alta velocidade

Portugal
mais próximo

The Portuguese High Speed Rail Project

Norway, 17th November 2009

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Projecto co-financiado pela União Europeia

Definition of the Project

Main issues:

1. **Why** did Portugal consider **high speed rail**?
2. How should the **State develop and coordinate the project**?
3. Which should be the **network shape** and which **cities** should be served?
4. Which should be the **travel time** and therefore the **design speed** in each axis?
5. For which **type of traffic** should the lines be designed? (passenger or mixed)
6. How should the **articulation with the conventional rail** network be made? (different gauge)
7. How should the **articulation with other transport modes** be made? (airports, ports and road)
8. What should be the **business model** for the project?

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1. Why did Portugal consider high speed rail?

Sustainable Mobility – improve the competiveness of the rail transport while **reducing sinistrality, emissions** and the country's **dependence of oil based energy**

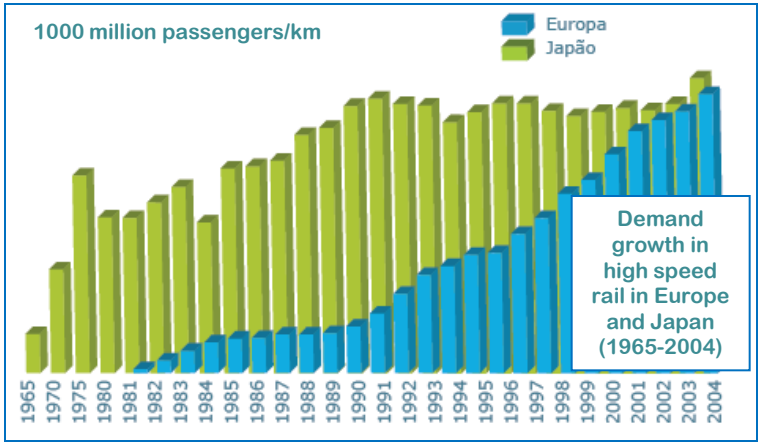
Release of capacity in the conventional rail network – improving suburban, regional and freight rail services

Increase the competitiveness of the port, airport and logistics systems – improving their **articulation** and making their **area of influence broader**

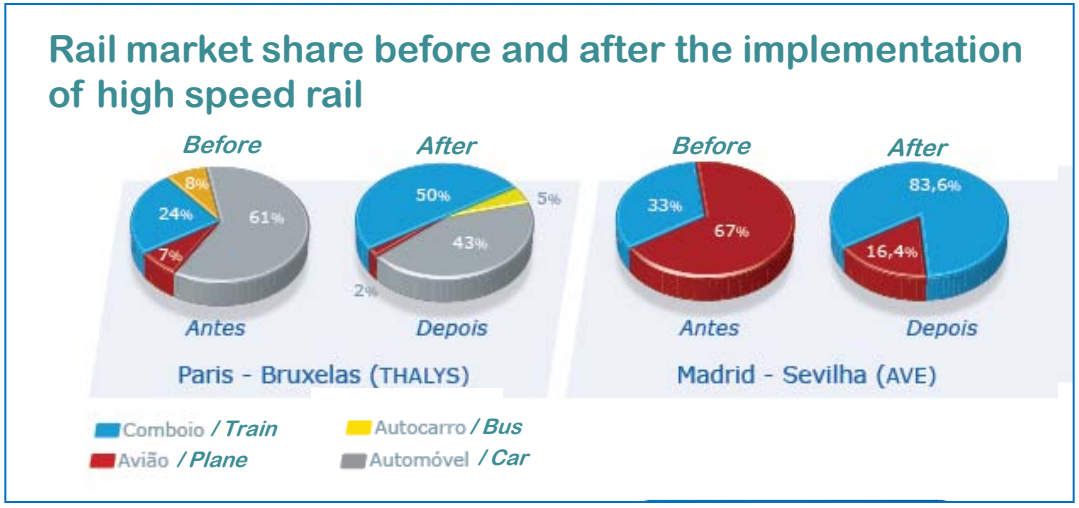
Structuring the European Atlantic south-west front – bonding the region and contributing to its **competitiveness**

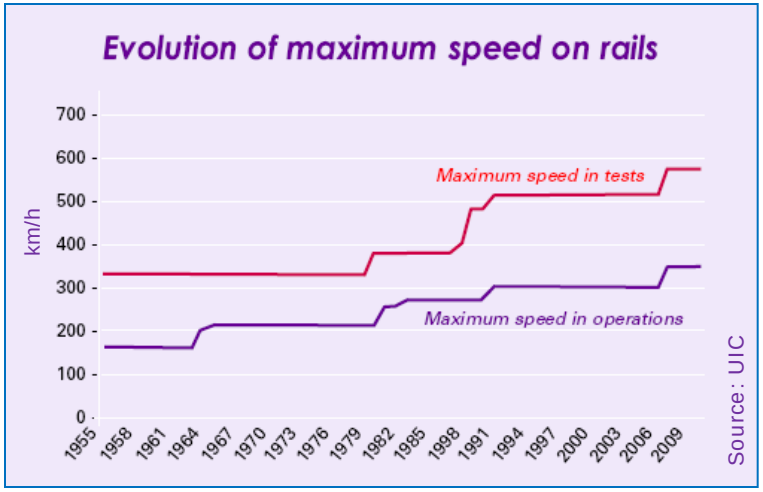
Integration of the national rail network in the Trans-European Rail Network – assuring the **interoperability** both in the **passenger and freight** transport

High Speed Rail has proven to be a social and commercial success



High levels of demand are increasing the rail market share





The maximum speed of the rail lines has been increasing, improving the high speed rail competitiveness regarding other transport modes

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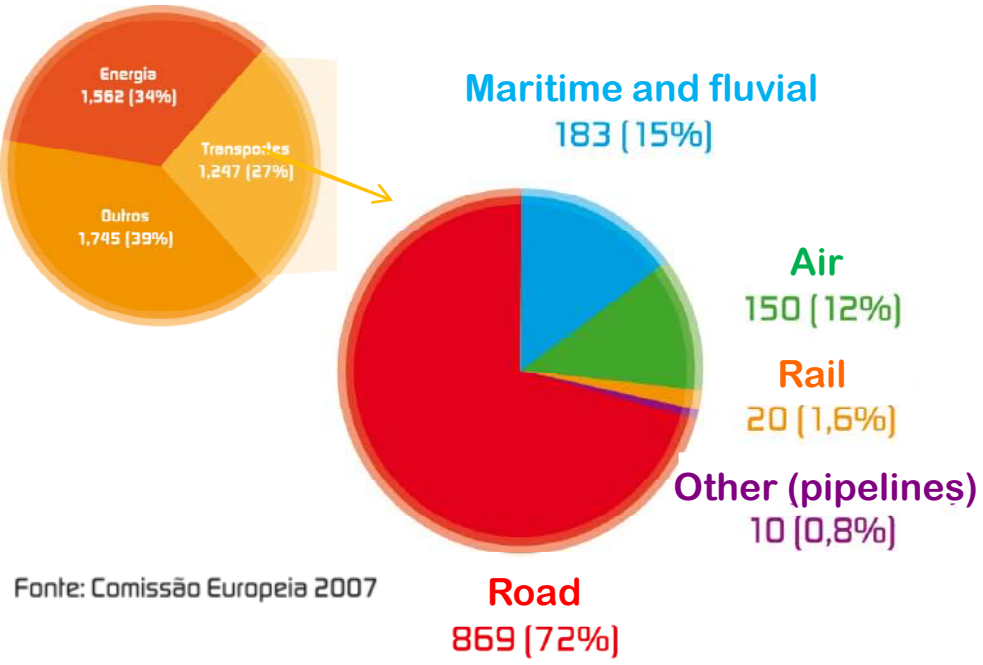
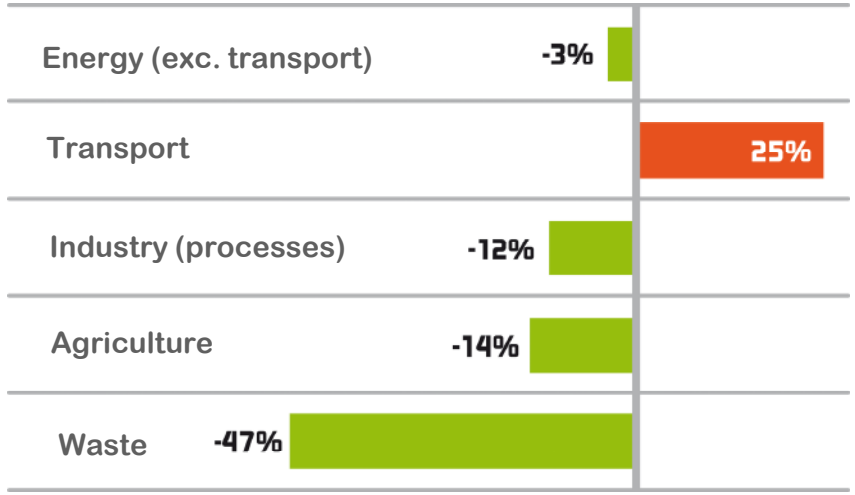
CO2 emissions (EU-27), 2005 (million tonnes)



