



GOBIERNO
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WEST-MOS

Western Europe Sea Transport &

Motorway of the Sea
2005-EU-90609-S-SINCOM



Port de Barcelona

D 7.8 – BARIT PRACTICAL STUDY

MARKET STUDY AND COST BENEFIT ANALYSIS AT MICRO LEVEL

Barcelona - Italy



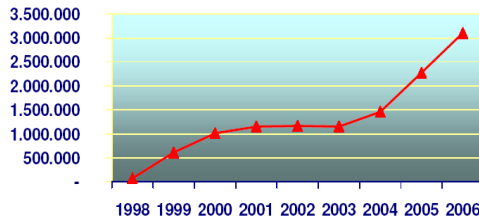
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Project co-funded by the European Commission within the trans-European networks budget (TEN-T)

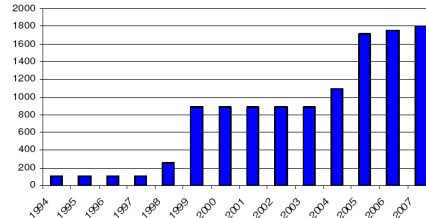


Port de Barcelona has made a resolute bid in favor of Short Sea Shipping and Motorways of the Sea

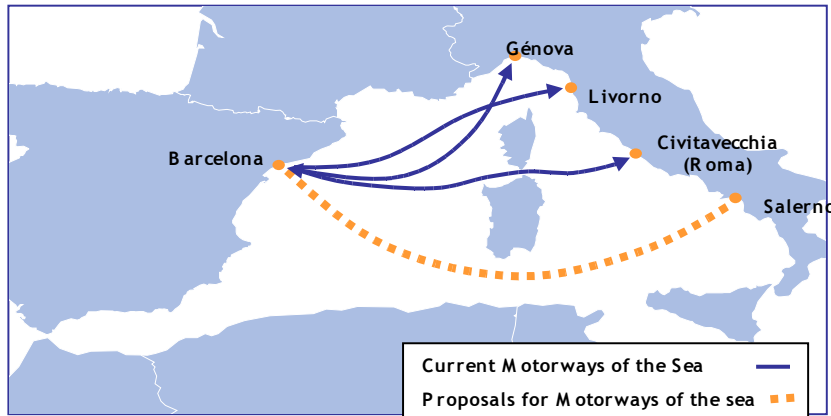
Traffic Evolution (in tonnes) of the SSS services with Italy (1998-2006)



Stopovers have grown spectacularly during the past years



Nowadays Port de Barcelona has already three services of Motorways of the Sea while this offer could be extended



2008

Livorno will increase frequency to daily
Tanger will increase frequency to twice a week

2007

Beginning of Barcelona/Livorno's service (3 times a week) and Barcelona/Tangier's service (once a week)

2006

Beginning of Barcelona/Algeciras/Tangier's service (once a week)

2005

Barcelona/Roma's frequency increased daily (except for Sundays)

2004

Beginning of Barcelona/Roma's service (3 times a week) and Barcelona/Tunisia's service (once a week)

1999

Barcelona/Genoa's frequency increased daily (except for Sundays)

1998

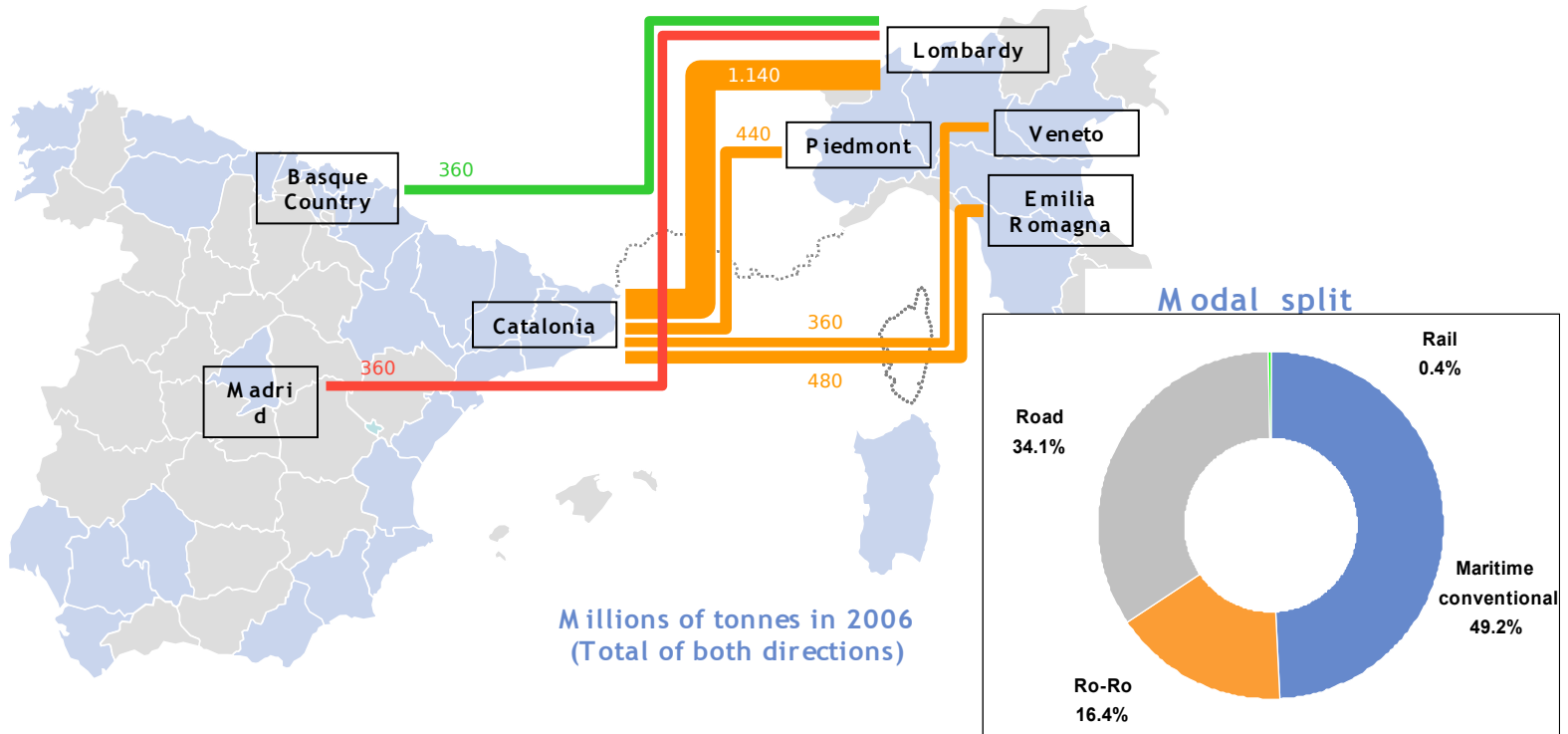
Beginning of Barcelona/Genoa service (3 times a week)

