

**TRADE FLOWS IN SPANISH  
MEDITERRANEAN PORT AREAS**

Alfredo Morales Gil  
University of Alicante

## I. PRESENTATION

Trade today is very different to what it was thirty years ago. This new situation is marked, not only by the technological advances which have taken place in the field of transport, but also by telematic changes which make stocks of raw materials, foodstuffs, manufactured products easier to monitor, ... at a time when satellite images and geolocalization enable some to discover where these stocks are available and when they will reach the destinations which require them and are able to acquire them and thus speculate with them. .

The territories, in addition to being physical support or areas containing activity, have been conceived as areas for relationships, both internally and with a view to abroad. The extent to which they are connected to world exchange networks, shall determine how well they have integrated or otherwise into the more advanced economies or whether they are marginalised in comparison to them. Thus, some spatial interdependences have developed which have essentially been brought about by forms of transport, production systems and commercial globalisation. Western Europe, North America and Japan were to predominate. But over the two last decades as Asia progresses, some of these are being replaced by China, Korea and South East Asia – Singapore.

We are, therefore, witnessing a process of globalisation, which is making the earth seem larger, more diversified and complex, where relations via networks are intensifying, where exchange of information, merchandise, capital and ideas make for better socioeconomic health for all those involved. On the other hand, remaining outside this process leads to marginalisation and economic impoverishment.

Thus a new complex and mobile structure is being drawn out which links metropolises, industrial areas, ports ... visible places which are separated by large distances but where strong invisible bonds have been woven which are evident in their functional behaviour and thus they appear close to each other.

Therefore, it could be said that globalisation relies on the existence of local and regional areas. Infrastructures of all types start to play a relevant role with the fixed capital accrued in them and while diversification is taking place. Thus, the growing differentiation between regional areas which have managed to enter the communication networks and exchange on an international and global scale and those which have not managed this, which will be areas which survive, for which the prevailing economic and political discourse upholds the so-called

“sustainable or endogenous development” reserved for those subsidiary or dependent areas, which on different levels, shape a new geographical universe. (ORTEGA, J. 2004).

## **II. THE DISTANCE- TIME PERCEPTION**

Technological changes, both material and immaterial, have helped reduce the area due to decreased distances, as a consequence of the growing competition created by the different means of transport and the new wireless communication systems. All of this is reliant on “just in time systems” which allow loads to go out and come in fast and considerably reduces the need to have abundant stocks available, as demand is dealt with from one day to the next, making full use of the existence of the logistical areas distributed strategically over the territories which have been organised for this purpose.

Containerisation in merchandise transport has revolutionised the trade system, while defining and redefining which regions have perfectly organised ports equipped with the essential tools to reduce the time in which contents pass from producer to consumer. This complex traffic involves some communication requirements which affect both the circulation plan and the security of advance reservation, which lead to the creation of telecommunications networks at the service of the fleets and assets in general.

On the other hand, we should not forget what this technological advance implies in terms of capital requirements needed for it to be put into operation. Public and private, even mixed, actions have been necessary to this end. The EU Territorial Strategies Plan of 1999 applies here or, in the Spanish case, the Council of Ministers’ approval on 15.07.2005 of the Spanish Infrastructures Plan 2005 – 2020, with proposals for resolving the new demands for spatial restructuring. Both cases attempt to meet the expectations generated on different levels in the process of globalisation in which we are involved.

Relationships with telematics and logistics have become increasingly closer. Logistics mark the operation between the markets and merchandise arrival flows. In addition, they have become the key to integrated systems, which base their operation on the quantitative forecasting of component needs, in the smallest amounts possible, in the assembly destinations which can be sent or replaced daily from a central storage area, an established logistics area (logistics areas or platforms) with ever lower costs. This is how information and communication technology (ICT) has become a basic instrument in the new order of relationships which have been established on a world scale.

Intermediate logistics areas are necessary, therefore, between the producers and the sales markets. These have been setting up around the sea and river ports which are prepared to receive large container ships. In the interior regions, without river routes, they are being set up in relation to fast transport – motorways and railways – in places at an equal distance from the issuing markets. Thus, in Spain, in addition to Barcelona and Valencia, logistics areas are at an advanced stage of construction in Saragossa and Victoria, and at project stage in Algeciras, Vigo or Gijon to which must be added the functional areas scattered around Madrid and Seville.

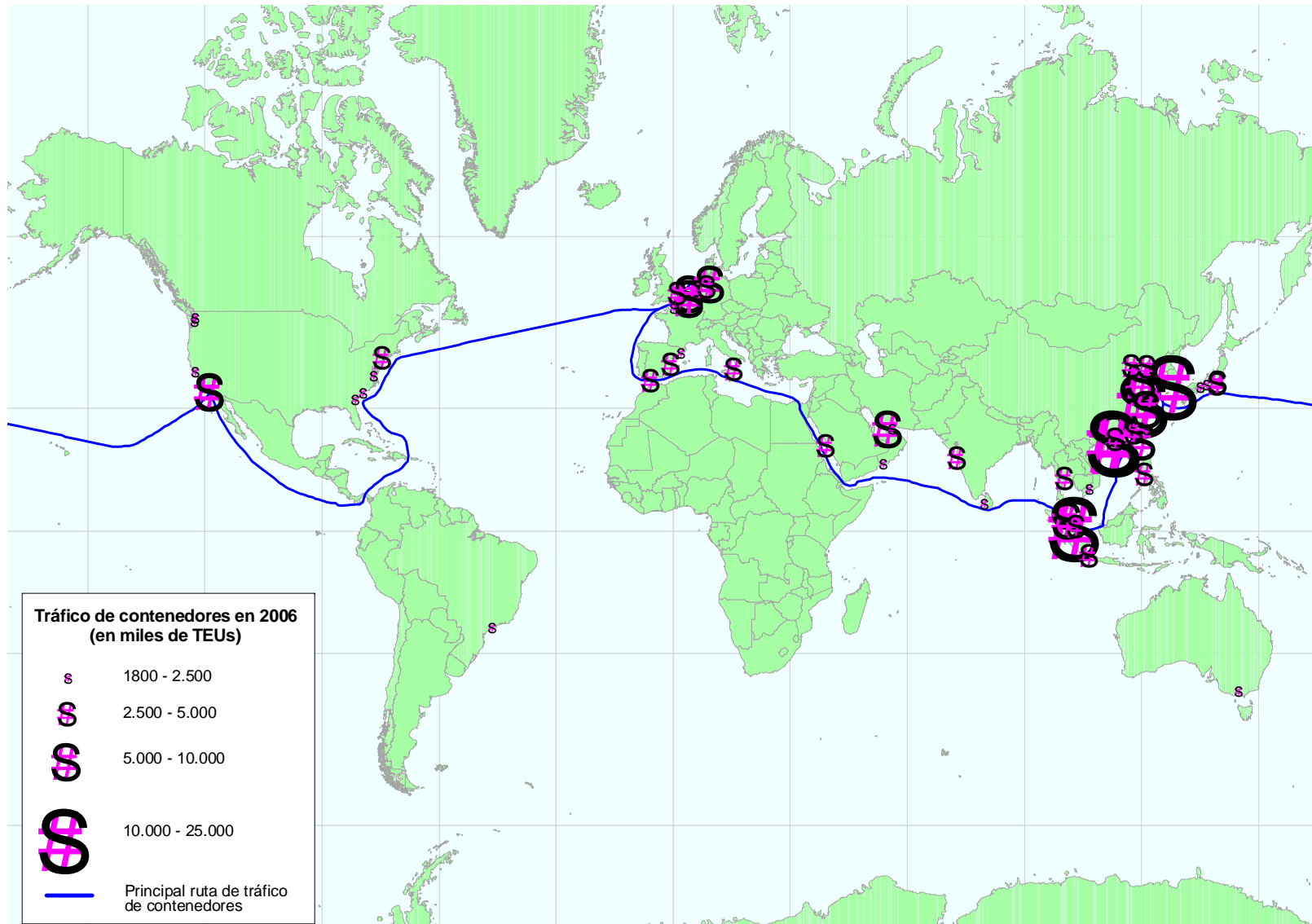
### **III. SPANISH PARTICIPATION IN THE NEW SPATIAL ORGANISATION OF MARITIME TRANSPORT.**

