

URBAN PASSENGER RAIL

*High and Higher
Speed Rail*

wsp



We are WSP

As one of the world's leading professional services firms, WSP exists to future-proof our cities and environment. We provide strategic advisory, engineering, and design services to clients in the transportation, infrastructure, environment, building, energy, water, and mining sectors. Our 66,000 trusted professionals are united by the common purpose of creating positive, long-lasting impacts on the communities we serve through a culture of innovation, integrity, and inclusion. Sustainability and science permeate our work. In 2022, WSP derived more than half of its \$11.9 B (CAD) revenues from services that support the UN Sustainable Development Goals. The Corporation's shares are listed on the Toronto Stock Exchange (TSX:WSP).





Designing World-Class *High and Higher Speed Rail*

High Speed Rail (HSR) provides a means to help local communities and regions address significant challenges. HSR transport networks alleviate congested roads. As population growth around the world continues to put pressure on road transport systems, HSR trains, which generally travel at least 200 km (124 miles) per hour, offer a mobility option for longer trips with less time needed for travel. The high energy efficiency of these trains supports reduction in greenhouse gas emissions, which means reduced environmental pollution and decreasing climate-change impact. HSR plays an integral role as transport stakeholders seek to achieve transportation systems that integrate multiple modes, strengthen connections and coordinate transport services to provide choices for users. WSP is pleased to present this collection of our advisory and design work to advance high speed rail for communities and regions around the world.



Table of Contents

| | |
|--|----|
| Canada | |
| <i>VIA Toronto-Ottawa-Montreal</i> | 6 |
| <i>Genesee & Wyoming Railroad</i> | 9 |
| <i>Niagara GO Train</i> | 10 |
| China | |
| <i>China High-Speed Rail</i> | 13 |
| Denmark | |
| <i>DSB Fremtidens Tog</i> | 14 |
| France | |
| <i>Paris-Strasbourg High-Speed Line</i> | 17 |
| <i>Paris-Normandie High-Speed Line</i> | 18 |
| Germany | |
| <i>Erfurt-Leipzig/Halle High-Speed Railway</i> | 21 |
| <i>Cologne Rhine/Main Line</i> | 22 |
| <i>Karlsruhe-Basel High-Speed Railway Line</i> | 25 |
| Norway | |
| <i>The Follo Line</i> | 26 |
| <i>Fjerntog N10</i> | 29 |
| Spain | |
| <i>Multiple High-Speed Lines</i> | 30 |
| <i>Spanish High-Speed Line Bridge Behavior</i> | 33 |
| <i>High-Speed Railway Projects Dynamic Supervision</i> | 34 |
| <i>Murcia-Cartagena High-Speed Rail Project - El Reguerón to Cartagena Section</i> | 37 |
| <i>HSR Bobadilla-Granada Antequera-Peña de Los Enamorados Section</i> | 38 |
| <i>HSR Ourense-Santiago Lalín-Lalín and Lalín-Silleda Section</i> | 41 |
| <i>Vitoria-Bilbao-San Sebastián High-Speed Line</i> | 42 |
| Sweden | |
| <i>Feasibility Study Jönköping-Malmö</i> | 45 |
| <i>Railway Plan East Link- Bäckebo-Tällboda</i> | 46 |
| <i>X2 Upgrade</i> | 49 |
| <i>SJ Delta</i> | 50 |
| Switzerland | |
| <i>New Rail Link through the Alps Gotthard Base Tunnel</i> | 53 |
| Taiwan | |
| <i>Taiwan High-Speed Rail</i> | 54 |
| Thailand | |
| <i>Bangkok - Nong Khai High-Speed Rail</i> | 57 |
| United Kingdom | |
| <i>HS2</i> | 58 |
| United States | |
| <i>California High-Speed Rail</i> | 61 |
| About WSP | |
| <i>Our People</i> | 62 |



Location
ONTARIO AND QUEBEC, CANADA

Client
CANADA DEVELOPMENT INVESTMENT CORPORATION (CDEV)

Status
COMPLETED IN 2017

VIA

Toronto-Ottawa-Montreal

WSP was engaged by the Canada Development Investment Corporation (CDEV) to carry out a financial and technical peer review and due diligence of VIA Rail's proposed High-Frequency Rail (HFR) service between Toronto-Ottawa-Montreal. This included a review of passenger travel demand forecasting, capital and operating costing, financial modelling and alternative financing and procurement (AFP) options. The goal of this assignment was to provide CDEV, the federal Ministry of Finance and Ministry of Transport with guidance on the work completed to date by VIA in the development of their HFR business case and requests for funding.

The passenger rail due diligence included a review of travel demand forecasting, capital and operating costing, financial modelling and alternative financing and procurement (AFP) options.

WSP carried out a full value-for-money analysis and P3 feasibility, including consideration of alternative financing and delivery structures. This project occurred over a six-month timeframe and involved engagement of multiple project stakeholders, including: Transport Canada, Finance Canada, and various potential industry participants. The work included a due diligence review of previously prepared ridership, assessment of the environmental risks of the proposed alignment, capital and operating cost estimates, development of a sophisticated financial model to assess project performance, market sounding, case studies, and guidance on project structure and governance models.





Genesee & Wyoming Railroad



Location
US, CANADA, UK, EU AND AUSTRALIA

Client
**BROOKFIELD INFRASTRUCTURE
PARTNERS**

Status
COMPLETED IN 2019

Engaged by Brookfield Infrastructure Partners, WSP acted as buy-side technical due diligence lead on the CAD 11.4 billion transaction to take railroad operator Genesee & Wyoming Inc. (G&W) private. The overall acquisition was led by Brookfield Infrastructure Partners.

The G&W is an American short line railroad holding company, that owns or maintains an interest in 120 railroads throughout six countries: the United States (US), Canada, Australia, Belgium, Netherlands, Poland and the United Kingdom (UK). It operates more than 15,500 miles (24,900 km) of owned and leased track, with more than 3,300 miles (5,300 km) under track-access arrangements.

WSP assessed the track infrastructure, rolling stock assets, other associated infrastructure and overall operations for the G&W assets in the US, Canada, UK, and Australia.

In North America, a total of 60 short line railroads were assessed in detail. This included a full review of health and safety systems and performance of the company. WSP team provided an assessment of environmental, social and governance related to the existing rail operations of G&W, including recommendations for improvements. It also included a review of environmental permits, regulatory compliances, environmental management plans, and quantitative assessment of environmental liabilities.

As part of the engagement, a full review of the operating and maintenance strategies was undertaken, including staffing strategy, dispatching strategy, organizational structure, and technology review. Operational efficiency was assessed in terms of overall asset utilization, capacity, labour productivity and other metrics. The integrity of the assets was assessed, below-rail and above-rail, including track, ties, crossings, signals, bridges, rolling stock, ancillary facilities and subgrade condition. A review of the overall asset management strategy was conducted, including a review of the locomotive and fleet management strategy. Overall risks and red flags were determined for all the elements reviewed and WSP worked to produce forecasted OPEX and CAPEX values for all G&W jurisdictions.

