

Explanatory Memorandum to the M4 Motorway (West of Junction 23A (Magor) to East of Junction 29 (Castleton)) (Variable Speed Limits) Regulations 2011

This Explanatory Memorandum has been prepared by the Department for Transport, Housing and Regeneration and is laid before the National Assembly for Wales in conjunction with the above subordinate legislation and in accordance with Standing Order 24.1.

Minister's Declaration

In my view, this Explanatory Memorandum gives a fair and reasonable view of the expected impact of The M4 Motorway (West of Junction 23A (Magor) to East of Junction 29 (Castleton)) (Variable Speed Limits) Regulations 2011. I am satisfied that the benefits outweigh any costs.

Ieuan Wyn Jones

Minister for the Economy and Transport

17 January 2011

1. Description

The Regulations will introduce an enforceable variable speed limit system on the M4 Motorway between Junction 23A (Magor) and Junction 29 (Castleton) and adjoining slip roads.

2. Matters of special interest to the Constitutional Affairs Committee

None.

3. Legislative Background

The power enabling this instrument to be made is Section 17(2) of the Road Traffic Regulation Act 1984 (RTRA). This gives the Welsh Ministers the power to make Regulations with respect to the use of special roads (motorways). This power has been transferred to the Welsh Ministers by virtue of paragraph 30 of Schedule 11 to the Government of Wales Act 2006.

This instrument follows the negative procedure.

4. Purpose and intended effect of the legislation

The main purpose of the Regulations is to reduce accidents and delays, increase network resilience, improve management of incidents and road works and improve driver information provision for users of the M4 Motorway. The concept of the scheme is to smooth traffic flow by controlling speed, particularly during peak periods and incidents. The use of mandatory speed limits will be through the provision of queue detection, automatic warning system and the provision of additional information on road conditions via the electronic message signs. The Regulations will enable variable speed limit signs to apply, restricting drivers from driving at speeds exceeding those displayed on the speed limit signs or the national speed limit where no other speed limit sign is displayed.

If the legislation was revoked the speed limit would remain at 70mph. This means that should any incidents occur on this stretch or queues build up it would not be possible to control the smooth flow of traffic, thus causing delays and frustration.

5. Consultation

The Welsh Assembly Government consulted the list of consultees at Annex A on the 10th September 2010. Details of the consultation undertaken are included in paragraph 8 of the Regulatory Impact Assessment below.

PART 2 – REGULATORY IMPACT ASSESSMENT

6. Options

Secondary legislation is required to implement variable speed limits (VSL) on the M4 Motorway in South Wales between Junction 23A (Magor) and Junction 29 (Castleton).

The implementation of variable speed limits on the M4 between the above junctions will assist with policy objectives to:

- Improve traffic flow and therefore provide more reliable journey times.
- Reduce accidents along this stretch which has a higher personal incident accident (PIA) rate than the national UK average.
- Reduce carbon emissions and noxious particulate levels.

The options that have been considered included:

Option 1: Do nothing. To do nothing will retain the status quo for existing daily congestion, higher than national average PIAs and pollution levels increasing pro-rata year on year. (Note: it is acknowledged that over the past year traffic volumes have not increased by their typical 4% to 5% due to economic conditions although this is likely to change during the life time of the scheme).

Option 2: (Preferred). Implement the provisions from 21st February 2011.

The policy under Option 2 will:

- Enable proactive management of the motorway network around Newport with variable mandatory speed limits displayed on the motorway taking into account prevailing traffic conditions with the aim of ensuring the smooth flow of traffic.
- Reduce accidents and incident delays, increasing network resilience, improving management of incidents and road works and improving driver information provision for users of the M4. This will be through the provision of queue detection, automatic warning systems (using mathematical algorithms) and the provision of additional information on road conditions via the electronic message signs.

7. Costs & benefits

a) Costs

Option 1: Nil Cost.

Option 2: The monetised cost of the variable speed limit scheme comes from

- Installation costs
- Maintenance costs
- Enforcement costs

The installation cost of the variable speed limit scheme is £9.6m. This covers all the required infrastructure plus design and project management costs.

The maintenance costs of the system have been based on £115k pa. Maintenance work will be undertaken under existing Welsh Assembly Government contractual arrangements to maintain motorway communications and technology.

The All Wales Casualty Reduction Unit will enforce the speed limits on the variable speed limit scheme through the use of enforcement cameras (cost of installation covered above). The cost of enforcement will be included within the existing service of the All Wales Casualty Reduction Unit which is funded by the Assembly.

b) Benefits

Option 1: None

Option 2: The monetised benefits of the Variable Speed Limit scheme will come from -

- Journey Time Reliability
- Journey Time Saving
- Personal Injury Accident Savings
- Damage Only Accidents

An “Assessment of Benefits Study” was undertaken and published by Atkins in November 2007 on behalf of the Assembly. This study considered the benefits found in similar schemes operated by the Highways Agency, England, along with schemes operated in mainland Europe. Using a transport model, data from this area of the M4 over a three year period was used to calculate to benefits.

The benefits calculated over a three year period are:

Benefit	Monetary Value
Journey Time Reliability	£822,000
Journey Time Saving	£1,820,000
Personal Injury Accident Savings	£821,000
Damage Only Accidents	£638,000
Total	£4,101,000

Based on a linear extrapolation of these benefits over 30 years (2010 – 2040, 2002 prices) equates to £40m. When discounted by 3.5% this figure equates to £20m. The use of a 30 year period is seen as conservative as road schemes are normally evaluated over a 50 – 60 year period.

