

CUSTOMER

Balfour Beatty

PROJECT

Monitoring the A3 during the M25 J10 project

SOLUTION

Trimble S9 Total Stations, Settop M1 comms boxes and Trimble T4D software

No fuss and full control: Monitoring the M25 Junction 10/ A3 Wisley interchange

How Balfour Beatty smoothly implemented a high-performance, easy-to-use Trimble automated monitoring system - with minimal traffic disruption and limited reliance on prisms - during essential utility work at the UK's busiest motorway junction.

The M25 Junction 10 / A3 Wisley interchange is the busiest section of the M25 with over 300,000 vehicles travelling through it every day. As part of a major National Highways upgrade scheme that began in November 2022, Balfour Beatty is delivering substantial improvements to ease congestion and enhance road user safety. These include the construction of four new slip roads, widening the A3 to four lanes in each direction around the junction, and increasing the overall capacity of the roundabout.

The project has also seen the Balfour Beatty team redirect and install a range of utilities requiring the firing of drill shots for the telecoms, water and electricity and the construction of two tunnels for the gas.

With each crossing demanding careful planning and execution to ensure safe operation, Balfour Beatty Engineering Surveyor, Jack Richardson, was responsible for the installation and smooth running of a precise and reliable monitoring system to detect any movement of the A3 carriageway during the utility work.

System selection

As a long term KOREC customer and Trimble user, Balfour Beatty engineers on this site are familiar with Trimble equipment and workflows. Consequently, four Trimble S9 Total Stations, renowned for both their high precision and reliability in all weather conditions were purchased, later supplemented with four additional S9s also hired from KOREC. When used in conjunction with Trimble 4D Control software (T4D) for automated movement detection and monitoring of infrastructure, these total stations became a straightforward to use and highly effective monitoring solution.

While the total stations were powered by an on-site generator, control was managed via the Settop M1 monitoring devices, enabling real-time remote monitoring and management. Acting as a field computer, remote switch, device server, router, Wi-Fi router, and 4G cellular modem all in one, the Settop M1s provided seamless remote access to the S9 total stations. This allowed Jack to check system status at any time, from anywhere, without the need for a complex IT setup, saving him a significant amount of time.



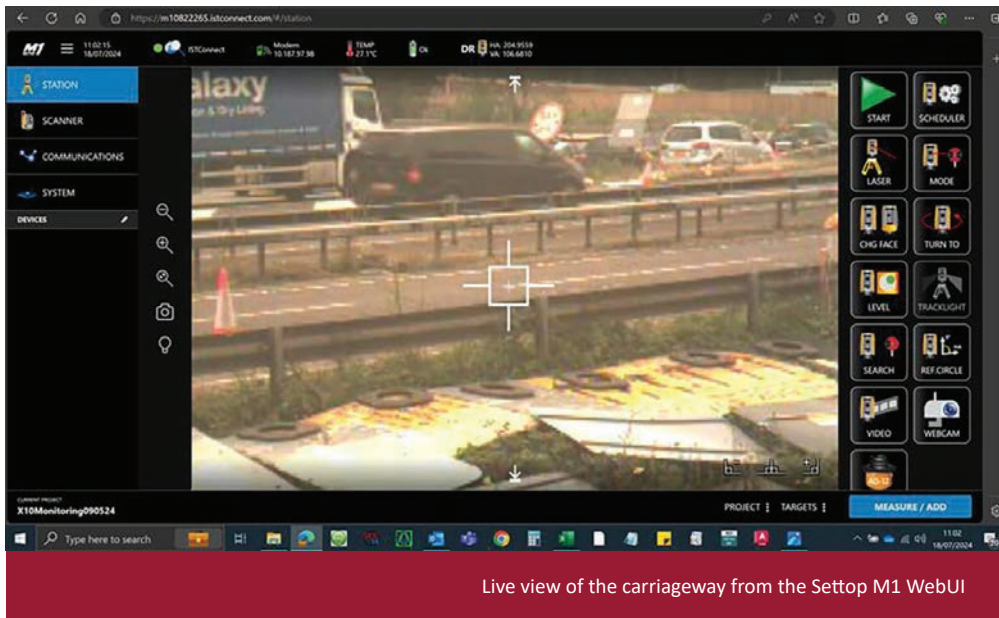
The S9s were placed at strategic locations outside the zone of influence

