combined transport service supplies over land. In other words, combined transport modes that include the first land link using river or rail transport. Once the boxes have been offloaded in the port, their "barrowing" (transportation over a short distance) to the port site for rail (or river) trans-shipment takes place in an efficient manner due to the substantial volumes involved and the high-performing rail or river networks that irrigate the inland areas of the continent (Frémont & Franc, 2010).

However, many goods are logistically processed in the immediate vicinity of the port area. These logistic operations involve stripping or "devanning" the containers after which the goods are very often repacked to form batches and then forwarded elsewhere on the continent. Sometimes these operations are more sophisticated and the borderline between services that are strictly logistic - (involving the flows of goods and feedback from the flows of information) on the one hand and industrial services (actually converting the goods themselves) on the other hand - is becoming increasingly blurred. Whatever the case, the freight from the port in question does not follow the same itinerary as in the previous case. The container is forwarded from the port to the logistics warehouse by road haulage in all cases because of the short distance to be covered. The goods are then re-dispatched, reformatted to comply with European logistics standards, usually palletized and in a container that is either a road haulage trailer or a movable box that holds approximately the same volume if combined transport is envisaged. In the latter case it must once again be forwarded by road to the nearest trans-shipping site to continue its journey by train or on a river barge.

It is well known fact that the financial and logistic costs (in terms of organisation and time) involved in offloading is the main obstacle to the development of combined transport (Hayuth, 1982). A standard combined solution, pre-forwarded to the trans-shipping site by road, a rail (or river) trip to the second site, distributing the goods by road again on the last

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leg to their final destination usually involves two offloading operations, whereas the road haulage solution gets the consignment directly to its final destination. Apart from the large volumes of goods that can be handled in each flow, combined transport can be especially competitive to clear the ports because, for this segment, a road haulage solution would entail the same offloading operation on departure from the port. Conversely, the combined solution does not entail the constraints of pre-forwarding.

In this type of situation, the flows of containers that just go through the Mediterranean shipping ports to reach the business centres inside the continent are more likely to use a combined transport solution for their overland leg, whereas the flows that are repacked in the port areas are in the standard situation of goods sent by overland transport and are structurally less advantageous for the combined solution. One can therefore see why relocating logistics operations to the southern bank of the Mediterranean can be seen as a factor that may very well step up the use of combined solutions: the flows that are thus repacked (in 45'PW) in the south in Tangiers, for example, are not a new milestone in port logistics. On the contrary, these relocated activities should generate flows that will merely pass through the European ports to gain access to continental Europe; because of this these flows will be more readily attracted by a combined solution.

The weight of logistic demands

To continue the discussion, we can perhaps consider another factor, related to the changes that occur in the type of flows of goods as a result of the logistics operations, whether these are carried out in the North or the South. One should not believe that when a consignment goes through a logistics warehouse the goods are just physically repacked. In actual fact, during the re-packing process a certain amount of information from the market that the goods are intended for becomes part of the consignment. This information does not only concern the volume of this or that product to be sent to so and so in continental Europe. It also obviously contains parameters such as delivery time and deadline. The customer's demands entail more than just dispatching the goods as fast as possible. Just as importantly they also entail reliability constraints such as whether the deadlines for delivery will in fact be respected.

In overland logistics, these instructions can be very precise, for example in terms of pick-up and delivery times when orders have to be compatible with a "just-in-time" system. A method of transportation that includes a sea-leg is not suitable for goods that must be strictly organised to be moved in this way. This point is probably a major concern in selecting the logistics activities that could be relocated to the south of the Mediterranean. However, we must not extrapolate from this that the flows from the south to the north would have no time constraints. They would include demands in terms of time, maybe not of the exact time of delivery, but of the day of delivery perhaps (Bontekoning & Priemus, 2004). This means of course that the shipping connection would have to be able to meet these constraints with very frequent services and satisfactory availability of the port facilities at both ends. For the road haulage leg, the operators no longer have to prove their capacity to meet this type of constraint in terms of their reliability to deliver on time. Wherever they are, motorways are never so congested that they generate delays in the day's orders. If a rail (or river) leg is considered, the issue is very different, because concentration of the supply means that a

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“rendez-vous” must be organised to coordinate the ship’s arrival in port with the departure of the train (or barge). Missing this “rendez-vous” often means that the trip will take an extra day and the boxes that missed the connection will arrive a day late. From this angle, therefore, for alternative transportation modes to work, the satisfactory performance of a combined sea-rail (or river) supply puts the emphasis on well-coordinated port activities.

CONCLUSION

This paper starts with the observation that the ambitions of certain ports on the southern seaboard of the Mediterranean are based not only on the intake of the local traffic and the development of the hub function in the maritime network for container transport, but also on the development of on the spot logistics activities that mark to a certain extent the entrance of the relevant goods into the European area. This in fact corresponds to the relocation of logistics functions that were previously positioned in Europe. This evolutions in particular concerns the port of Tanger-Med. The development of these activities creates conditions that are favourable to the development of a maritime service supply via the Mediterranean based on the use of containers that make it possible to load standardised EUR-pallets in an optimum manner, which the ISO maritime containers do not allow. The 45’PW container would indeed seem to be a good compromise between compliance with the standards and practices of European logistics on the one hand and the productivity requirements of maritime transport on the other. Moreover, this point relativizes the stress placed on the development of the “motorways of the sea”.

The flows that result from these activities in the direction of Europe no longer have the vocation of marking a stage in a harbour district at the entrance to the European Union: the logistics processing that the flows are subjected to “on the southern seaboard” is precisely designed to configure them according to the needs of the addressees located on the inland part of the continent. The paper then goes on to explore the coherency of the development of such flows with the objectives pursued in Europe by the transport policies with regard to the adopting of alternative modes of transportation i.e. rail or inland waterway over road transport. It explains firstly that the simple evacuation of containers that arrive by sea is an activity that is structurally more favourable to combined transport solutions for the land link. On the contrary, if the goods are subjected to a logistics stop over in an area close to the port of disembarkation, routing by road is favoured for the next part of the journey over land. A second consideration is related to issues regarding rail clearance that is nevertheless a problem that should soon be solved, at least for the large port corridors. Finally, logistics processing, in the South as in the North of the Mediterranean, tends to include with the goods, time constraints and demands such as the reliability of the deadlines and this is something that the combined transport service supplies will have to meet. This last point underscores the importance of port coordination that plays an essential role for the connection of maritime, rail and river service supplies.

Quantitative forecasting of the market share that intermodal inland transport supply could attract under the hypothesis of a transmediterranean 45’PW chain is still lacking. Henceforth, such an estimation can rely on new tools able to take into account logistic constraints (Blauwens, 2006). All in all, the evolutions in Mediterranean traffic bring with them specific challenges with regard to the objectives of modal rebalancing. They provide opportunities for

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developing accessibility supplies in the port hinterlands using alternative modes of transport. They also bring with them their share of risks that need to be identified and overcome.

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