

**Customer:**  
Colas Rail Survey

**Project:**  
Bridge strike survey for Network Rail

**Solution:**  
K-SERVICES Trimble MX8 Mobile Mapping survey

# Case Study



Network Rail specified a deliverable of bridge imagery and a 3D point cloud in JPEG and LAS 1.2 formats. In addition, if a junction was present, data was also to be captured 30m in each direction. Captured data would then be used by Network Rail to analyse clearance of the eight bridges from road level to either a deck or protective beam. This would be done by using the data with different dynamic vehicle models, which in turn would establish whether the official displayed bridge clearance signage was correct or

needed tweaking. The 30m either side were required to properly analyse the behaviours of a particular vehicle passing under the structure, subject to conditions such as speed or driving on kerbs.

“...high-quality data delivered within a very tight deadline backed up by daily progress reports.”

**Tomasz Koniuszy,**  
**Colas Rail Survey**

Responsible for data delivery, survey standards and QA at Colas Rail Survey is Survey Technical Manager, Tomasz Koniuszy. With the

project's tight time constraints, Tomasz opted to undertake the survey using mobile mapping and considered a number of options before contacting KOREC's K-SERVICES team which specialises in mobile mapping surveys and data processing. The K-SERVICES team offers a number of mobile mapping options depending on the deliverable required and in this case, KOREC's dedicated Trimble MX8 vehicle, capable of sub 10mm accuracy, was designated the most suitable option for the 8 bridge surveys.

dependent on the correct maximum height of the bridge being recorded.

## Mobile mapping delivers on a bridge strike survey

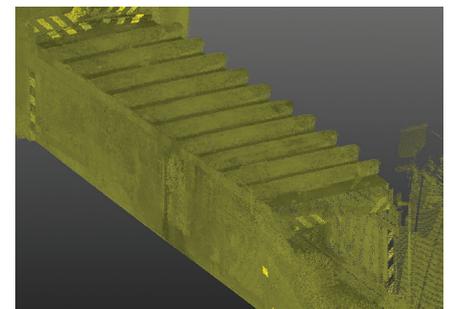
10mm accuracy, no road closures and a tight deadline. When Colas Rail Survey needed a fast solution combined with an even faster turnaround on a recent survey project to assist Network Rail in its efforts to reduce bridge strikes, KOREC's Trimble MX8 mobile mapping service delivered.

The job of looking after the thousands of structures across our railway lines lies in the hands of Network Rail. Many of these bridges, tunnels and viaducts are from the Victorian era or constructed at a time when road vehicles, both commercial and personal, were considerably smaller than they are today. The upshot of this is a decade that has seen 1500+ underline bridge strikes reported each year\* with safety consequences for vehicle drivers, trains and members of the public alike, as well as the attendant cost and inconvenience of repairs and disruption to both road and rail users.

The avoidance of bridge strikes is a challenge that Network Rail therefore tackles with diligence. Whilst there is no one solution to prevent bridge strikes, correct, visible and clean road signage in advance of low bridges is vital and of course the usefulness of these signs is

Therefore, when scratch arcs were spotted on crash beams and some of the lower parts of several bridge decks around the UK, Network Rail wished to verify that the displayed maximum height was sufficiently accurate and commissioned a survey of the eight sites.

Carrying out the work on behalf of Network Rail was Colas Rail Survey, a part of Colas Rail UK based in Manchester. Experienced in all aspects of survey work from setting out to tamping schemes, topographic survey, control and validation, Colas Rail Survey is familiar with a variety of workflows and was therefore unperturbed by a tight Network Rail deadline that required data to be delivered within a week of completed site works with those site works begun as soon as possible.



▲ Bridge 76 in Kings Langley

## Delivering fast and safe project execution

Tomasz participated in the demonstrations carried out by the K-SERVICES team and was impressed by both the technology and the timetable of works offered.

KOREC's Trimble MX8 spatial imaging vehicle is an advanced mobile data capture system that combines centimetre accuracy GNSS and IMU (inertial measurement unit) positioning with high quality imaging and laser scanning capabilities. The end result is a high-density point cloud with video and high resolution images that can be visited time and time again to produce deliverables.

Data is collected from the roof mounted 'pod' which means that operators are safely inside the vehicle and no traffic management is required. In this case, the sub 10mm accuracy achievable by the MX8 and the speed with which the surveys can be undertaken, without the need for traffic management, made the system ideal for the Network Rail job.

K-SERVICES supplies the complete vehicle mounted MX8 system along with a driver and an operator for each project so Tomasz's presence was not required on any of the bridge sites.

### One week - 8 locations!

All 8 bridges had to be scanned in a single week and were located across the UK from the northern Lake District, through the Midlands and down to the South. At each location, the K-SERVICES team

established control on the day of the survey using a Trimble R10 GNSS and specialist mobile mapping targets to achieve the required 10mm accuracies and to allow the data to be referenced to the Ordnance Survey OSTN02 coordinate system.

All the bridges were surveyed using the Trimble MX8 system apart from one coastal bridge in Cumbria which was too low for the KOREC vehicle to safely pass beneath. In this case the team carried out the survey using Trimble's top of the range TX8 3D laser scanner in order to deliver the high-density 3D point cloud that the job required.

### Deliverables

Once the survey was completed, K-SERVICES processed the data to provide the point cloud, imagery, cross sections and E57 data format (compact, vendor-neutral format for storing point clouds, images, and metadata produced by 3D imaging systems) on time and on budget.

Tomasz concluded "Not only did the K-SERVICES team supply the high-quality data we required to a very tight deadline, they also kept us clearly informed during the week of surveys with daily progress reports and a member of the team has always been available to respond to any queries we had throughout the process. Network Rail was very happy with the data provided and in particular, the level of detail which would satisfy all their design and analysis needs."

\*Network Rail website



▲ KOREC's MX8 vehicle enroute to bridge 237 in Cumbria



▲ The Trimble TX8 was used for Bridge 178 in St Bees



▲ K-SERVICES operates a mobile mapping service nationwide

## 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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