For this engagement WSP brought the combined resources of its global network to support this acquisition, led out of Canada with expert technical resource teams located in Canada, USA, Australia, Sweden and the UK.

The due diligence support to Brookfield was conducted over a period of approximately eight weeks, and financial close was announced early 2018.

Niagara GO Train



Location
NIAGARA REGION, ONTARIO, CANADA

Client
THE REGIONAL MUNICIPALITY OF NIAGARA

Status
COMPLETED IN 2015

Engaged by the Region of Niagara, Ontario Canada, WSP developed a business case for the extension of Greater Toronto-Hamilton (GTHA) GO Train service to Niagara. While the GTHA is connected by an integrated network of GO Rail and GO Bus infrastructure, Niagara had yet to benefit from this level of connectivity. The business case recommended that a two-way, all-day service be established between the James Street North GO station in the City of Hamilton and Niagara Falls, with stops in Grimsby and St. Catharines.

Through the development of the Business Case WSP provided:

- Assessment of the estimated capital and operating costs, and potential benefits from GO Niagara, ranging from travel time savings to land value uplift potential, including an analysis of the demand for the service;
- Analysis of the benefits of rail over bus service;

- Assessment of the contributions of GO Train to building a dynamic economy and accessible employment, as well as improving quality of life;
- Consideration of the alignment with regional and local planning initiatives;
- Analysis of the economic impact of the proposed service including consideration of direct, indirect and induced contributions to jobs during construction and operations; and the user and environmental benefits.

The business case formed the basis of the successful pursuit of funds from the Province of Ontario allowing the initiative to proceed to development.



12



DESIGN



Location
MAINLAND CHINA

Client
CHINA MINISTRY OF RAILWAY

Status
COMPLETED IN 2016

HIGH SPEED RAILWAY NETWORK IN
THE WORLD

Longest

TOTAL LENGTH

>40,000 km

LINKING PROVINCIAL-LEVEL
ADMINISTRATIVE DIVISIONS

33

China High-Speed Rail

WSP has contributed to the construction of the world's largest high-speed rail system in China. Currently with a total length of over 40,000 km, the system connects all 34 provincial-level administrative divisions except Macau.

WSP was mandated to provide professional services on four sections of the China High-Speed Rail (HSR) program with a combined line length of over 800 km, 100 tunnels totalling 260 km, and 280 bridges. Our services on four sections of the China HSR program cover project management, systems assurance, systems integration, safety and risk management and construction supervision. This project's main challenge was that it extended over vast remote areas including uninhabited regions in the mountains.

Our involvement began in 2005, on the 476 km high-speed passenger dedicated line, linking Zhengzhou and Xi'an, two ancient capitals of China located in Henan and Shaanxi provinces. As part of a consortium, we provided project management advice, systems assurance advice and construction supervision services for this new line, which included 38 tunnels totalling 75 km and 140 bridges totalling 225 km. The project was undertaken on a highly accelerated schedule and opened in 2010. It now saves users up to six hours in travel time between these major cities.

From 2005 to 2009, we worked on the 161km-long Shijiazhuang-Taiyuan Line, where we provided construction supervision services for 32 tunnels totalling 74 km, and 82 bridges with a total length of 33 km. These services included building the 27.8km-long Taihangshan tunnel and the 11.5km-long Nanliang tunnel, two of the longest on the Chinese HSR system.

We also worked on:

- Changsha to Kunming, Guizhou Section, Construction Supervision Package 5 & 6: As part of a joint venture with the Beijing Tietan Construction Supervision Co., Ltd, WSP was commissioned to provide international expertise, which includes chief supervising engineers, construction supervision team leaders and resident engineers to support the local teams.
- Hefei to Fuzhou Package 1: WSP, in a joint venture with the construction supervision division of China Railway Fourth Design Institute, provided construction supervision services for this 56km-long section.



Location
COPENHAGEN, DENMARK

Client
DSB

Status
ONGOING

DSB

Fremtidens Tog

Denmark is investing to upgrade its railway network, electrifying most of the routes and implementing the European standard signalling and safety system, ERTMS.

Fremtidens Tog (Future Trains) is the program set up by the Danish state railway, DSB, for the procurement of the new rolling stock, the largest rolling stock program in Danish history. This includes electric multiple units (EMUs) for intercity and regional service, coaches and locomotives, enabling DSB to replace the old rolling stock as well as meet the expected passenger growth.

WSP was taken onboard as a partner to deliver multidisciplinary technical and business advisory services. These services are provided for the new high-speed EMUs during several program phases to specify, procure and bring into operation the new trains, plus a 30-year maintenance contract for these trains.

During the second program phase, WSP implemented its demand-driven design philosophy through undertaking workshops to capture needs of various stakeholders within DSB and developing the technical specification and other tender documents from these captured needs, including market intelligence and benchmarks.

The third phase included evaluation of submitted bids and recommendations for tender selection. It was a negotiated procedure in three steps after the pre-qualification where input from the competing tenderers was considered in updates of the tender documents.

The fourth phase (ongoing 2021-2025) includes technical and commercial expert advice during the design, production and approval of the first five trainsets.

WSP's involvement has included but is not limited to the following: Technical, commercial and project management, WSP is currently supporting the DSB technical leads in managing the project activities and planning as well as coordinating with third parties, such as solicitors and Banedanmark, the entity responsible for the maintenance and traffic control on the state-owned Danish railway network.

WSP has used its experience to develop the technical specification for both trains and corresponding maintenance strategy, ensuring not only that there are products on the market that fit the specification but that the rolling stock will meet the future needs. This includes RAM and LLC strategy and analysis to form key performance measure to allow DSB to meet the passenger demands.





DESIGN



Location
FRANCE - VOSGES DU NORD

Client
**RFF (RÉSEAU FERRÉ DE FRANCE) /
SNCF RÉSEAU**

Status
**COMPLETED IN 2015
COMMERCIAL OPENING IN JULY 2016**

RAIL TUNNEL LENGTH

4 km

MAX SPEED IN TUNNEL

352 km/h

RAILWAY PLATFORM

3.5 km

Paris-Strasbourg *High-Speed Line*

The seventh railway corridor of the European Union (referred to as "Main Line") links Paris to Bratislava. The French portion of the corridor links Paris to Strasbourg and has been divided into two phases.

The first phase reduced the Paris-Strasbourg trip time from four hours to two hours and twenty minutes and was opened to traffic on June 10, 2007. It consisted of 300 km of high-speed railway line from Paris to Baudrecourt. This line set the world speed record for a commercial train on steel wheels in 2007 at 574.8 km/h.

The second phase, 106 km long from Baudrecourt to Strasbourg, reduced the Paris-Strasbourg journey time to one hour and fifty minutes. It was opened to traffic on July 3, 2016.

The emblematic work of the second phase is the Saverne Tunnel, one 4 km twin tube tunnel, linking the two French regions of Alsace and Lorraine, designed for a maximum speed of 352 km/h. The main characteristics of the new line are the commercial speed of 320 km/h,

and the absence of merchandise traffic. This is the first tunnel in France to be designed and constructed since the new European Safety Regulation CE 2008/163 has been issued.

