Smart Motorways M5 junctions 4a to 6

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Welcome

We are improving the M5 between junctions 4a (Bromsgrove) and 6 (Worcester) by introducing a smart motorways - all lane running scheme. Introducing new smart motorways - all lane running technology will:

- Reduce congestion and smooth the flow of traffic
- Improve journey time reliability
- Support economic development in the region

It will also improve access to the region’s business hubs including: Birmingham International Airport, the National Exhibition Centre (NEC), major freight depots and business centres.

Please note that images in this exhibition are used for illustrative purposes only.
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Improving journey time reliability

An objective of smart motorways is to improve journey time reliability. To achieve this on the M5 between junctions 4a and 6 we will be adding extra capacity by converting the hard shoulder to a permanent additional traffic lane.

We will also use variable mandatory speed limits to improve and control the flow of traffic at particularly busy periods of the day. You will find more information on these features on some of our other exhibition boards.

The number of respondents who felt that use of variable speed limits would improve traffic flow remained consistent at 52% in 2012-2013 and 2013-2014.*

Supporting economic growth

Congestion is estimated to cost the economy £2 billion per annum and, with traffic levels forecast to grow by 46 per cent by 2040, Highways England recognises that effective management of congestion is needed together with smarter use of our motorway network.

A functional transport system is important to help the economy to grow. If our roads are congested it impacts on businesses and can discourage investment. Reducing congestion, removing major bottlenecks and improving journey time reliability will help businesses in the area to be more efficient.

Smart motorways deliver significant benefits for the investment made because of the way they work. They have many advantages over conventional widening schemes.

Smart motorways can be introduced without the need to take large amounts of land. They can also be delivered at up to 40 per cent cheaper to implement than traditional road widening. We work closely with our supply chain to maximise efficiencies throughout construction.
Environmental assessment

All our construction works will be located within the existing highway boundary. We have undertaken an environmental assessment report that covers a range of topics including noise, air quality, ecology, cultural heritage, materials used and visual impacts on the landscape. The report’s overall conclusion is that the environmental impact of the scheme is not significant (full report is available on the Highways England website).

Ecology
Surveys for protected species have been carried out, and Great Crested Newts were identified within ponds adjacent to the scheme. To ensure their habitat and lifecycle remains protected during construction, mitigation work will take place under a licence granted by Natural England.

Noise
Resurfacing of the carriageway will be completed with low-noise surfacing. This work will be completed as part of the construction programme for the scheme.

Landscape and views
Any changes in views will be minimal for most residents, re-using existing road gantry sites where possible and siting new signage away from residential properties.

The existing planting provides good screening of the motorway corridor for nearby properties, as well as those with more distant views. Mitigation measures, including restoring areas of vegetation lost during construction, will reduce the visual impact of the scheme as new planting matures.
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The evolution of smart motorways

The first controlled motorway opened on the M25 in 1995 and led to a 15 per cent improvement in journey times. It was the success of controlled motorways that led to the M42 between junctions 3a and 7 becoming the first section of our network to test hard shoulder running during peak periods in 2006 to increase capacity on the existing network.

Data from the M42 showed a 22 per cent improvement in journey times, with incidents reduced by more than 55.7 per cent. The schemes that followed on the M6, M62 and M4 / M5 near Bristol operate as controlled motorways until busy periods when additional capacity is needed. Traffic is then directed to use the hard shoulder.

Highways England has recently opened the next development of smart motorways on the M25 between junctions 23 to 25 and junctions 5 to 7. These feature all lane running and the permanent conversion of the hard shoulder to an extra traffic lane. Smart motorways feature four lanes open to traffic supported by variable mandatory speed technology, and incident detection with emergency refuge areas spaced at intervals along the carriageway.

The design of smart motorways - all lane running is not fundamentally different to the existing road network that does not have a hard shoulder. However, it has the added advantage of providing technology to detect and monitor traffic flows on the network. This is coupled with messaging systems able to communicate instructions to drivers, such as lane closures or speed limits. When used together, they create a controlled environment that leads to safe and more reliable journeys with smoother traffic flows.