Land and air transport systems are perfectly familiar to the societies in which they operate. Nevertheless, the current networks and operational flows of maritime and river transport, which traditionally allowed greater spatial relations in distance and time, are not known despite how dependent they make many of their beneficiaries. There is much less awareness of their future prospects with a view to improving their territorial socioeconomic repercussions (hinterland). Port cities remain subject to the movements of world economic restructuring. Maritime cities and port complexes tend to be closely linked to dynamic international exchanges, which promote their adaptation to current socioeconomic changes. Thus, the local, regional or national deciding bodies must act in accordance with diversification strategies supported by organisation directives and which are defined as functional, long or mid term, for the future of their installations. Should they fail to respond along these lines of action they are at risk of being excluded. This is why, in Catalonia and the Valencian Community there is growing concern for the future of their main port installations: Barcelona and Valencia. The socio-economic development of their hinterlands which already go beyond regional areas will depend on them and both want to place them on the other side of the French and Portuguese borders.

## Ranking of the main world ports in container traffic – 2005

CONTAINER TRAFFIC (TEUs, 000s)			
RANK	PORT	COUNTRY	TEUs
1	Singapore	Singapore	23.192
2	Hong Kong	China	22.427
3	Shanghai	China	18.084
4	Shenzhen	China	16.197
5	Busan	South Korea	11.843
6	Kaohsiung	Taiwan	9.471
7	Rotterdam	Netherlands	9.287
8	Hamburg	Germany	8.088
9	Dubai	United Arab Emirates	7.619
10	Los Angeles	United States	7.485
11	Long Beach	United States	6.710
12	Antwerp	Belgium	6.482
13	Qingdao	China	6.307
14	Port Klang	Malaysia	5.544
15	Ningbo	China	5.208
16	Tianjin	China	4.801
17	New York/New Jersey	United States	4.785
18	Guangzhou	China	4.685
19	Tanjung Pelepas	Indonesia	4.177
20	Laem Chabang	Thailand	3.834
21	Bremen/Bremerhaven	Germany	3.736
22	Tokyo	Japan	3.593
23	Xiamen	China	3.342
24	Tanjung Priok	Indonesia	3.282
25	Algeciras	Spain	3.180
26	Gioia Tauro	Italy	3.161
27	Yokohama	Japan	2.873
28	Jeddah	Saudi Arabia	2.836
29	Felixstowe	United Kingdom	2.700
30	Jawaharlal Nehru	Saudi Arabia	2.667
31	Manila	Philippines	2.665
32	Dalian	China	2.665
33	Salalah	Oman	2.492
34	Nagoya	Japan	2.491
35	Colombo	Sri Lanka	2.455
36	Valencia	Spain	2.410
37	Oakland	United States	2.273
38	Santos	Brazil	2.268
39	Kobe	Japan	2.262
40	Le Havre	France	2.119
41	Keelung	Taiwan	2.091
42	Seattle	United States	2.088
43	Barcelona	Spain	2.071
44	Tacoma	United States	2.066
45	Charleston	United States	1.987
46	Hampton Roads	United States	1.982
47	Khor Fakkan	United Arab Emirates	1.930
48	Ho Chi Minh	Vietnam	1.911
49	Savannah	United States	1.902
50	Melbourne	Australia	1.863

Source: *Shipping Statistics Yearbook 2006, Containerisation International Yearbook 2007, U.S. Army Corps of Engineers, Waterborne Commerce of the United States CY 2005, AAPA Surveys and web sites of different Port Authorities.*



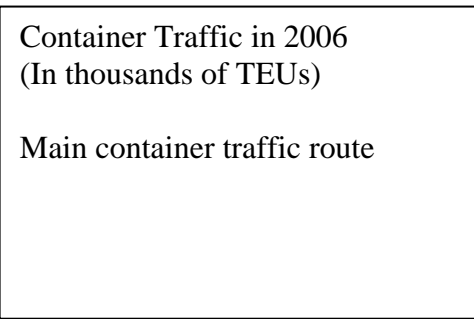


Figure 1 - Location of the main container traffic ports in 2006 and main route followed by specialist boats.





The basic points of this organisation of large networks, which link the most dynamic areas in the world, in the Mediterranean, are capitalizing on the set of top level trade nodes which are the Italian ports of Gioia Tauro, Genova, the French port of Marseilles and the Spanish ports of Algeciras, Valencia and Barcelona. In the 2006 ranking of world ports, the three Spanish ports occupied positions 23, 37 and 39 respectively. In that same year, with regard to Europe, they were in 4<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> place, with a total movement of 67.5% of all the containers handled in Spanish ports, which reached 12,135,244 containers. This traffic placed Spain in second place in the EU, behind Germany with 13.4 million and in front of Holland (9.9), Belgium (8.6) and Italy (8)

In addition to the trade of merchandise in containers, other Spanish Mediterranean ports have large quotas of loading and unloading of bulk. Thus in liquids – oils and derivatives- outstanding in 2006 were: Cartagena (19.3 Tm), Algeciras (20.4), Tarragona (18.6). In bulk solids – coals and seeds - Tarragona (11.2), Valencia (7.1), Cartagena (5.1) and Almeria (5.9). For passengers the leaders are, Algeciras, Ceuta, Barcelona and Palma de Mallorca

#### **IV. THE SPANISH MEDITERRANEAN PORTS IN THE CONTEXT OF THE PEIT (Strategic Plan for Transport Infrastructures)**

In Spain in fact, except for the metropolitan area of Madrid, the major socioeconomic developments of the past fifty years have taken place in coastal regions and in the vicinities of the large urban areas which grew up around the large ports (Barcelona, Valencia, Bilbao,...). But this functional reality generates large regional imbalances and thus several Strategic Plans for Transport Infrastructures Transport have been drawn up in an attempt to gain some territorial cohesion. However, this objective has not been achieved, as often the old eighteenth century approach converging on Madrid has been used, with little interest in the development of the transversal axes (The Bay of Biscay, Mediterranean, Valencia-Lisbon or Gijon-Seville) and with no effective approach for these land infrastructures in their convergence at the large ports. The state of abandonment of our major merchandise port Algeciras is still striking, while the Italians have built a new port, for containers exclusively, Gioia Tauro, operational since 1996, already connected to the large European transport network, by railway, motorway and feeder, and in which the European Commission and SNCF have shown interest. Yet for the Spanish only the SNCF have anticipated a link from Vénissieux via Marseilles to Barcelona and Valencia. Thus the Andalusian port is left completely cut off from any possibilities of inclusion.