RFF / SNCF Réseau launched a design and build tender for the tunnel and its surroundings. The designer-builder (BG Consulting Engineers, now WSP) chose to create a two-pipe tunnel.

The second phase included the construction of the tunnel, a 270 m-long viaduct, three bridges and underpasses, a 3.5 km railway platform surrounding the tunnel, and all the tunnel security equipment.

The contract was awarded to a JV lead by Dodin Campenon Bernard, a VINCI group contractor, which includes companies coming from VINCI and Spie Batignolles TPCI. The French company CEGELEC was in charge of the equipment. The engineering was led by BG Consulting Engineers, now WSP.

Paris-Normandie *High-Speed Line*



Location
FRANCE

Client
SNCF RÉSEAU - MISSION LNPN

Status
COMPLETED IN 2018

The new Paris-Normandie line (LNPN) operation is an effort to meet the growing demand for alternative transportation (non-car), bearing in mind that, in addition to passenger rail transportation, the development of the Paris-Normandie axis also appears to be strategic from an economic and territorial point of view. The construction of new infrastructure should also make it possible to promote the development of rail transportation, for the purpose of creating the "Seine Gateway" (transportation corridor in the Seine Valley).

The LNPN project foresees the completion of nearly 250 km of new lines, combined with the construction of 5 new stations and improvements to the existing network.

We carried out the infrastructure assessments as part of stage 1 of the studies and prior to the public inquiry, with the following main objectives:

- to identify preferential travel areas that correspond with potential infrastructure and that are 1 to 3 km wide (or less depending on the context);
 - to ensure the feasibility of infrastructure at the "preliminary study" level;
 - to assess the costs of this infrastructure at the "preliminary study" level and to ensure that these costs are controlled, understand the associated risks;
 - to seek the acceptance of the territory stakeholders.
- to enable the State to validate a functional and performance-based program based on infrastructure hypotheses that best fit the environmental context and meet service objectives;





DESIGN



Location
**NUREMBERG-ERFURT-LEIPZIG/
HALLE-BERLIN, GERMANY**

Client
DEUTSCHE BAHN AG

Status
COMPLETED IN 2017

TRACK LENGTH

500 km

TUNNELS

27

SPEED

300 km/h

Erfurt–Leipzig/Halle *High-Speed Railway*

This major new high-speed rail link connecting Berlin to Munich via Nuremberg is a ten-billion-Euro (CAD 14.3 billion) project approved by the German federal government in 1991. WSP supported the German railway company Deutsche Bahn and dedicated contractors with engineering design services in several sections along the 500 km-long new and upgraded route, through all stages to completion. This included signalling systems; overhead catenary lines; electrical power and point heating systems; and telecommunications and remote-control systems. Trains run with a speed of up to 300 km/hour on the new line, which was inaugurated at the end of 2017.

The new line Erfurt - Leipzig / Halle was designed as a standard gauge, double-track, electrified railway line for passenger and freight service quality. It has a total length of 123 km and included a 3,700-square-kilometre study area. The line initially runs from Erfurt Central Station parallel to the existing line but then branches off to the northeast by Vieselbach and runs through the Thuringian Basin over the Scherkonde Viaduct by Krautheim and the Gänsebach Viaduct by Buttstädt. In its central section, it runs through the Finne range of hills, where there are tunnels with a total length of 15.4 km. The line then goes over the viaduct over the Saale-Elster floodplain

south of Halle towards the east and Leipzig. On this viaduct, the line branches off toward the north and Halle and joins the existing line from Weißenfels to Halle. The approach to Halle has been completely reconstructed with two new tracks. The line toward Leipzig goes to the municipality of Gröbers, where it joins the existing line from Halle to Leipzig. Freight trains leave the new line at this point and continue toward Leipzig on the existing line. From this point, there are tracks for freight trains to the air freight, the freight distribution centre and the Leipzig-Wahren container terminal.

The goal has been achieved: high-speed trains run on the entire new route, taking people between Berlin and Munich from city to city in record time. At the same time, the project helped close a gap in the German rapid transit network. The route opened up many opportunities to implement state-of-the-art transport concepts in the S-Bahn system and in regional and long-distance transport.

DESIGN



Location
GERMANY

Client
DEUTSCHE BAHN

Status
COMPLETED IN 2002

TRACK LENGTH

26 km

TRAVEL TIME SAVING

1 hour

SPEED

300 km/h

Cologne *Rhine/Main Line*

The Cologne – Rhine/Main high-speed railway opened in August 2002, capping approximately seven years of construction. Roughly 180 km, this railway links the cities of Cologne and Frankfurt. New routes were built to further link the railway to Cologne Bonn Airport and to the cities of Wiesbaden and Mainz. Added to that was the construction or redevelopment of long-distance train stations for high-speed rail at the sites of Siegburg, Montabaur, Limburg-Süd, and Frankfurt International Airport.

Between Cologne's central train station and the town of Siegburg, the railway first follows the old route into the Siegtal countryside until track kilometre 25, where it veers southeast and basically runs parallel to Autobahn A 3, one of Germany's federal highways. At track kilometre 152, the railway branches off to Wiesbaden and the Rhine-Main Region. At track kilometre 169, it arrives at the new long-distance railway station of Frankfurt Airport, just 4 km to the two-way junction where the railway meets the Riedbahn (Frankfurt – Mannheim line).

When it comes to cutting travel time between Germany's two most densely populated areas—the Rhine Main Region and the Ruhrgebiet—the new railway surpasses previous Rhine railways by about one hour.

Given the unusual track layout, with a longitudinal tilt of more than 40 per mille, this railway is only open for passenger traffic. Only multiple units of the InterCity Express 3 type train, which is specifically designed to handle steep inclines, can use the Cologne – Rhine/Main high-speed railway as regular service.

WSP won the bid for construction planning for the Cologne - Rhine/Main high-speed line and, in particular, the north section from Cologne Central Railway Station (Hbf) to Siegburg/Bonn. Across an area of roughly 26 km, plus the Cologne Airport Loop, this planning section encompassed both the new line and the original Wiesbaden (East Rhine Railway) and Siegen (Sieg Railway) lines running parallel thereto. The fact that this section serves a vast network of junctions and branch-off points—the combined use of S-Bahn commuter rail, local passenger service, high-speed rail and freight traffic—made planning particularly complex and challenging.





DESIGN



Location
**KARLSRUHE (GERMANY) – BASEL
(SWITZERLAND)**

Client
DEUTSCHE BAHN AG AND AFFILIATES

Status
COMPLETED IN 2019

TRACK LENGTH

40 km

STATIONS

5

SPEED

250 km/h

Karlsruhe-Basel Railway Line

The Karlsruhe-Basel line extension was of strategic significance to cross-regional, European and international rail traffic. Because of its geographical position, it is part of Europe's most important freight traffic corridor, Rotterdam-Cologne-Basel-Milan-Genoa.