1994

First routes: Barcelona/Tunisia and Barcelona/Oran (once a week)

Regarding nowadays demand, there are six regional O/D relationships of more than 350,000 t/year, which means 30% of road traffic

These six O/D relationships over 350,000 t/yr moved more than 3 million tonnes by road in 2006. The remaining O/D relationships, below 350,000 t/yr, account for the remaining 6.5 million tonnes moved by road between Spain and Italy



Source: own creation based on data from the Hispano-French Observatory of Pyrenees Traffic

- New vehicles, chemical products and metallurgy and other manufactured goods make up more than 50 % of road traffic between Spain and Italy
- Among exports to Italy, important flows are those of fruit and vegetables from regions such as Valencia, Murcia and Andalusia.

Changes in the modal spread in the next years will be most affected by the development of the Motorways of the Sea and *ferroutage*

- According to the European Commission's forecasts for modal growth, the current split between land and maritime transport in Spain-Italy flows must be maintained (except in the unlikely event of a change in the structure of products involved in the trade)



The capacity of a daily return journey by a *ferroutage* train is half the capacity of a Sea Motorway with three calls per week



- However, moderate changes in the detailed modal distribution between Spain and Italy are predicted as a consequence of two factors:

The development of *ferroutage*:

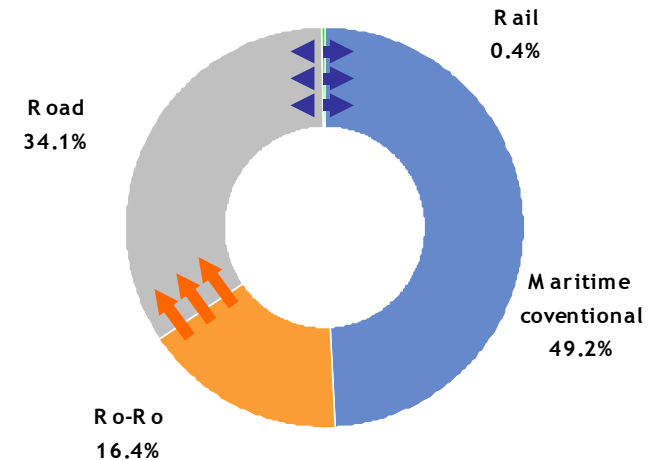
This will produce an increase in the modal participation of rail due to the acquisition of some maritime container flows and road traffic.

Its potential is not thought to be great: the final participation of rail will not exceed 5%.

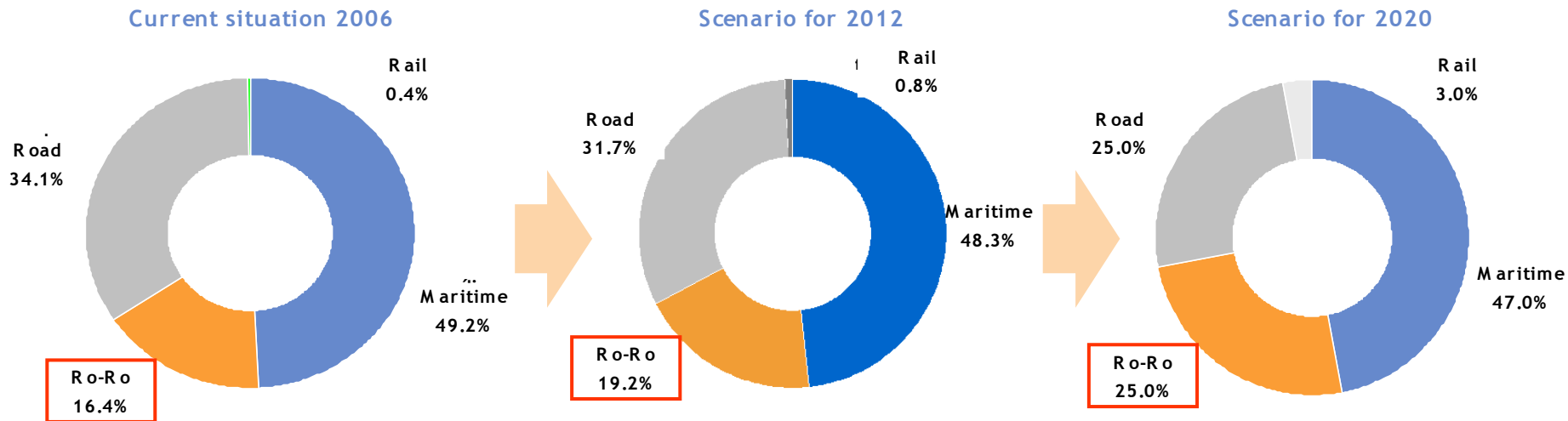
The development of Sea Motorways:

These will produce an increase in the modal participation of Ro-Ro services at the cost of the current modal participation of road transport.

In the next years, in accordance with the promotion policies underway, the modal impact of Sea Motorways is predicted to be notably greater than that of *ferroutage*.