Stand out features of the system:

- Extremely easy to use
- Assistance from KOREC to set up useful features relevant to the project
- Reliability of the S9s
- Time saving VISION technology
- Easy reporting for National Highways



Aerial view of drill sites either side of the carriageway



Set up

Under Jack's guidance, the total stations and Settop M1s were positioned outside the zone of influence, away from the drill's centre line. Mounted on pillars and protected by cages, the instruments were strategically located in accordance with the Geotechnical Design Report (GDR) provided by VEDA – specialists in trenchless installations working alongside Balfour Beatty on these crossings.

A four-week pre-monitoring phase was then conducted to gather sufficient baseline data, with the Trimble software configured to carry out automated monitoring rounds every hour, day and night.

An alternative approach

While a few prisms were used for coordination before each round, the instruments mainly measured to the white centre line of the carriageway instead of fixed targets. This proved to be a highly effective use of DR measurement- especially on projects like this, where keeping traffic moving is key. By avoiding the need to constantly remove and reposition targets, disruption was kept to a minimum.

The Trimble S9s also come with VISION technology which provides live video streaming and high-resolution image capture, allowing Jack to see exactly what the instrument sees. This is essential for verifying measurements or checking for obstructions, movement, or tampering, without needing to physically access the site.

Using Trimble T4D software

Jack reports that even though he was relatively new to monitoring he found the Settop M1 WebUI and T4D software intuitive to use:

"If you want to check the level, just log on to the Settop box and hit the 'check level' button – it's that simple and a real time saver – otherwise I'd have to go on site and physically stop and check each instrument. The same if you want to see where all the points are, just click the map, if you want graphs, click graphs. No need to dig around in settings and menus."

"The system was extremely easy to set up.... I was easily able to summarise the operation into a single page document for another member of the team."

Jack Richardson, Engineering Surveyor, Balfour Beatty

"Being able to see what the instrument sees with the Trimble S9's VISION technology has been a real time saver."

**Jack Richardson,
Engineering Surveyor, Balfour Beatty**

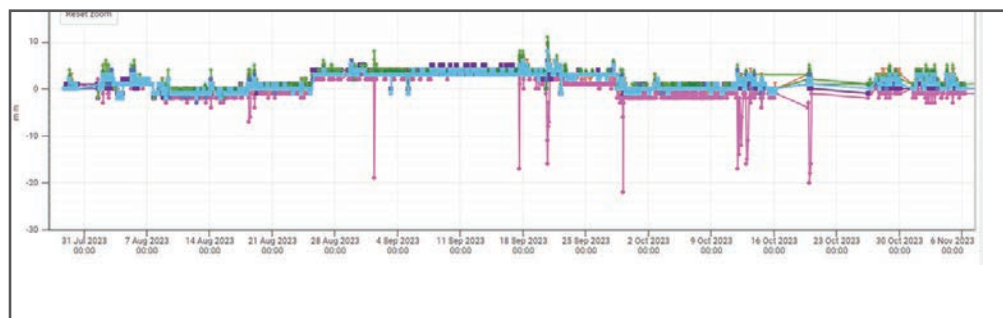


Map Screen View of Monitoring Points on Carriageway in T4D

Additionally, with a few helpful tips from the KOREC monitoring team, he was able to set up exactly the alert triggers he required using colour coded bands for the different tolerances with green indicating anything below the required 6mm of movement.

