

VMS -THE CORRECT APPLICATION OF MOBILE, TEMPORARY AND PERMANENT VMS IN THE UK



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Introduction

This Guidance Note replaces the earlier version created in July 2018 to take account of changes in legislation and other requirements.

ARTSM members design, manufacture and install a very wide range of permanent, mobile and temporary VMS (Variable Message Signs) used in the UK. However, members of ARTSM who manufacture, supply and hire mobile and temporary VMS face a dilemma that they are being requested by users (for example, civil engineering, road construction maintenance, traffic management contractors and road and highway authorities) to display messages that do not comply with the regulations set out in TSRGD 2016. Members may fear losing business if they do not accede to demands from users.

The purpose of this guidance note is to:

- provide guidance to users of mobile and temporary VMS
- improve users' appreciation of what messages are currently permitted to be displayed and
- where to find information to set concise, accurate and lawful messages.

The word 'paging' described in TSRGD in respect of VMS, defines the setting of a message that is too long to fit into one display surface i.e. the visible part of a VMS that contains the elements - often referred to as pixels - that may be activated to display the message and requires two or more pages. Scrolling or sequencing messages fall into the same category as paging because they are basically too long to fit into one display surface.

The position in the UK

Around 1985 electro-mechanical magnetically operated flip dot signs were introduced onto the road network; two early schemes were the Forth Road Bridge and Severn Crossing Bridge. With the advent of economical and reliable LED technology, the application of VMS in strategic locations and smart management schemes on motorways and trunk roads has made VMS a familiar sight to drivers. Add to this numerous urban installations for car park guidance and general driver information and it is evident that VMS are a helpful tool in contributing to the management and free flow of traffic. Mobile VMS are invaluable in situations where drivers need to be informed amongst other topics of forthcoming events and temporary conditions.

The earliest standard in the UK for VMS was TR0154 with the objective being to ensure common visual and physical performance plus a degree of certainty that the messages would be legible. This document evolved under the authorship of the former Highways Agency on behalf of the Secretary of State.

Following a change in the Type Approval process and removal of the requirement for authorisation from the Secretary of State and Direction 58 within TSRGD, procurement specifications are now held and managed by TOPAS – a tripartite body made up of government, users and industry.

Since the implementation of TSRGD 2016 the specification for VMS is **TOPAS 2516**; see Table 1 below for TOPAS details and link to website and the most up-to-date version of the TOPAS specification.

A European Standard for VMS was created and remains in place, with the UK developing a National Foreword and National Annex. The latest published version of this standard is BS/EN 12966:2014; with corrigenda added in June 2018 and April 2021.

This standard is called up in TSRGD 2016 and TOPAS 2516 as the standard required for all VMS – mobile and permanent and must be adhered to on public and private roads where vehicular access is provided and when such signs are used for the purpose of road traffic signs.

For the avoidance of doubt under the Road Traffic Regulation Act 1984 "road" is defined as:

- (a) in England and Wales, any length of highway or any other road to which the public has access, and includes bridges over which a road passes, and
- (b) in Scotland, has the same meaning as in the Roads (Scotland) Act 1984;

Control of permanently installed VMS has traditionally been by experienced practitioners based in traffic control centres who implement message plans and protocols. However, with the introduction of cloud based systems it appears to be the case that those creating the messages may not fully understand the regulatory requirements. Those managing the sign face messages and the highways authority requesting these messages must always be aware of the legal requirements.

The only words and phrases that can be chosen to compile messages are found in TSRGD 2016 schedule 16 or messages with specific authorisation from the DfT on a site-specific basis. It is worth noting that Schedule 16, part 1, clause (9) also states

“When a variable message sign displays a sign or legend the variable message sign must display the whole of that message at the same time”.

This means:

Messages must always be displayed on a single face. No ‘single message’ should appear as a scrolling or paging message. It is possible to display more than one different message using changing screens, but each message must be clearly understood independently of any other message shown.

For example a sign stating “lane closed between 01/01/21 and 06/01/21” can appear on one page. A second face stating “diversion routes via A45” is NOT a second message in this instance since as a stand-alone message it is incomplete in that it only applies between the 2 dates indicated and, therefore, forms part of the first message. The whole message must be displayed on one page only.

However, if the first face message states “roadworks between 01/01/21 and 06/01/21” and a second page states “slow down, delays ahead” then this could be regarded as a separate message which could appear on a second face, since both statements can be stand alone and do not rely on each other to be understood.

All pages must meet the requirements for character heights and number of words or units permitted.

Further detailed guidance on the use of VMS, permitted messages and the message content can also be found in Department of Transport TAL 01/15 (Traffic Advisory Leaflet 01/15). On page 2 of the leaflet it says:

“VMS may only be used to display traffic signs, as defined in the Road Traffic Regulation Act. Their use to display any other message renders the installation unlawful. Messages should be as short as possible while being fully comprehensible to drivers. The messages should not normally consist of more than eight words or six units of information. All messages must be displayed on a single sign aspect (here the word aspect has the same meaning as display surface).”

It is unlawful to display messages that require the use of multiple displays (“paging”) or scrolling text.

Further, Highways England's (HE) publication "Policy for the use of Variable Signs and Signals (VSS)" version 3 .2 May 2020 states:

The most visible type of VMS to drivers are fixed and these shall always be used before a portable VMS is considered. If a decision is made that a portable VMS is to be used it is subject to all policies detailed in this document and shall only be used when:

- filling in a gap in the fixed VMS infrastructure
- to guarantee the 24/7 availability of a legend
- for use as permitted with Traffic Signs Manual: Chapter 8.

and re-enforces the precepts of TSRGD (outlined above) about where and when permanent, mobile and temporary VMS should be recommended and used:

Portable VMS shall be set, monitored and used under the direction of the relevant control room. Any dynamic messages set on portable VMS, such as travel times or delays, must have the appropriate data to support near real-time updates.