### Movement of merchandise in Spanish Mediterranean ports in 2006

Port	Bulk Liquids (Tm)	Bulk solids (Tm)	Number of containers	Tm containers	Tm transit containers	Total general merchandise(Tm)	TOTAL Tm*
ALICANTE	189,406	1,642,514	172,729	1,227,880	56	1,821,111	3,730,914
ALMERIA	6,613	5,964,929	192	408	0	575,515	6,694,177
ALGECIRAS	20,410,263	2,708,226	3,244,641	38,972,968	36,479,037	43,204,439	71,719,009
BALEARES	2,161,096	2,207,301	200,697	1,374,789	4,430	9,879,868	14,519,634
BARCELONA	10,537,000	4,107,583	2,317,368	22,572,252	10,240,740	31,765,484	47,648,093
CARTAGENA	19,349,271	5,173,022	39,594	435,415	0	1,002,201	25,663,627
CASTELLON	8,120,272	3,590,891	71,660	944,675	2,010	1,546,441	13,313,718
CEUTA	904,080	66,449	10,283	60,713	276	884,457	2,306,044
MALAGA	67,429	1,984,863	450,694	3,135,128	1,887,476	3,610,586	5,793,112
MELILLA	74,447	45,826	21,227	154,053	0	690,523	2,876,767
MOTRIL	1,422,788	1,172,380	32	72	10	258,962	2,876,797
TARRAGONA	18,623,739	11,233,703	12,135	106,069	12,528	1,440,737	31,481,352
VALENCIA	4,293,049	7,187,715	2,612,139	28,157,269	10,934,856	35,781,578	47,486,506
Spanish MEDITERRANEAN	86,158,203	47,085,402	9,153,391	97,141,691	59,561,419	132,461,902	276,109,750
% above the Spanish total	58%	41.48%	75.42%	77.74%	85.28%	71.88%	59.90%
<b>TOTAL SPAIN</b>	<b>148,533,261</b>	<b>113,510,663</b>	<b>12,135,244</b>	<b>124,957,016</b>	<b>69,836,186</b>	<b>184,258,737</b>	<b>460,893,332</b>

\* Includes the provision of supplies to the boats berthed in these ports

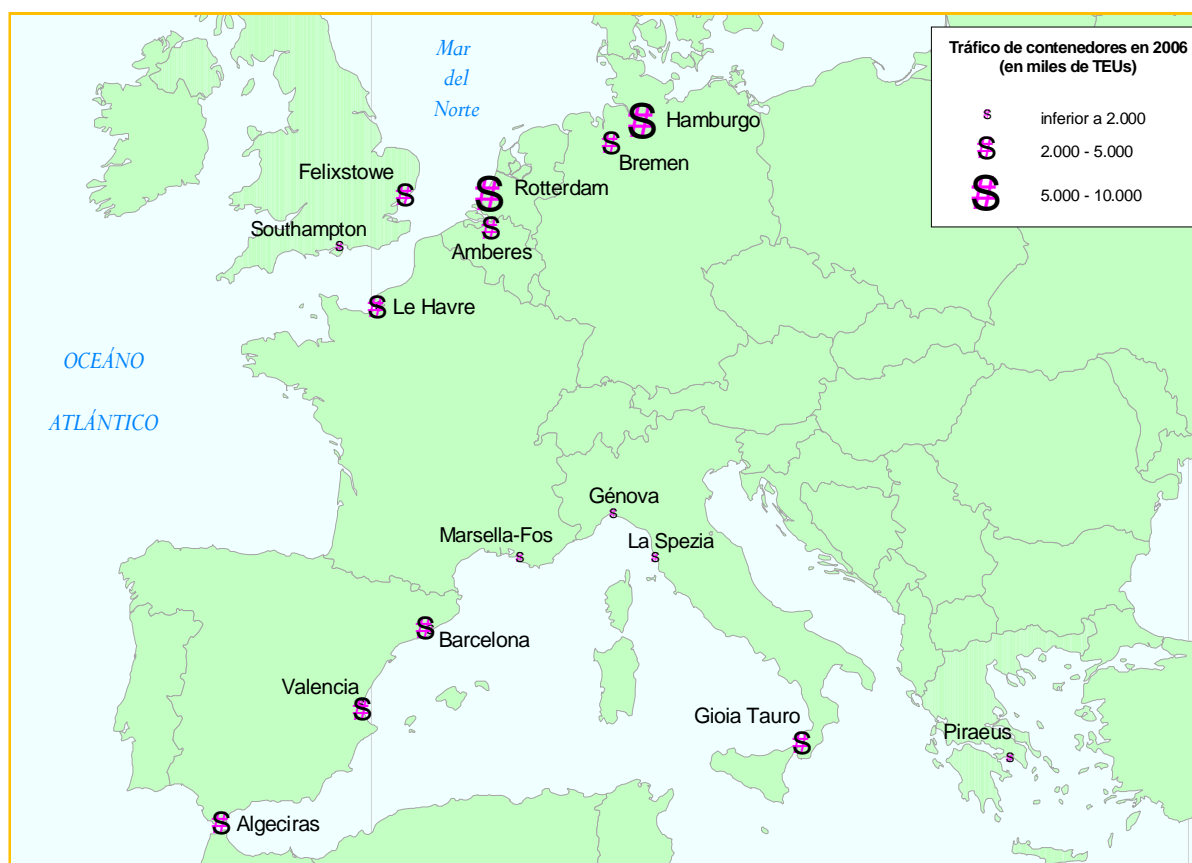


Figure 2 - Location of the main EU ports specialising in containers 2006

The Strategic Plan for Transport Infrastructures Transport (PEIT) 2005 – 2020 was approved by the Council of Ministers in July 2005. This was done in an attempt to achieve optimum operating conditions for the transport infrastructures and services in the first decades of the 21st Century, in order to achieve better economic and social development. The authors of the plan make a declaration of principles in their framework analysis recognising that between the end of the eighties and the mid nineties of the last century, Spain along with Germany was in first place in the EU in terms of the percentage of their GDP spent on investment in transport infrastructures. At present investments to this end are double the European Union averages (between 1.0 and 0.85% of GDP). Furthermore it is known that the port system constitutes the main entry and exit route for merchandise, with approximately 70% of the total. In the last decade a continuous increase of port traffic was recorded, reaching a total aggregate volume of 460 million tonnes in 2006 of particular note is that 40% was in container traffic.

