



CASE STUDY

MARKET: HIGHWAYS

REGION: EUROPE

COMPANY: HIGHWAYS ENGLAND

Highways England

Deploying an IP/MPLS and ultra-broadband communications network for England's motorways



Highways England needed to replace its fragmented, aging and expensive-to-run communications system with a modern, reliable network and comprehensive operations management system.

To meet their needs, Nokia – as technology partner of the GeneSYS Private Finance Initiative (PFI) – is providing a state-of-the-art communications solution, with an IP/MPLS-over-WDM network and management solution.

NOKIA

CHALLENGES

The communications infrastructure of Highways England – the legacy of 40 years of highway growth and regional control of roads in England – was a patchwork of many voice, video and data networks, with limited interconnectivity and high maintenance costs. The business challenges were to:

- Improve operational efficiency: Nokia's transmission system will enable fast data exchange between the regional control centers and all devices along the highway, rapidly informing drivers as needed. Based on scalable open standards, the system will support new technologies as they become available.
- Improve vehicle traffic flow: Highways England plans to deploy a new Active Traffic Management program, whereby a motorway emergency lane becomes an active traffic lane in case of road congestion. This is made possible by real-time traffic monitoring via sensors, closed circuit TV (CCTV) and automatic queue warning systems.
- Enhance safety and security: CCTV and always-on communications across the entire road network will significantly improve safety for road workers and travelers. Fire sensors and fire control systems will also improve safety in highway tunnels.
- Improve driver information: The system will enable accurate, real-time information (on road works, alternate routes, weather conditions, delays, etc.) to be reported over various types of media (variable message signs, radio, the Internet, mobile phones, TV, etc.). Drivers can re-schedule or re-route journeys to save energy and avoid delays.

SOLUTIONS

To achieve their objectives, Highways England established a Private Finance Initiative (PFI) for a National Roads Telecommunications System (NRTS), awarding a 10.5-year contract to the GeneSYS PFI. As the technology partner, Nokia is delivering an end-to-end communications solution including an IP/MPLS-over-WDM (wave division multiplexing) network and management platform. It provides effective management of the highway systems through a dedicated website, with selective access for Highways England staff and contractors, network operators and the traveling public.

BENEFITS

By replacing its highly fragmented system with an integrated, cost-effective communications network, Highways England can:

- Offer travelers safer, more reliable journeys
- Expand the network as required in the future and implement new technologies for "smarter roads"
- Leverage opportunities to provide carrier services for third parties



"We chose Nokia because of their technology, their approach, and their commitment to deliver this contract."

Ron Davison, Managing Director of GeneSYS

Nokia's perspective

Customer requirements

The mission of Highways England is to provide "safe roads, reliable journeys and informed travelers." The NTRS project was designed to support this mission with a national high-speed communications network, providing a platform for delivering in-car driver information.

Key requirements included:

- Network longevity by deploying the latest technologies
- Minimal network latency
- A single network for legacy and new services
- Network intelligence to the network edge
- Network scalability and adaptability
- State-of-the-art control of the operation and maintenance of highway assets

Our methodology

Key features of Nokia's approach to this highly complex project included:

- Ensuring that Nokia had a thorough understanding of Highways England's requirements and the constraints imposed by legacy systems
- Providing a comprehensive, fully integrated solution that addressed all customer requirements
- Forming an integrated delivery team with in-depth expertise in all key technologies
- Using an open architecture, based on IP/MPLS running over WDM

Delivery challenges

- Tight delivery schedule: Nokia is working closely with Highways England and GeneSYS to align public authority approval procedures with the challenging delivery schedule. All key dates have thus far been met.
- Project complexity: Nokia's solution must be integrated with a GeneSYS infrastructure build, operate and maintain operation, as part of a long-term PFI contract with high penalties for non-performance. Nokia placed its management team within the GeneSYS project team to ensure optimal coordination.

NOKIA

- Deployment in the highway environment: Equipment must be installed in the potentially dangerous environment near live highways. Nokia therefore runs training and awareness-building programs for all Nokia and sub-contractor site personnel.
- Integration into the existing system: Nokia must successfully integrate legacy assets into leading-edge architecture without service break

The added value

- Nokia is using a single architecture to carry all traffic, from 1970s weather station output to new-generation CCTV
- A key factor for success of the overall solution is proper planning of the optical transmission layer. Nokia is using WDM transport to provide the necessary capacity and reliability.
- The Nokia solution is supporting distributed digital video recording, enabling the Highways England to operate the entire communications system from a single Regional Control Center in the event of disaster
- The management solution provides truly comprehensive support, integrating operational control of the communications network with the highway system management

The Highways England solution at a glance

The communication networking solution

The communications infrastructure of Highways England was historically a patchwork of over 30 voice, video and data networks, with limited inter-connectivity and high maintenance costs. To improve service, Highways England wanted a modern, reliable network and comprehensive operations management system.

Highways England decided to place responsibility for the creation and management of the network with a single organization, establishing a Private Finance Initiative (PFI) for a National Roads Telecommunications System (NRTS), and awarding a 10.5-year contract to GeneSYS.

As technology partner, Nokia is delivering an end-to-end, state-of-the-art communications solution, with an IP/MPLS-over-WDM network and integrated operational support.



Highways England decided to place responsibility for the creation and management of the network with a single organization, establishing a Private Finance Initiative (PFI) for a National Roads Telecommunications System (NRTS), and awarding a 10.5-year contract to GeneSYS. As technology partner, Nokia is delivering an IP/MPLS and multi-broadband communications network

Next steps

Throughout the 10.5-year contract lifetime, Nokia will provide equipment for the network and advise Highways England and GeneSYS on next-generation communications solutions.

The technical solution

- A complete communication networking solution, supporting all software and multi-party systems
- Full management solution with selective web-based access for Highways England staff and contractors, network operators and the traveling public
- Core network built around 10 Gb/s Ethernet connected by Dense Wavelength Division Multiplexing (DWDM) technology. The edge of the optical network runs at 2.5 Gb/s for high reliability and high capacity
- Core and edge IP/MPLS network providing IP transport mechanism for true triple play services, using Nokia's 7750 Service Router (SR-1 and SR-12s)

- Support of existing emergency phones into VoIP gateways and support of the contact centre solution
- Service and performance management using Nokia's powerful 5620 Service Aware Manager (SAM)
- Integration of legacy services integrated using TDMoIP technology
- High-density 10/100 Mb/s Ethernet aggregation, meeting all network edge performance and IP security needs

Nokia OYJ
Karakaari 7
02610 Espoo
Finland

Tel. +358 (0) 10 44 88 000

CID:156124

nokia.com

NOKIA

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering the future where networks meet cloud to realize the full potential of digital in every industry.

Through networks that sense, think and act, we work with our customers and partners to create the digital services and applications of the future.

Nokia is a registered trademark of Nokia Corporation. Other product and company names mentioned herein may be trademarks or trade names of their respective owners.

© 2024 Nokia