

## Smart Motorways Deploying Latest Radar Technology to Enable the Roads of the Future



### The 'Smart Highway'

The concept of the 'smart highway' is not new. Variable speed limits, active lane closures and dynamic traffic management are aspects of travelling on modern UK motorways that many drivers will be very familiar with.

For the operators at the multiple regional control centres, decisions made based on traffic monitoring information make the critical difference between a smooth running network, or one plagued by jams and bottlenecks.

But the decisions made are only as good as the data that informs them.

More than 230 miles of Britain's motorway network have been converted to utilise traffic monitoring; harnessing systems analysing traffic flows to inform interventions designed to help reduce congestion and enhance safety.

And in his Autumn Statement of 2019, the then Chancellor of the Exchequer, Philip Hammond, committed £25.3bn for the second Road Investment Strategy (RIS2), with proposals to 'prepare the network for a digital future'.

As part of the RIS2, the Government lays out its vision for a Strategic Road Network (SRN) of the future and described what it might look like in 2050: ►

*The SRN has been 'levelled up' across the nation, so that the SRN and Major Road Network connect all areas well, including those where poor quality links are currently a barrier to growth. This not only includes the technology of today, but also the equipment needed to create the road of the future, so that no part of the country is left in a 'not spot' with gaps in physical or digital infrastructure.*

Department for Transport Road Investment Strategy 2: 2020-25

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## Infrastructure

The Government's recognition of the negative impact of the flaws in the existing road network infrastructure is an opportunity to reflect on what may be possible. What would the 'road of the future' look like? What are the current gaps in deployment of the latest technology and how is this hampering efforts to improve the overall network?

### Do I have to still rely on outdated highways monitoring technology?



Real time traffic conditions are now routinely monitored to generate traffic data, by vehicle detection systems positioned at intervals along the motorway, which relay information to control centres.

There are two main types of detection systems in use in today's smart motorways - an older inductive loop system, installed directly into the road surface, which measures vehicle speed, road occupancy and classification and a more modern radar-based system, which is used to analyse multiple aspects of traffic information simultaneously and can be positioned at the side of the carriageway.

Radar systems have overtaken inductive loop systems as the monitoring method of choice due to the flexibility of positioning of the radar, and the avoidance of complex and disruptive installation measures and costly ongoing maintenance. It's not a silver bullet however, and risks still exist in choosing the right radar solution.

### What are the potential pitfalls in moving to a radar system?



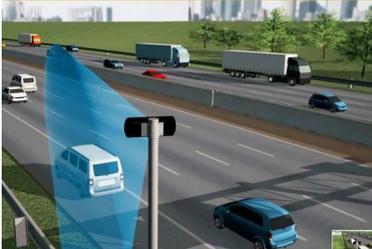
The Highways England Motorway Incident Detection & Automatic Signalling (MIDAS) system exists to improve safety on the network and has relied on the inductive loop system as a means of providing traffic data.

However, the drawbacks of using such installations when failure occurs are acknowledged, such as the need to carry out disruptive maintenance within the carriageway and so the use of approved radar in MIDAS schemes is becoming more commonplace.

Despite this, however, Highways England has warned of performance issues with some systems, leading to inconsistent data. So how do you know your system will perform adequately?

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#### What are the important considerations in choosing the right radar system installation?



Problems with poorly performing radar systems led to Highways England producing the Radar Guidance and Commissioning Checklist. This highlights assessment methodology that should be applied during the adoption of appropriate radar technology and what might be necessary to overcome radar performance issues as part of improved highway monitoring.

The checklist highlights many considerations for monitoring system designers, but crucially acknowledges that there are limitations with 'side-firing' radar systems, stating that the performance of some devices could be affected by a strict minimum offset from the carriageway of at least six metres in order to ensure accuracy and comprehensive lane coverage.

Of course, in some circumstances, achieving this distance may not always be possible, due to limitations of the environment in which the highway is located, be they physical buildings or geographical features.

#### How can I get round these limitations?



#### Full lane coverage at just two metres offset from nearest running lane

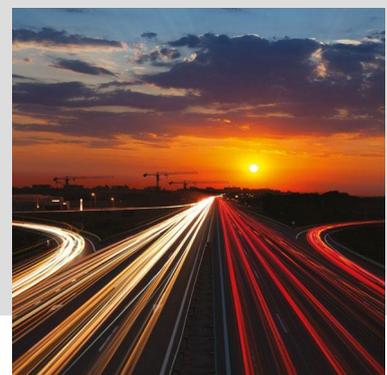
At AGD Systems, our unstinting commitment to continual innovation has allowed us to develop the 343 Highways Monitoring Radar, which operates as close as just two metres from the carriageway, at a height of six metres, crucially angled at 30° to cover up to ten lanes. These features dramatically enhance the quality of traffic profiling and incident detection.

The unit employs proven enforcement-grade radar and measurement techniques to track and measure speed, range, length and direction of individual targets, in all weather conditions.

The AGD 343 radar easily replaces intrusive high-maintenance loops, and can be mounted on existing roadside poles or gantries. The additional capability to operate as close as a two metre offset, while maintaining a six metre plus

mounting height, ensures reliable operation in managed motorway scenarios and All Lanes Running schemes.

The 343 has been purpose designed to cope with the specific challenges facing international road network installations, to bring about better informed control rooms, allowing for instant and safer decision making, comprehensively enabling highways fit for the future.



Highways