

Variable Message Signs



A Guide to Variable Message Signs (VMS) and their use





Department for Transport

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The purpose of this brochure is to provide information about how "legend/matrix based" Variable Message Signs (VMS) are used on the trunk road and motorway network in England. It describes what is being done to increase the use of VMS; the current procedures and legislation for approved messages; future developments; and where to go for further information. It is intended for use by Highways Agency staff and operational stakeholders.

This leaflet will be updated as necessary and if you have any comments about the information contained within it or suggestions of what you might like to see included in future publications please e-mail infoline@highways.gsi.gov.uk or telephone HAIL on **08457 504030**.

Background

The primary purpose of Text Based Roadside Variable Message Signs and Matrix Signals (more commonly known as Variable Message Signs or VMS) on the Agency's network is to communicate information and advice to drivers about emergencies, incidents and network management, aimed at improving safety and minimising the impact of congestion.

There are a number of types of VMS in use on the Agency's network and they provide the capability to display a wide range of warnings, messages and other traffic information. The Agency has identified a need to oversee the policy and use of VMS. A (Policy) Steering Group has therefore been set up to develop the Agency's policy and procedures on the use of VMS and Matrix Signals.

The objective of the Steering Group is *"to achieve enhanced, consistent, effective and best value use of electronic signals and signs with a view to:*

- meeting the needs and expectations of customers, stakeholders and end users;
- developing and disseminating agreed strategy and policy; and
- exploring new uses and developments of signed and signalled traveller information."

The Steering Group is supported by a Secretariat, which is based at the Highways Agency in Birmingham.



Current Highways Agency VMS Policy is contained in Area Management Memo No. 9 'Policy Statement on VMS', which is available from the Highways Agency. This requires that messages displayed on VMS must be limited to those that help drivers complete their journey safely and efficiently. VMS cannot be used for advertising or any other unnecessary information. The Policy is currently being reviewed by the VMS Steering Group.

Legends displayed on VMS are classed as traffic signs under section 64 of the Road Traffic Regulation Act 1984. Prescribed legends are given in Schedule 15 of the Traffic Signs Regulations and General Directions (TSRGD) 2002, although only those legends shown on the authorised Association of Chief Police Officers/Highways Agency (ACPO/HA) list can be displayed on the Highways Agency network.

It is important to remember that approval to display a legend not shown on the ACPO/HA list should be sought from the Highways Agency signs team in Dorking. They can be contacted via e-mail to the SSR inbox from the Highways Agency address book under "SSR Traffic Signs Team" or by telephoning HAIL on **08457 504030**.

The national policy and procedures on the use of VMS are contained in two documents, they are:

1) "The Joint ACPO & HA Policy and Procedures for the Police use of Variable Message Signs" published October 1999, which contains a base menu of generic authorised legends. These accord where possible with a European-wide initiative to harmonise such legends to avoid confusion, particularly for the international road user, by the Deputy European Road Directors (DERDS);

2) "The joint ACPO and HA Policy and Procedures for the Police use of Matrix Signals", issue 1, published April 2002, which takes into account system developments such as MIDAS, automatic fog signals, controlled motorways and wide area diversion systems.

IT IS IMPORTANT THAT THE DOCUMENTS ARE READ IN CONJUNCTION WITH ONE ANOTHER.

ACPO/HA Policy and Procedures for VMS are currently under review to update them. The review will reflect new initiatives such as the National Traffic Control Centre (NTCC) and planned Regional Control Centres (RCC's).

Main Types of Signals and Signs

Below are examples of signals and signs (which are all types of VMS) in use on the Highways Agency network. For further definitions please refer to the MCH 1320 Issue G: "Introduction to Motorway Control and Communications Systems".