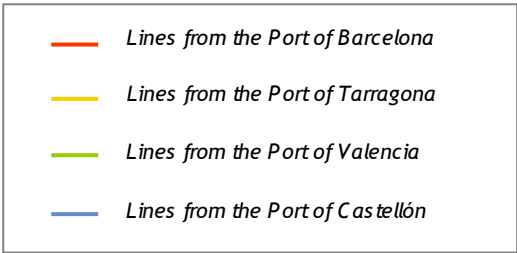
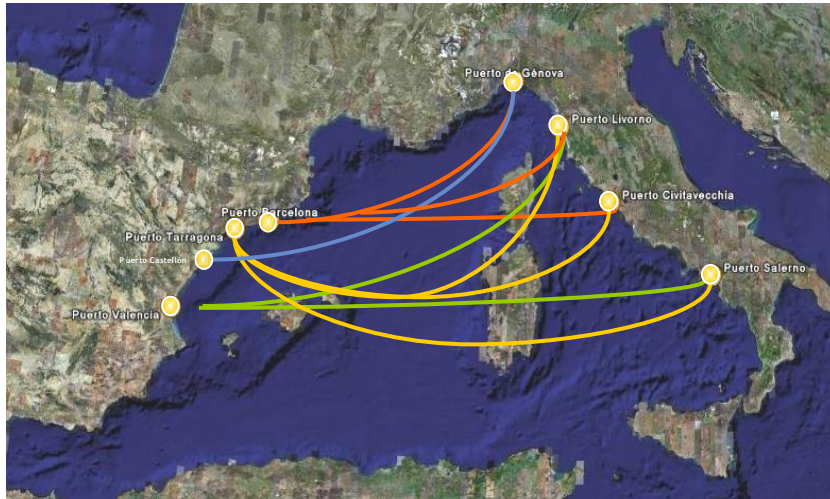


Attending to all the previous R o-R o services are expected to represent 25% of the Spain-Italy in the scenario for 2020

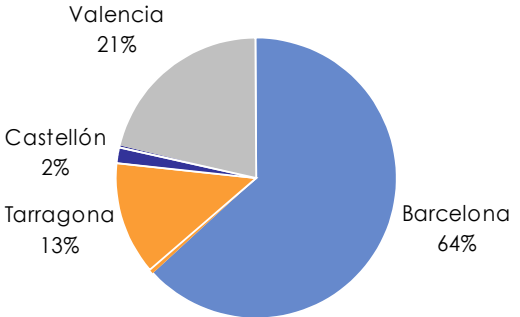


- According to the relative weighting of imports and exports between Spain and Italy, and the potential of R o-R o services in each direction, these services could reach a modal share between 35 and 60% of the total flow.
- However, for the 2020 scenario, considering the slow growth in supply, a 25% share (which implies a tripling of current demand for Ro-Ro services by 2020) is considered more realistic.

The current supply of freight transport with Italy by R o-R o/ P ax ships, is located in four ports from the Spanish M editerranean arch



Distribution in Spain of the Italian market in R O-R O freight transport as a function of the supply capacity



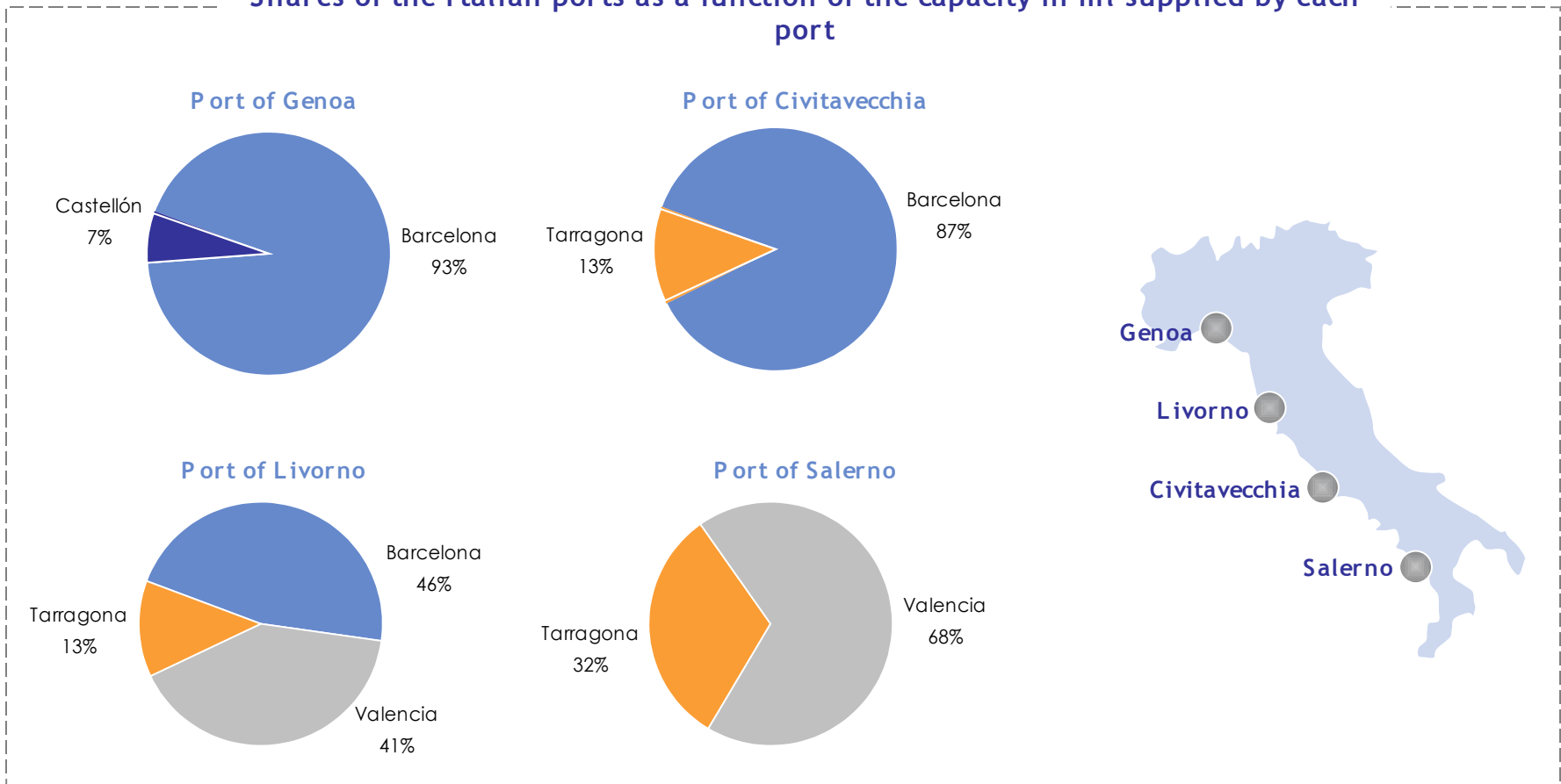
The Port of Barcelona offers the greatest annual capacity for R O-R O freight transport to Italy