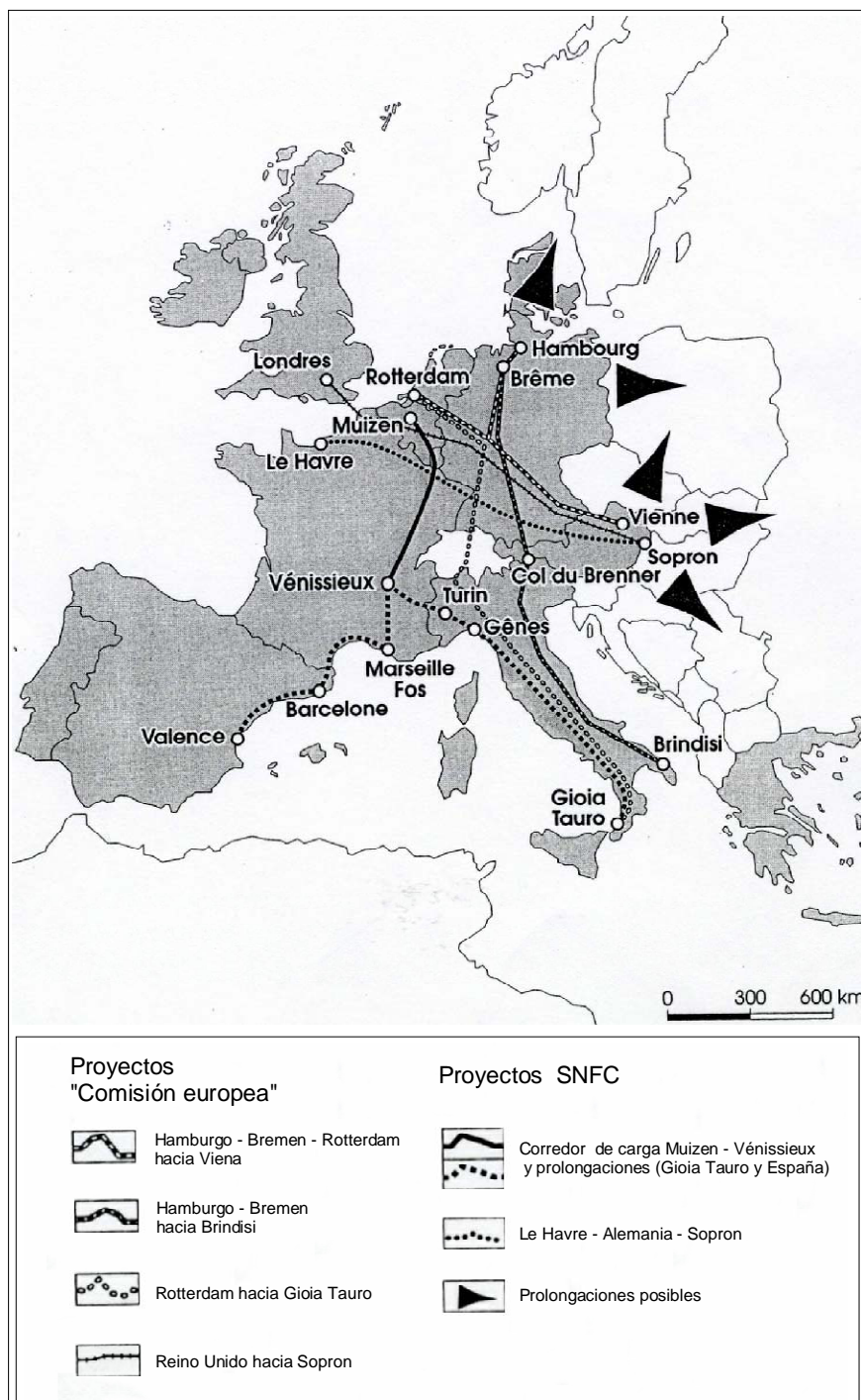


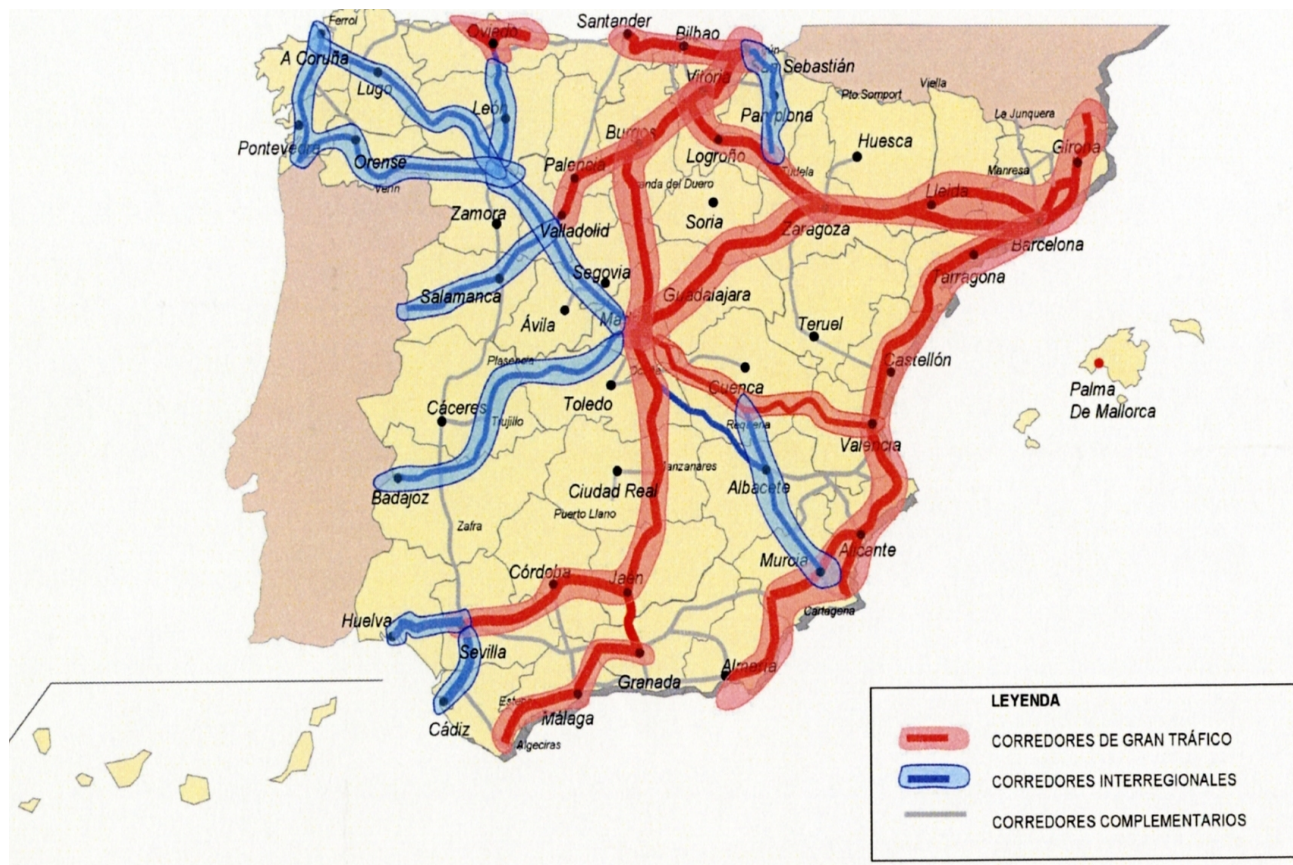
Figure 3. Projects and execution of EU railway corridors.  
Source: Wackermann, G., 1998.

"European Commission" Projects	SNCF Projects
Hamburg – Bremen – Rotterdam to Vienna	Cargo Corridor Muizen – Vénissieux and extensions (Gioia Tauro and Spain)
Hamburg – Bremen to Brindisi	Le Havre – Germany - Sopron
Rotterdam to Gioia Tauro	Possible extensions
United Kingdom to Sopron	

Some concentration can be observed of this type of transport in the ports of Algeciras (38.9 million TM), Valencia (28.1), Barcelona (22.5), Las Palmas (13.6), Bilbao (5), ... Three of these leading five ports are on the Mediterranean coast, which handled almost 36% of the total merchandise coming in and going out this year throughout Spain. For this reason, this set of ports and their hinterlands show the greatest socio-economic growth in the country.