At over 150 years old, the line between Karlsruhe and Basel, also known as the Rhine Valley line, is one of the oldest and most frequently travelled railway lines in southwest Germany. Over 250 local, long distance and freight trains travel daily along the 182 km double-track line between Karlsruhe and Basel. It has therefore reached its capacity limit. Adapting the lines to meet the demands of current and future traffic was urgently required in light of existing bottlenecks and the resulting quality constraints as well as the increased traffic expected in years to come.

The Karlsruhe-Basel line extension and new constructions have been conceived with a four-track extension in mind, in order to significantly increase line capacity and reduce travel and transport times.

The Karlsruhe-Basel project involved placing two new sets of track adjacent and parallel to the existing double track. With the two new tracks mainly designed for high-speed traffic, a travel

time reduction of 31 minutes was achieved for high-speed passenger trains. The two new tracks were designed for a speed of 250 km/h and mainly routed parallel to the existing tracks.

The Karlsruhe-Basel project was structured into nine sections. WSP was awarded the contract for overall structural and equipment planning in Section 9, between Buggingen and Basel Badischer Bahnhof station (approx. 40 km in track length, 5 stations). The section included the Katzenberg railway tunnel, the longest two-lane tunnel in Germany, with 9.6 km of double track.

The contract involved the planning and design of the following structures and equipment:

- Control and signalling technology (interlocking systems)
- Telecommunication and signalling facilities
- Catenary systems and traction power supply
- Electrical systems (50 Hz)

The new and expanded Karlsruhe-Basel Line, a very complex design project, was an outstanding opportunity for WSP. The unique challenge was combining modern high-speed line equipment with existing technology. It demonstrated our special competence in planning and designing future high-speed railway projects.

DESIGN



Location
OSLO, NORWAY

Client
BANE NOR

Status
COMPLETED IN 2022

NEW TRACK LENGTH

64 km

RAILWAY TUNNEL

20 km

SPEED

200 km/h

The Follo Line

The Follo Line has been built to meet the increased demand for rail capacity south of the Norwegian capitol of Oslo.

In 2016, the Follo Line project was the largest infrastructure project in the country. It includes the longest railway tunnel (20 km) in any of the Nordic countries (Norway, Sweden, Denmark, Finland and Iceland). In addition, it is Norway's first long twin-tube rail tunnel and one of the first tunnels to be constructed in the country using tunnel boring machines.

The main construction work began in 2015, and the project was completed in December 2022.

The Follo Line project is comprised of four tracks that run from Ski Station to Oslo Central Station, Norway's largest hub for public transport. Constructing new rail tracks in such a densely trafficked metropolitan area was a major logistics challenge. One of the goals of the project was to cause the least amount of disruption possible, and to that end much of the work was carried out without interfering with the daily flow of traffic to and from this busy station.

Trains on the new Follo Line run directly between Oslo and the public transport hub at Ski. The Follo Line runs alongside the Østfold Line, which currently provides service between Oslo and Ski. The Follo Line brings improved service to passengers, as the Østfold line has reached its capacity limit.

Between Oslo Central Station and the tunnel, the Follo Line must accommodate other rail traffic in and out of Oslo Central Station. The line has been constructed so that the tracks will connect with several existing platforms.

In addition, we have worked rigorously to preserve the physical integrity of Oslo's Medieval Park to respect the archaeological and historical significance of the area.

WSP's primary services:

- Construction management;
- Technical management;
- Quality manager;
- Environment, Health and Safety Management and Compliance (EHS advisory and supervisor
- Strategic planning;
- Processing and follow-up of public/governmental plans;
- Delivery of project specialists to the client.



 Ski stasjon





Location
OSLO, NORWAY

Client
NORSKE TOG

Status
ONGOING

Fjerntog N10

Norske Tog's project Fjerntog has the objective to procure new long-distance trains to replace the current trains when reaching their technical life expectancy. The trains will serve both electrified and non-electrified lines on the following four routes:

- Sørlandsbanen
- Dovrebanen
- Bergenbanen
- Nordlandsbanen

The new trains, with a top speed of 200km/h, need to meet many needs, including day and night function, multiple passenger needs, varying infrastructure, and harsh weather conditions. This includes reclining seats, sleeping compartments, bistro, family areas and flexible luggage handling.

WSP is supporting Norske Tog with multidisciplinary technical and business advisory services in several phases of the project. From developing initial overall goals in the pre-study,

to planning and developing tender documents and evaluating tenders in the procurement phase. WSP also supported by preparing the contract and the organization for the next phase. The project is currently in the delivery phase where WSP is supporting with technical and commercial expert advice. The first train will be in traffic by 2026.

WSP's involvement includes but is not limited to the following:

- Providing technical, commercial and project management.
- Providing support with market intelligence.
- Providing technical expertise for all aspects of rolling stock, including maintenance.
- Providing technical expertise for the development of an IT Concept.
- Providing reliability, availability and maintenance (RAM) and life cycle cost (LCC) technical expertise.

DESIGN



Location
SPAIN

Client
**ADMINISTRADOR DE INFRAESTRUCTURAS
FERROVIARIAS (ADIF)**

Status
ONGOING

AUDITED TRACK LENGTH

1,200 km

TUNNEL LENGTH

125 km

VIADUCTS

67

Multiple *High-Speed Lines*

Since 2010, WSP has been carrying out the quality control, quality management and monitoring of a significant portion of the high-speed railway network in Spain, supporting ADIF to ensure all new high-speed stretches are being built under the strictest quality national and international standards.

Within the contract, the Olmedo–Zamora–Lubián–Ourense high-speed line is included, where more than 320 km of high-speed platform, over 125 km of tunnels, and 67 viaducts totalling more than 19 km have been audited, designed for a speed of 350 km/h, and divided in 15 stretches, with an estimated total construction cost of 2.2 billion euros (CAD 3.2 billion).

Quality audits of the high-speed railway network in southern Spain (Seville–Córdoba, Jaén, Almería, and the transversal axes of Seville–Cádiz) are also being conducted, as well as those in the northern region of Spain (the León–Zamora high-speed line, high-speed sections in Zamora and Asturias, as well as the Atlantic High-Speed Corridor).

In total, more than 1,200 km of high-speed rail in the Spanish railway network have been audited, which provides us with a unique knowledge of the requirements, needs, strategy and main stakeholders.

Our scope of works includes the revision and monitoring of quality plans, conducting technical audits of suppliers, providers, laboratories, concrete and prefabricated plants, technical audits of works, geometric control in all platform works, management of disconformities between the property and the contractor, and reporting all deviations to minimize errors, omissions and ensure works are developed in accordance with the project, rules and regulations.

The typology of projects includes track assembly works, track renewal and/or duplication, station remodelling, overhead contact lines and their associated electrical systems, level crossing elimination, and auxiliary railway facilities (security facilities in tunnels, logistic platforms, electrical substations, CCTV, etc.).