The HE VSS policy further states that VMS must not be used to display scrolling, alternating or sequential legends whilst traffic is moving. More references to comments in the policy document may be found in the table below.

Where is the confusion regarding mobile and temporary VMS message settings?

Some of the reasons would seem to be:

- (a) The user is unaware of the regulations in TSRGD, advice in TAL 01/15 and HE's publication "Policy for the use of Variable Signs and Signals (VSS)"
- (b) The desire of the user to display messages with more than eight words or six units of information that exceed the capability of the VMS display surface in terms of its number of horizontal and vertical elements
- (c) Features in the mobile or temporary VMS control software gives the user the possibility to set paging messages by dividing messages into bits and displaying two or more pages on the VMS display surface
- (d) A claim that BS EN 12966 - and therefore TSRGD - does not apply to mobile or temporary VMS

It is easy to understand (a) that TSRGD, TAL 01/15 and HE policy may not be the favourite bedtime reading for civil engineering, road construction maintenance, traffic management contractors and local authorities. However, it is less easy to understand why users persist in displaying unlawful messages even when they have been guided by the mobile and temporary VMS supplier.

When (b) and (c) are the case there is also a temptation to compress messages to fit into the display surface ignoring inter-word and inter-line character spacing and creating unconventional character

fonts. Upper case characters with 7x5 (or proportionally equivalent) vertical by horizontal elements are most easily read; if the ratio is changed to 7x3 for letters such as A, E, F, L, T the legibility of the message is compromised. Likewise, if the inter-line spacing is reduced to one element the lines of characters tend to blend into one another. Character proportionality and line spacing should match and sizes should include the border, which is the same as the character height.

Annex N of BS EN12966:2014 is informative regarding character heights, legibility distance and possible recognition times to allow the approaching driver time to read, comprehend and take action on the message displayed. If multiple messages were paging as the driver approaches, how does the driver know what is important, which of the two or three pages has primacy and what if the paged message exceeds the approach time? Annex P of BS EN 12966:2014 is informative regarding character height, character width, character spacing and line spacing. In addition, driver behaviour may well change with traffic slowing to read second or third pages of text.

The National Annex of 12966 provides the UK determination of character heights applying Annex N and stipulates a maximum reading time for typical approach speeds for the road classification. This ensures a cut-off point beyond which drivers should not see the sign message to prevent any potential delayed reaction and hazardous driving by diverting attention from the road ahead.

Table 1 below summarises the regulation and standards for easy reference.

Insofar as (d) above is concerned, this is simply ignoring the UK Regulations which expressly state that all VMS – mobile and temporary are required to comply with TSRGD.

Another explanation for misunderstanding of requirements would seem to be that the user has a genuine desire to inform drivers of real time and forthcoming events. They compose the message to be displayed then find that the message will not fit within a single sign display surface. It has to be assumed that the user:

- (e) Just does not know the regulations pertaining to setting a message on a mobile or temporary VMS are the same as a permanently installed VMS
- (f) Does not know what is lawful and unlawful and proceeds anyway to set paging messages or, as noted earlier, request the supplier to set unlawful messages or
- (g) When advised by the supplier that paging messages are unlawful the user goes ahead regardless and puts pressure on the supplier to set paging messages.

It would be uncomfortable to think any of these were the case. Unfortunately, there are instances where users set paging messages on VMS in full knowledge of TSRGD regulations.

Following approaches to DfT by ARTSM to reconsider the restrictions on paging, DfT have confirmed that paging is not permitted in the UK referring to paging messages trial in Scotland that had found that drivers did not have time to read the second page of a two-screen message displayed at 320 mm character height, as all available time was taken up reading the first.

DfT reminded all stakeholders in the roads sector that they must comply with the current regulations.

ARTSM accepts this position and as with all policy reviews involving signs would be happy to participate if there were ever a review.

Conformity Marking CE/CA labelling

You should also be aware of the requirements to CE/CA mark products. There are various conformity assessment markings to consider, both within and beyond the Construction Products Regulations (CPR). For example, whilst there is no requirement for CE/CA for mobile VMS under CPR and therefore BS EN 12966, there is nevertheless a requirement in the UK for **ALL VMS**, fixed and mobile, to CE/CA to EMC, LVD and where appropriate RED – all of which Directives are beyond the requirements of the CPR, and all of which have been adopted by the UK (excepting rules on NI under the NI Protocol).

In addition, ALL VMS must prove compliance to BS EN 12966:2014 regardless of the ability to CE/CA mark under it. VMS that are registered with TOPAS all meet those criteria in full.

Table 1

Definitions, requirements and standards	Information to be obtained
TSRGD 2016 In particular Schedule 16	Traffic Signs Regulations and General Directions Requirements in relation to Variable Message Signs
BS EN 12966:2014 incorporating corrigenda June 2018 & April 2021	Road vertical signs-Variable message traffic signs BSI standards publication
TOPAS 2516	Traffic Open Products and Specifications Refer to www.topasgroup.org.uk for details.
“Policy for the use of Variable Signs and Signals (VSS)”	Highways England (available to download)
Traffic Advisory Leaflet 01/15 Variable Message Signs	TAL 01/15, DfT (available to download)

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