



CUSTOMER CASE STUDY

High Speed 1 (HS1)

Solution: ESN Total Coverage Plus



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BUSINESS**

High Speed 1: making the fast track, faster.

How EE added a whole new level of speed and coverage on trains from St Pancras International to the Eurotunnel.

High Speed 1 (HS1) required mobile coverage along their highly complex, 68-mile railway, for their 37,000 daily journeys, on trains travelling up to 180mph through over 15 miles worth of tunnel.

As the provider of UK's fastest network, EE, part of the BT Group, was delighted to become the Principal Contractor of High Speed 1 (HS1) for Mobile Network Operator (MNO) and Emergency Services Network (ESN) coverage.

EE is also the Home Office's chosen network provider of the Emergency Services Network, delivering the world's first 4G voice and data network that will transform the way Britain's Emergency Services operate. EE is responsible for providing ESN coverage up to 12 nautical

miles offshore and up to 10,000 ft above the ground, in vehicles travelling at nearly 200 miles per hour.

EE's top priority is providing a great customer experience. On HS1 this commitment extends to a potential 37,000 daily travellers (almost half of which are customer commutes), 50 HS1 employees and 400 operations and maintenance staff, as well as any emergency services personnel in attendance.



UK'S FASTEST NETWORK: Based on the RootMetrics® UK RootScore® Report: H1 (Jan-Jun) 2023. Tested at locations across the UK with the best commercially available smartphones on 4 national mobile networks across all available network types. Your experiences may vary. The RootMetrics award is not an endorsement of EE. Visit ee.co.uk/claims for more details.





The challenge: tunnel vision

HS1 required a reliable 4G capable service that supports Emergency Services Network users, other Mobile Network Operators (MNO) and future Long-Term Evolution (LTE) developments.

To determine the coverage and quality of the existing EE 4G network along the HS1 route, a detailed design survey was conducted using an onboard antenna. The survey identified large sections of tunnels with no mobile coverage. Whilst EE was tasked with navigating and deploying a solution across 15 miles of tunnel, as London Tunnel 1, 2 and the Thames Tunnel are dual bore (two rail lines), this could be interpreted as nearly 30 miles of actual bore coverage. Critically, EE had to achieve this without compromising the safety or journeys of HS1's, and their own, staff and customers.

The solution: best in (first) class

EE specified an end-to-end solution capable of supporting services to all four UK mobile operators.

The in-train commercial and ESN coverage along HS1 is made possible by EE Certified ESN-Ready® Distributed Antenna System (DAS) solutions in five key tunnel locations: London Tunnel 1, London Tunnel 2 and the Thames, North Downs and Ashford tunnels. These in-tunnel solutions designed by EE for HS1, support multiple operators and are multi-band, multi-technology and ESN ready. As the host mobile provider, EE has activated both 2G and 4G services in preparation for ESN replacing the Airwave TETRA network as the voice and data communications system for the Britain's Emergency Services.

To meet HS1's requirements, EE installed 42 kilometres of radiating cable and deployed over 100 optical / RF repeaters. All infrastructure was designed and installed alongside other radio services and satisfactorily demonstrated no interference or co-existence issues. EE's installation had to be highly secure, resilient and without interruption to high-speed trains' aerodynamics.

The journey: keeping on track

This major high-speed rail infrastructure project demanded enhanced levels of technical, operational and safety considerations. As a multi-supplier, multi-discipline solution, delivery was especially complex. Work was carried out every night for over three years through 'night possessions'; three-to-four-hour windows of opportunity to work and deliver on operational rail infrastructure. The challenge only increased following the onset of COVID-19 in March 2020, and the subsequent need for smaller teams or 'bubbles' of workers.

EE successfully mitigated the risks and complexities associated with night-time engineering, high speed trains, high voltage isolations and heavy plant road rail vehicles and cranes, to ensure all work was carried out in a highly controlled, safe and COVID-secure environment. It is estimated that around 164,800 hours were spent working on this project between November 2016 and June 2021.

The result: you have reached your destination

EE's multi-operator DAS solution system is now live, increasing the coverage footprint on the entire HS1 route, particularly in the five tunnels between St Pancras International and Ashford Cut and Cover. This enables users and workers on the Southeastern and Eurostar services to exclusively benefit from 4G speeds and continuous coverage they enter the Eurotunnel.

Laurent Bellan, Chief Information Officer, Eurostar:

"We know that a reliable internet connection is really important to our customers, and have been making improvements to provide a sustained, reliable connection throughout the journey. The addition of EE 4G to the tunnels just outside of London St Pancras has improved the customer experience for our travellers, contributing to seamless connectivity on board."

Fast facts:

- > 4G multi-Mobile Network Operator (MNO) solution
- > Supports Emergency Services Network (ESN) priority users
- > 42 kilometres of radiating cable, 28,000 clamps and over 100 optical / RF repeaters
- > 165,000 hours of work across 4.5 years