Fonte: Comissão Europeia 2007

Sectorial variation on emissions (EU-15), 1990-2010



Fonte: EEA 2007

1000 millions euros on **oil importation** and **1000 millions euros** on **CO2 emissions** are expected to be saved during the first 30 years of the high speed project in Portugal

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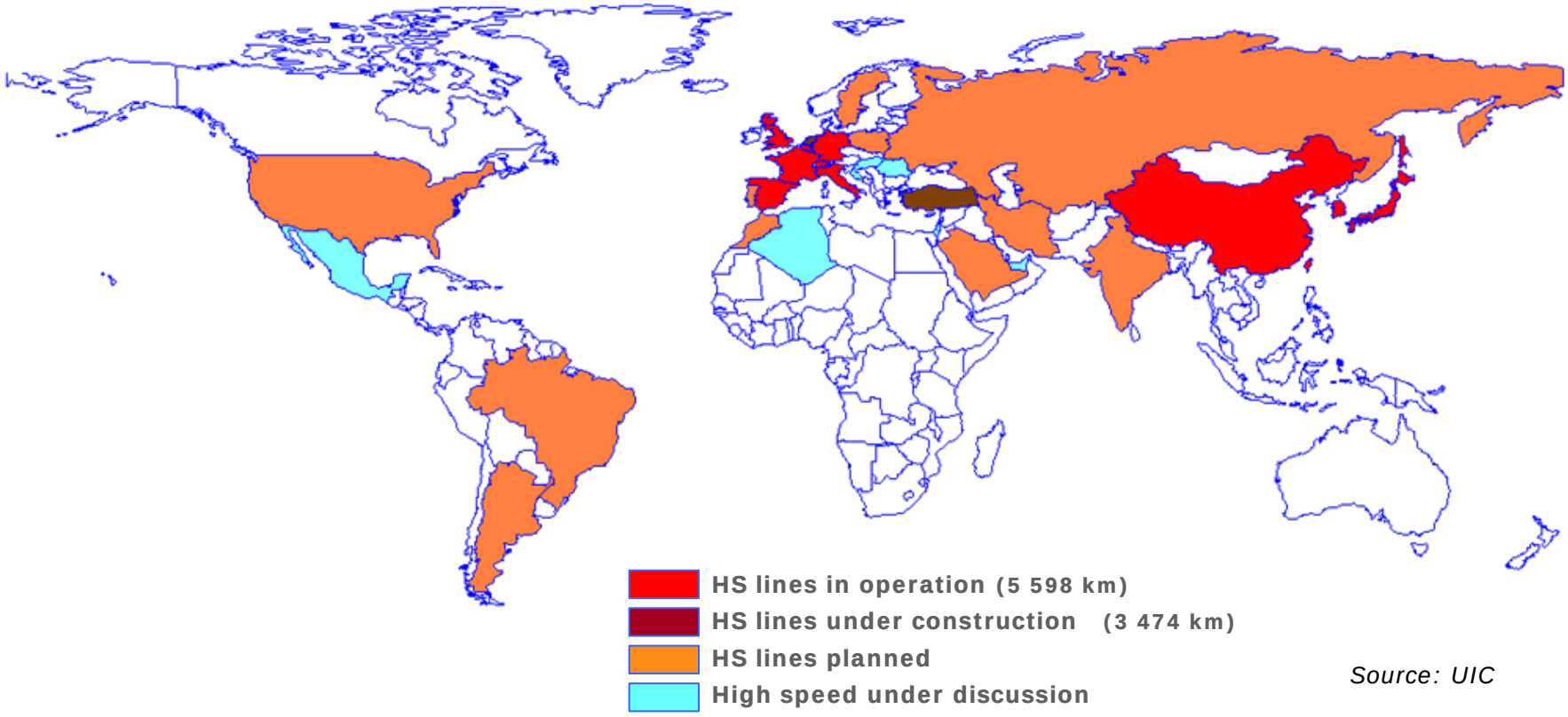
High speed rail in the world – a common approach



