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# Collision Investigation and GNSS technology

... or where have all the cameras gone?

As a result of the dramatic public sector cut backs recently announced by the government, one area of saving has been causing extensive debate. Road safety funding is being cut by 40% which perversely has delighted some but caused despair amongst many. The delighted will rejoice in seeing hundreds of speed cameras being shut off as witnessed recently in Oxfordshire, whilst those despairing will argue that road deaths and injuries have reduced in recent years due to various road safety measures, including the bright yellow box. What is true is that accidents still occur on our roads every day and whether speeding or other factors are the cause, the knock on effects are widespread. Fatalities and injuries are the inevitable human consequence with the cost to the economy of road closures and traffic delays amounting to millions of pounds.

In what seems to be a trend of less Police on our streets (and roads) few will have failed to notice the increasing number of "Police" style marked vehicles on the motorways which, when you slow down, turn out to be Highways Agency Traffic Officers (HATOs). There are 207 of these vehicles in use on our 2025 miles of motorway, apparently, or one every 9.78 miles (they also patrol one or two major A-roads too). These HATOs, who were granted extra powers back in 2003, have been put on our roads with the primary goal to keep the traffic flowing on Britain's road network. These pseudo police officers are allowed to direct traffic, set up diversions and move debris or immobilised vehicles from the road which actually helps free up traffic police officers to concentrate on law enforcement and driver education.

In another move designed to keep traffic flowing, the Highways Agency recently invested millions of pounds in state-of-the-art surveying equipment for Police Collision Investigation. For many years these Police Collision Investigation Sections used robotic total stations for surveying the scene of fatal and near fatal incidents but with this new investment in



technology the Highways Agency has provided Integrate Surveying Solutions, i.e. using both robotic total stations and GNSS receivers. The use of both technologies would hopefully allow collision scenes to be surveyed much faster than traditional methods or robotic total station surveying alone. Introducing a more recent technology, that of Network RTK Surveying, has in fact increased productivity and hence reduced the time taken to open the road.

Network RTK Surveying makes GNSS more accessible to non surveyors. With little or no experience in surveying the user can carry out basic surveys without extensive training. Traditionally RTK Surveying would be done with two GNSS receivers, one setup as a base station over a known point transmitting local corrections to the second unit, the rover, via a radio link. The base station would need its own power supply and once setup would be located away from the survey site and so security could often become an issue. As soon as the base station is up and running the rover could then be switched on and connected to the base. Only then could the survey commence. Once the site survey had been completed you would have to return to the base station to pack it away.

There are some applications where this base and rover setup is still used, for example in high accuracy surveys and construction sites, but Network RTK allows the use of just one GNSS rover receiver with subscription delivered corrections being supplied over the mobile phone network as opposed to via a base station. With Network RTK, the surveyor just needs to get the GNSS rover out of the van, switch it on, wait a few seconds for it to initialise and pick up the correction service via his mobile phone (or GSM module in the GNSS receiver) and then start surveying. This makes Network RTK ideal for use in collision investigation where speed is of the essence (and perhaps the cause!).

There are three commercially available Network RTK solutions available in the UK today, Trimble VRS™ Now, SmartNet from

Leica GeoSystems and Topcon's TopNET Plus. These systems cost in the region of £2K for a 12 month unlimited subscription. Compare this to the cost of operating a separate base station and radio of around £15k, then even without the time savings and improved efficiencies it looks like an obvious decision. Network RTK is not used in all collision scene surveys though. As with any GNSS application the limiting factors of a clear view of the sky can often prevent GNSS being used at a collision site that might have occurred under a bridge for example. This is when a robotic total station can be used.

The Highways Agency has found that with the Police Collision Scene Officers now using this new technology roads have been reopened much more quickly, often in half the time, proving the investment in technology has been well worthwhile.

So now that these fixed speed cameras are being switched off, remember that mobile speed cameras will still be used (these can be mistaken for robotic total stations on a tripod!) and when you're sitting in traffic waiting for the motorway to be reopened, without GNSS technology you'd probably be waiting there twice as long!