Thus Spain is a special case in terms of its ports, its network is very disperse and poorly organised. As, while they are committed to developing at least 11 port infrastructures out of a total of 28, in France it is six, (basically Le Havre and Marseilles), Italy four (Genova and Gioia Tauro, the most), Germany two (Hamburg and Bremen), Holland one (Rotterdam) and Belgium one (Anvers). This is doubtless a particular case due to historical and spatial factors. However, in order to compete and be at the same level as the great European countries, their action policy on improving port infrastructure must be redefined in order to be able to take full advantage of their privileged position on the great world maritime traffic route.

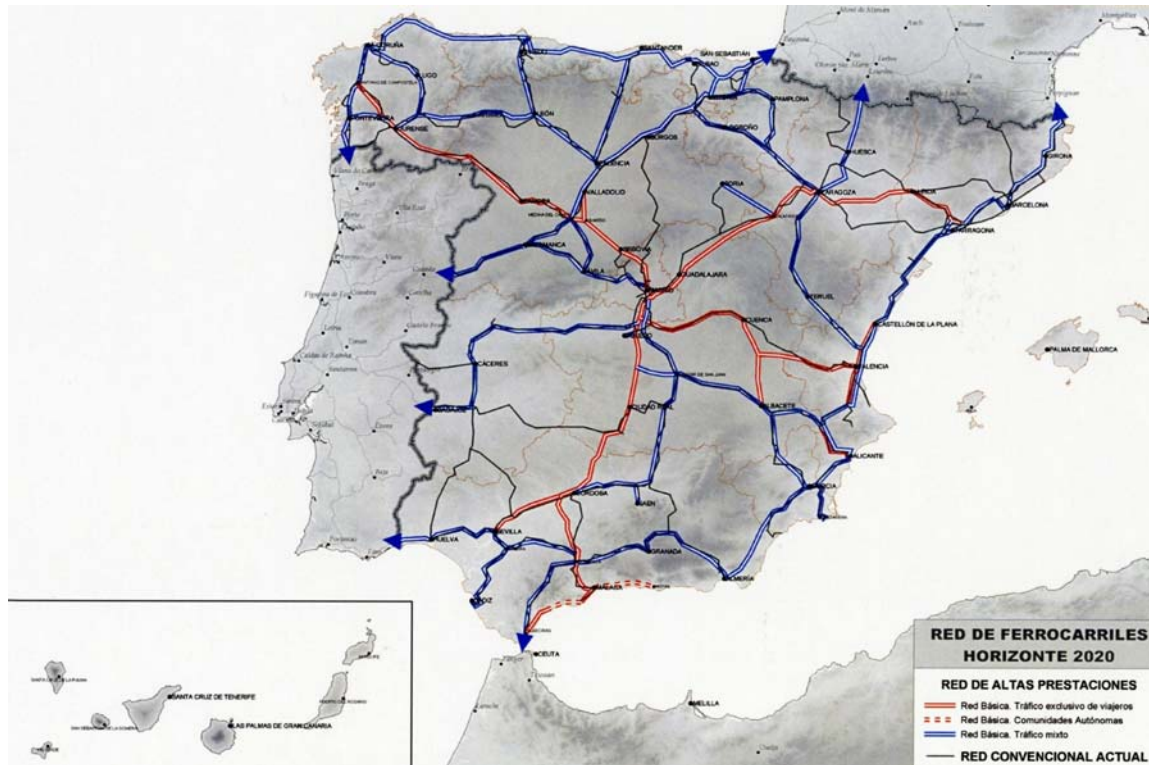
Although, in some cases regional initiatives are having a positive effect on the primacy and importance of these ports (Valencia and Barcelona), which are currently vying with one another to be at the head of container transport for redistribution over land to Spain and the south western part of Europe.



**LEGEND**  
 LARGE TRAFFIC  
 VOLUME  
 CORRIDORS  
 INTERREGIONAL  
 CORRIDORS  
 COMPLEMENTARY  
 CORRIDORS

Figure 4. Railway corridors anticipated for 2020. Source: PEIT 2005-2020. Ministry of Public Works





## RAILWAY NETWORK HORIZON 2020

### HIGH PERFORMANCE NETWORK

Basic Network exclusively  
passenger traffic  
Basic network Autonomous  
Communities  
Basic network Mixed traffic

### CURRENT CONVENTIONAL NETWORK

Figure 5. Railway network (horizon 2020). Source: PEIT 2005-2020. Ministry of Public Works

Spain's transport with the rest of the EU follows similar guidelines to the other States. The PEIT states that it is influenced by the growing integration of European economies. In

international transport of merchandise movements are by sea route or motorway (50% and 43% respectively). Cabotage is used to replace some deficiencies in the coastal regions' planning and the motorway and the railway to make up for the lack of a river network. The former supporting 86% of merchandise transport and 88% passenger transport. Cabotage is used for connections with the islands and it specialises in certain types of cargo, bulk liquids and Ro-Ro. The railway only moves 4% of the total goods, although it is expected to undergo great development later, for relations with the EU. Therefore the road must deal with the spatial organisation of relations in the Spanish peninsular interior.

If that which has been legislated by the EU in recent years is complied with on Common Transport Policy, Spain must make great changes to and rebalance their modes of transport. That which was agreed by the Gothenburg European Council in 2001 stating that "a sustainable transport policy should confront the growing intensities of traffic and levels of congestion, noise and pollution and promote the use of modes of transport which are less aggressive to the environment and the full internalization of the social and environmental costs. It is necessary to act to achieve significant disassociation between the growth of transport and GDP, *particularly by means of the modal change from the road to the railway, maritime transport and public passenger transport*". The PEIT clearly echoes these pieces of advice throughout its 160 page report for this road-railway modal change and the organisation of public transport on the outskirts of the major cities. However, although there is a commitment and a declaration of principles, these, at a first stage are geared towards the consolidation of ports as benchmark intermodal nodes but the main problem has not been dealt with, that of the prioritization of and commitment to the basic development of two or three essential port installations in order to be able to compete with neighbours France and Portugal. However, on the graph on page 97, it can be gathered that there is awareness of the matter and in the forecasts for 2020. Looking at this the following order of port priority and development can be deduced: Algeciras, Valencia and Barcelona (see figure 6).



