

ERTMS DEPLOYMENT IN SPAIN

FROM AIR TO RAIL— INCREASING THE SPANISH RAILWAY'S PERFORMANCE WITH ERTMS



With over 2,000 km of lines already in service and almost 6,000 km of rail tracks contracted or planned (almost 3,000 km of lines), Spain clearly emerges as a worldwide reference and leader in ERTMS deployment. Whilst ERTMS has contributed to the success of iconic lines, such as the "AVE" Madrid-Barcelona, where rail is gradually replacing air as the transport of choice (from 48% of market share after 12 months of service to 60% at end of 2013), the Spanish experience is also a showcase for the effective interoperability of ERTMS, with no less than 5 companies involved in various projects on the Spanish network.

What is the status of ERTMS deployment in Spain?

Under the strong leadership of infrastructure manager ADIF, Spain has embarked on a major program of railway investments, identifying ERTMS as the signalling system of choice. The first contracts were signed in the early 2000s and ERTMS now covers the major part of the Spanish High Speed network. Indeed, the "AVE" network has become a phenomenon in Spanish society and is a clear paradigm of speed, punctuality and efficiency. Travelling in AVE is fast, safe, environmentally-friendly and even "trendy".

At present, the following major lines are running using ERTMS:

- Madrid – Lleida - Barcelona High Speed line (621 km route)
- Cordoba - Malaga High Speed line (155 km)
- Barcelona – Figueres High Speed Line (130 km)
- Madrid – Segovia - Valladolid High Speed line (197 km)
- Madrid – Toledo High Speed line (21 km)
- Madrid Atocha High Speed By-pass (12 km)
- Zaragoza – Huesca (80 km)
- Madrid – Albacete - Valencia High Speed line (500 km)
- Figueres - Perpignan High Speed international connection (45 km)
- A Coruña – Santiago – Ourense (150 km)
- Madrid "Cercanías C4" suburban network (Parla – Colmenar) (95 km)
- Albacete – Alicante High Speed line (239 km)
- Port of Barcelona – Can Tunis - Girona - Figueres Freight / Mixed traffic line (150 km)

Other major projects are currently under construction, with several lines scheduled for commercial service within the next few years:

- Valladolid – Ourense High Speed line
- Madrid – Portugal High Speed line
- Vigo – Porto High Speed line
- Alicante – Murcia High Speed line
- Sevilla – Granada High Speed line
- Sevilla – Cadiz High Speed line
- Basque "Y" Project (High Speed line linking the 3 Basque capitals with each other and with Madrid via Valladolid)



Which ERTMS suppliers are involved?

Six UNISIG suppliers of ERTMS have been involved in the Spanish railway network, and full interoperability between their products (both on-board and trackside) has been achieved. In other words, the trains supplied by any of the 5 on-board units suppliers in Spain (see picture below) are able to run on trackside equipment built by any of the others, which represents a major technological achievement. This brings significant advantages to the Spanish infrastructure manager ADIF, who has the guarantee that several suppliers will respond to tenders, lowering the cost of the signalling equipment through basic commercial and healthy competition.





What are the benefits brought by ERTMS in Spain?

Infrastructure manager ADIF is viewed as a pioneer in ERTMS deployment in Europe. After several years of ERTMS use in Spain it has brought considerable benefits:

- From an infrastructure manager point of view, choosing ERTMS means enlarging tendering opportunities, since any ERTMS supplier may respond to tenders;
- In the first year, passenger transport recorded considerable growth on Madrid - Malaga (+88%), Madrid-Valladolid (+109%) and Madrid-Barcelona (see below) lines.
- On these three lines, punctuality rates were averaging more than 98% (second only to Japan), attracting a considerable number of customers.
- As a consequence, ERTMS also has considerable environmental benefits, since passengers are knowledgeably opting for the train instead of the plane when travelling between these cities, therefore producing on average one sixth of the carbon footprint emissions as opposed to air or road traffic.

(Source: ADIF)

From plane to train: the example of the Madrid - Barcelona line

The Madrid-Zaragoza-Tarragona-Lleida-Barcelona line went into commercial service in February 2008, and is acknowledged to be one of the most successful examples of modal shift from plane to train, with the only equivalent to be found in the Paris-London and Paris-Brussels lines.

Thanks to the use of ERTMS level 2, trains enjoy record punctuality rates (see above). Travelling between the two cities takes only takes 2h30' (compared to 6 hours in the past), with an average speed of 248,4km/h.

Spanish operator RENFE estimates that the line attracted 1.4 million passengers that were previously using air transport during the first year of service. . In the first 6 months the average number of passengers had already increased by 84.5%!! After the first year of service, the AVE Madrid Barcelona enjoyed a share of 40 % of all trips between the two cities. But in 2013, the share increased to exactly 60%, with 6 M passengers traveling the corridor in 2013 (an increase of 18% over the previous year).



Additionally, international connections started in 2012 between Barcelona & Paris using the Figueres-Perpignan line opening exciting new opportunities for cross border High Speed traffic. In 2013 new services launched by RENFE & SNCF increased the frequencies between Barcelona & Paris but also inaugurated new services to Madrid, Toulouse & Marseille.

On the Spanish side, the opening of the Atocha by-pass in December 2008 considerably reduced travelling time between Barcelona and the South of Spain. Indeed, there are now new High Speed connections between Barcelona and Seville / Malaga that don't need to pass by and stop in Madrid, reducing travelling time by more than 50 minutes.

Tweaking the Excellence

ADIF, in its never ending effort to reach excellence, has activated in 2011 its very first lines in ERTMS level 2. It is expected that every single Spanish ERTMS High Speed line will enjoy ERTMS level 2 services in the near future. This measure will increase speed and capacity while reducing travel time but always with the highest levels of safety and efficiency available in the market. It will ultimately also help passengers to shift from plane to train.

SUPPLIERS

ALSTOM

 AnsaldoSTS

 PRAHA

BOMBARDIER

CAF

 mermec group

SIEMENS

THALES