Source: own creation based on data from the services



The supply to the Italian ports is absorbed by the different Spanish ports with the distribution shown below

Shares of the Italian ports as a function of the capacity in ml supplied by each port



Source: own creation based on data from the services



An exhaustive study, considering quality criteria defined in the WEST-MOS study, has been made of the current SSS supply between Spain and Italy and has made possible to identify the following bottlenecks in the Port of Barcelona ...

Operations

- Need for improvement in the tasks of loading/ unloading
 - Make possible flexible contracting of stevedores by hours and quantities
 - Shipping companies' own personnel to be in charge of placement of towropes on the ship

4

1 Organisation of the terminal

- Improvement and extension of specialised Ro-Ro traffic facilities with exclusive places for shipping companies

Main bottlenecks in the Port of Barcelona

Superstructures

- The new terminal must include the following services:
 - Waiting rooms for drivers
 - Suitable services for traffic and passengers
 - Control of lorry traffic
 - Customs facilities
 - Immigration control facilities

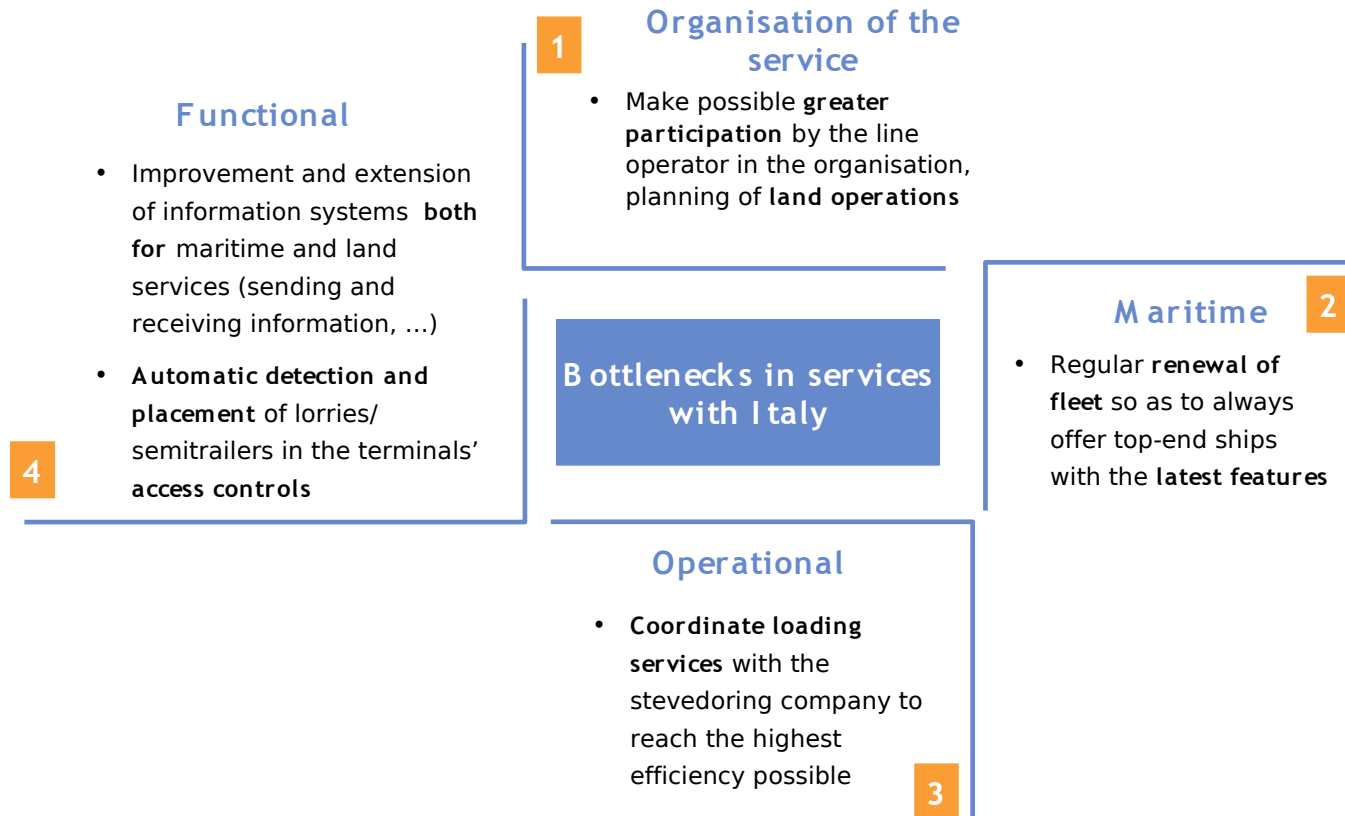
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Infrastructures