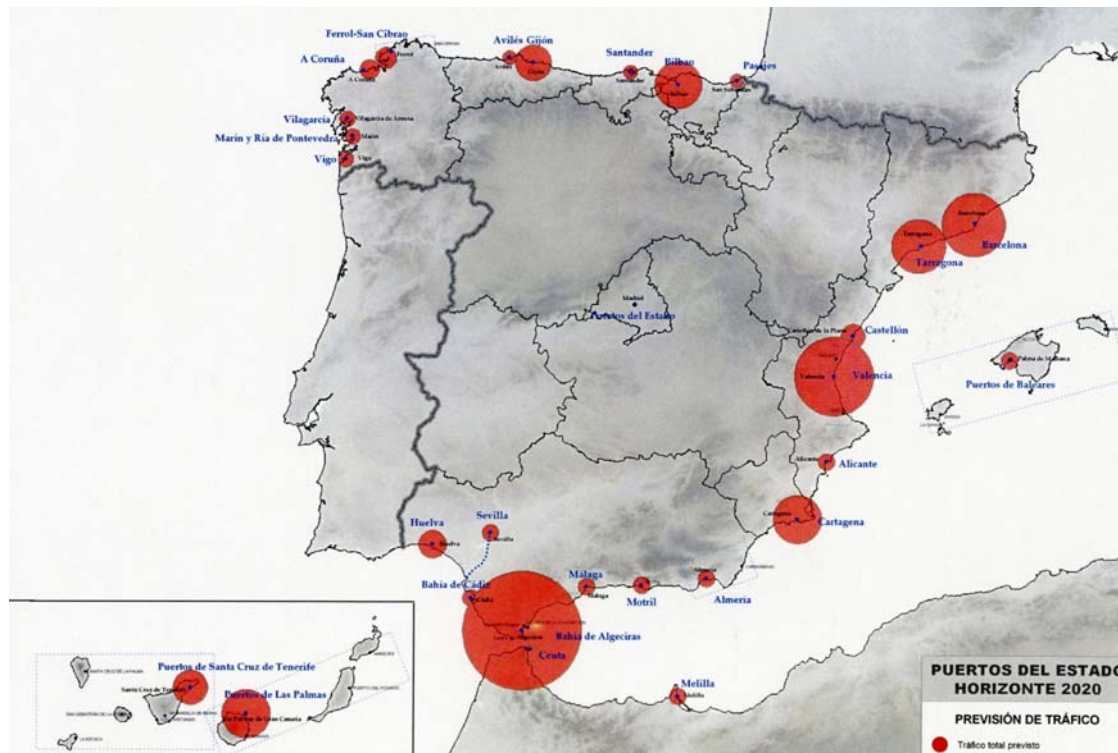


Figure 6. Ports of Spain forecasts for the 2020 horizon Source: PEIT 2005-2020. Ministry of Public Works

Also acknowledged in the PEIT is that the transport of merchandise by road was pioneering, but Spanish carriers, although they continue to lead bilateral trade (from Spain with France, Germany or Italy), are hardly present in railway trade. This intermodal conversion is in the hands of land operators or sea freight forwarders, not defining the creation of a large high performance railway line for the transport of merchandise, which would mean linking the Mediterranean port installations with Central Europe, as is happening in Italy and France with the ports of Gioia Tauro and Marseilles, respectively, to further support intermodality as in the Marco Polo programme.

J.V. Boira, J.Romero and J.Sorribes expressed their opinions on the lack of intermodal transport planning in El País of 10 July 2005 in the following terms:” The Valencian region is a great logistics platform today. The whole region is one of the areas where transport and communications play a more important role within the geography of the Spanish peninsula and not for itself alone but also for economies such as that of Madrid. And if this analysis is done along with Catalonia – and occasionally Andalusia - , we can conclude that Spain’s great logistics platform is the Mediterranean arc, between Algeciras and Barcelona. However, along with this, it can also be said that there is lack of articulation of future projects with real flows from the different economies they comprise and a lack of any general reflection on the economic market envisaged and which should determine our infrastructures”.

In this regard FERRMED, a not-for-profit organisation founded in Brussels in 2004 to promote the Rhine-Rodano-Western Mediterranean railway axis, proposed a new infrastructure for the Iberian Peninsula which would use the existing axis between Port Bou and Lorca, freed from passenger traffic and added to by improvement works on some parts of its route and the construction of a coastal extension to Almeria, Malaga and Algeciras. This hub would have the advantage of joining all the large Spanish Mediterranean ports and Marseilles, with the rivers of the Rodano and Rhine and those of the North Sea as it would go as far as Duisburg. Furthermore, it would help to take over 20,000 lorries a day off the roads. This corridor is planned to have two electrified rails and be of European width, with slopes of under 1.2% and stations and sidings suitable for trains of 1,500 metres in length and up to 3,600 Tm of freight movement with average speeds of between 80 and 100 km/h, very much above the average of 17km/h which they are currently recording in the operational section between Murcia and the French border. This axis should be totally operational between 2015 and 2020 (see figure 7).

Along with this claim for basic infrastructure, proposed from Brussels and supported by the guarantors of the Logistics Centre's Consortiums of Barcelona and Valencia and also backed by the regional governments of the autonomous regions of the Mediterranean arc, are the PEIT projects which at present only anticipate the extension of the axis between Lorca and Almeria for the combined use of travellers and merchandise.

## ■ EJE FERROVIARIO DEL MEDITERRÁNEO DE 2.500 KILÓMETROS

- Trazado del eje principal  
 ..... Ramales de conexión con ciudades o áreas relevantes

El eje FERRMED es una ruta ferroviaria que une el Mar del Norte con el Mediterráneo.

Se calcula que en esta ruta se incrementará el tráfico de mercancías un 30%.

**PRESUPUESTO**  
**APROXIMADO: Mas de 10.000 millones de euros**

### FASES DE EJECUCIÓN

- Primera fase **2010**
- Segunda fase **2017**
- Tercera parte **2025**
- Ancho de vía internacional: **UIC**
- Vía doble en todo el recorrido y gálibo GB1
- Perfil del recorrido con pendientes inferiores al **12‰**. Excepcionalmente, hasta **15‰**.
- Tracción eléctrica en todo el recorrido
- Trazado, apartaderos y estaciones aptos para trenes de **1.500 metros** y de hasta **3.600 Tm.**



- **MEDITERRANEAN 2,500 KILOMETER RAILWAY AXIS**

**Principle axis route**

**Connection branches iwht cities or relevan tareas**

**The FERRMED axis is a railway route which joints the North Sea with the Mediterranean**

**Merchandise traffic is calculated to increase by 30% on this route**

**APPROXIMATE BUDGET: More than 10,000 million euros**

**EXECUTION PHASES**

- **First phase 2010**
- **Second phase 2017**
- **Third phase 2025**
- **International track width: UIC**
- **Double track the entire route and loading guage GB1**
- **Section of route with slopes under 12%. Very occasionally up to 15%**
- **Electric traction the entire route**
- **Train path, sidings and stations suitable for trains of 1,500 metres and upto 3,600 Tm.**

Figure 7. Project for the Algeciras – Duisburg railway axis. Source: FERRMED. Ministry of Public Works

Then there are the RENFE forecasts which are focussing on freeing the traditional Malaga-Madrid-Barcelona- Port Bou railways from passenger traffic in December 2007, to use them, due to low investment, around 350 million euros, as a large merchandise communications route between Algeciras-Madrid-Barcelona-Perpignan. This project would only require substantial improvement between Bobadilla – Algeciras, and the construction of a loop around the large cities and sidings for convoys of 759 metres in length. The advantage of this would be that it could be operational for 2008. However, no mention is made of the obstacle of keeping the Spanish rail width which would make it difficult to cross the French border, as there is still no ideal system for changing the axles of moveable container platforms rapidly in operation, given the technical difficulties with their installation, due to their low height. Neither is their average speed specified where there are slopes of above 1.3% and of course, they make do with moving convoys of smaller dimensions than that proposed by the FERRMED project (see figure 8) .

Should this action proposed by RENFE take place, the most important logistics action area which exists currently in Spain, the Port of Valencia and its hinterland, would be left without railway connection, as shall be shown a little later. Furthermore, we would not be in a position to compete with the Italian project of the large logistics centre which is already operational in Gioia Tauro, near the Mesian Strait, on the large ocean routes which join Europe with the East by the Suez Canal and used by the large container ships.

