

The M4 Variable Speed Limit Scheme in Wales

The M4 South East Wales variable speed limit scheme uses the latest technology to tackle congestion on a 13km stretch from M4 Junction 24 (Coldra) to Junction 28 (Tredgar Park). Its underlying principle is to keep traffic moving by adjusting the speed limit, helping to make journeys safer and more reliable.

The scheme is managed by the Welsh Government from the South Wales Traffic Management Centre in Cardiff. It forms part of a wider strategy to improve major road links across Wales, aiming to effectively manage the strategic road network now and for the future, encouraging inward investment, growth and jobs.

Q. How does the variable speed limit scheme work?

Through this section of motorway, the mandatory speed limit is adjusted according to traffic conditions to keep vehicles moving at a steady rate.

Normally during periods of no congestion on an incident-free carriageway, no variable speed limit signs or signals are set and the national speed limit applies.

At busy times or in the event of an incident, sensors will detect congestion beginning to build up. The system calculates the optimum speed limit for the current amount of traffic and this is displayed on the electronic signals above lanes or at the side of the road.

Drivers may not be able to see why the signals are set; however, the system is detecting congestion building up and is using the speed limit signals to slow the traffic and keep it moving. Vehicles travel at more constant and similar speeds, making the journey smoother and safer for all. Congestion and queuing is reduced which in turn reduces a key risk of collisions from vehicles approaching the backs of queues.

When the traffic flow has subsided and the signs and signals are no longer required, these will return to blank and the carriageway will return to normal motorway operation.

Q. Who monitors the variable speed limit scheme?

Alongside the automated speed limit system, authorised control centre operators are monitoring the road network and can intervene if needed to react to incidents on the carriageway.

Q. Why do I see apparently inappropriate signals and messages?

The system is responding to a real event that is happening at that moment further ahead of the driver. It is possible that by the time the driver arrives at the location of the event there is no apparent cause, as the traffic conditions have resolved themselves.

In certain circumstances, lower speed limits may also be set manually by control centre operators. The reason is usually to support maintenance works and help protect the workforce, especially when completing the dangerous job of setting out and removing traffic cones. Occasionally, particularly at night, it can appear that speed limits have been set for no reason but this may be because drivers are seeing the signs just before the cones are set out or just after they have been removed.

Between the Brynglas tunnels and the Coldra (junction 24), a further factor in the setting of speed limit signs is the undulating topography of the road. This often leads to heavy goods vehicles travelling at reduced speeds which can in turn trigger automatic reduced speed limits in order to protect faster-moving traffic approaching from behind. In addition, the number of lanes also changes on the approach to the tunnel. Three lanes merge into two causing traffic to slow, which in turn can trigger reduced speed settings to smooth the traffic flow.

Q. Why does the speed limit sometimes change several times over a short stretch of road?

When an incident occurs, control centre operators may set signs and signals to protect the areas affected but the resulting slower-moving traffic can in some cases trigger an automatic setting to prevent queuing. The combination of these two setting modes can cause a combination of speed limits to be set in relation to the incident and the live traffic conditions. This is normal operation, which ensures that the system protects road users from the effects of both the incident and the traffic congestion.

On the westbound carriageway, due to damage sustained during the Brynglas tunnel fire in 2011, reduced lighting is in operation which requires the permanent display of a 50MPH speed limit on the approach and travel through the tunnel. Works are currently underway at Brynglas tunnels to replace the lighting. These works are mainly taking place overnight to avoid congestion.

Q. What happens when there are roadworks in the variable speed limit section?

Additional signs and signals may be manually set for the protection of the workforce and approaching traffic.

If major long-term roadwork schemes are needed, fixed plate mandatory speed signs may be used to display the speed limit in force. These may be supplemented by the electronic signs and signals.

Q. What else is being done to reduce congestion on the M4 around Newport?

Information on the Welsh Government's plans for improvement to the M4 around Newport is available at <http://gov.wales/topics/transport/roads/schemes/m4/?lang=en> or by calling 0300 0603300.

Q. What visible changes are there to equipment on the roadside?

Many of the physical features of the variable speed limit scheme are already familiar to motorway users.

Electronic signs and signals are used on overhead 'gantry' structures (as pictured below) and in the verge throughout the road network. Within the variable speed limit section, these signs and signals are used to display reduced speed limits for the carriageway.

The speed limit shown applies to all lanes of the carriageway, even though speed limits might not be shown over individual lanes.

Unlike some smart motorways in England, the Wales variable speed limit scheme does not use the hard shoulder as a running lane. The hard shoulder must only be used in a genuine emergency in accordance with the Highway Code.



Figure 1 – Electronic signals on an overhead gantry

Variable message signs (as pictured below) provide traffic information via text and picture messages. A number are located on overhead gantries.





Figure 2 - Variable message sign at the side of the road and on an overhead gantry with speed limit signals

Reduced sized message signs (pictured below) are positioned in the verge, spaced 250m to 700m apart. The signs display reduced speed limits currently in force on the carriageway.

They are installed on innovative wind-down poles designed to be rotated and lowered, enabling access for maintenance teams from behind the roadside safety barrier. This reduces the need for lane closures when access is required and has the advantages of preventing disruption to the public and reducing maintenance costs.



Figure 3 - Reduced sized message sign

Road users joining the M4 via slip roads in the area will see electronic signs mounted on posts (as pictured below). If a reduced speed limit is in force on the main carriageway, it will also be displayed on these slip road signs.



Figure 4 - Electronic signals on an entry slip road

Variable Speed Limit Enforcement – Managed by GoSafe

Q. How is speed enforcement carried out in the variable speed limit?

Speed enforcement cameras are fitted onto overhead gantries. The cameras are activated when they detect a vehicle travelling in excess of the speed limit in force at the time. The system has the necessary Home Office Type Approval (HOTA) which allows its use for enforcement purposes.

Q. Who owns and operates the speed cameras?

Speed enforcement through the use of roadside cameras across Wales is managed and coordinated by GoSafe, a multi-agency partnership comprising all highway authorities within Wales and the four Welsh police forces. Within that partnership structure the Welsh Government owns and installs the cameras located on the M4 Motorway and the police, as the enforcement authority, are responsible for operating them and carrying out enforcement on a day-to-day basis.

Q. What happens if there is a technical fault with the system?

There are built-in safeguards which prevent the camera from activating if there is a technical fault. The system is designed to ensure that it will only capture an offence when the equipment is working correctly. This is a requirement of HOTA.

Q. I do not believe I was travelling in the M4 variable speed limit section at the time stated on my speeding notice sent by the police.

The speed enforcement system includes a calibrated, fully synchronised clock which meets required specific Home Office standards. Enforcement of the speed limit is carried out by the police and the processing of those offences is undertaken by the Central Ticket Office within South Wales Police. Any enquiries about specific speeding offences should be referred to the Central Ticket Office.

Q. The speed limit changed just as I passed under the electronic sign, so I had no time to reduce my speed.

When a mandatory speed limit changes on the overhead signal, there is an automatic delay before enforcement can begin against the newly displayed limit. In this situation, drivers are not expected to brake sharply, but rather to reduce their speed so that they are within the speed limit as soon as it is safe to do so.

Q. There was no speed limit showing above my lane, even though other lanes had overhead signs showing a speed limit.

Providing a valid mandatory speed limit is properly displayed for the carriageway (not necessarily over each individual lane), that limit will apply to all lanes.