



Project Summary

Organization

Highways England

Solution

Road and Rail Asset Performance

Location

England, United Kingdom

Project Objectives

- Reduce the number of lane closures by 3,600 per year by sharing closure information with the public, thereby limiting cost and risk for road workers.
- Increase free-flowing traffic by minimizing road closure disruption and boosting user satisfaction.

Products Used

AssetWise™

Fast Facts

- Highways England operates, maintains, and advances the Strategic Road Network (SRN) of England, which spans 4,300 miles of motorways and trunk roads.
- NOMS is a cloud-based system, developed with AssetWise, that provides real-time updates and transparency to all stakeholders, the local authorities, and the public.
- All asset managers can visualize all road closures and events on a single map.

ROI

- By reducing 1 out of 20 closures, Highways England expects to see a return on investment of 1,651 percent in year one, and a potential savings of GBP 7 million per year.
- Information sharing through NOMS reduces 14,400 hours of maintenance crews working on the SRN.

Highways England Reduces Road Closures with Network Occupancy Management System

Diminished Lane Closures Saves GBP 7 Million Per Year

Managing and Improving the Strategic Road Network

Highways England is a company owned by the Secretary of State for Transport in the United Kingdom, and it is responsible for operating and maintaining the motorways and major “trunk” A-roads that make up England’s Strategic Road Network (SRN). With a complex and aging SRN, Highways England must ensure the operational safety and efficiency of all assets on the network. The organization is investing GBP 12.16 billion on the network over the next five years, developing highways and upgrading 1,580 miles of existing motorways to Smart Motorways, where the hard shoulder is occasionally opened to traffic to increase capacity. In addition to improving the network, Highways England wishes to bolster network operation, helping drivers make better decisions before and during their journeys.

In part, Highways England manages road closures across the entire SRN, which spans 4,300 miles of roadways and includes various structures such as bridges, tunnels, drainage systems and technology assets including variable message signs and cabling. While the SRN represents around 2 percent of the total road length in England, it carries around one third of all motor vehicle traffic and two thirds of all road freight in England, amounting to over 4 million vehicles per day. Supervising these lane closures alone costs the government GBP 140.4 million every year. Therefore, limited closures on this high traffic road network are vital as roadwork delays increase traffic and fuel costs and can result in business losses as deliveries are delayed. The organization’s license to operate the SRN has a key performance indicator (KPI) that ensures at least 97 percent lane availability at all times.

To reduce costs, maintain the KPI, and manage the closures more effectively and expediently, Highways England sought to replace its legacy systems and create a Network Occupancy Management System (NOMS). Highways England aims to reduce 3,600 lane closures each year using the system. Highways England believes NOMS has the potential to provide a cost savings of around GBP 7 million per year by mapping the road network and visualizing assets and maintenance closures.

“The objective that we’re aiming for is to have a free-flow network. That is our ideal,” Simon Came, Highways England head of asset management for the East Midlands, said. “We want everyone to be able to get where they want to go, and our aim is for everybody to do a mile in a minute.”

Delivering Closure Status in Real Time

NOMS is a core component of Highways England’s larger asset lifecycle information solution, which is founded on Bentley technology. The main duties of NOMS are to plan and manage road closure events. NOMS will help manage both scheduled and unscheduled events through event clash detection, collaboration, visualization, and sharing of events to occupancy managers immediately so that the organization can ensure a free-flowing customer experience.

When a lane closure occurs, NOMS tracks the status of the closure in real-time and informs relevant stakeholders as soon as possible, ensuring the closure takes place without any issues. If an event of any sort occurs that could result in a delay to the re-opening of the road, NOMS is set up to communicate with senior managers and initiate necessary actions that will return the network to a free-flowing state as quickly as possible.



AssetWise visualized all of the data of England’s Strategic Road Network to manage all of the information related to infrastructure assets.

“Bentley’s NOMS solution is key to us integrating and sharing asset information, allowing Highways England to reap cohesive and comprehensive benefits while collaborating across the entire business.”