Nevertheless, the authors of the PEIT are obviously aware of the above as on page 30 they state “In short, transport trends in Spain are increasingly tending towards the same direction as those of the rest of the EU. Even taking the relative peripheral situation into consideration, Spain cannot develop a policy on transport infrastructures and services based on domestic considerations alone. Not only because the community legislative framework might be a determining factor, but also because of the consolidation of transnational operators and the significance of the problems posed by transport to sustainable development, similar in all countries and in many cases impossible to tackle without common responses.”.



#### ALGECIRAS PERPIGNAN AXIS

----- Axis

#### RAILWAY NETWORK FOR 2020

Exclusively passenger traffic  
 Autonomous communities  
 Line in service in 2004  
 Mixed traffic

#### APPROXIMATE INVESTMENT IN THE PROJECT : 340 million euros

- 150 million euros for the Algeciras – Bobadilla section
- 150 millions for the city loop lines
- 40 million euros on the creation of siding for overtaking and stations for 750 metre trains

Figure 8. RENFE plans to replace the Spanish line planned by FERRMED for 2010. Source: RENFE



Thus it is clear that without a powerful railway axis, the future of the economies of the countries, regions and ports of the areas attached to the abovementioned corridor, is seriously compromised, and any possibilities reduced of new investments in these territories. This is a particularly critical aspect internationally, as globalization and the new world economy demand constant improvements in logistics processes. A rapid response is needed prior to 2010, otherwise we shall lag very much behind with the consequent negative repercussions on the three large Spanish port areas.

## **V. THE THREE LARGE SPANISH MEDITERRANEAN PORT AREAS: STRENGTHS AND WEAKNESSES.**

Of particular note out of the thirteen sets of port installations in the Spanish Mediterranean, is certainly the Bay of Algeciras, with a movement of 71.7 million Tm in 2006 with a strategic situation on the great transoceanic route which passes through the Strait of Gibraltar and in a position near the African continent, which makes it the fundamental pillar of the sea bridge which joins both continents, that is why it is an important place for passenger traffic.



Photo 1. View from the air of the Bay of Algeciras. The container terminal in the foreground.  
Source: Port Authority

But its major activities are recorded in the movement of bulk liquids and container traffic (TEU). This is why it was chosen by the Danish multinational Maersk Line as the base for their operations with the rest of the Spanish peninsula and the North of Africa in 1987. The 1,156 m

long East Juan Carlos I dock was built, to cope with these needs for merchandise movement (TEU) with a draught of 14 to 16 m and a surface area of 61 hectares for handling containers. Closed to the north by another 345 m long wharf, 15 m draught, this infrastructure currently constitutes Maersk Sea Land's base. The Isla Verde Container Terminal is in an advanced stage of construction with a 535 metre long south wharf with a draught of 15m and a 680 metre long west wharf supported over the current east protection dyke with a draught of 17.5 m with a total surface area adjacent to them of 66 hectares. A third phase shall equip this area with 2,045 metres more of wharfs and draughts of 18 – 22 m with an additional surface area of 59.70 hectares. After these works have been completed there will 2,754 metres of wharfs and a surface area of 121 hectares. To the north of the Bay the Campamento complex is being finalised, which, when these works have been completed shall have a useful surface area of 74 hectares, surrounded by wharfs with draughts of between 15 and 20 m and a total length of 1,700 m. Finally the creation of a powerful LAZ must be highlighted in the vicinity of the San Roque railway terminal, which will occupy some 350 hectares. This will be devoted to the installation of port service and transport companies, a business centre, industries and vehicle parking areas. But the chapter on land accessibility is still somewhat delayed. The motorway to Seville has now been completed and the restructuring of the Algeciras – Bobadilla railway has been planned. The port of Algeciras still functions in a basic fashion redistributing containers for cabotage. A strong competitor has appeared for this function since 2007, Mediterranean Tangiers. This is why they must rethink their future by extending their hinterland into the Peninsula and even beyond the Pyrenees by means of a good railway link.

Valencia, was in third place with 47.4 million Tm in 2006, and in second place as it moved 2,612,139 TEU. The progress of the Valencian port in recent years is due to two actions which positively affected their rise. The first action was seen to fruition by the Port Authority in the planning and execution of the Principe Felipe wharf, which along with the Levante region (Valencia and Murcia) offer a berth length of 3,000 m and draughts of over 14 m, and adjacent to the latter a surface area of 150 hectares for the container terminal, which extends towards the W along the area of the left side of the new Turia bed which acts as a LAZ and industrial estate. The second action was due to the public construction in its hinterland of several main roads and motorways which converge onto it. In particular the completion of the A-3 which brings the dry port of Coslado in Madrid closer both in time and distance, and the old railway line, which has been improved along many of its sections, working with passengers and goods. However, as has already been noted above, the great matter, as yet unresolved, is the construction of this large Mediterranean railway axis to bring it close to Central Europe and the south of the Iberian

Peninsula. Yet, with these constraints hindering its operation, its positive action as a container terminal compared to the ports which precede it and those which follow it in container movement should be highlighted. At present the *Mediterranean Shg. Co* has consolidated the Valencian port as a basic hub in Europe to deal with operations concerning the Far East. To that end its own terminal opened in March 2006 with a handling capacity of one million TEUs per year. As a demonstration of these intentions the MSC Pamela was berthed on 8th August 2005, the largest in the world in her speciality, on her first day's run from the Chinese ports, unloading 5,755 TEUs, of which 3,282 were sent out into its hinterland and 2,473 redistributed with feeder ships through the neighbouring Mediterranean ports.



Photo 2. View from the air of the Port of Valencia. Its two large container wharves can be clearly seen. Source : Google Earth (2005).

At present, the possibility is being considered of converting the Sagunto harbour, located about 25 kms to the North, into a container hub with a large adjoining LAZ, as the growth of the city of Valencia and its immediate leisure areas are impeding the enlargement of the wharves and the immediate logistics area with the consequent risks, mid term, of restricting its use for commercial purposes. This possible action is regarded favourably by Valencian regional and municipal authorities, not so by the Port Authority whose focus is still the construction of a new wharf to the east which would increase availability for the handling of large container ships.



The port of Barcelona, which aspires to be the first in its class in the movement of merchandise in general, was in second place in 2006 for this with a movement of 47.6 million TM. To achieve this aspiration they have made two Strategic Plans for their port ordinance, for 1998 – 2000 and 2003 – 2015. Along with these decisive works were undertaken, rerouting the mouth of the river Llobregat to the south, which has already been done, and the construction of a new 4,095 metre south dyke, and to the east another of 2,119 metres, there being a new entrance between both with a draught of over 14 metres and a 160 hectare extension of the LAZ over the old river delta. As a whole it is expected that the port shall have a land surface area of 1,265 hectares of which 700 shall be for the LAZ, and a total length of wharves and dykes of 29,702 metres. Once the port extension has been decided and is in progress, the second plan focuses on the organisation of its hinterland, because, as indicated by the Port Authority, it is in this field where the competitiveness of the great Catalan port lies. It is crucial to gain access to more distant continental areas to be able to make optimum use of its scale. Supremacy, already considered, as indicated above, is being vied for on land, more than on the wharves, where a clear trend can be seen in competing ports towards equality in quality of service. The conclusion is reached therefore that to maintain and increase the functionality of a port in the future its strategy needs to be developed with land in mind, in this case towards the interior of the peninsula and the north of the Pyrenees. And this means competition with the port of Valencia. For this reason the Barcelona Port Authority wants the public planners to deal with the access routes to the port by road, and above all, by rail, beyond Catalan territory.