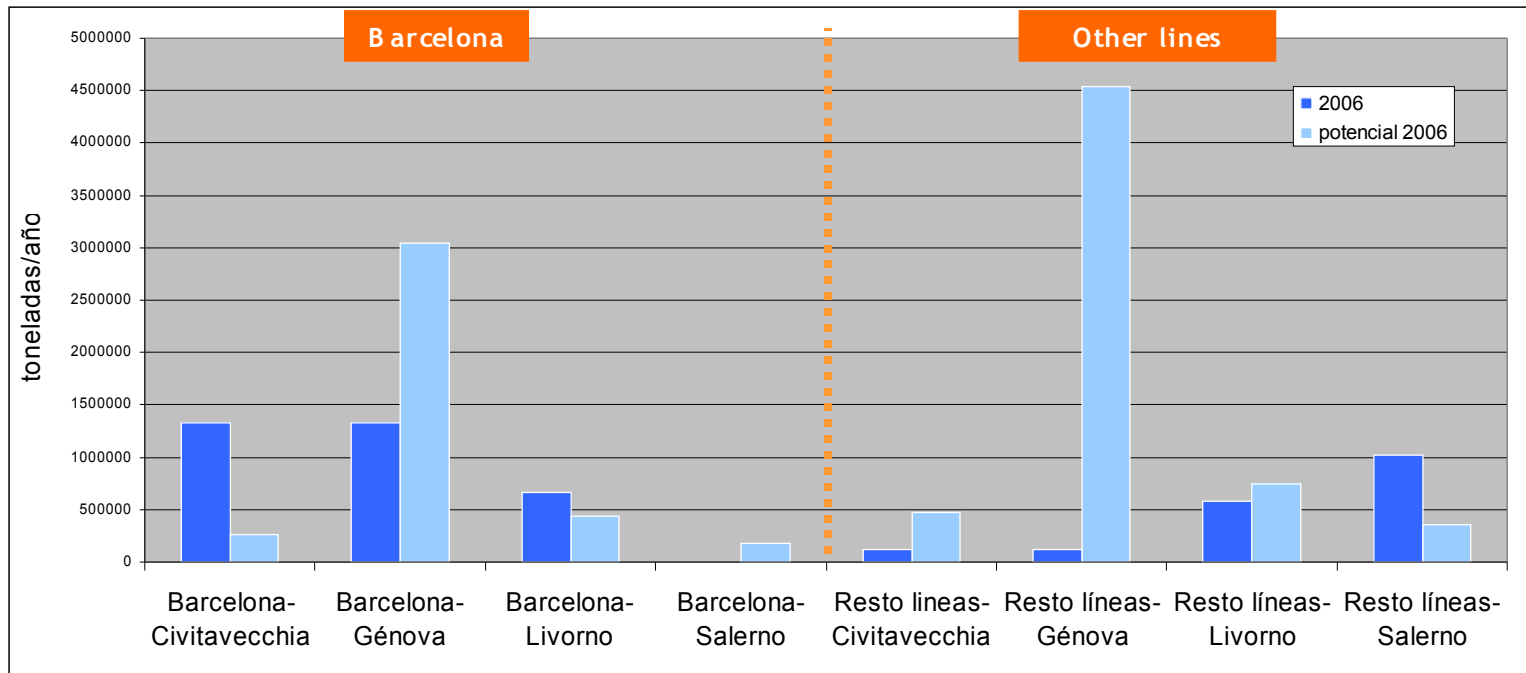
2

- Improve land access to facilitate intermodality
- Ensure adequate connections with the city for passengers when the new specialised Ro-Ro terminal is constructed beside the Prat dock
- Improvement and extension of rail connections with port terminals

... and the problems that exist in the SSS with Italy

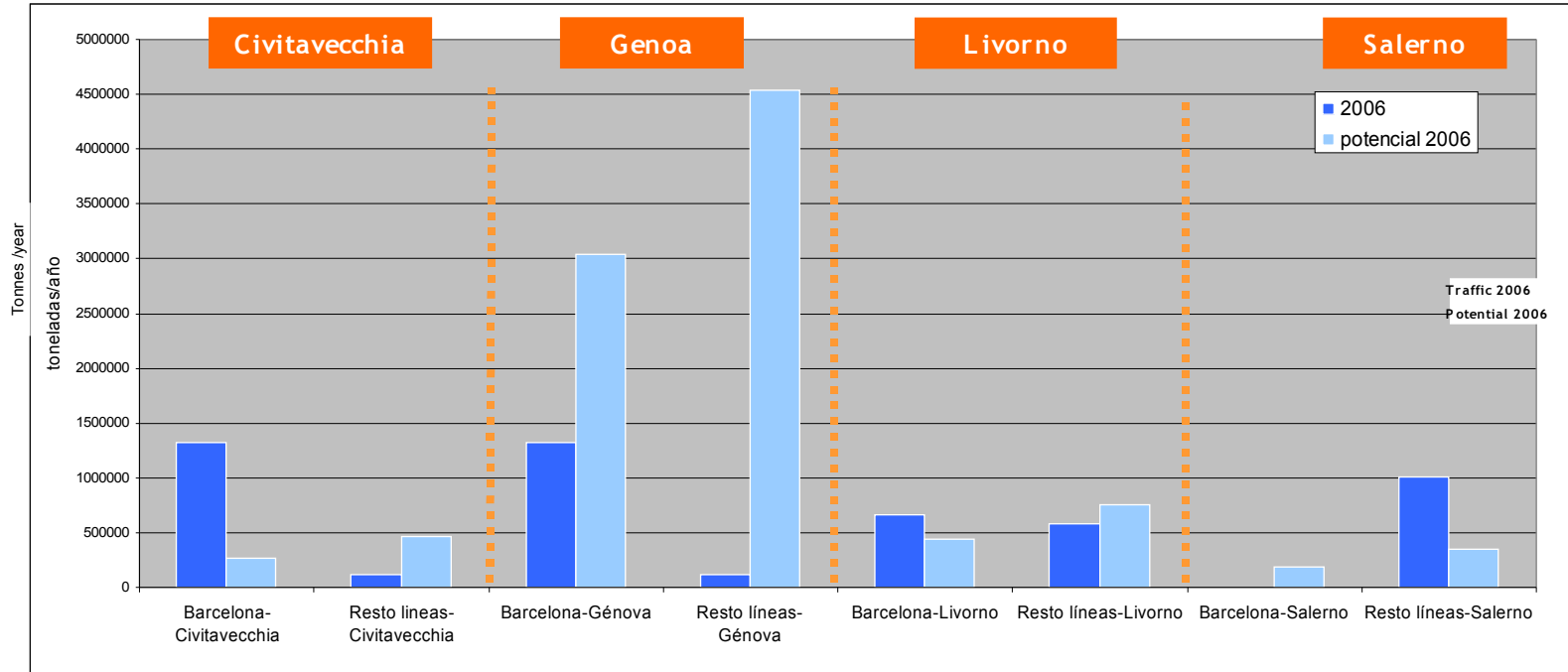


Analysis of potential demand 2006: From all the Spanish ports, there is a significant potential for R o-R o services with Genoa which nowadays is underserved



- The Port of Barcelona has the bigger offer of Ro-Ro services with Italy (64%)
- The Port of Barcelona has its offer oriented towards Genoa and Civitavecchia while the others are oriented to Livorno and Salerno.
- The potential Italian market is highly concentrated on the port of Genoa.