Spazio di
As Lamy 80 m



DESIGN



Location
SPAIN

Client
**ADMINISTRADOR DE INFRAESTRUCTURAS
FERROVIARIAS (ADIF)**

Status
COMPLETED IN 2010

ANALYZED VIADUCTS

100

DIVERSE TYPOLOGIES

**From mixed
concrete-steel to
innovative designs**

SPEED

200 km/h

Spanish High-Speed Line Bridge Behavior

Our project was a two-fold endeavor. The first phase involved a meticulous examination of 100 viaducts belonging to operational high-speed rail lines. This entailed a rigorous inspection of their structural health and the precise measurement of horizontal movements, expansion joint adjustments, displacement in sliding bearing systems, longitudinal and transverse settlements at abutment heads, concrete section cracking at the abutment base, and the performance of various track expansion devices.

The second phase was dedicated to the monitoring and interpretation of data collected from four recently constructed viaducts of distinct engineering marvels: The Las Piedras Creek Viaduct, Valle Creek Viaduct, Sanboi Mixed Viaduct in Llobregat, and Sanboi Concrete Viaduct in Llobregat. These state-of-the-art structures presented unique challenges. Our mission was to observe and correlate foundation and pier crown movements with thermal influences and wind effects while delving into the dynamic behavior of the viaducts.

The Las Piedras Creek Viaduct, a continuous structure spanning 20 segments with a total length of 1208.90 metres, boasts a unique mixed concrete-steel structure. On the other hand, the Valle Creek Viaduct is a key component of the New Railway Access to the North and Northwest of Spain, stretching over 1750 metres and characterized by a hollow-box-type girder design. Meanwhile, the Sanboi Mixed Viaduct, spanning 340 metres, features an innovative structure with suspended concrete slabs between longitudinal girders.

In essence, our project combined a meticulous inspection of operational viaducts with the cutting-edge monitoring of newly constructed viaducts. We addressed crucial aspects such as structural movements, thermal behavior, and dynamic response. Each viaduct, from the mixed marvel of Las Piedras to the Valle Creek girder bridge and the innovative Sanboi Mixed Viaduct, was treated as a unique engineering masterpiece. Our ultimate goal was to ensure the safety and stability of these vital components in the high-speed rail network.

DESIGN



Location
SPAIN

Client
**ADMINISTRADOR DE
INFRAESTRUCTURAS FERROVIARIAS
(ADIF)**

Status
ONGOING

RAILWAY PROJECTS

>120

CONSTRUCTION COST

>3B €

SPEED

200 km/h

High-Speed Railway *Projects Dynamic Supervision*

Since 2019, WSP has taken on a significant role in the management and supervision of a wide spectrum of railway projects across the Spanish network. These encompass a diverse range of elements such as track alignment design, electrification, overhead line design, station development, structural enhancements, and tunnel projects throughout the country's railway network. Acting as project supervisor, WSP reviews all documentation produced by third-party consultants to guarantee strict alignment with ADIF's stringent requirements and regulatory standards.

WSP acts as project supervisor, reviewing all the documents developed by third-party consultants, to ensure its alignment with ADIF requirements, rules and regulations, providing technical support and advice to the client prior to the approval of the railway projects in each of its phases (preliminary documents, preliminary design and detailed design) as well as the BIM deliverables, BIM execution plan and the rest of BIM documents that might include the project before construction.

The scope of WSP's supervision responsibilities encompasses more than 120 railway projects, each with its unique challenges and complexities. Some noteworthy projects that stand out include the ventures undertaken in the R2 underground rail network in Barcelona, valuing 520 million euros (CAD 750 million) in construction costs, and the railway access project to the port of Castellón, involving nearly 100 million euros (CAD 144 million) of construction investments. Additionally, several other critical infrastructure initiatives are poised to fortify and expand Spain's railway network.

As total, the construction cost of all the projects supervised, amount over 3 billion euros (CAD 4.4B).

As part of our Future Ready® approach, we have developed a tool that facilitates automation; improves efficiency in the communication between stakeholders; and makes it easy to customize reports, include alerts, filters and get real-time statistics, among other features. It also helps keep track of the high number of documents that are being developed within the contract, to ensure the latest versions are being used, minimizing errors and mistakes.





DESIGN



Location
SPAIN

Client
**ADMINISTRADOR DE INFRAESTRUCTURAS
FERROVIARIAS (ADIF)**

Status
ONGOING

TRACK LENGTH

45 km

DOUBLE STANDARD-GAUGE TUNNEL

2.2 km

STATIONS

2

Murcia–Cartagena High-Speed Rail Project - El Reguerón to Cartagena Section

The Region of Murcia is poised for a transformative shift in its railway transportation network with the execution of a comprehensive project that will revolutionize connectivity and the efficiency of rail service in the area. This ambitious project aims to enhance both passenger and freight transportation and is anticipated to be a key catalyst for economic and tourism development in the region.

WSP developed the detailed design of the project that spans a length of 45.7 kms, stretching from El Reguerón to Cartagena, traversing the municipalities of Murcia, Torre–Pacheco, and Cartagena. This high-speed railway corridor runs in parallel with the existing conventional line (Chinchilla–Cartagena, with Iberian gauge) and is designed to harmoniously coexist with the existing rail service, maintaining cross-transverse permeability of the dense network of roads and highways.

Key Features of the Project

- **Expansion of High-Speed Platform:** The essence of this project lies in the expansion of the high-speed railway platform, which is developed through a double standard-gauge track. This will enable greater capacity and efficiency in rail transportation between Murcia and Cartagena.
- **Sustainable Drainage Solutions:** The

project design pays special attention to water management and drainage of the proposed platform. Coordination with the Segura Hydrographic Confederation is underway to define new bridges and drainage works over dry riverbeds without compromising the existing railway.

- **Modernization of Stations:** Existing stations, such as Balsicas–Mar Menor and Torre–Pacheco, will undergo significant expansion and remodelling, enhancing the passenger experience and ensuring a high-quality infrastructure.
- **Altaona Tunnel:** The most prominent infrastructure of the project is the Altaona tunnel, with a length of 2.2 km, crossing the Altaona mountain range. This tunnel is essential to overcome the mountainous terrain and protect the natural environment.
- **Environmental and Cultural Impact:** The project is committed to mitigating impacts on irrigation systems, environmentally and culturally sensitive areas, and habitats of community interest. Noise, vibration studies, and archaeological surveys will be conducted to ensure compliance with environmental and cultural standards.

DESIGN



Location
SPAIN

Client
**ADMINISTRADOR DE INFRAESTRUCTURAS
FERROVIARIAS (ADIF)**

Status
COMPLETED IN 2010

LONGEST VIADUCT LENGTH

2.5 km

TRACK LENGTH

8.45 km

SPEED

200 km/h

HSR Bobadilla–Granada *Antequera–Peña de Los Enamorados* Section

WSP has carried out the preliminary and detailed design, as well as the supervision and structural adaptation of this major high-speed section from Antequera and Peña de los Enamorados, an 8.45 km stretch that crosses the municipal districts of Antequera and Archidona within the province of Malaga (Andalusia).

The beginning of the section is located about 3 km northeast of Antequera, passing its plains during the first 2 km and crossing the A-45 highway. Its course then veers left toward the Guadalhorce River and the A-92 highway, crossing them by means of a single structure, and then continuing north of them until reaching the Málaga–Granada railway line, in the vicinity of which the end of the section is located. The layout is based on the design proposed for the previous feasibility study, for a maximum speed of 200 km/h and for passenger traffic.