Signals (limited displays known as "aspects")



Central Reserve Post-mounted Signals (Matrix Signals)

- Caters for up to 3-lane motorways and major trunk roads
- Spaced at 3km intervals
- Limited to display advisory fog warnings, speed restrictions and lane closures with amber flashing warning lanterns



Slip Road Post-mounted Signals

- Normally situated in pairs at entry slip roads
- Similar to matrix signals; displays advisory fog warnings, speed restrictions and lane closures with amber flashing lanterns
- Additional function to display red lanterns to allow mandatory closures of slip roads only



Gantry Mounted Signals

- Allows flexibility for individual lane signalling (display applies to the lane below each signal)
- Displays advisory fog warnings, speed restrictions, lane closures and lane diversions
- Can display red "X" and red flashing lanterns to provide a mandatory "stop" signal
- Spaced at 1km intervals



Signs (display information using text)

EMS (Enhanced Message Sign)

- · Can be mounted either on cantilever posts or alongside Gantry Mounted Signals
- Display information about incidents and hazards
- 2 lines of 12 or 16 characters are used for tactical* messages and 3 lines of 12 or 18 characters are used for strategic* messages. These legends inform motorists of the reason why the signals have been set



MS2 (Message Sign Mark 2)

- Mounted on cantilever posts
- Display information about incidents, hazards and campaigns
- Usually an EMS with 2 lines of 12 characters, together with an enhanced matrix indicator (EMI), which is a slightly larger Matrix Signal
- Now obsolete replaced with MS3 for new installations



MS3 (Message Sign Mark 3)

- Mounted on Cantilever Posts only
- Display information about incidents, hazards, campaigns and restrictions and can include a matrix signal aspect
- 2 lines of 16 characters or 3 lines of 18 characters





*Strategic and tactical are explained on pages 8 and 9

Use of VMS: Approved legends

Messages displayed on VMS are referred to as legends. An approved legend is a message authorised for display upon a single VMS sign face. There are 4 main categories of approved legends. These are incident management, driver information, strategic diversions and roadworks.

1. Incident Management

Tactical legends to assist with the management of local incidents where immediate action is required to cope with a safety hazard. Where motorway Incident Detection and Automated Signalling is available messages can be set automatically.

Tactical diversion legends which divert all or certain classes of traffic from one route to another in support of local incidents or hazards; and

Site specific legends which are specifically authorised to support locally agreed or area-specific contingency plans.

For consistency, tactical legends are restricted to a 2x12 format.

2. Driver Information

Link legends to inform the road user of events or conditions affecting the highway on which they are travelling, but are not directive or instructive; and

Network legends to inform the road user of events or conditions affecting the highway, other than the one on which they are travelling, and are not directive or instructive.

These legends are set on VMS from local Police Control Offices (PCOs). From 1 April 2004, responsibility for operating these VMS is gradually being transferred to Regional Control Centres, where they will be operated by Highways Agency staff.







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3. Strategic diversions

Strategic legends inform the road user of significant delays on a route and advise strategic alternative routes

Strategic VMS are located at key points on the network and are designed to provide drivers with sufficient information to re-route or change their travel plans. Strategic VMS can be used to improve the performance of the network by redistributing traffic efficiently when congestion occurs and spare capacity is available elsewhere on the network. The format for strategic diversion messages is:

Line 1: affected route, condition and any location identifier

Line 2: intended destination (main town; route number)

Line 3: suggested alternative route

The National Traffic Control Centre is responsible for setting strategic Variable Message Signs. When not required to display strategic messages, strategic VMS can also be used to display incident management or driver information messages.

4. Road Works

Road Works legends should be used in advance of road works for the following:

- 1) To assist the safety of operatives when setting up or removing traffic management;
- 2) To give advance warning of mobile lane closures
- They should not be used to support Chapter 8 "hard signing" of road works other than for an incident or temporary hazard within the works area.

Project Sponsors are encouraged to plan suitable use of ACPO/HA approved legends for road works as early as possible including warning of delays and/or giving diversionary routes.

For non-approved legends it is advised to allow about 6 months before works are due to start to agree legends. Agreement of proposed legends should be sought from the relevant Police Control Office/Regional Control Centre well in advance of the Road Works. There is a Highways Agency "Designated Officer", who is authorised to approve temporary legends, as well as changes to the VMS base menu. For information on who to contact please telephone HAIL: **08457 504030**.

Requests can be made for VMS to be used as part of the traffic management strategy for planned events or major works on the project network, a copy of the written instruction and pro-forma for making requests has been inserted in this leaflet. Alternatively you can contact HAIL on **08457 504030** for further information.