Analysis of the potential demand 2006: Currently, the Livorno, Civitavecchia and Salerno lines have more demand than real potential



- The impossibility of absorbing the Port of Genoa's strong existing potential demand (generated by the industrial regions in the north of Italy) has made possible the significant development of alternative lines to secondary ports: Barcelona-Livorno, Barcelona-Civitavecchia, Valencia-Livorno, Valencia-Salerno.
- That is to say, significant demand for possible lines with the Port of Genoa is transferred to other lines with nearby ports (Civitavecchia, Livorno).

Scenario 1: supply focused in one main corridor B arcelona-Genoa

- This scenario foresees major development of the supply with Genoa from Barcelona to meet the high potential demand.
- The remaining lines will maintain low levels of supply, as nowadays.
- The Port of Barcelona supply would capture demand from the nearest hinterlands and could reach a potential demand of **9 million tonnes annually in 2020**, which would make possible to convert the services to Genoa into a true Motorway of the Sea (5 departures daily).
- However, this concentration of the offer in Genoa is probably not possible due to the congestion it could cause.
- As a result, a scenario should be chosen including other alternative lines to Genoa such as Barcelona-Livorno and Valencia - Civitavecchia.

Scenario 2: supply focused in two main corridors B arcelona-Genoa and B arcelona-Livorno

- This scenario comes from the congestion problems that could generate the concentration of the offer in Genoa
- The solution could be another big corridor between **B arcelona and Livorno** which would complete the service from **B arcelona to Genoa**
- The Port of Barcelona would capture a potential demand about **9 million tonnes in 2020** with 3 daily departures to Livorno and 2 to Genoa

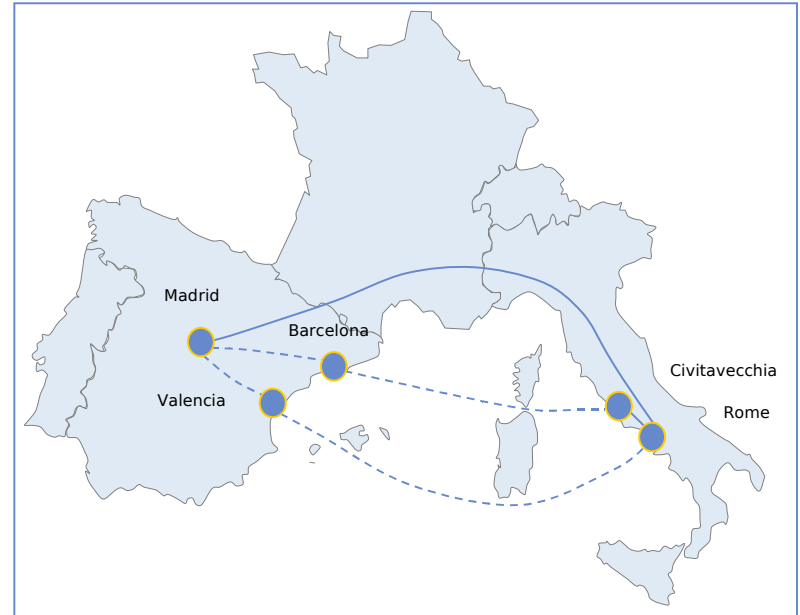
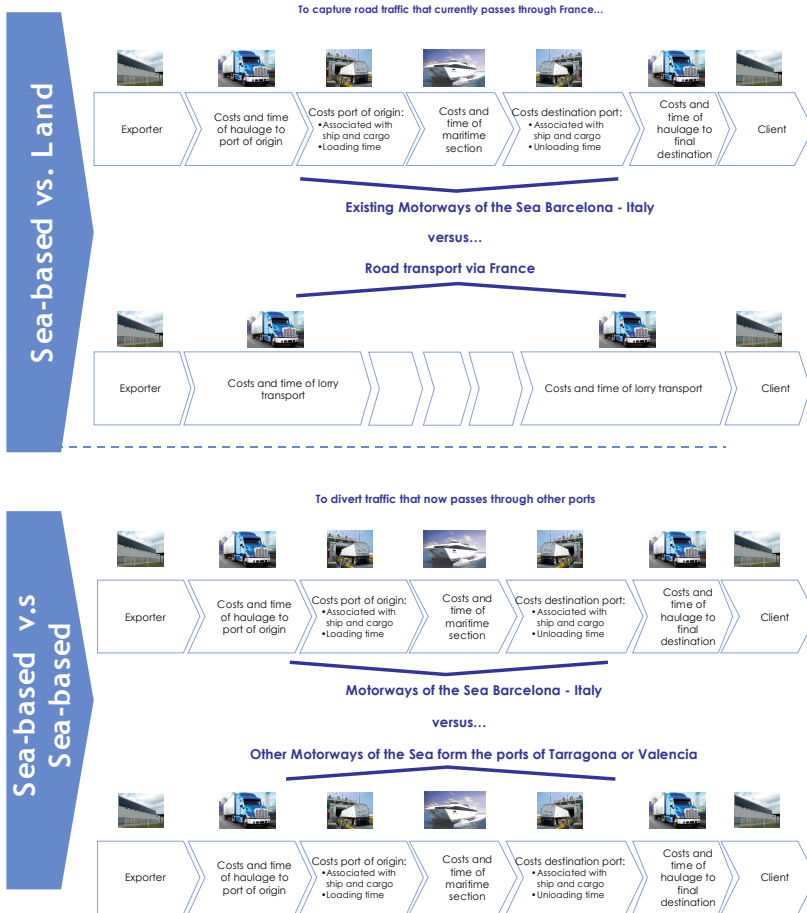
Scenario 3: maximum distribution of supply among all ports

- A scenario with a network of Ro-Ro services that connects any two of the ports would create maximum dispersion of demand and lowest departure frequencies (lower demand in each line)
- A low frequency and reduced demand will make some lines economically unviable in this scenario.
- In this scenario, it would be difficult for a service to offer sufficient weekly departures to justify the denomination of Sea Motorway, and consequently the capture of potential demand will be low.
- For the Port de Barcelona, this scenario reduces potential demand to **6 million tonnes in 2020**, strictly from its own hinterland (each port serves its hinterland with its supply in this case).