Photo 3. View from the air of the port of Barcelona, the container terminal in the foreground, 2004. Source: Port Authority

## VI. EPILOGUE

Out of all the Spanish ports, the Mediterranean ports moved 75.42% of all containers in 2006. It is general container merchandise cargo which has grown most out of all port traffic. The degree of containerisation will exceed the current 67.8% to 80% in 2020 of general merchandise cargo, including traffic in transit. Not included in this calculation are bulk cargos. This shall mean that container activity shall go from the current over 12.1 million TEUs to some 24 million in 2020. The ports with more container traffic are now and shall be in the future, Algeciras and Valencia, which might reach 6.6 and 5 million TEUs respectively for 2020. For Barcelona, forecasts of 2.8 millions are being made, according to JIMÉNEZ SANTOS, F. (2005), although this estimate at present is completely out of date, as it already almost reached this in 2006, whereas the forecasts of the Barcelona Port Authority are that they shall exceed Valencia in the same period of time, approaching 5 million TEUs. Competition between these two neighbouring ports has been obviously going on over the past twenty years as can be seen from the movement of traffic in their harbours.

**Container movement in 2006**

<b>Ports</b>	<b>Total TEUs Movements</b>	<b>TEU in transit <i>Feeder</i></b>	<b>%</b>	<b>Distribution to the hinterland  Rail and road</b>	<b>%</b>
Algeciras	3,244,641	2,883,039	89	361,602	11
Valencia	2,612,722	808,437	30	1,804,285	70
Barcelona	2,317,368	867,235	37	1,450,133	63

From this data it can be deduced that the Port of Valencia has a better organised hinterland as it absorbs 70% of the containers moved in its wharves, compared to Barcelona's 63%. Algeciras is of particular note as having little influence at 11%.

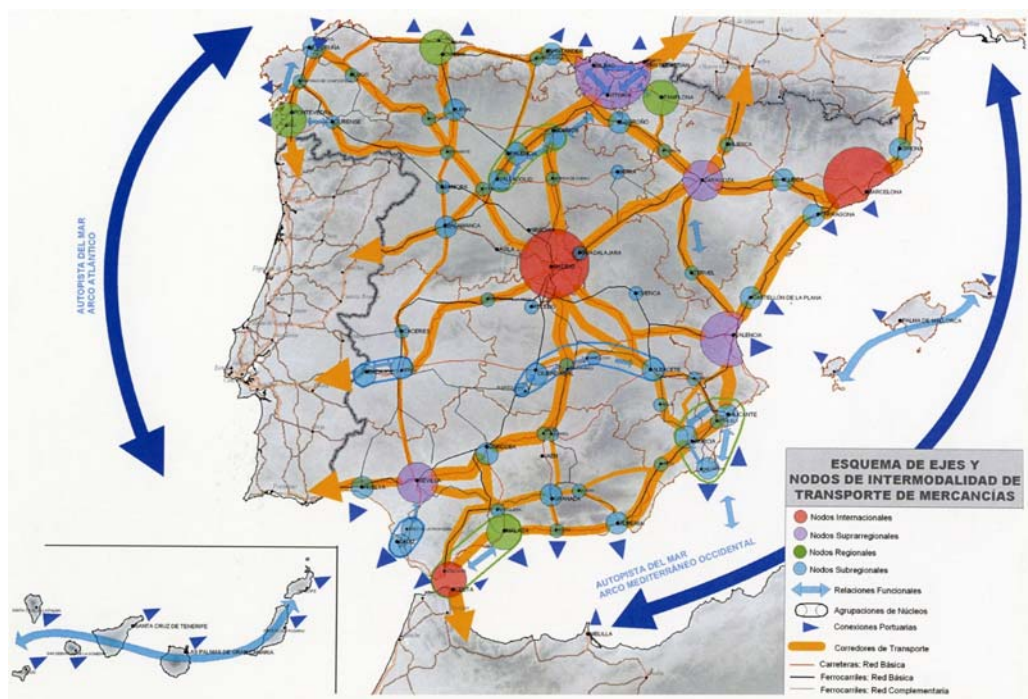


Figure 9. Diagram of merchandise transport intermodality axes and nodes. Source: PEIT 2005-2020. Ministry of Public Works

In the PEIT (2005-2020), intermodal merchandise transport is conceived as an element of rationalisation and improvement of the quality of transport. It is based on greater cooperation amongst all means of transport, the logistics chain being crucial, influencing the lowering of the final price of the merchandise in the destination markets. It constitutes therefore, a particularly critical aspect in the international area, as globalisation and the new world economy demand constant improvements in logistics processes. This declaration of principles is a response to the status quo in the international context, but when applied to the Spanish case (see figure 9) it appears that for them to be realised they are guided more by the demands of some regional governments than by the reality of current international relationships. Thus Valencia and its catchment area are placed in second place – supraregional node – when in reality it is in a leading position in international sea route trade. It is sufficient to analyse the movement of containerised merchandise through regions of the Mediterranean arc in 2006 in all of its ports:

<i>Ports</i>	<b>TEUs entrances - exits</b>	<b>TEUs transit</b>	<b>%</b>	<b>TEUs moved to hinterland</b>	<b>%</b>
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Catalonia	2,329,903	868,289	36.3	1,461,614	62.7
Valencian C.	2,612,139	808,568	28.4	2,047,960	71.6
Murcia	39,594	0	0	39,594	100
Andalusia*	3,695,559	3,193,956	86.5	501,603	13.5
Balearic Islands	200,697	665	0.4	200,032	99.6

\* Does not include the Atlantic Ports of Andalusia.

Container movements clearly demonstrate how the Valencian Community is the most dynamic logistics area of the entire Spanish peninsula. It has a special relationship with the economy of Madrid via the port of Valencia. In essence, we have a flow which benefits that community in general terms and its main port. It should be remembered that almost a quarter of Madrid's exports and imports by sea use the Valencian port. In this case, according to BOIRA, V; ROMERO, J.; SORRIBE, J. (2005) the terms of the relationship are precise: "an economy which is highly dependent on a port and a port which, in part, feeds off this relationship". But there is much more, the hub of the Spanish Mediterranean arc, as such, has not formed a part of the network of projects which the Van Miert Commission, formed at the heart of the EU, brought to the attention of Brussels, within the trans-European communications projects, which does include that of Sines (Portugal) – Madrid- Barcelona- Central Europe, as a relationship axis.

Once again, it seems that the planners are turning their backs on an operational reality of the Mediterranean Arc, although it has several deficiencies, in particular railways to the North and South. It is now that it is essential to serve an advanced service economy, with a logistics base and industrial and modernized agricultural activities, such as those which are being developed from Barcelona to Almeria. Therefore, greater interregional integration is needed, overcoming political barriers and achieving the socio-economic development necessary to gain a good position in the future afforded us by globalization and in which Spain, due to its geographical position, shall be called to play a vital role in international trade exchange as a whole, as already indicated by its being in second place amongst all the countries of the EU in container merchandise trade in 2006.

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