Source: UIC

HIGH SPEED SERVICES ARE RUNNING IN 13 COUNTRIES AND WILL BE RUNNING SOON IN 30 PLUS

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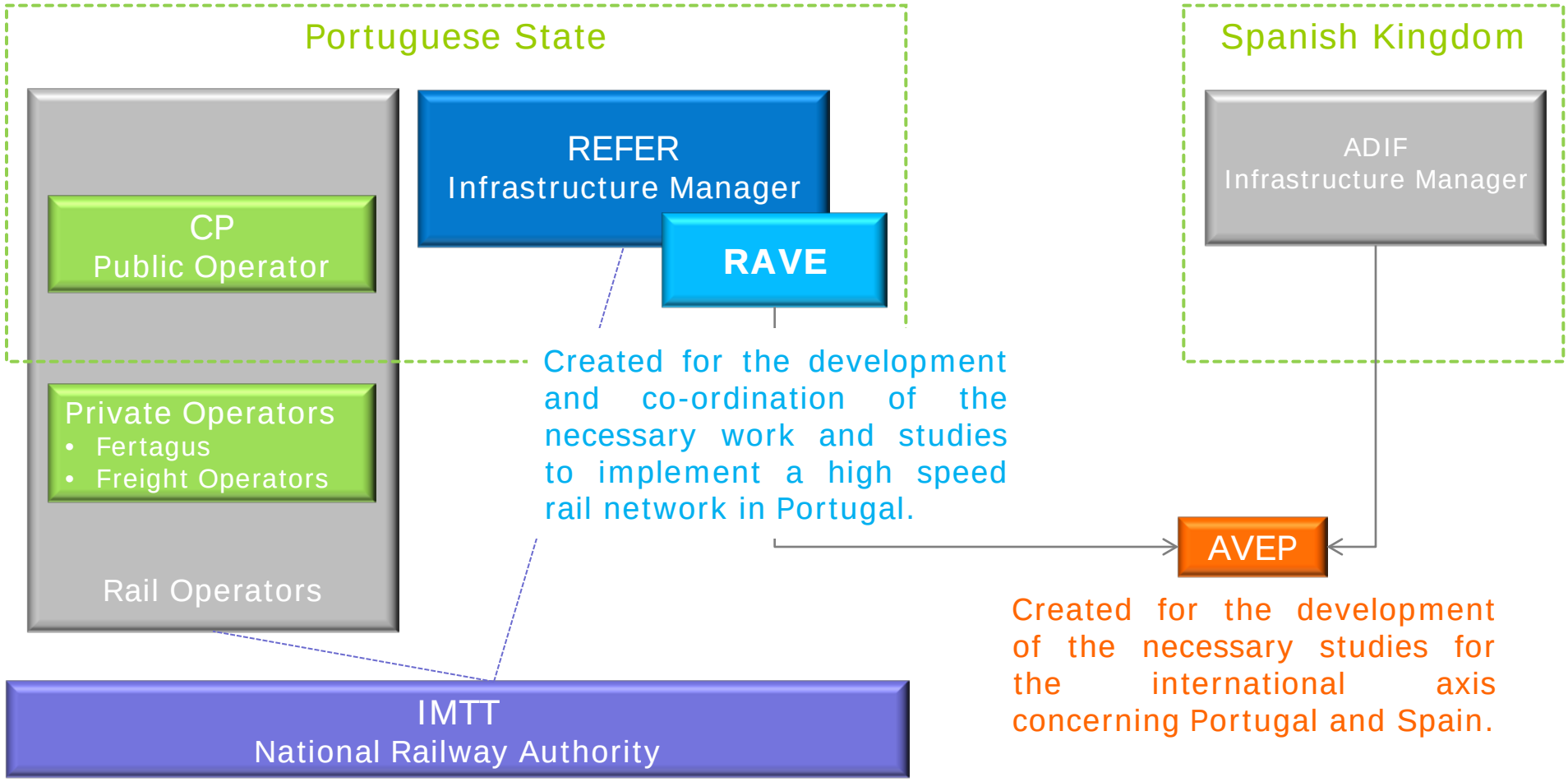
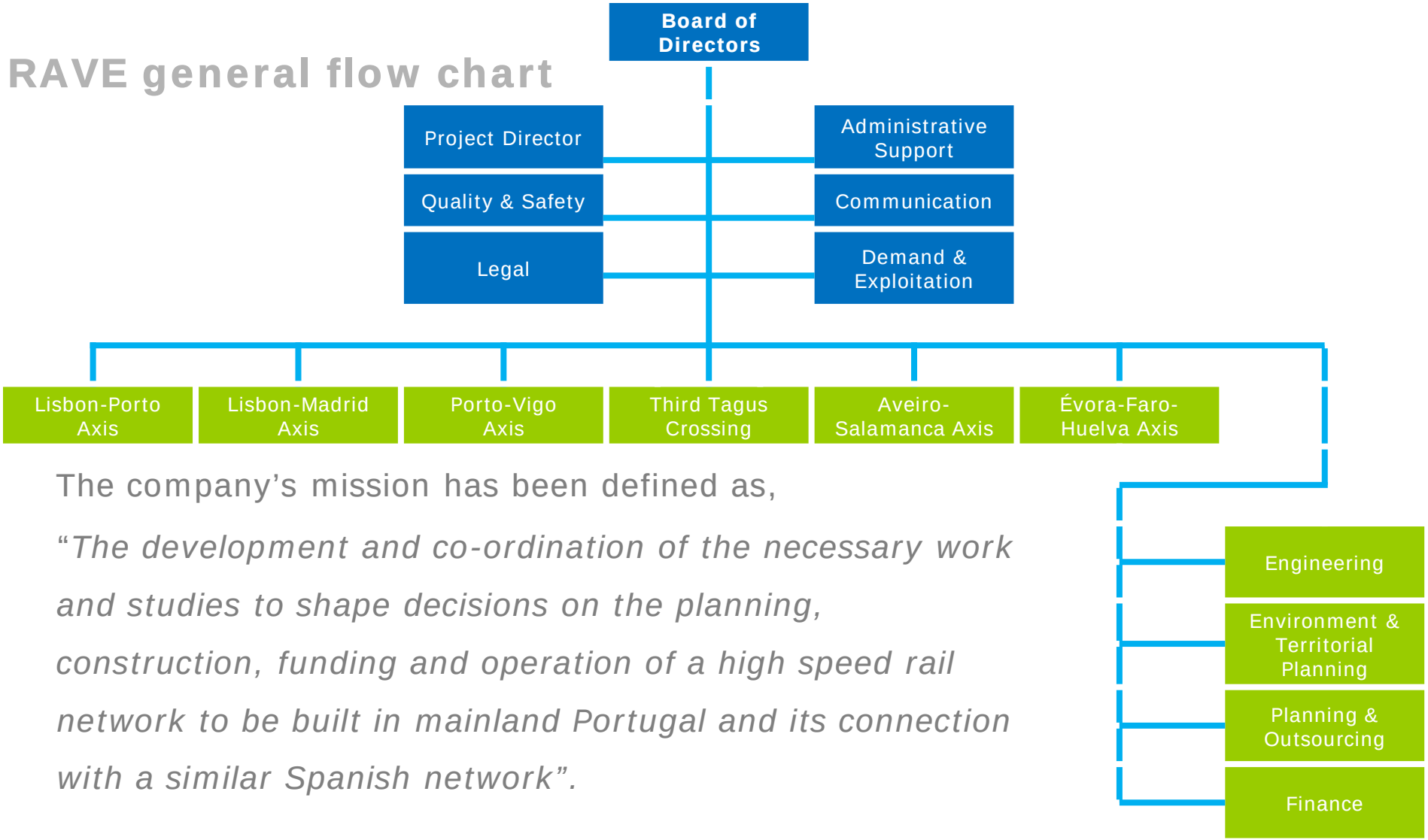
2. How should the State develop and coordinate the project?

Institutional Framework



RAVE general flow chart



The company's mission has been defined as,

"The development and co-ordination of the necessary work and studies to shape decisions on the planning, construction, funding and operation of a high speed rail network to be built in mainland Portugal and its connection with a similar Spanish network".

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3. Which should be the network shape and which cities should be served?


Rail gauge in Europe
1520 mm
1435 mm
1667 mm
SWEDEN
NORWAY
FINLAND
Helsinki
Oslo
Stockholm
Tallinn
ESTONIA
Riga
LATVIA
LITHUANIA
Vilnius
Kaliningrad
RUSSIA
Minsk
Moscow
RUSSIAN FEDERATION
BELARUS
UNITED KINGDOM
Dublin
DENMARK
Copenhagen
North Sea
Amsterdam
NETHERLANDS
London
REP. OF IRELAND
Bruxelles
BELGIUM
Paris
FRANCE
Berlin
GERMANY
POLAND
Warsaw
Kiev
UKRAINE
CZECH REP.
SLOVAKIA
Chisinau
MOLDOVA
Bern
SWITZ.
Wien
AUSTRIA
HUNGARY
ROMANIA
ITALY
Sarajevo
BULGARIA
Sofiya
Black Sea
GEORGIA
Tbilisi
Corsica
Sardinia
Roma
ALBANIA
Tiranë
Ankara
GREECE
TURKEY
Balearics
Sicily
Athens

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Portuguese HSR Network

Five main axes:

- **Lisbon - Madrid (2013)**
- **Porto - Vigo (2013)**
- **Lisbon - Porto (2015)**
- Aveiro - Salamanca
- Évora - Faro - Huelva

Part of the **Trans-European Network for Transport** (TENT)

