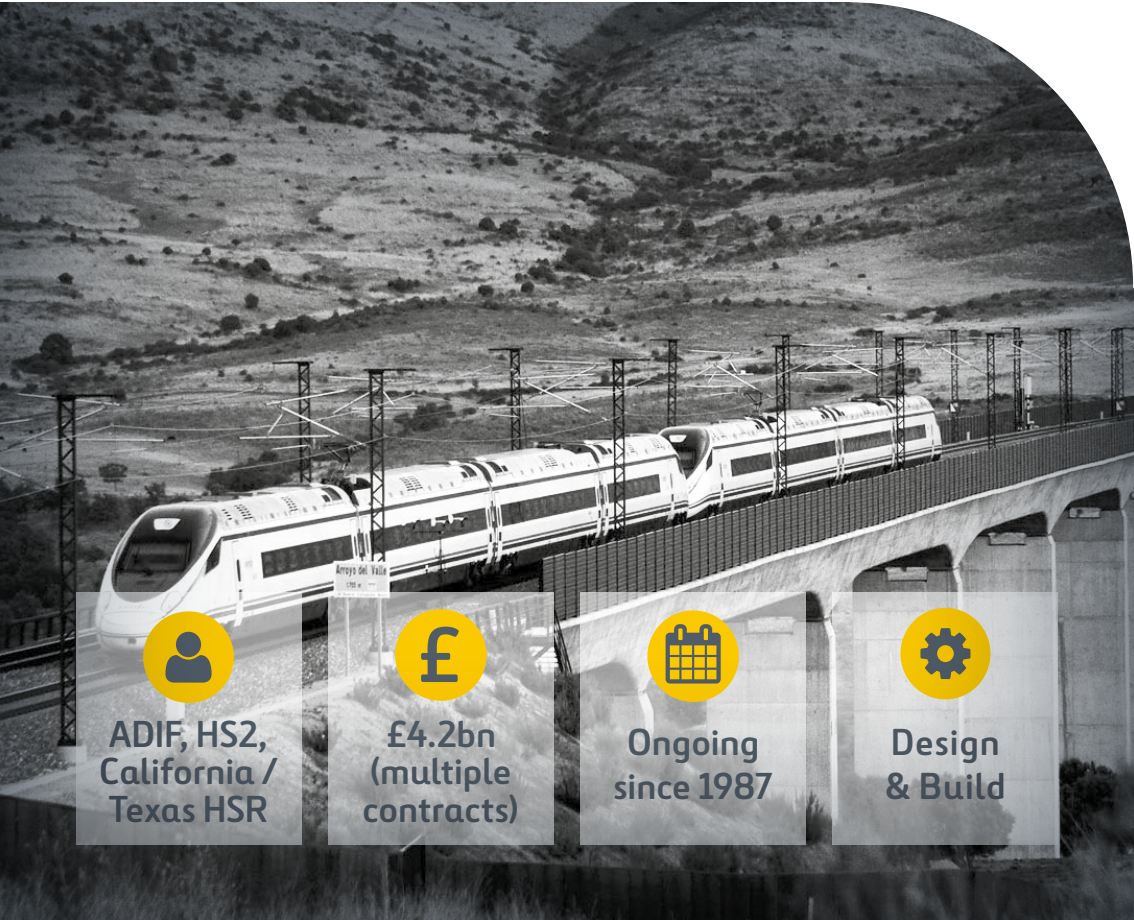


High Speed Rail (HSR)

Since our involvement in Spain's first High Speed Rail (HSR) line in 1987 – the longest network in Europe and second longest in the world – we have become an **international leader** in HSR design, construction and maintenance, with **over 1,000km of HSR infrastructure developed**. We have delivered more than 28% and are maintaining 55% of Spain's HSR network today.



ADIF, HS2,
California /
Texas HSR



£4.2bn
(multiple
contracts)



Ongoing
since 1987



Design
& Build

We deliver complex, end-to-end, large-scale HSR projects covering all infrastructure disciplines:

Design – Leading the engineering and design (including construction costing) for 21km of the HSR line between Dallas and Houston.

Enabling works – High Speed 2 Phase 1 Enabling Works central section and Barcelona La Sagrera HSR station enabling works.

Surface route involving every typology, e.g. at-grade, embankments, cuttings, viaducts, over/ underbridges, culverts, ancillary works, associated highway works. Examples include using a launching gantry for one of two viaducts at Venta de Baños (1,128m with a maximum span of 55m over River Pisuerga).

Railway systems covering track (ballasted and ballastless), OLE, traction power, signalling and communications and M&E fit-out works. Examples include the multi-disciplinary design, construction and fit-out of the 28km Guadarrama Tunnel (world's fifth longest railway tunnel), which was delivered three months ahead of schedule, and 200km of high speed double-line track between Olmedo and Zamora.

Stations – Chamartin multi-modal interchange, serving 60,000 people per day and consisting of five levels, extending 45m below ground to support HSR from Madrid to Segovia and Valladolid.

Depots – Fuencarral Technical Treatment Centre and the Santa Catalina II workshop depot – two of the largest and best-equipped facilities in Madrid for first-level maintenance.

Our cross-discipline capabilities are underpinned by a deeply rooted culture of innovation – applying and sharing advanced technology and ideas across our projects.



ADDED VALUE

- Ferrovial Construction Engineering Services (our in-house engineering design team), drives value through Early Contractor Engagement from the outset, bringing innovation and best practice into designs and achieving significant CAPEX and OPEX savings
- We have optimised our Off-Site Manufacturing techniques over the past 30 years of HSR experience, to identify efficient and cost-effective solutions. Our knowledge is captured in a strategy manual, outlining approaches such as: reusing launch nosings / integrating falsework / permanent works designs



INNOVATION

- **Partnership with Adif's Rail Technology Centre, Málaga** – Specialising in HSR cutting-edge technologies and leading a number of research programmes. Our R&D outputs contributed to Spain's HSR network exceeding 99.5% operational availability since 2002
- **'Rail of the Future'** – Aiming to reduce track maintenance costs and increase OPEX efficiency as part of a five-year joint venture between the Massachusetts Institute of Technology (MIT), ADIF and Ferrovial
- **S-CODE project ('Shift to Rail' initiative)** – Researching radical new design concepts for switches and crossings, with partners including Birmingham University and Network Rail
- **Award-winning Barajas Rail Link** delivery, featuring the first dual-gauge track system in Spain

28%

of Spain's HSR main civils and systems, including track delivered by Ferrovial

30 years' experience

delivering over 1,000km of complex, multidisciplinary HSR schemes

55%

of Spanish network maintained by Ferrovial

35km

design and construction for California HSR project

100km

Enabling Works Contract for HS2

£48m

invested in R&D in 2018