Several structures in this section are noteworthy: the 130-metre-long viaduct over the A-45, the 2525-metre-long viaduct over

the Guadalhorce River and the A-92, the 800-metre-long tunnel, and the 123-metre-long viaduct over the Malaga–Granada railroad.

This viaduct over the Guadalhorce River and the A-92, 2.5 km long, is in the Antequera–Peña de los Enamorados section, in the municipality of Antequera (Málaga). Its design and construction process allowed minimizing the impact on the Singular Agricultural Landscape of the Vega de Antequera.

The structure has 49 spans. The deck, 14 metres wide, accommodates the platform of the high-speed double track. The most emblematic element of this viaduct is the metal arch that allows it to cross the A-92, with a span of 90 metres between supports, with a deflection of 17 metres.

The piers have a variable height to adapt to the profile of the route, reaching a maximum height of 27 metres in the area closest to the crossing over the A-92.





DESIGN



Location
SPAIN

Client
ADMINISTRADOR DE INFRAESTRUCTURAS
FERROVIARIAS (ADIF)

Status
COMPLETED IN 2005

SPEED

350 km/h

TUNNELS

7

MAJOR VIADUCTS

2

HSR Ourense–Santiago *Lalín–Lalín and Lalín–Silleda* Section

WSP carried out the preliminary and detailed design services of the 14.4 km high-speed railway line from Lalín and Silleda in Pontevedra, as part of the Ourense–Santiago high-speed line.

This section includes the design of 7 viaducts at Rego da Cabritas, Rego da Laxe, Rego das Lamas, Rego da Faquinitas, Anzo 1, Anzo 2, and Deza River as well as 7 tunnels at A Pena, Castro (cut & cover), Bendoiro (cut & cover), Vilar do Xestal, Anzo, Vila de Cruces, and Carboeiro.

The Río Deza (1,175 m long) and Anzo 2 (732.40 m long) viaducts consist of a box girder (4.50 m high) of prestressed concrete. The typical span, for both viaducts, is 70 m long, although the longest span of the Río Deza Viaduct is 75 m long. They were built by the incremental launching method,

with a 43.50-m long nose. The deck was divided in segments of 35 m of maximum length (among the longest segments made in Spain up to date). The cross section of the piers is octagonal and has a linear variation of its transverse and longitudinal dimensions in those piers taller than 50 m. The tallest pier in Anzo 2 is 70 m high, whereas the tallest one in Río Deza is 96.50 m high.

The Río Deza Viaduct crosses it at a height of more than 100 m by means of a 131.50 m span pointed arch. The erection procedure used in the construction of the arch was the vertical rotation method. For this purpose, the two half leaves of the arch were built in vertical position and then moved to position and met at the closure. It is the third longest arch built in the world by this method.

DESIGN



Location
SPAIN

Client
**ADMINISTRADOR DE INFRAESTRUCTURAS
FERROVIARIAS (ADIF)**

Status
ONGOING

SPEED

250 km/h

TRACK LENGTH

180.5 km

VIADUCT LENGTH

3.2 km

Vitoria–Bilbao–San Sebastián *High-Speed Line*

The new High-Speed Line Vitoria–Bilbao–San Sebastián–French border is part of the Atlantic branch of the European Union's Priority Project No. 3, providing continuity in Spanish territory of the Madrid–Valladolid–Vitoria–French border line.

This line will connect the three capitals of the Basque Country through high-speed rail, bringing it closer to the rest of Spain and France. In addition to linking the three Basque capitals, the new railway infrastructure will have a connection to Pamplona through the Navarrese Corridor.

The new line will have a total approximate length of 180.5 km (excluding access to the capitals). It consists of two separate branches: Vitoria–Bilbao, measuring 90.8 km, and Bergara–San Sebastián–French border, spanning 89.7 km.

WSP has participated in the preliminary and detailed design as well as construction management of several stretches from the Vitoria–Bilbao–San Sebastián high-speed line. The layout is mainly constrained by the complex topography of the

territory. This leads to the need to construct several tunnels and viaducts along the stretches.

In total, WSP has participated in over 4.9 km of tunnel, constructed using both conventional blasting and mechanical methods, as well as sections of artificial tunnel, and over 3.2 km of viaduct—with the Kortazar viaduct in the Mondragón–Elorrio–Bergara section standing out as a unique structure spanning more than 570 metres with double track.

All the sections in which WSP has been involved add up to a total of more than 290 million euros (CAD 419 million).

One of ADIF's priorities is environmental protection. That's why 6.7 percent of the high-speed rail construction budget is allocated to ensure environmental integration, making improvements to the surroundings, guaranteeing compliance with the Environmental Impact Statement regarding the project for the New Railway Network in the Basque Country.







Location
SWEDEN

Client
**TRAFIKVERKET (SWEDISH TRANSPORT
ADMINISTRATION)**

Status
COMPLETED IN 2018

Feasibility Study *Jönköping-Malmö*

Capacity on the Swedish railway network is limited, and capacity utilization on the Southern and the Western Main Lines is high today. The high-capacity utilization means that the traffic becomes sensitive to disturbances and cannot be developed in line with increased demand. As a possible solution due to the shortcomings and needs that exist, an expansion of high-speed rail has been proposed.

In 2015, WSP was commissioned to carry out a feasibility study for high-speed lines between Jönköping and Malmö (a distance of 250 km). This section is part of the planned high-speed train network between Stockholm and Malmö.

WSP analyzed both possible alignments and possible location of new stations in Lund, Hässleholm and Värnamo. Alternatives with track and station at ground level, on a bridge and in a tunnel were studied.

The work included:

- Landscape Character Assessment
- Environmental Impact Assessment
- Overall System Design
- Conceptual Design, alignment studies
- Station location
- Cost and socioeconomic estimates

The work was carried out with the landscape character assessment as the starting point. This meant that WSP worked in an integrated way with different aspects of the project; all disciplines worked together to identify possibilities and to develop solutions. This also included close dialogue with the Swedish Transport Administration's organization. The project was coordinated with several other projects within the Swedish Transport Administration.

In both the landscape character assessment and the environmental assessment, social aspects in relation to the new infrastructure and planned future construction and development of the city were studied. Analysis of social sustainability was an aspect assessed in the environmental assessment.



Location
SWEDEN

Client
**TRAFIKVERKET (SWEDISH TRANSPORT
ADMINISTRATION)**

Status
COMPLETED IN 2021

Railway Plan

East Link- Bäckebo-Tallboda

The East Link will be a new, approximately 150 km long, double-track railway between Järna outside Södertälje and Linköping. WSP has been commissioned to draw up a railway plan, system documents and an environmental impact assessment for the section Bäckebo-Tallboda, east of Linköping, a distance of 16.5 km.