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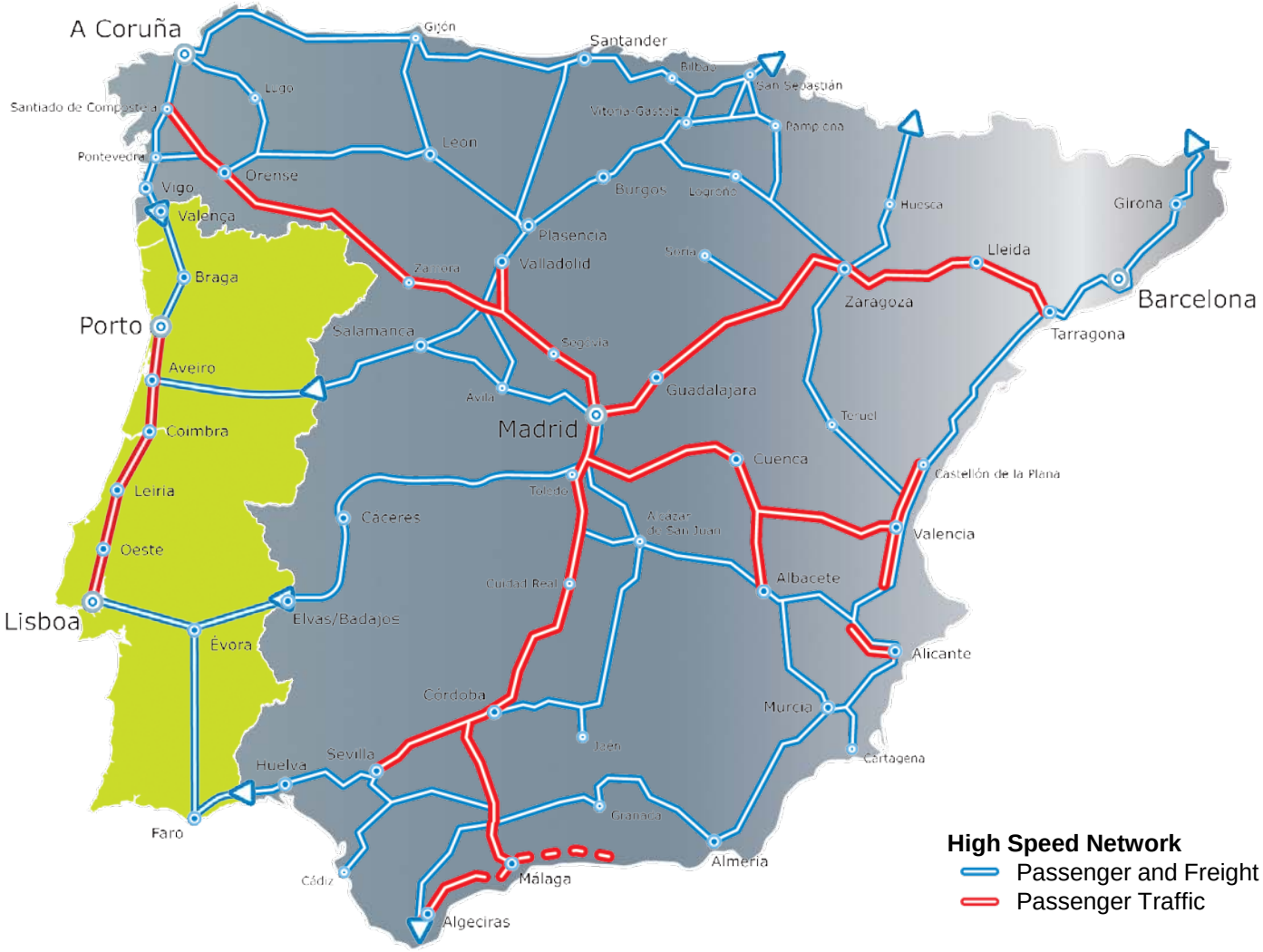

High Speed Network

- Passenger and Freight Traffic
- Passenger Traffic

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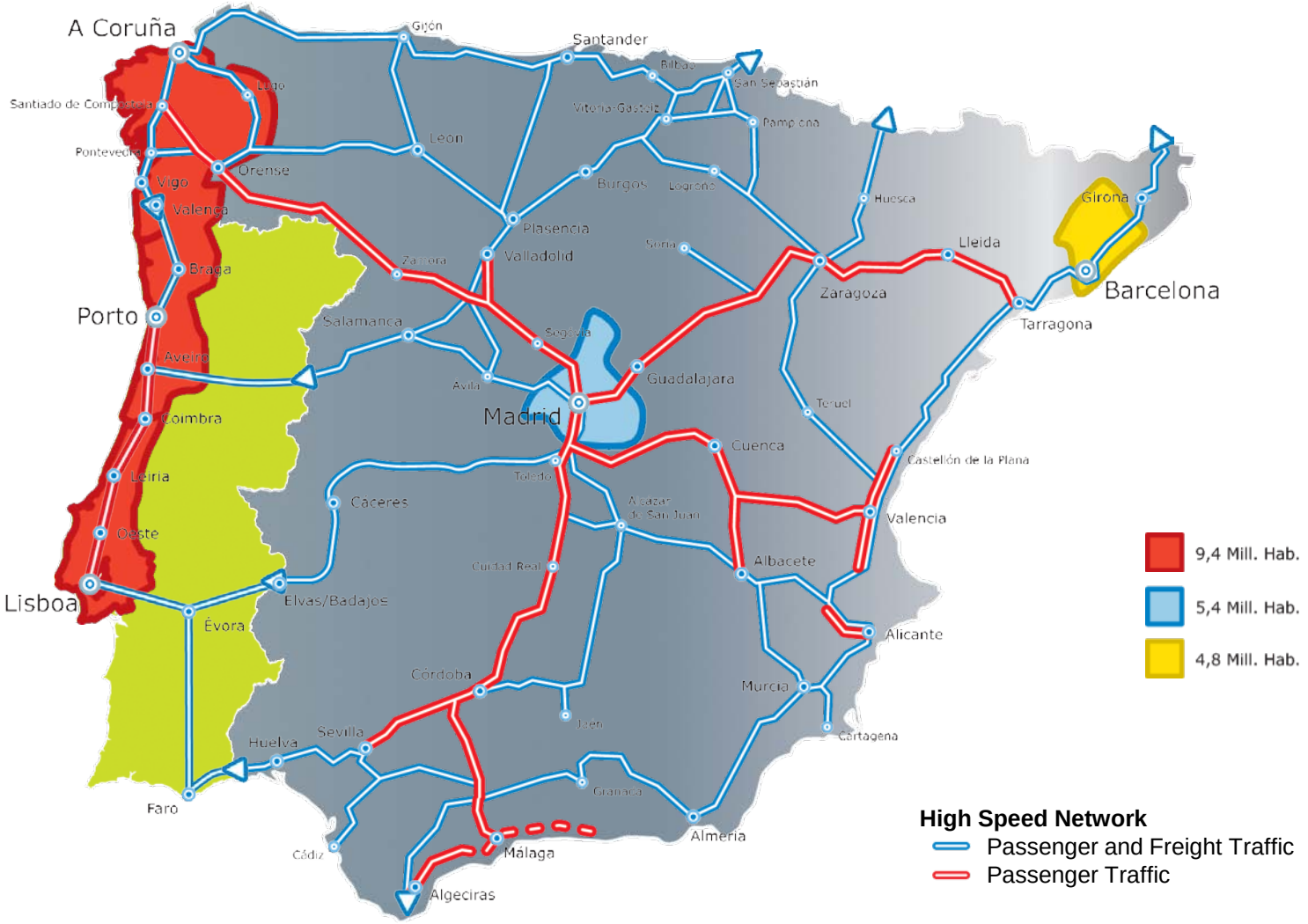

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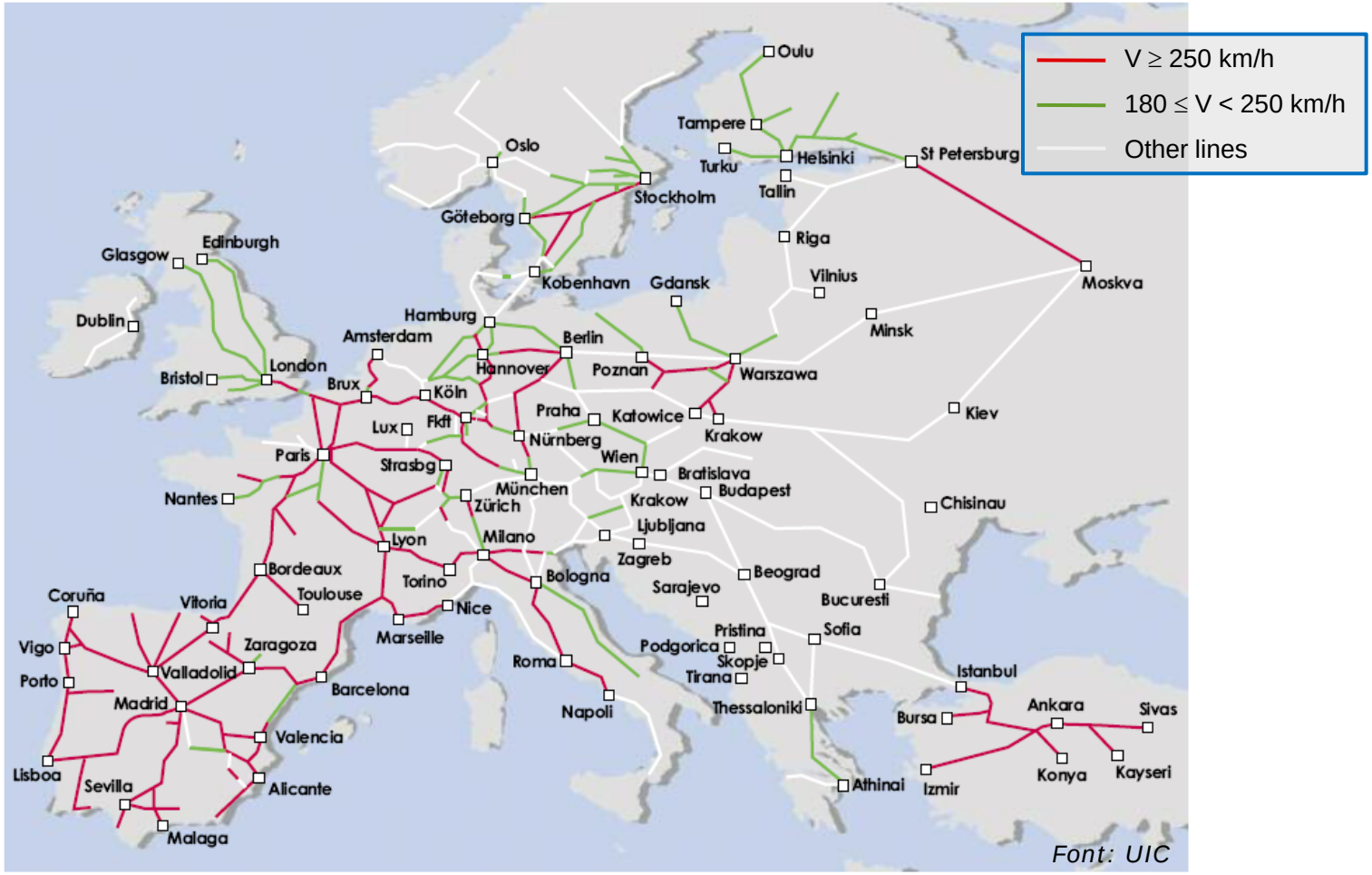
European High Speed Rail network