The national policy for traffic management and signing at Road Works is set out in Chapter 8 of the Traffic Signs Manual and the standard on mobile closures and safe working practices is set out in TD 49.



VMS Safety Campaigns

VMS are used to display messages to support national road safety campaigns. Department for Transport/Highways Agency policy is that these are agreed only where Highways Agency is a partner and the message relates directly to users of the Agency's network. The legends are given specific approval for each campaign and can be displayed 24 hours a day, 7 days a week or for a set time and days as required.

An annual programme of safety campaigns has been prepared. This involves identifying appropriate campaigns to support them, and also selecting the most appropriate VMS for each campaign.

An annual programme of campaigns allows timely authorisation of legends and quicker implementation through a 'courtesy function', which allows the legends to be included in the operational software. Campaign messages have a low priority and are overwritten by higher priority messages such as queue and incident warnings.

Previous agreed campaigns include those which support Department for Transport (DfT) campaigns:



Proposals for additional or other campaigns can still be made and will be considered alongside the annual programme of campaigns, which will be updated and reviewed on a regular basis. A copy of the programme for 2004/05 is included in this document.

Proposers of campaigns are encouraged to first consult HA Area Managers and relevant Police Control Office/Regional Control Centre on the suggested legend.

When proposing a safety campaign it is important to consider the following:

- Timescale for the approval and implementation process can take 6 months
- Identifying the problem to be addressed and relevance of campaign to the Highways Agency Network
- Duration of the campaign
- · Appropriate times for the message to be displayed
- The balance between the impact of the message against the potential to distract drivers
- Publicity
- Funding for campaign

All campaign legends must be authorised. For advice on whom to contact about legends telephone HAIL on **08457 504030**.



The Agency is investigating the possibility of undertaking research to assess the effectiveness of using VMS to support future safety campaigns. Details will be made available once the research is completed.

New Developments

National Traffic Control Centre (NTCC)

The prime objective of the NTCC is to reduce the effects of congestion on England's motorways and trunk roads by informing motorists about incidents, traffic conditions and road works and offering alternative routes where appropriate.

NTCC began providing real-time traffic information in November 2003. The full service is being delivered in phases and final delivery is expected in summer 2005. Part of the NTCC service to the Agency will be a telephone and website service (currently available as demonstrator on the Highways Agency website) which will allow drivers to plan their journeys using up-to-date traffic information before leaving home. During their journey drivers will receive advice and information from NTCC through Variable Message Signs at major junctions and decision points. NTCC is also providing updates direct to the media, which will contribute to greater accuracy of traffic information on the radio. A further 92 new variable message signs have been installed which will be used in conjunction with the signs already on the network.



Regional Control Centres

Regional Control Centres (RCC's) will be manned by HA staff with assistance from the police. Working together under partnership arrangements with local police forces, RCCs will act as a referral point for all emergency roadside services providers. All will monitor the network and in partnership with the National Traffic Control Centre set the variable message signs in response to both planned and unplanned incidents on the network.

Mobile Variable Message Signs

Mobile electronic VMS (but not flap type and rotating plank signs that can only display a limited number of preset messages) are used to provide real-time information at locations where fixed VMS are not available. They are currently being used in advance of the Thelwall Viaduct to inform drivers of journey time delays and possible problems. Although these units operate in isolation to the national network of VMS they are governed by the same rules and can only display authorised legends as prescribed in the ACPO/HA Policy & Procedures manual. Mobile VMS can also display any sign that conforms to paragraph 53(1) of Traffic Signs and General Directions 2002. Under no circumstances can mobile VMS units display pictograms or scrolling text.

In certain circumstances, mobile VMS are less legible than static signs and therefore the use of mobile VMS does not fulfil any obligation to provide static signing. In addition, mobile VMS should not be used within the zone defined by chapter 8 Traffic Management.



Active Traffic Management (ATM)

Installation of the Active Traffic Management (ATM) pilot, currently being constructed on the M42 from junctions 3a to 7, east of Birmingham, will be complete by Spring 2005.

When fully operational the 17km of ATM motorway will provide the most responsive stretch of road in England, featuring information signs and signals to inform drivers what speed limits apply and what lanes to drive on.



