PRODUCT SOLUTIONS FOR
INTELLIGENT TRAFFIC SYSTEMS

AGD **318**
TRAFFIC CONTROL RADAR

Case Study

Above-ground detection – radar delivers MOVA solution

Independent traffic consultant Dan Preece specialises in adaptive control of signal controlled junctions, primarily using MOVA (Microprocessor Optimised Vehicle Actuation) solutions. Always looking for innovative detection technologies, Dan worked with AGD Systems to introduce its 318 Traffic Control Radar to a busy junction in Worthing, Sussex, with excellent results.

Deployed on over 3000 sites across the UK, MOVA has provided a well-established strategy for traffic control at isolated junctions and small networks for nearly 30 years. Upgrading a junction or crossing with MOVA can be cost prohibitive when using intrusive loop detection. If costs could be dramatically reduced, more junctions and crossings could be upgraded, offering greater efficiency across a local authority's road network.

West Sussex County Council wanted to upgrade a busy junction in Worthing which faces the challenge of high demand during peak periods, with large platoons on the main road. Barry Edmunds, Manager of Traffic Signals and Street Lighting at West Sussex County Council, explains: "We were looking for improved performance from a low-maintenance solution and were hoping to test a new methodology that we could apply to future schemes." The site in question (Grand Avenue, Worthing) has AGD318 detectors controlling all four arms with stop line detectors all round.

Traffic & Pedestrian Control

Ducting was available on the site, but some works would still have been needed to enable loop cutting and cabling to be implemented where required.

"If we had approached this in the traditional way, it would have required alteration to the existing ducting, chambers and lots of civils, with all the associated issues of time and cost, plus traffic management and the disruption that causes," explains Dan Preece. "While we did already have some ducting in place and could have created the chambers, we saw this as an excellent opportunity to test an above-ground solution instead.

safer, greener, more efficient

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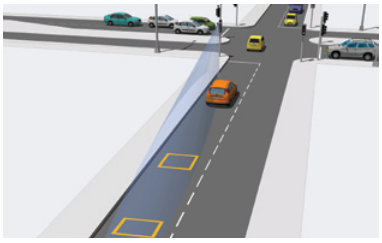
AGD's 318 Traffic Control Radar replaces inductive loops at this MOVA junction in Worthing

"The AGD 318 traffic control radar is mounted on poles at the junction, so it is easier and cheaper to maintain, quicker to deploy and you can easily make changes on site – for example, moving the detection zone without any intrusive works."

Clever engineering



When deploying the AGD 318 in a MOVA application, the fact that it does not provide detection of stationary vehicles has presented problems in the past. "If vehicle speed drops below 4kph, it is invisible to the radar," says Dan. "With MOVA you really need accurate detection. In particular, reliability of the 'X' loop is essential for MOVA to be able to operate efficiently. MOVA monitors flow over the X loop and knows how many vehicles have turned up while the approach is at red, and performs a calculation about how much green time it needs to apply at the start of the stage. This calculation forms the variable minimum which is a critical part of the MOVA cycle. Following variable minimum saturation, flow is monitored at the X loop to allow gap acceptance and the start of optimisation. It is at this point that the lack of stationary detect can be a problem. If there is not enough variable minimum time to allow movement over the X loop to start, the signals will gap out prematurely."

To overcome this, Dan had to come up with some controller special conditioning to mitigate the issue. "This worked very well on site," he explains. "Although a small amount of efficiency can be lost while MOVA is running variable minimum, the lost efficiency is marginal and as soon as green time goes past the upper limit of variable minimum (typically up to about 15s), full efficiency is regained."

Dan explains how he set up the site: “We did have to apply some clever engineering. We are using the stop line detector, in addition to the X detector, to extend green up to the variable minimum period. Just past the variable minimum period the stop line is removed from extending. This ensures that during busy times the approach will always extend and not get stuck running minimum green times. We also made changes to how we usually validate a site on MOVA, making it more susceptible to optimisation to minimise any masking that may occur, although in practice this wasn’t an issue on this site. It wasn’t just a case of putting the 318 up and it working out of the box – we did have to do some development, but once we had done that, the site worked very well.

“Care needs to be taken to observe behaviour and traffic patterns at junctions prior to deployment, to ensure suitability and to create mitigation measures that may be required through controller special conditioning. Sites that are prone to exit blocking should be carefully considered for suitability. Sites with a high HGV content can be considered by using the AGD 318 to detect that it is a large vehicle and dealing with this in the dataset, similar to freight priority methodology.”

The AGD 318 Traffic Control Radar

A great success

This solution was achieved with minimal traffic management and no downtime of lanes or major disruption to traffic. Using AGD 318 radar also allows for ease of maintenance and adjustment in future, without the need for re-cutting loops in the carriageway and the traffic management and roadspace requirements that would bring.

Dan Preece estimates that the detection cost for this junction would have been around £30,000 if there had been no ducting in place and if the entire solution had been created around intrusive detection. “This includes ducting in hard ground, chambers/underground works, slot cutting and traffic management,” he says. “The actual cost was a fraction of this, and of course the cost savings continue throughout the lifetime of the junction.”

The scheme was seen as a great success, with no perceived lack of performance by using the 318 radar instead of inductive loops for this MOVA scheme. “West Sussex County Council will use this methodology on future schemes,” concludes Dan.

> “It is an exciting time in the industry as new technology is coming through fast, not least of which is the AGD 318 radar. The dual output version of this radar is going to make a big difference to the number of schemes that can be converted to MOVA operation, particularly in the urban/semi-urban environment where traditionally cost, services and available ducting have made the upgrade prohibitively expensive or simply not practical.”
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> *Dan Preece, independent consultant, Integrated Traffic Services*