Europe 2025

4. Which should be the **travel time** and therefore the **design speed** in each axis?

5. For which **type of traffic** should the lines be designed? (passenger or mixed)

Concepts for the priority links

Porto-Vigo Axis

Lenght: **125 km** (100 km in Portugal)

Travel time: **1h00m** → max speed **250 km/h**

Passenger and **Freight** Traffic

Investment: **€ 1,8 billion**

Lisboa-Porto Axis

Lenght: **290 km**

Travel time: **1h15m** → max speed **300 km/h**

Passenger Traffic

Investment: **€ 4,5 billion**

Lisboa-Madrid Axis

Lenght: **640 km** (206 km in Portugal)

Travel time: **2h45m** → max speed **350 km/h**

Passenger and **Freight** Traffic

Investment: **€ 1,8 billion**

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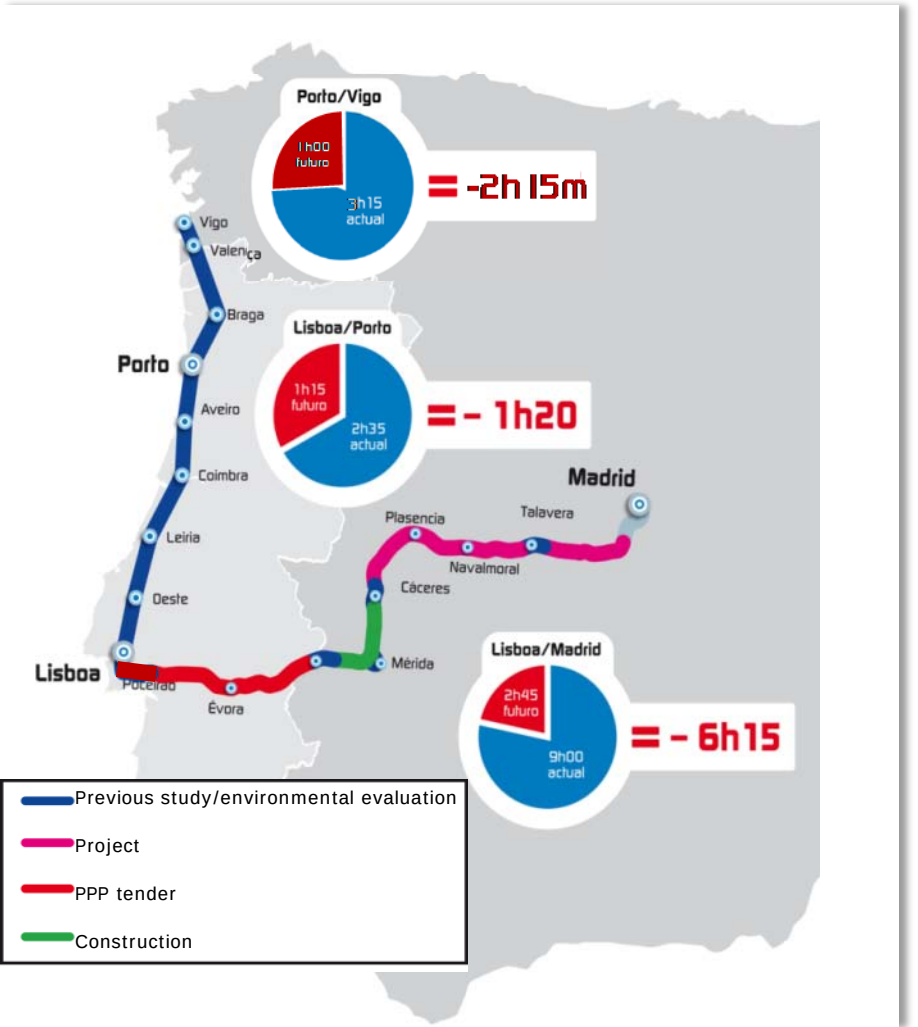
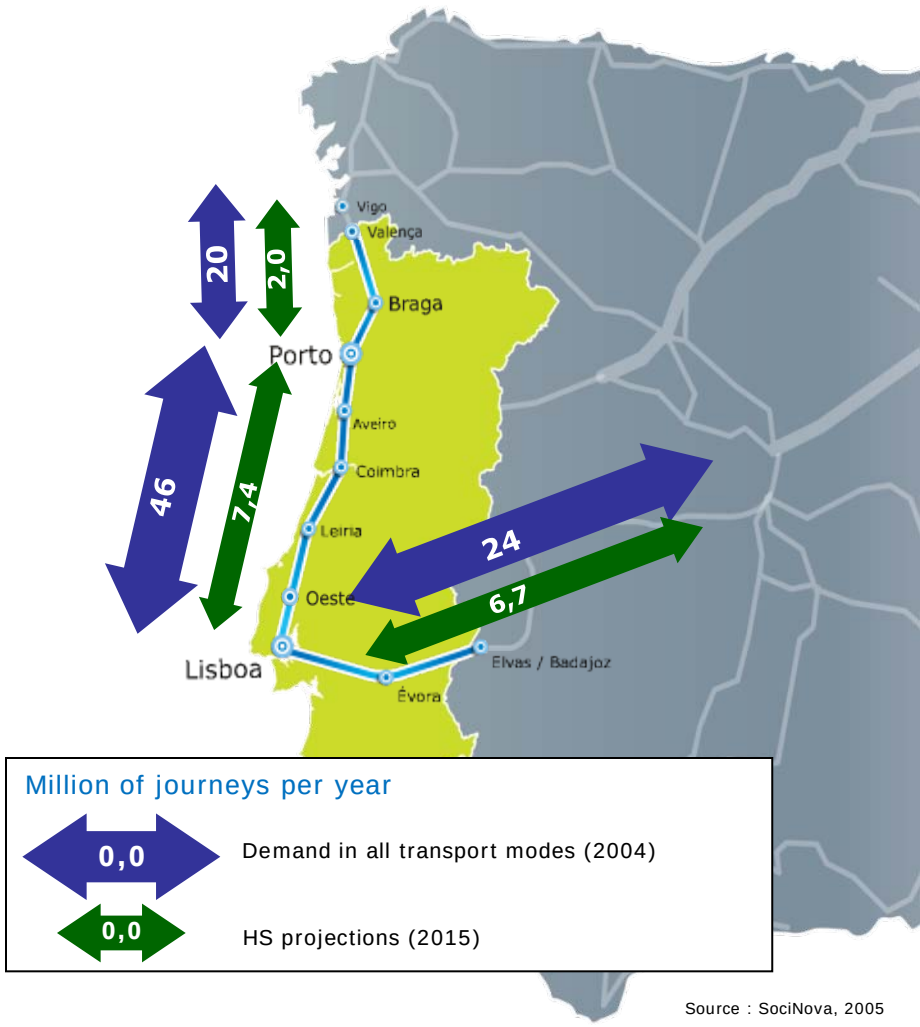
Travel Time and Demand