ATM features include the latest lightweight gantries, containing signals depicting maximum mandatory speed limits and MS4 signs, capable of displaying colour pictograms and text. CCTV cameras will be installed on gantries for enforcement purposes.

Drivers on the ATM stretch of motorway will pass beneath signals on gantries every 500 metres, which will instruct if a lane is available or not. These will look like the signals below.



This signal displays the 50mph maximum mandatory speed limit. The mandatory instruction is depicted with a circle around the number. If a signal depicting a speed limit is not circled it is advisory.



This signal shows the hard shoulder is available only for emergency use or breakdown. Note - this signal will only ever appear above the hard shoulder and will NOT be accompanied by flashing lights at each corner.



This signal displays that the lane ahead (excluding the hard shoulder) is closed for use. It features a red X surrounded by four flashing lights. This is a mandatory instruction.

1. MIDAS

To make the signals and signs more responsive to traffic conditions a system called Motorway Incident Detection and Automated Signalling (MIDAS) has been developed. The system detects incidents or congestion from loops in the road and automatically sets appropriate VMS messages to warn drivers of conditions of the road ahead, together with maximum speed advised. The inductive loops are installed in the road surface at nominal 500m intervals and detect the formation of queues. The signal settings are switched off automatically a short time after traffic returns to free flow conditions. Currently MIDAS is in use only on some parts of the most heavily trafficked motorways.



These MIDAS signal settings can be over-ridden by control room operators, but only if:

- The system is clearly malfunctioning to such an extent that it is believed to be creating a public safety concern; and
- Road works and/or planned maintenance is being undertaken and the Highways Agency or its agents have negotiated a generic local arrangement with the individual force and subsequently request specific disablement at predetermined locations and for a predetermined period of time.

2. Controlled Motorways

The controlled motorway system is on the M25 between junctions 10 and 16. This is an automated system, which monitors flow levels and sets speed limits accordingly. It provides:

- Mandatory speed limits
- Enforcement by speed cameras

Variable speed limits improve traffic flow; can improve journey times and cut accidents by delaying or preventing the build-up of stop-start conditions. The limits are set either automatically by MIDAS or can be set manually by the control room operator.

Operating Systems

Control room operators and the automatic systems (MIDAS) control the signals and signs on the motorway through the Agency's Control Office Base System (COBS) located in the control rooms. This system is also used to operate the emergency roadside telephones.

The prioritisation and management of what message is displayed on each sign is handled by the Message Sign Sub-system (MSS). MSS is an automatic system which sets message signs in response to a control room operator request via the operators interface (OIF) or automatic requests from MIDAS, depending on what is happening on the network.

Documents Associated with VMS and Further Information

The following documents have already been referred to in this brochure and are available on the Highways Agency's website.

- Road Traffic Regulation Act 1984
- Traffic Signs Regulations and General Directions 2002
- Design Manual for Roads and Bridges (Volume 9)
- The Joint ACPO & HA Policy and Procedure for the Police use of Variable Message Signs
- The Joint ACPO & HA Policy and Procedure for the Police use of Matrix Signals
- Chief Highway Engineer Memorandum 73/99
- Chief Highway Engineer Memorandum 112/02
- Traffic Signs Manual, Chapter 8

Other documents associated with the use of VMS:

- TA 60/90 The Use of Variable Message Signs of All Purpose and Motorway Trunk Roads
- TA 70/97 The Purpose, History and Summary of Motorway Communications
- TA 71/97 Design and Implementation of Motorway Communications Systems
- TA 74/97 Motorway Signalling
- TA 83/99 Guide to the Use of Variable Message Signs for Strategic Traffic Management on Trunk Roads and Trunk Road Motorways
- TD 18/85 Criteria for the use of Gantries for Traffic Signs and Matrix Traffic Signals on Trunk Roads and Trunk Road Motorways
- TD 33/90 The Use of Variable Message Signs on All Purpose and Motorway Trunk Roads
- TD 46/94 Motorway Signalling
- MCH 1320 Issue G: Introduction to Motorway Control and Communications Systems
- VMS Interim Advice Note 43/02

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