Scenarios 4 and 5: 4:supply distributed in Spain and concentrated in Italy 5:supply concentrated in Spain and distributed in Italy

- These are mixed or intermediate scenarios, in which different supply development strategies are used for Spanish and Italian ports: supply centred on two ports for one country, while it is distributed between all ports in the other.
- In general, these scenarios generate a certain asymmetry between the two directions of trade. As well, the dispersion of the supply on one of the two coasts will cause a low frequency of services.
- For the Port of Barcelona, scenario 5 would be preferable to scenario 4, since the former concentrates the supply in Barcelona, as in scenario 1.
- For this reason, the potential demand in this scenario for the Port of Barcelona could be less, although close to scenarios 1 and 2 (9 million tonnes in 2020)

On the one hand, economic viability will depend on the competitiveness of each of the lines ...



Cost land route
Cost alternative maritime-based route

vs.

Estimated costs of
maritime -based
route shown

% savings in time and cost

... and on the other hand, the profitability of these lines will be an important factor

Revenues

- Tariffs
- Volumes, growth and capture hypotheses in the following years
- Ramp-up (in case of a newly created line)
- Marco Polo II
- Ecobono:
 - Italy end 2007
 - Spain 2008?

Expenses

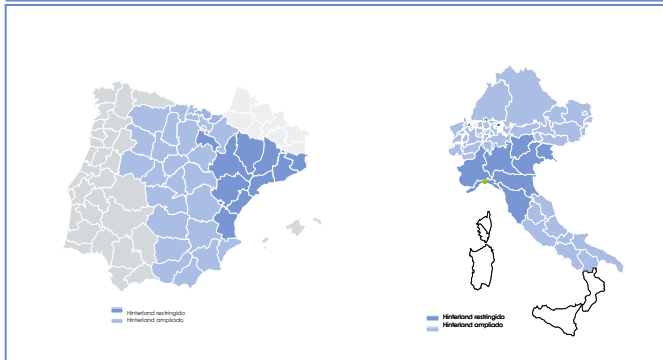
- Fixed costs
 - Rental of ships
 - Administration and sales
 - Fuel (fixed)
- Variable costs
 - Fuel (variable)
 - Operating costs
 - Expenses of ship in port
 - Freight and passenger fees

Results

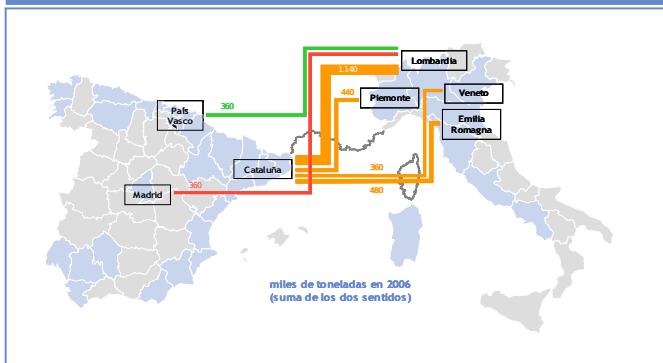
- P&L account
- Break even
- Sensitivity analysis
 - Rental costs
 - Loading costs
 - Tariffs

The competitiveness study of the lines must focus freight search on those routes where the SSS is most profitable

Theoretical *Hinterlands*



Freight flows

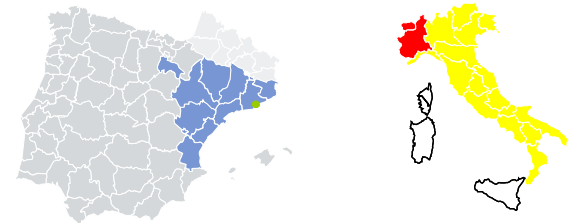


Characteristics of the service studied

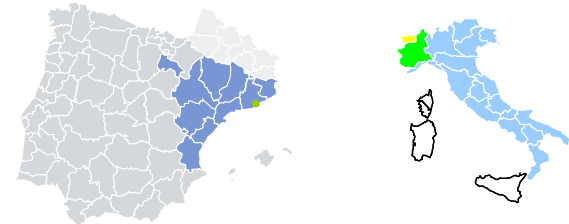
Competitiveness in time and cost

Savings

Cost savings



Time savings



Study has also been made for the current profitability of existing lines, the expansion of the supply and the opening of a new service with Salerno

- The current existing services are the following lines, with the frequencies and operators shown below:

B arcelona-Genoa

6 sailings weekly


 GRANDI NAVI VELOCI

B arcelona-Civitavecchia

6 sailings weekly



Grimaldi Group Napoli

- Expansion of the current service supply:

B arcelona-Livorno

Instead of the current
 3 sailings weekly → 6 sailings weekly



Grimaldi Group Napoli

- Possible new services: viability and break-even study

B arcelona-Salerno

2 sailings weekly
 Traffic expected in the most optimistic scenario according to potential demand

Example: Analysis of the hypothetical Barcelona - Salerno line with service 2 days per week (1 of 2)

Hypothesis for traffic prognosis

- Based on this study estimates required, the following potential demand figures were reached:
 - Barcelona - Salerno line: **182,010 t**
 - Tarragona - Salerno line: **122,124 t**
 - Castellon - Salerno line: **75,578 t**

Given that, there is no regular service between Salerno and any of these ports and in order to study the economic viability of a line from Barcelona, an optimistic estimate of capture will be made, as follows:

- **First year:** 100% demand Barcelona line
- **Second year:** 25% demand from the Tarragona and Castellon lines
- **Third year:** 25% demand from the Tarragona and Castellon lines
- **Fourth year:** 25% demand from the Tarragona and Castellon lines
- **Fifth year:** 25% demand from the Tarragona and Castellon lines