Source : SociNova, 2005

6. How should the **articulation with the conventional rail** network be made? (different gauge)

7. How should the **articulation with other transport modes** be made? (airports, ports and road)

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Articulation with the conventional network

An effort was made to **articulate** the high speed and the conventional rail network:

- through **shared stations** allowing easy connection and tranfer between services
- through automatic track **gauge changeovers** allowing the circulation of high speed and conventional trains in both networks

Automatic track gauge changeovers

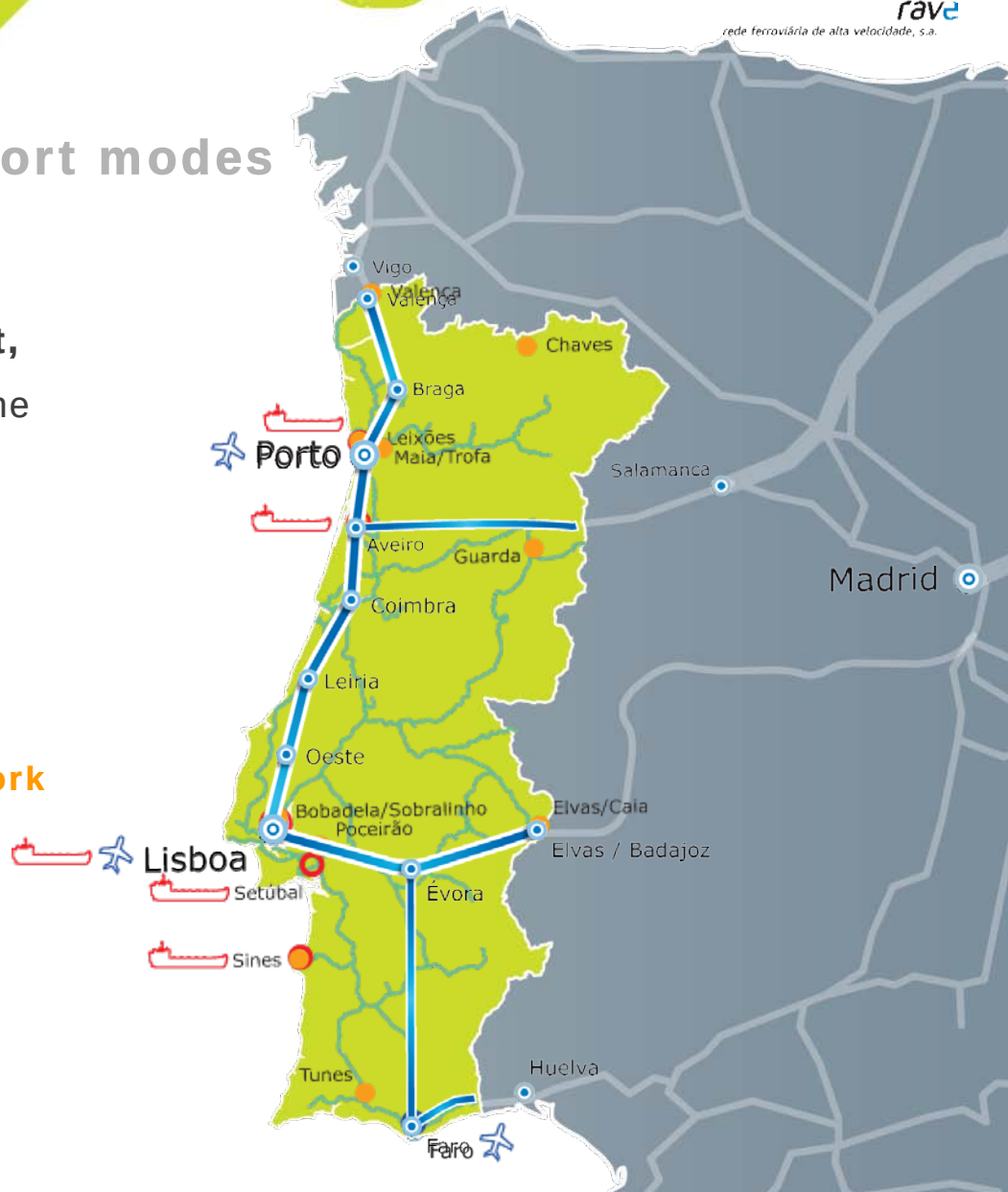
High speed and conventional rail stations

Articulation with other transport modes

An effort was made to **articulate** the **port, airport** and **logistics systems** through the transport network**:**

- **Conventional Railway Network**
- **Main Ports**
- **Main Airports**
- **National Logistics Platforms Network**

HSR as the Backbone of the Future Portuguese Transport Network



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8. What should be the business model for the project?

Main issues to develop the Business Model

What should be the role of both Public and Private Entities?

Traditional Procurement
vs
Public Private Partnership

How should the breakdown of the value chain be made?

Horizontal segmentation
and
Vertical segmentation

how should the project be divided into parcels?

what specialities should each parcel contain?

Business Model Selected: Infrastructure

Capacity Allocation and Railway Traffic Management (State / REFER)

Signalling / Telecommunications (PPP6)

Substructure / Superstructure (PPP1)	Substructure / Superstructure (PPP2)	Substructure / Superstructure (PPP3)	Substructure / Superstructure (PPP4)	Substructure / Superstructure (PPP5)

- Dimension of the investment
- Technological risk
- Assure high level of competition
- Horizontal and vertical interface risks
- National & International experience
- Lifecycle / Useful Life
- Level of national incorporation
- Keep the strategic role within the State

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Business Model Selected: Infrastructure

PPP Substructure / Superstructure

Scope: Design, Built, Finance and Maintain
Concession Period: 40 years
Payment Mechanism: Availability (75%)
Maintenance (25%)
Demand (+-2%)

PPP Signaling / Telecommunication

Scope: Design, Supply, Installation and Maintain
Concession Period: 20 years
Payment Mechanism: Availability

PPP5 Braga-Valença
2009/2010

PPP4 Pombal-Porto
2009/2010

PPP3 Lisbon-Pombal
2009/2010

PPP6
Signaling / Telecommunication
2009

PPP2 Lisbon-Poceirão / € 1.93 Billion
PPP Tender Launched on March 30
Bids Delivered on August 31

PPP1 Poceirão-Caia / € 1.34 Billion
PPP Tender Launched on June 2
Bids Delivered on October 2
BAFO on June 1

