

## Keeping the construction of HS2 on track

# Balfour Beatty VINCI

## The Challenge

- Managing a complex engineering project across an 80 km route
- Making shared data available to thousands of workers from the joint venture, subcontractors and partners

## The Benefits

- Timely design changes to reduce excess costs
- Improved health and safety on construction sites
- Informed decision making to keep the project on schedule
- Effective coordination of hundreds of teams

Through an ArcGIS Managed Cloud Services agreement with Esri UK, the long-established joint venture Balfour Beatty VINCI launched 48 custom apps, dashboards, story maps and geospatial information tools for 2,500 users within just twelve months. These ArcGIS solutions are helping the organisation manage costs, protect workers and improve scheduling to keep the delivery of HS2 firmly

### The Challenge

Balfour Beatty VINCI (BBV) is responsible for delivering the longest section in the first phase of HS2, the UK's new high speed rail link to the north of England and one of the most challenging railway projects currently underway in Europe. The organisation needs to design and build 80 km of state-of-the-art rail infrastructure, comprising 66 overbridges, 42 viaducts, 35 cuttings, 33 km of embankments and four motorway crossings.

To help it coordinate and deliver this huge feat of engineering, BBV wanted to be able to store all of the geospatial data relating to all aspects of the project in one place, and create tailored apps and dashboards to make it available to everyone, including subcontractors and partners. The project would involve teams across dozens of disciplines from designers and engineers to ecologists, but while they would all be fulfilling different roles, they would all need to use much of the same geospatial information to make informed decisions.

### The Solution

BBV evaluated multiple different geographic information system (GIS) solutions, selecting Esri's ArcGIS suite because it provides the versatility that the business needs to create a variety of solutions for different groups of users. From the outset, BBV opted to use ArcGIS in a Managed Cloud Services environment, to remove the need for on-premise IT infrastructure. In doing so, it gained peace of mind from knowing that the GIS platform is being constantly monitored and supported by Esri UK's GIS experts.

"The biggest benefit of an Esri UK Managed Services contract is the support," says Faisal Khan, GIS Manager at BBV. "Our GIS platform is being monitored and maintained by experts who really understand geospatial data, can react quickly to any issues and have the knowledge to answer any questions that we might have."

Within twelve months, BBV created 15 interactive ArcGIS apps, 14 ArcGIS Dashboards, 8 ArcGIS StoryMaps and 11 other geospatial tools. In total, within the first year, BBV amassed over 2,500 ArcGIS users. The majority of the ArcGIS apps and dashboards have been developed for specific teams, giving them the precise functionality that they need to undertake their roles as efficiently as possible. The ArcGIS StoryMaps often accompany dashboards and are used to give employees, subcontractors and partners a shared understanding of importance aspects of the project, such as achieving a net zero impact on biodiversity. BBV also uses ArcGIS Pro to create maps for the community engagement team, helping it to advise local people about road closures and works in the region.

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Faisal Khan, GIS Manager, Balfour Beatty VINCI



ArcGIS analysis showing the last seven days of COVID-19 positive cases by local area

### The Benefits

#### ***Timely design changes to reduce excess costs***

Through the use of ArcGIS, BBV can make up-to-date information from ground investigations and site surveys available to designers more promptly. This enables potential issues, such as unexpected ground contamination, to be captured and incorporated into designs earlier, rather than having last minute changes that could be more costly. “You can never completely eliminate the need for design changes on a project as large and complex as HS2, but if you remove issues before construction work starts on site, it helps to keep the project within the tight construction budgets,” Khan says.

#### ***Improved health and safety on construction sites***

ArcGIS helps to improve health and safety by enabling employees and subcontractors to view the geographic context of sites, alongside computer-aided design (CAD) plans and other project data on potential hazards, all in one place, before they go there. In addition, senior managers use an ArcGIS dashboard to view scheduled works at each location along the railway route within the next four weeks. The dashboard automatically creates an alert if two contractors or two activities are scheduled simultaneously in the same location, so managers can consider safety implications and reschedule activities to protect workers if necessary.

#### ***Informed decision making to keep the project on schedule***

The tailored ArcGIS apps and dashboards give different groups of users the information that they need to make well-informed planning decisions and help keep the complex, multi-phased project on schedule. For example, employees can use ArcGIS to click on land parcels, see what land is in BBV possession and where land access is needed, so that the necessary acquisitions and access permissions can be secured well ahead of time, to prevent unnecessary delays. Equally, employees can refer to a dashboard to see historic weather patterns, and use this insight to plan the best times for works to take place.

#### ***Effective coordination of hundreds of teams***

The suite of ArcGIS solutions helps BBV to coordinate the work of multiple subcontractors and prevent unnecessary duplication of activity. For example an ArcGIS web app developed for the ground investigations team shows where boreholes have already been drilled and where new ones are proposed, so different subcontractors do not drill in the same areas. “We can have hundreds of teams working along BBV’s section of HS2 simultaneously,” Khan says. “ArcGIS gives everyone shared access to the same information and prevents unnecessary duplication of tasks, which improves the overall efficiency of the project.”

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