

Sharing the Vision on the A14



Drone shot of roadworks upgrade on the A14 at Bar Hill on the outskirts of Cambridge and heading towards Huntingdon. Photo: Speedacer / Shutterstock

How a new approach applies Augmented Reality to construction sites to bring design information to life

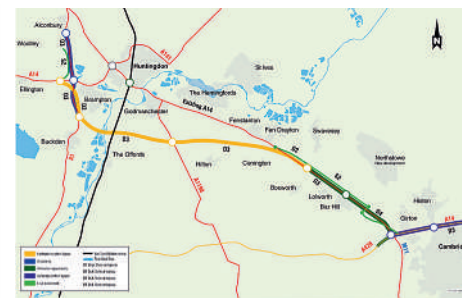
As the largest road project under construction in the U.K., the £1.5 billion improvement scheme for 34 km of the A14 between Cambridge and Huntingdon will help around 85,000 vehicles a day avoid the frequent delays caused by breakdowns, accidents and roadworks. The A14 Integrated Delivery Team, a joint venture between Costain, Skanska, Balfour Beatty and Atkins Jacobs, has applied new approaches in sharing project information with the workforce, residents and landowners affected by the work.

Mark Lawton is Skanska UK's chief engineering surveyor and lead survey manager for the A14 Cambridge to Huntingdon (C2H) improvement scheme. He knew that it would be important to discuss the impact and benefits of the project with people not familiar with highway construction. With 70 structures, a 750-meter-long viaduct and a new 19-km-long bypass to the south of Huntingdon (see map), the project will improve safety, increase



Mark Lawton

capacity and reduce travel time between Cambridge and Huntingdon by up to 20 minutes.



The new 12-mile A14 bypass to the south of Huntingdon, as denoted on the map (top) as a thick yellow line and as pictured (below) was opened to traffic in December 2019. Images: Highways England

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Lawton needed to explain where the road was planned to go and how the construction would affect the surrounding areas. But for many stakeholders, it would be difficult to understand the project based on conventional highway design plan sheets. So Lawton turned to the Trimble SiteVision outdoor Augmented Reality solution. Running on a user-supplied Android®-based smartphone, SiteVision combines precise GNSS positioning with 3D design data to provide real-time, on-site visualisation of the project’s planned roadways, structures and construction zones.

The simplicity and familiar platform of the SiteVision system made it possible for both technical and non-professional people to understand and visualise the plans. “I tell people that it’s just a phone,” Lawton said. “It’s a small, easy and friendly way to show people what is happening.” He explained that once a resident can see how trees and land will be protected, Skanska UK can gain buy-in for the work. “My goal is to connect decision makers with accurate information. I see Trimble SiteVision as a way of providing information that any user can understand,” Lawton said.

Big picture view

Lawton also needed to work with construction teams in planning the work and defining locations for fencing, excavation limits, construction materials, equipment and trailers and work yards. By using SiteVision, Lawton could provide a big-picture view enabling contractors to see how their work interacts with other needs and activities on the site.

“We went to a bridge site and worked with the engineers who would be driving piles and getting steel in place” he said. “At the same time, the site foreman is deciding



Above: This pedestrian/cycle bridge over the A14 at Swavesey is shown in its on-site location. Trimble SiteVision can use 3D models from CAD and engineering software with live, real-world views. Below: Here, information on buried utilities is combined with real-time on-site visualisation for asset management purposes.

where he’s going to have his lay down area, job cabins and wash-outs for the concrete trucks. It was easy to use SiteVision to mark out four small plots and say ‘Keep out of this area.’ The entire planning process moves forward really quickly.”

SiteVision can use 3D models and information from a wide array of sources including CAD and engineering design packages, BIM and GIS. This flexibility enables users to share views of buildings and structures, utilities, earthworks and more. Using Trimble Catalyst GNSS positioning, SiteVision creates on-site depictions of its

models with accuracy of a few centimeters. It can be used for verification of models and data sets and for checking construction progress and as-built information.

Lawton is quick to point out the high value of using SiteVision to indicate the location of underground utility cables and pipe lines, an important safety consideration in nearly any project. By linking to the growing body of precise utility location information, SiteVision can help utilities and contractors to increase accuracy and reduce time and cost in locating and protecting buried assets.



Left: Trimble SiteVision’s small size and easy operation enables professional and non-technical personnel to use in-field, real-time Augmented Reality. Right: Here, it displays a 3D model of underground utilities combined with a live view of existing features.