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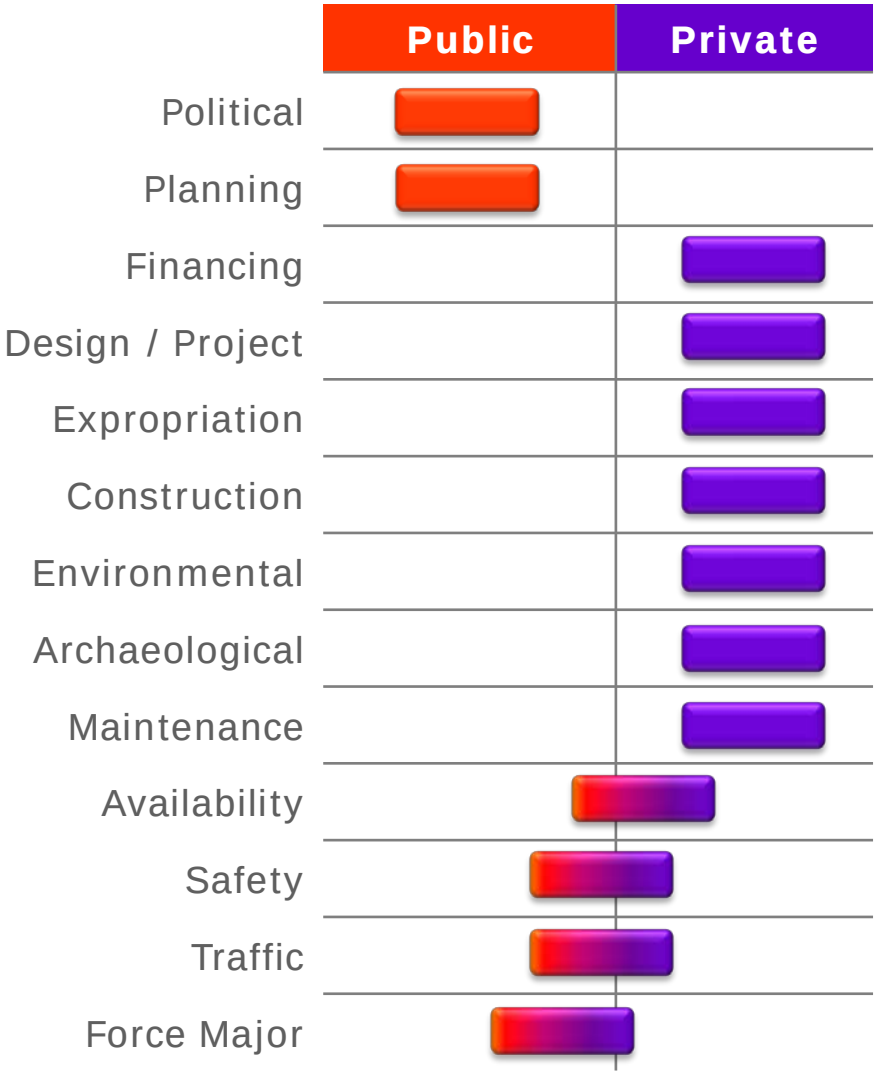
Risk Allocation

Principles for risk allocation:

1st Minimization

2nd Efficient Allocation



Financial Model for the Portuguese HSL Project

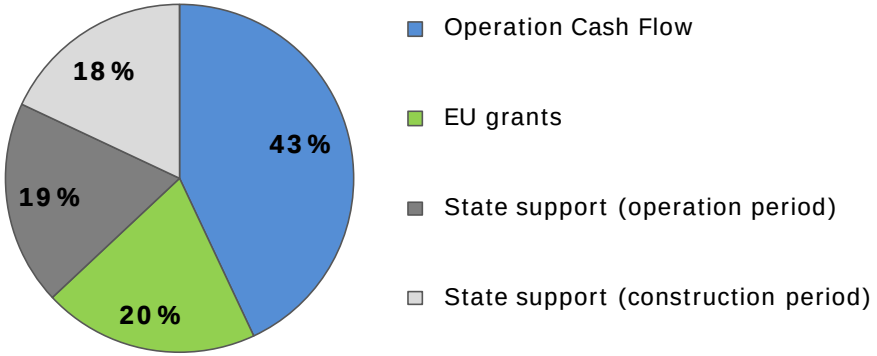
5 Infrastructure PPP's + 1 Signalling & Telecommunications PPP

	Construction Period (Approx. 4Y)	Operation Period (Approx. 36Y)
Funding Model	Portuguese State Subsidy + REFER Subsidy + European Union Funds	Availability Payment (75%) + Maintenance Payment (25%) + Traffic/Demand Payment (+-2%)
Financing Model	EIB Loan + Commercial Banks Loan + Equity	

Investment Coverage

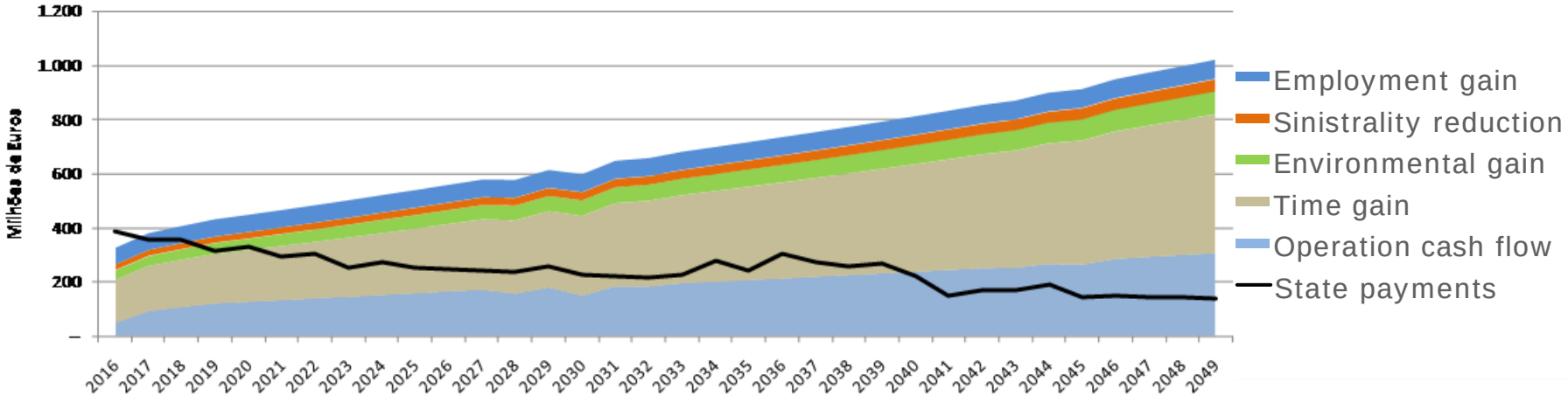
Investment Coverage

(on the Portuguese State net financial effort perspective)



State payments to the Concessionaires **vs** Revenues and Economical Benefits

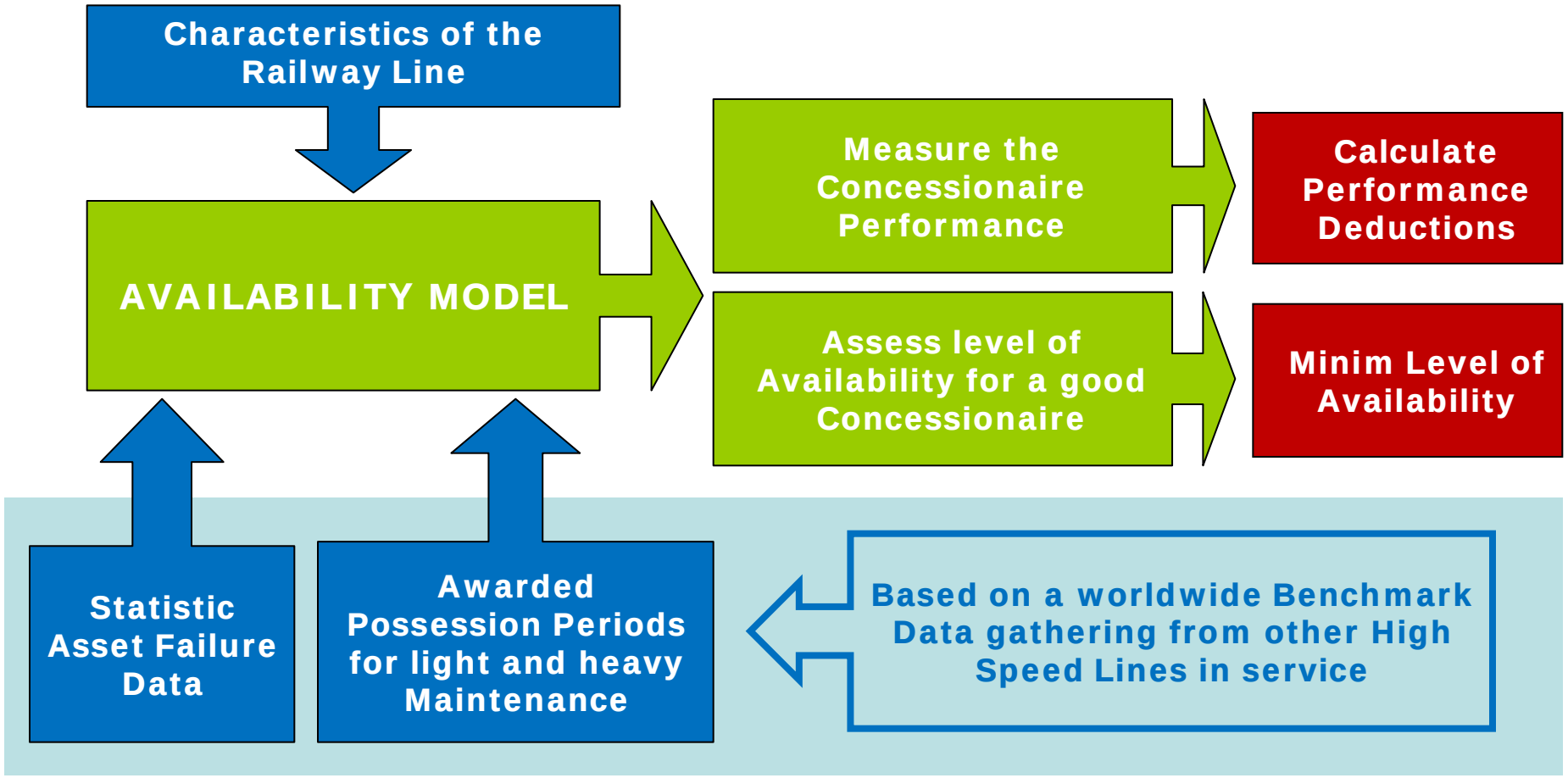
Availability Period / constant prices 2008