He was also able to program the system to ensure that no major triggers were alerted unless five points in the same area registered movement outside the specified tolerances. This was an important aspect of the set up because a misplaced traffic cone on the carriageway could cause multiple alarms.

Additionally, T4D would alert Jack if no data was collected over a period of hours, something that proved especially useful during a period of problems with the generator. Stand out features of the system.



T4D Analysis Graph

For Jack, the priority on this project was clear: deliver accurate, reliable monitoring data without causing disruption to the utilities team. That meant the system had to provide clear, easy-to-understand reporting and Trimble's T4D software delivered exactly that. Not only could it generate reports in the format required by National Highways, but it also made it easy to visualise key data, such as movement shown on a heat map.

One of the standout benefits for Jack was just how straightforward the system was to use and share with others. Training a colleague took no more than a single page of notes:

"If we did have any questions, then a quick call to KOREC has been answered immediately or returned within 10 minutes, KOREC has been brilliant!"

Jack Richardson, Engineering Surveyor, Balfour Beatty



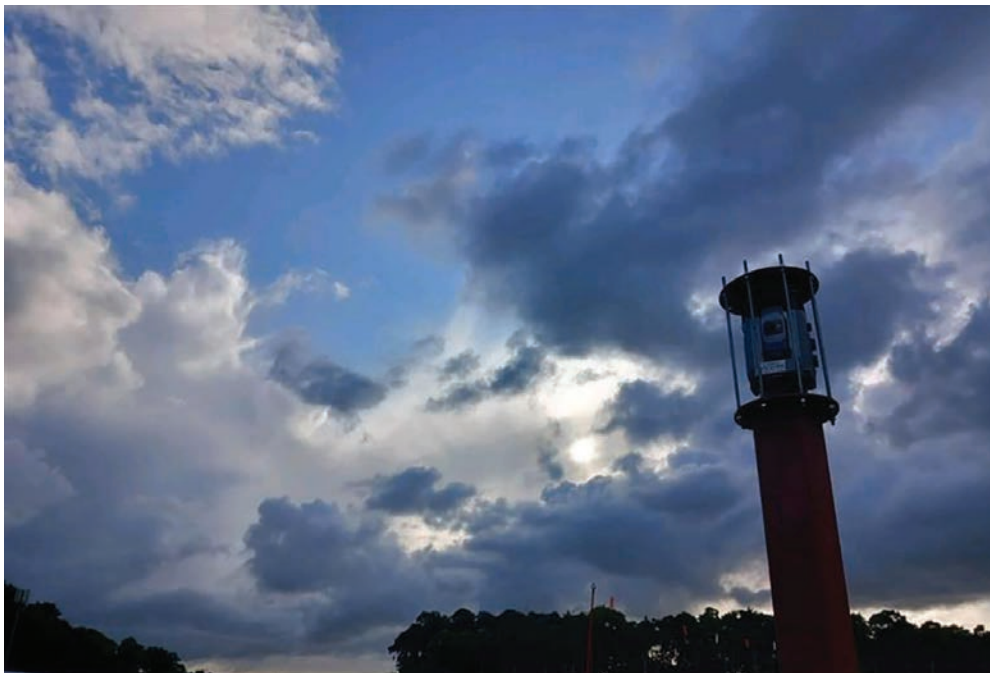
The S9s were kept secure

"The S9s, Settop M1's and T4D were extremely easy to set up, especially because we are already used to Trimble equipment. I was easily able to summarise the operation into a single page document for another member of the team."

Project completion

With the final crossing completed earlier this year, Jack reports that there were zero issues with the Trimble equipment, even when they had eight systems running simultaneously:

"The system has been so reliable and easy to use. If we did have any questions, then a quick call to KOREC has been answered immediately or returned within 10 minutes, KOREC has been brilliant!"



The S9s and Settop M1's were placed at strategic locations outside the zone of influence

CONTACT US

Please do get in touch for further information on any of the products or services mentioned in this case study, a demonstration, support or just a chat about your requirements.

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