The mandate included, inter alia, the following:

1. Railway plan
2. System document
3. Road plans included in railway plans
4. EIA
5. Design program
6. Prepare documentation for the application of environmental permits, notifications and exemptions, etc.
7. Mass management plan

The assignment included, among other things, about 17 km of double-track railway and several grade-separated crossings, including a bridge at

Tallboda over the old E4. A new site between Bäckeby and Tallboda. The assignment also included in-depth investigation and planning of the connection of the East Link to the Southern Main Line at Tallboda, with a new operating site in Tallboda, as well as the investigation into the relocation of the existing Southern Main Line to avoid major encroachments on existing buildings.

Among the technical areas covered by the assignment were track, land, telecommunications, signalling, road engineering/design, civil engineering, geotechnics, field geotechnics, risk management, land/water and sewerage/wiring, rock, noise, structural sound and vibrations, landscape architecture, architecture, surveying, hydrogeologist, environmental impact assessment, railway plan, land negotiation, natural and cultural environment study.

The WSP's role started in 2016 and ended in 2021.



Courtesy of the Swedish Transport Administration





Location
STOCKHOLM, SWEDEN

Client
SJ AB

Status
ONGOING

X2 Upgrade

The X2 vehicles were the first high speed trains operating in Sweden when these were taken into operation in the beginning of the 1990s. Thanks to the train-tilting function and the top speed of 200km/h, the vehicles could operate at higher speeds on the existing rail network. In 2013, SJ AB decided to refurbish and modernize the vehicles to increase the lifetime expectancy by 20-25 years.

The following system and components were replaced within the scope of the project:

- High voltage components
- Main transformers
- Propulsion converters
- Brake computer
- Auxiliary power converters
- Cooling tower
- Battery charger
- Air condition (HVAC)
- Train control (TCMS)
- Doors

The upgraded electrical systems of the new X2 vehicles will ensure more reliable power supply while reducing energy consumption in a significant way. Punctuality, reliability and higher comfort are key factors to further improve customer satisfaction.

The train will be equipped with the latest version of TCMS (Train Control and Management System). This means that the train will constantly be connected to a remote analysis and diagnostics system. It will be possible for fault diagnosis when the train is in traffic and when the train arrives for maintenance; everything is already prepared for the train to get back to traffic as soon as possible. The new X2 vehicles have extensive computer systems and continuously produces data about train conditions and performance.

WSP is supporting SJ AB in advising and reviewing in several technical areas. Especially within TCMS, Vehicle Functionality, Propulsion and HV system. Further, WSP is working with requirement analysis, validation and testing.



Location
SWEDEN

Client
SJ AB

Status
ONGOING

SJ *Delta*

To meet the increasing public demand for climate-friendly and comfortable train journeys, SJ AB has decided to invest CAD 910 million in procuring 25 new high-speed trains, with a procurement option of an additional 15 trains. The new vehicles will be the fastest trains in operation in Sweden, with a top speed of 250 km/h. The routes of operation are mainly between major cities in Sweden, but the trains will be adapted to be able to cross the borders into Denmark and Norway.

A high emphasis has been placed on providing comfort for passengers, along with the ease and ability to work while onboard the vehicles. Additionally, the vehicles will have a first-class section, bicycle storage and flexible luggage handling, as well as a bistro car that can serve hot food in a dedicated seated serving area.

WSP has been involved from the initial tendering phase to providing technical expertise and advisory services. The tendering phase was executed according to a demand-driven design philosophy in the creation of the tender documentation, requirement specifications,

and evaluation model. Close attention was paid to the involvement of the end-user-related SJ personnel, such as drivers and onboard personnel, as well as maintenance and cleaning staff.

Furthermore, WSP was tasked with providing the digital evaluation tool used for the bid evaluation during the tendering phase. This included tool development, testing, implementation, and technical support. During the bid evaluation, WSP was involved in the evaluation of the technical quality of the submitted bids. This included rounds of negotiations with the tenderers, in order to better understand the vehicle concepts offered by the tenderers.

During the vehicle realization phase, WSP has been involved in supporting SJ AB in the review of the technical solutions proposed by the awarded tenderer.





DESIGN



Location
GÖSCHENEN – AIROLO, SWITZERLAND

Client
ALPTRANSIT GOTTHARD AG (ATG)

Status
COMPLETED IN 2016

TRACK LENGTH

57 km

ESTIMATED RIDERSHIP

15,000

SPEED

250 km/h

New Rail Link *through the Alps Gotthard Base Tunnel*

The Gotthard Base Tunnel, also called the “Project of the Century,” was inaugurated on June 1, 2016. It is the world’s longest (57 kilometres) and deepest (2.3 kilometres) railway tunnel and the first flat, low-level route through the Alps. To meet the rigorous requirements and challenging conditions, WSP’s rail experts were chosen by the construction consortium to lead the approval procedure for the special catenary system as well as to carry out the design.

The Gotthard Base Tunnel represents the centrepiece of the New Rail Link through the Alps (NRLA). It embodies Swiss values such as innovation, precision and reliability. It provides a quicker, more reliable link between north and south for both people and goods. The national railway company of Switzerland, SBB, is proud to be operating the longest railway tunnel in the world.

Faster, more frequent and more convenient services as well as new and modernized rolling stock have considerably increased the transport quality on the north-south axis. Customers also benefit from more seats. The improvements took effect gradually from the end of 2016 and provided their full benefit from the end of 2020. At the same

time, SBB actively marketed the Gotthard region and the mountain route. In total, SBB expects demand for passenger services to almost double by 2025, with passenger numbers increasing from 9,000 people to approximately 15,000 people per day. More new trains are provided in order to meet this increase in passenger demand.

When it comes to freight traffic, the new Gotthard tunnel brings increased capacity, faster services and greater reliability. SBB Cargo customers receive efficient, congestion-free and environmentally friendly solutions for their logistics requirements.

For international transit traffic, the new Gotthard Base Tunnel marks the first major step toward a flat-rail route through the Alps. With the Ceneri Base Tunnel and the 4-metre corridor, rail has become significantly more competitive on the north-south axis.

Following an intensive test and approval period, the tunnel constructor AlpTransit Gotthard AG handed over the completed tunnel to the federal government, or more precisely SBB, on 31 May 2016, signalling the completion of the construction project.

DESIGN



Location
TAIWAN

Client
**TAIWAN GOVERNMENT & TAIWAN HIGH
SPEED RAIL CORPORATION**

Status
COMPLETED IN 2016

SPEED

300 km/h

TRACK LENGTH

345 km

TRIP FROM TAIPEI TO KAOHSIUNG

90 minutes

Taiwan *High-Speed Rail*

Over a period of 16 years, WSP performed a variety of roles in advancing what was at the time the world's largest build-operate-transfer (BOT) project.

We worked on behalf of the Taiwanese government, the BOT concessionaire, design-build contractors, and other consultants. In January 2007, the 345km-long high-speed line opened—on time and underbudget—whisking passengers from Taipei, the capital city in the north, to the southern port city of Kaohsiung, in just 90 minutes, at speeds up to 300 km/h. The line serves cities along Taiwan's western corridor, home to more than 90 percent of Taiwan's population. Residents of the center of the island are now within an easy 45-minute commute to employment centers in Taipei and Kaohsiung.

