© Severn Partnership

Revolution in motion

by Natalie Binder

Severn Partnership strives to provide services to its customers using the very latest and innovative solutions. Since acquiring the Leica Pegasus:Two, the firm of Chartered Geomatics (Land) surveyors based in Shrewsbury, England, has utilised this cutting-edge technology in various infrastructure and construction projects for their customers. Keen to pass on the benefits of this new technology, Severn Partnership was delighted to be commissioned to survey a section of the M6 to collect important assets for their risk and maintenance strategy plan. A full detailed survey of a 17-kilometre (10-mile) section of the M6 in the Midlands area included carriageway limits, crash barriers, assets such as road signs and SOS phones, centre lines, central reservation, bridge structures and lamp posts. The survey was needed to improve the overall layout of the motorway ensuring regular maintenance checks can be maintained eradicating pot holes and maintaining a smooth and safe road surface for drivers.

The challenges of surveying a section of the M6 motorway are vast, and closing this section of the busy motorway was not an option. Restrictions to access were a serious issue as the motorway needed to remain open whilst the data was collected. The vast volume of assets to be surveyed on a motorway in a short period of time was also important to remember. Using traditional total station instruments to carry out this project would have taken twice the time of using a Leica Pegasus:Two, collecting thousands of points of survey data per day. Logistically and

© Severn Partnership

Severn Partnership

Established more than 30 years ago, Severn Partnership is a firm of Chartered Land Surveyors based in Shrewsbury, England. Working throughout the UK and overseas, Severn Partnership uses the latest robotic survey equipment, 3D laser scanning technology and 3D modelling software. They offer professional services in geomatics, railway survey services, utilities survey to 3D and building information modelling (BIM), and mixed in a wealth of survey expertise and experience.

In 2014, Severn Partnership made a significant investment in the Leica Pegasus:Two, the new mobile mapping solution from Leica Geosystems, becoming the second company worldwide to adopt this new technology. The Leica Pegasus:Two enables Severn Partnership to scan an impressive 1 million points per second with 120 metre (390 foot) range, resulting in survey grade data being captured in a fraction of the conventional survey time. The use of mobile mapping has allowed Severn Partnership to capture calibrated imagery and point cloud data together, making for higher accuracy and faster data collection.

practically speaking, it is dangerous for surveyors to collect data in the middle of a motorway. The overall cost of the project increases with the need for active traffic management throughout the project cycle. A more efficient collection process was needed.

The best solution for mapping the M6 motorway

Severn Partnership used mobile mapping – the process of collecting 3D geospatial information from a moving vehicle – to quickly and accurately provide customers with 2D and 3D CAD plans as well as fully registered point clouds of the entire route section. These point clouds are millions of individual coordinates measured on anything the laser reflects off, such as bridges and roads and can be used to extract even more information, such as GIS datasets. The device is attached to the roof of a moving vehicle and seven cameras then capture a full 360° dome image every 2 metres (6.5 feet). Simultaneously, a LiDAR scanner records cross section data every 2 millimetres (0.08 inches). All this is combined into a single cloud creating a 3D model. The result is a direct mapping of features without the need for complex post-processing of observed data, saving time and resources.

A world of opportunity

The Leica Pegasus:Two and the mobile mapping process have revolutionised the world of surveying. There are huge benefits for using mobile mapping systems, especially for infrastructure projects such as the M6 motorway. Access to the motorway is left clear, with no need to close off roads, as the Pegasus:Two acts in the same way as any other public vehicles, only it is collecting 3D geospatial data. Safety is drastically improved using mobile mapping because surveyors no longer need to stand in the road working under time pressure in critical environments to complete projects. All data is now captured from the safety of a vehicle travelling the same speed as the rest of the traffic.

With no need to close roadways, the Leica Pegasus:Two safely captures assets and surroundings.

The speed and accuracy of the data collected is also improved. Using traditional static laser scanning methods, two teams would spend several months to survey the highway and other assets along the 17-kilometre (10-mile) section of the M6. Using the Leica Pegasus:Two, Severn Partnership provided the customer with detailed deliverables in just two weeks. Reducing the speed of data collection means a cost saving for customers of 60 percent when compared with the traditional static laser scanning. Also, larger circumferences were covered, giving more accurate, efficient and complete data using combined LiDAR and photogrammetry.

"At Severn Partnership, we understand the need to invest in the latest technology in order to continue to offer the highest level of service to our customers. Pegasus:Two is one of the most accurate mobile mapping unit on the market and does not need survey ground control installed ahead of it," said Mark Combes, managing director at Severn Partnership. "We will be transferring it between mobile vehicles, cars, vans, roadrailers, trolleys and other vehicles to scan data across all number of terrain."

The world of surveying is changing and the combining and marriage of multiple technologies has been a giant leap, one which Severn Partnership has openly embraced and serenely adopted for its customers. Mobile mapping has provided a rapid data capture solution, minimising cost, reducing safety risk and maximising value. ■

About the author:
Natalie Binder is marketing and communications manager at Leica Geosystems Ltd. based in Milton Keynes, UK.
natalie.binder@leica-geosystems.com