Vessel characteristics

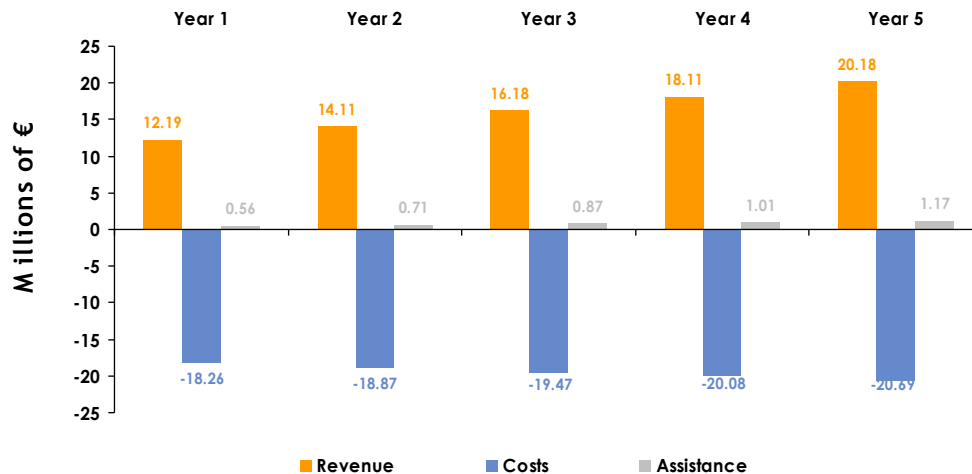
Type	“Other”
Year construction	2007
Length	200 m
Beam	25 m
Draught	7 m
Maximum speed	20.0 mn
Cargo capacity in ml	1,600 m
Cars	100
Passengers	400
Power (kW)	15,000
GT	25,000

Line characteristics

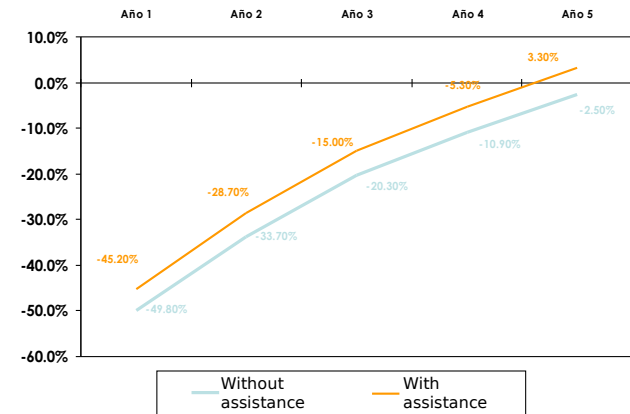
Frequency	2 days/week
Duration journey	32 hours
Nº ships required	Other (see 1 above)
Type of ship	Other (see 1 above)

Example: Analysis of the hypothetical Barcelona - Salerno line with service 2 days per week (2 of 2)

Evolution of revenue, spending and assistance



Evolution of profitability

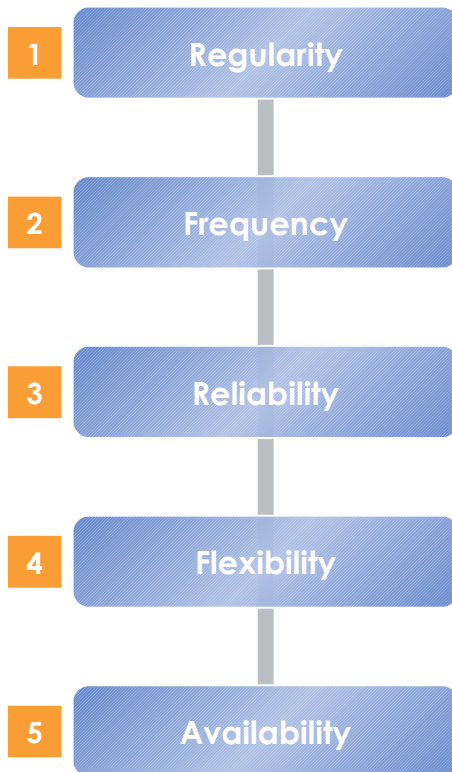


- **Benefits with assistance:** during the fifth year of operations (as long as assistance last 5 years)
- **Benefits without assistance:** not reached in 5 years with optimistic traffic scenario

In an optimistic traffic scenario (At the end capturing all the potential demand) the line will begin to make a profit in the fifth year of operations as long as the Marco Polo II assistance is maintained for the whole of this period

Taking into account the valuation achieved, considering the existing quality criteria, both by the SSS services and the implied ports, the three existing lines connecting Port de Barcelona with Italian ports may be considered as **Motorways of the sea**

Service's quality dimensions



Barcelona - Génova



Grimaldi Group Napoli

Barcelona - Civitavecchia



Grimaldi Group Napoli

Barcelona - Livorno



The Port of Barcelona, in order to develop its potential fully, must focus efforts on minimising the bottlenecks that have been identified

B ottleneck	I mprovement required
<p>1 Port Infrastructures</p>	<ul style="list-style-type: none"> - Increase available space, with new terminals specialised in SSS and M OS - Extension of current auxiliary services to drivers in the SSS and M OS terminals - Full compliance with the quality requirements for port infrastructures for SSS and M OS - Extension and improvement of rail links
<p>2 Accesses to the port</p>	<ul style="list-style-type: none"> - Make better and more independent accesses to port - Enlarge accesses and waiting areas at SS and MOS terminals
<p>3 Loading/ unloading</p>	<ul style="list-style-type: none"> - Greater flexibility in contracting stevedores that can be adapted to the loading unloading requirements - Ability for shipping company employees to carry out operations in the Terminal
<p>4 Information systems</p>	<ul style="list-style-type: none"> - Improvement in current PortIC systems so that they are better focused on the special requirements of SSS and MOS



Port de Barcelona



Thank you for your attention

Project co-financed by the European Union from the trans-European transport networks budget (TEN-T)



Proyecto cofinanciado por la Unión Europea con cargo al presupuesto de las redes transeuropeas (RTE-T)

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