WSP's many contributions to the CAD 21 billion undertaking began in 1990 with a preliminary alignment and feasibility study on behalf of the Taiwanese government. WSP was then selected by the Taiwan High Speed Rail Corporation (THSRC), a consortium of five companies, to assist in the preparation of its successful bid for the BOT concession awarded in 1999. Subsequently, THSRC appointed WSP to provide project management and a variety of related services to the consortium. We designed the project's tunnel environmental system and contributed mechanical and electrical design services for stations, depots and the main workshop. The establishment of seismic design criteria by a team of WSP experts from California is an example of the international expertise we brought to the project. At the project's peak, more than 250 employees from Taiwan, the United States, Australia, Singapore, Hong Kong and Thailand worked on various aspects of the high-speed rail line.





DESIGN



Location
THAILAND

Client
THE STATE RAILWAY OF THAILAND (SRT)

Status
ONGOING

TRACK LENGTH (PHASE 1)

253 km

TRACKS

2

SPEED

250 km/h

Bangkok - Nong Khai *High-Speed Rail* (Phase 1: Bangkok-Nakhon Ratchasima)

The Thai and Chinese governments have signed a Memorandum of Understanding on Railway Infrastructure Development Cooperation under the 2015-2022 Thailand Transportation Infrastructure Development Strategic Framework to develop and build the standard-gauge (1.435 mm) HSR from Bangkok to Map Ta Phut Sea Port for a total distance of 867 km in length.

The agreement includes the design and construction of the project in two phases—Phase 1 from Bangkok to Nakhon Ratchasima, and its extension Phase 2 from Nakhon Ratchasima to Nong Khai. Phase 1, starting from Bangkok's Krung Thep Aphiwat Central Terminal, covers a distance of 253 km and comprises six stations plus centralized traffic control (CTC) building and depot.

WSP, as one of the members of the consortium that has undertaken system safety certification roles for the project, is taking the leading role in the checking and validating tasks for system certification. This involves the preparation of the processes and methodologies to be adopted in the management of works and deliverables, including key documents of the project, to check and supervise the proceeding for accuracy and safety of railway works. We are planning the sequence of activities together with duties and responsibilities of each party, including the design consultant, design checker and construction supervision consultant for the civil works, contractors as well as the operation and maintenance services provider, to ensure that the entire HSR system is complete, safe, reliable, efficient, durable and ready to serve the public.

DESIGN



Location
LONDON, BIRMINGHAM, CREWE

Client
HS2 LTD.

Status
ONGOING

TRACK LENGTH

555 km

HIGH SPEED TRAINS PER HOUR

18

PASSENGERS PER DAY

300,000

HS2

HS2 will set a new standard for rail travel in the UK. Frequent, high-capacity trains will improve connectivity between key cities, providing much-needed additional capacity for the railway network and putting Britain on track to a net zero carbon future.

Once completed, it will represent a step-change in terms of customer experience, with passengers benefitting from advanced train control systems, ticketless travel and real-time journey information.

Since 2012, WSP has supported HS2 Ltd. through the development of railway systems, civil engineering, environmental services, operations, maintenance, construction planning and land referencing services for Phases 1 and 2. We have applied our station design expertise to the development of three of the four Phase 1 stations, London Euston, Old Oak Common and Birmingham Curzon Street.

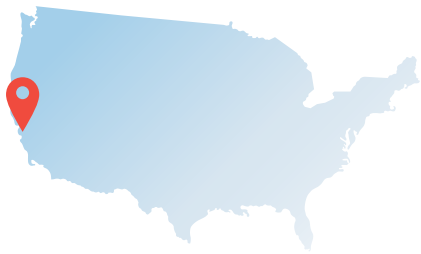
We have played a key role in developing the hybrid Bills for all three phases to date: Phase 1 (London to West Midlands), which was the largest single piece of legislation ever laid before Parliament; Phase 2a (West Midlands to Crewe), and Phase 2b (Crewe to Manchester), the hybrid Bill for this leg having been successfully submitted to Parliament in February 2022.

The new high-speed railway will feature 200m trains operating at speeds of up to 360kph – among the fastest in Europe. Using a series of models, we have demonstrated that the high capacity and speeds can be achieved without compromising on safety, sustainability or passenger comfort.





DESIGN



Location
CALIFORNIA, UNITED STATES

Client
CALIFORNIA HIGH-SPEED RAIL AUTHORITY

Status
ONGOING

TRACK LENGTH

804 km

SPEED

350 km/h

FULL-TIME WSP EMPLOYEES

275

California High-Speed Rail

WSP's international high-speed rail experience - along with its background with successful delivery of passenger rail mega projects in the United States (US) - has played a crucial role with the design, development and construction of one of the largest, most ambitious public transportation programs in US history. The 804 km California High-Speed Rail Project will connect San Francisco and the Los Angeles Basin with net zero emissions trains in under three hours - cutting travel times in half.

In 2015, WSP was awarded the Rail Delivery Partner (RDP) contract, as the prime consultant, through June 2022. Key elements of the RDP contract have been extended through December 2023. WSP brought its deep program and project management, technical and strategic expertise and leadership from a range of international projects - in the United Kingdom, Italy, Qatar and Taiwan and others. Staffing reached a peak of 275 full-time employees, with surges of part-time employees rising to more than 400.

In July 2023, 679 km were environmentally cleared and 309 km were under construction.

The WSP team has played a critical role in helping streamline environmental reviews and managing construction of 192 km of high-speed rail guideway and structures, the Authority's highest priority over the last decade. Our team has played a key role in coordinating among all project delivery functions - such as infrastructure delivery, engineering, rail operations, third-party agreements - to identify, address and resolve a range of technical, schedule, legal and other issues and challenges.

Serving as a strategic advisor and securing billions in federal funds, WSP brought to the program significant experience and expertise on the challenges associated with delivering mega projects in a dynamic political and funding environment.

We provide strategic advice and leadership on a range of issues and challenges, including policy, funding, project development and implementation strategies, and strategic communications.

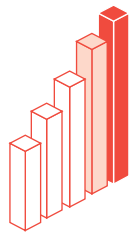
WSP, leading the RDP Team, has been instrumental in developing the performance requirements and design criteria - as well as the procurement strategies - that inform the contract packages for the track, systems, trainsets, and facilities procurements. Recognizing the importance of delivering a safe, fully integrated high-speed rail system, WSP has been leveraging holistic, systems-based international high-speed rail standards, specifications, and lessons learned while providing the technical "bridge" to demonstrate compliance with the federal regulations.

International Agility



68,000

EMPLOYEES



8.9B

2022 NET REVENUES* (CAD)

*Non-IFRS measure

ENR
Engineering News-Record

**Top International
Design Firm**

#1

TRANSPORTATION

#1

MASS TRANSIT AND RAIL

Source: ENR Global Sourcebook 2023





Our Guiding Principles

We value our people and our reputation.

We are locally dedicated with international scale.

We are future-focused and challenge the status quo.

We foster collaboration in everything we do.

We have an empowering culture and hold ourselves accountable.





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Can we anticipate the unforeseeable,
perceive the unexplainable,
and plan something unbelievable?

What if we can?

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