In addition to the quantitative benefits listed above qualitative improvements can be anticipated as a result of the variable speed limit scheme. These include:

- Driver stress – the need for sudden braking (shockwaves) to maintain headways is reduced providing a calmer driving experience.
- Improved driver behaviour – more uniform distribution of headways and improvement in utilisation may reduce the desire to change lanes for overtaking.
- Speed limit compliance – it has been noted on other similar schemes that the presence of signs and enforcement cameras have the effect of reducing speeds.
- Emissions – smoothing traffic flow reduces the need for stop start traffic, which reduces fuel consumption and consequent emissions. Studies on the M25 indicate vehicle emission reductions of between 2% – 8%.
- Noise – reduction in stop start traffic will reduce noise in the surrounding area.

In terms of qualitative benefits the study viewed that for every £1 of quantitative benefit there would be corresponding qualitative benefits. This would give a further £20m of benefits and a total benefit of £40m over 30 years.

Cost Type	Direct Costs
Installation (incurred between 2007 and 2011)	£9,600,000
Maintenance over 30 years at £115kpa	£3,450,000
Enforcement	nil
Total	£13,050,000

Benefits	Monetary Value
Quantitative	
Journey Time Reliability	£822,000
Journey Time Saving	£1,820,000
Personal Injury Accident Savings	£821,000
Damage Only Accidents	£638,000
Total over 3 years	£4,101,000
Total over 30 years	£40,000,000
Total over 30 years discounted by 3.5%	£20,000,000
Qualitative	£20,000,000
Overall Benefits	£40,000,000
Net Benefit	£29,550,000

The above costs and benefits can be linked to Option 1 (no costs and no consequential benefits) and Option 2 of achieving the net benefit shown. As such Option 2 is the recommended option.

Other Information

- No new land has been required for the scheme and there is no discernible impact on the landscape. Potential ecological impacts have been considered and mitigated where required.

- The scheme has utilised innovative “wind down posts” to mount reduced size message signs. This design allows an engineer safer and reduced risk access to the sign for maintenance purposes. It also removes the need for lane closures, negating the cost for traffic management.
- The gantry mounted advanced motorway indicators signals (AMIs) will implement mandatory variable speed limits as flows reach capacity. The limit will also be shown on verge mounted reduced sized message signs. The signals and signs will remain blank in periods of low traffic flow.
- Fixed gateway signs will be used to inform motorists entering the VSL area and that overhead, along with verge mounted, signs should be obeyed. Fixed gateway signs will be used to inform motorists they are exiting the VSL area and returning to normal motorway operation.
- In order to achieve compliance it will be necessary to enforce the speed limits. Home Office approved “spot” cameras will be used to automatically enforce limits.

8. Consultation

Of the consultees listed in Appendix A, the Gwent Police and HMCS Gwent Local Justice Area responded. Neither opposed the proposed Regulations but asked for clarification on the following matters

Gwent Police

- The role of Go Safe (the All Wales Casualty Reduction Unit).
- Confirmation that accurate records will be available to support enforcement.
- The stage in the implementation of the VSL that that the current average speed camera enforcement equipment will be removed.

HMCS Gwent

- Likely to increase workloads of the courts.
- The system for reporting and prosecuting offenders.
- Is it possible to estimate likely number of court cases.

These queries have been answered in a written response.

9. Competition Assessment

The completed competition filter is shown below.

It has been concluded that this scheme will not have any adverse effects on competition in the market place.

The competition filter test

Question	Answer yes or no
Q1: In the market(s) affected by the new regulation, does any firm have more than 10% market share?	No
Q2: In the market(s) affected by the new regulation, does any firm have more than 20% market share?	No
Q3: In the market(s) affected by the new regulation, do the largest three firms together have at least 50% market share?	No
Q4: Would the costs of the regulation affect some firms substantially more than others?	No
Q5: Is the regulation likely to affect the market structure, changing the number or size of businesses/organisation?	No
Q6: Would the regulation lead to higher set-up costs for new or potential suppliers that existing suppliers do not have to meet?	No
Q7: Would the regulation lead to higher ongoing costs for new or potential suppliers that existing suppliers do not have to meet?	No
Q8: Is the sector characterised by rapid technological change?	No
Q9: Would the regulation restrict the ability of suppliers to choose the price, quality, range or location of their products?	No

10. Post implementation review

Post implementation evaluation will be undertaken to compare the projected benefits of the Variable Speed Limit Scheme to those achieved. The main evaluation factors consider:

- Journey Time Reliability
- Average Journey Time
- Personal Injury (Casualty) Accident Savings
- Damage Only Accidents
- Reductions in emissions – carbon dioxide and noxious pollutants

In addition to these the following factors will also be considered:

- Average delay per vehicle kilometre
- Time spent in flow breakdown
- Average flows
- Number of shockwaves
- Improved driver behaviour
- Improved speed limit compliance

The base data for this evaluation has been sourced from:

- Inductive loops (MIDAS) which are integrated into the road surfaces. These collect vehicle numbers, type, time and speed data.
- Automatic Number Plate Recognition Cameras (ANPR).
- Signals setting data of speed limits set.
- Traffic management history to filter out periods when traffic management affected the traffic.
- Events that may have affected traffic.
- Stats 19 accident data
- Metrological data sources
- Local emissions data

Data from these sources was used in the pre-evaluation work to establish a baseline of evaluation factors. Following the implementation of Variable Speed Limit Scheme these factors, using the same data sources, will be calculated again to establish the affects of the scheme.

The timelines for the post evaluation work is projected to be 12 months for congestion impacts and air quality. For accidents a longer review period is required, where typically this is taken over a three year period. The reason this longer period is that accidents typically are random and a longer period is required to ensure the statistical analysis is sound.

Note: once the Scheme is implemented the algorithms that are used to implement and end variable speed limits will need to be tuned in line with the traffic flows along this diverse geographical layout of this stretch of motorway.