Technical Requirements

- Focus on **operational goals**
- **High-level requirements**:
  - Railway Services
  - Journey Time
  - Comfort
  - Availability
  - Safety
  - Crossing Points
  - Layout
  - Interoperability
  - Timetable
  - Interface w/ Third Parties
- Bidders are **free to optimize and innovate** in areas that do **not compromise the strategic goals** of the project

Availability Model – Development & Use



Payments due to the Concessionaire during the Availability Period

RC_t - Availability Payment in year t

$$RC_t = PD_t - D_t + CT_t$$

PD_t - Performance Payment

D_t - Performance Deductions

CT_t - Traffic Payment

$$D_t = D_d + C_d$$

D_d - Deductions due to non-availability of the Concession (to manage asset failure and possessions that restrict train operations)

D_d are calculated with an **AVAILABILITY MODEL**

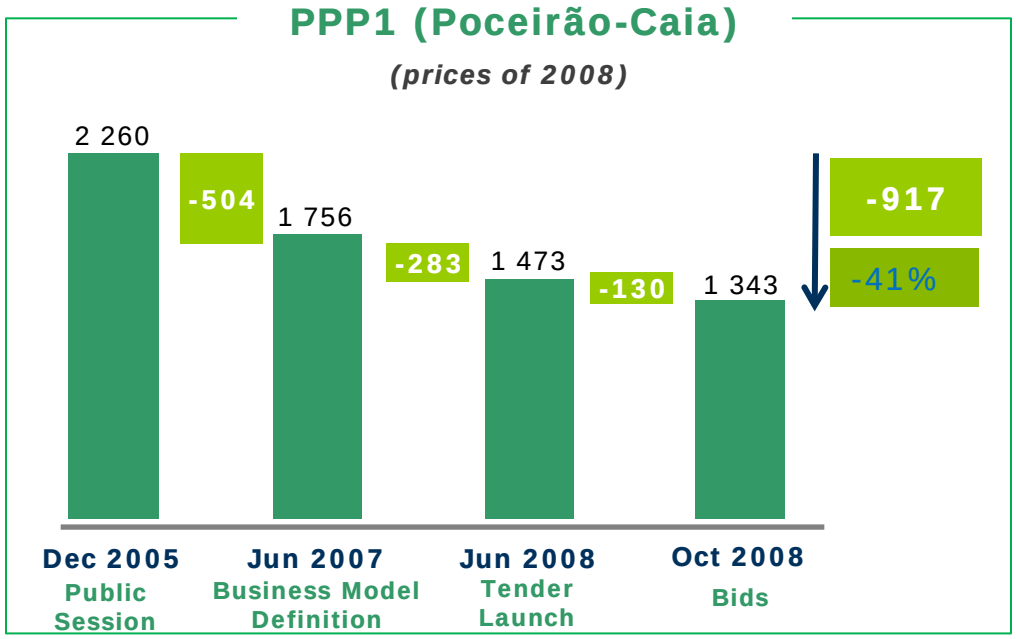
C_d - Deductions due to poor asset condition (to manage asset deterioration and loss of function that does not restrict train operations)

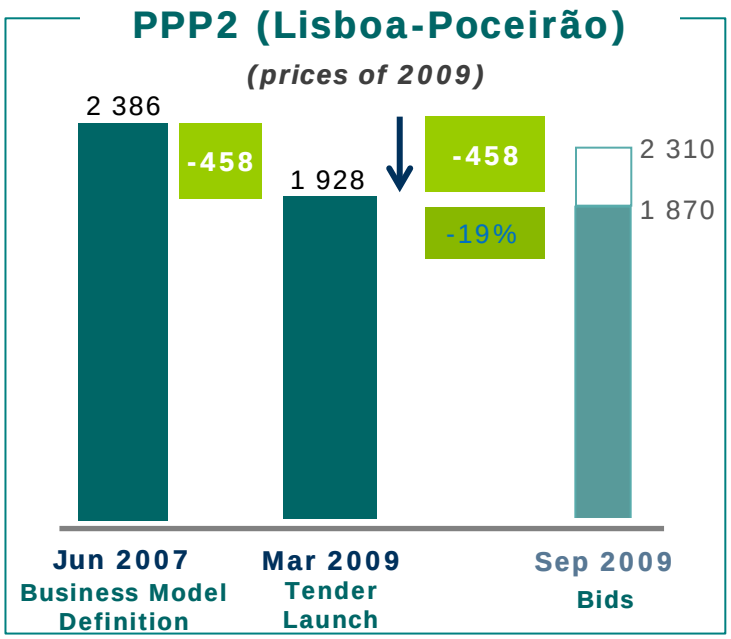
C_d are calculated based on set of rules and asset condition standards

The **AVAILABILITY MODEL** is based on the **LEVEL OF FUNCTIONALITY** and is designed to provide incentive to a good infrastructure management.

Optimisation of the cost of the project

Evolution of the Construction Investment (M€)





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The importance of communication

The importance of communication

Early phase of the project

- **Demystify misconceptions** about high speed and the future project – a good information campaign for the general public and specific actors **may prevent delays and obstacles**

Selection of information

- Give away the **strictly necessary information** on the project – too much information may lead to confusion and subsequent delays and obstacles

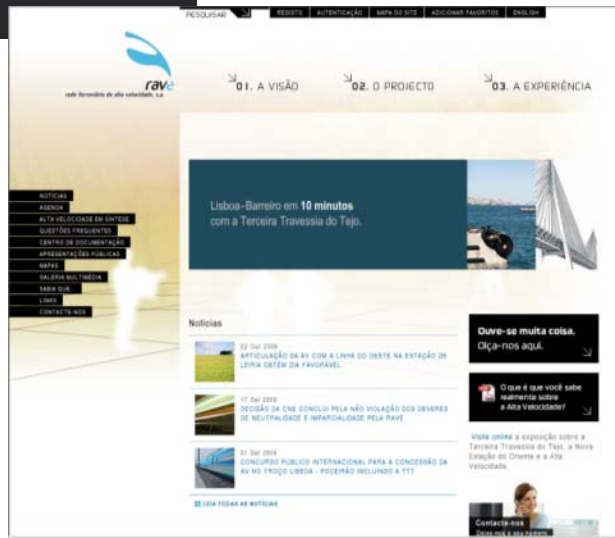
Local communication

- Contacts with the **local administration** and main **local actors**, to **gather information** and present the project locally, getting **people involved**

Exhibition on the Third Tagus Crossing

Project Brochure

RAVE website



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Thank you for your attention

Carlos Fernandes
www.rave.pt

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