*– Richard Arrowsmith,
Asset Information Group
Leader, Highways England*

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AssetWise Used as Foundation of NOMS

AssetWise provided a comprehensive solution that included management reports, risk-based management assessment, information collected on assets, and a comprehensive NOMS. In addition, AssetWise was used to visualize all the data, including road furniture, geotechnical, structural, and drainage assets. The application’s ability to manage, control, distribute, and archive all types of information related to infrastructure assets increased efficiency for Highways England.

The organization also recorded all the events or road closures across the SRN and plotted them on a single map. AssetWise digitizes this information, from small inspections to major projects, creating visibility of all events and of all assets in a single location. With all the information visible, the NOMS manager can make more informed decisions to improve the network. Additionally, with all the data in one location, the asset managers can use NOMS to see what is going on within the SRN and how they can best plan improvements, operations inspections, and maintenance renewals regarding the pavement, structures, road furniture, geotechnical, and drainage assets. AssetWise allows asset managers to visualize all planned road closures; centrally manage and schedule operational, maintenance, and scheme activities; and make informed decisions based on the data to minimize the need for road closures.

NOMS contains visualizations of both the national and local road networks. This provides greater visibility to Highways England, because even though the road may not be a Highways England managed roadway, knowing what is happening on other roads at different times helps the organization plan routes for drivers.

A Digitally Collaborative Workflow

With NOMS, Highways England is enabling digital collaboration and workflows across the business, including with local authorities, third parties, and the traveling public. Complex and time-consuming processes have been removed from its business models as they have been replaced with automated systems.

“Bentley’s NOMS solution is key to us integrating and sharing asset information, allowing Highways England to reap cohesive and comprehensive benefits while collaborating across the entire business,” said Richard Arrowsmith, Highways England’s asset information group leader.

Multiple stakeholders are involved in a lane closure event, including asset managers, road space bookers, road space authorizers, third-party road space requestors, day and night operation teams, and road closure crews. NOMS provides a cloud-based, single-source solution to all internal and external stakeholders and integrates the needs and access levels of each user. As a result, workers have access at all times and can share information in real-time, no matter their location.

Additionally, NOMS shares the road closure event data with the police and the traveling public, even sharing information to customers via social media so that drivers can be kept abreast of any road work or delays instantaneously. The information is also made available to third-parties, such as utility providers, that have a license to complete construction work. NOMS has a statutory procedure built into the system that third-party organizations must follow to authorize, manage, and track requests. All NOMS users can see these requests and they are considered when the system assesses road closure clashes.

Less Closures Lead to Financial Savings and Reduced Risk

With this new system, Highways England has eradicated manual clashes where events were taken care of on a first-come, first-served basis. Now, Highways England manages events in NOMS based on priority and allows for maximum utilization of every road closure.

Highways England’s NOMS reduced closures, increased free flowing traffic, implemented safety standards, integrated all service providers, and achieved regulatory spend compliance. Through maximum utilization, Highways England expects to reduce the number of total road closures by 3,600 per year, which in the first year alone could provide a return on investment of 1,651 percent.

A reduction in lane closures leads to a reduction in road construction, which diminishes the risk for road workers and increases user satisfaction. With NOMS, one out of 20 closures are saved through information sharing, reducing 14,400 hours of maintenance crews working on the roadways over a year’s span, limiting the risk for potential incidents.

Achieving True Performance

Highways England developed a Performance Specification, which lays out the eight key areas essential to measuring the SRN’s performance. These include: making the network safer, improving user satisfaction, supporting the smooth flow of traffic, encouraging economic growth, delivering better environmental outcomes, helping cyclists and pedestrians, achieving real efficiency, and keeping the network in good condition.

Highways England implemented NOMS in August 2017 and has since seen an incredible boost in operational efficiency. NOMS is the only system like it in the world and it showcases a tangible and proven solution for Highways England, offering full-fledged internal and external digital collaboration. With NOMS, Highways England replaced their legacy system, increased worker safety and customer satisfaction, and reduced spend.