1 ATM Monitoring & Evaluation, 4-Lane Variable Mandatory Speed Limits -12 Month Report (Primary & Secondary Indicators), 30/6/2008
2 M42 MM Monitoring & Evaluation, Three Year Review, 2011
Emergency refuge areas

As part of the smart motorway scheme on the M5 we will be constructing new emergency refuge areas at regular intervals between junctions 4a and 6. Drivers whose vehicles break down should try to drive to the nearest emergency refuge area or exit slip road. If a vehicle breakdown occurs in a live lane we set signs and signals on the overhead gantries until assistance can reach the driver. Once in the emergency refuge area drivers are encouraged to use the emergency telephone which will automatically pinpoint their location to Highways England’s Regional Control Centre.

Depending on the situation the Control Centre operator can send a Highways England Traffic Officer or recovery vehicle to the driver, or advise the driver’s recovery service. Further information and advice on preventing breakdowns and what to do if your vehicle breaks down on our network can be found on Highways England’s web site.
What are smart motorways?

**Controlled motorways**
Three or more lanes with variable speed limits. The hard shoulder should only be used in a genuine emergency.

**Hard shoulder running**
Traffic is managed by variable speed limits with the hard shoulder opening to add an extra lane at busy times. You should NOT use the hard shoulder unless overhead signs show that you can do so.

**Signs**
Signs will advise you of any lane closures and will provide information on road conditions such as severe weather.

**Lane closure signs**
When lanes are closed, a red X sign will be displayed above the hard shoulder or lane(s) that cannot be used.

**Speed limit signs**
Speed limits will vary and will be applied at times of congestion, to prevent stop - start conditions. Signs in the verge or above the carriageway will advise the current speed limit. If no speed limit is shown the national speed limit applies.
What the system will include

The design of smart motorways - all lane running is not fundamentally different to those sections of the existing motorway network that do not have a hard shoulder. However, it has the added advantage of providing technology to detect and monitor incidents that are happening on the network, coupled with dedicated systems able to communicate appropriate advice or instructions to drivers, such as lane availability or mandatory speed limits. When these are used together, they help to create a controlled environment that leads to safe and more reliable journeys with smoother traffic flows.
Incident management

Procedures for smart motorways

1. Incidents can be detected by equipment such as loops in the road and verge mounted CCTV, or calls from the public via emergency roadside telephones and mobile phones.

2. Where appropriate, signs and signals will be set to clear an access route for emergency vehicles. Typically a red X sign will be set above the selected access route to close the lane(s) to traffic. Supporting variable message signs will be set to reinforce the closure instruction and warn approaching motorists.

3. Signs and signals will be set to protect the incident and the back of the queue. The Regional Control Centre will continue to monitor traffic conditions throughout the duration of each incident to ensure that the signs and signals set remain appropriate to the conditions.

4. The Regional Control Centre is responsible for setting signs and signals to facilitate the re-opening of the carriageway and the safe dispersal of trapped or congested traffic.

These images show a hard shoulder (solid line). Our scheme will have a broken line.
Variable mandatory speed limits

One of the key features of smart motorways is variable mandatory speed limits. These speed limits displayed on the motorway come into operation when traffic volumes increase and sensors in the road activate lower speeds. By reducing the speed during peak demand this reduces stop – start conditions and allows traffic to move smoothly.

The variable mandatory speed limits are clearly displayed on signs mounted either above each lane of the carriageway or on verge mounted signs which are clearly visible.

The introduction of variable mandatory speed limits requires legislation in the form of regulations made under Sections 17(2) and (3) of the Road Traffic Regulation Act 1984.

A consultation to implement variable mandatory speed limits on the M5 between junctions 4a and 6 took place for a period of six weeks, from Monday 3 March 2014 to Monday 14 April 2014.

The proposed regulations will allow vehicle speeds to be controlled through the smart motorway scheme during periods of congestion.