

# VMS – To scroll or not to scroll?



[This Photo](#) by Unknown Author  
is licensed under [CC BY-NC](#)

## That is the question.

### Introduction

ARTSM members design, manufacture and install a very wide range of permanent, mobile and temporary VMS (Variable Message Signs) used in the UK and it would be no exaggeration to claim a figure of 95% of all installations. 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 local authorities) to display messages that do not comply with the regulations. Members fear losing business if they do not accede to demands from users. The purpose of this article is to

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

The word paging 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 falls into the same category as paging because they are basically too long to fit into one display surface.

Two questions arise:

1-Why do so many mobile and temporary VMS display messages that contravene traffic regulations for content, character height and read time?

2-How many users of mobile and temporary VMS know that it is unlawful to display paging messages?

In the first instance, it will be useful to understand the position with permanently installed VMS in the UK. Around 1985 electro-mechanical magnetically operated flip dot signs started to appear on 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. Composed in 1986/7 by the then Department of Transport with input from manufacturers, the objective being to ensure common visual and physical performance plus a degree of certainty that the messages would be legible. This document evolved into the former Highways Agency TR2136 and subsequently TR2516 issues A, B and C. For about 20 years the Highways Agency maintained authorship of these documents until deciding to step aside from ownership. Today it is TOPAS 2516B; see Table 1 below for TOPAS details and link to website. Around 1998 TR2136 A was adopted as the basis of the proposed European Standard for VMS which after much iteration became the European and UK national standard BS/EN12966:2005 and with further amendments BS/EN 12966:2014; the UK National Foreword and National Annex being published as a corrigendum in June 2018.

Control of permanently installed VMS has always been in the hands of experienced practitioner based in traffic control centres who implement message plans and protocols. The words and phrases that can be chosen to compile messages may be found in TSRGD 2016 schedule 16 and its earlier editions. It is worth noting that Schedule 16, part 1, clause (9) 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 quite clearly means that sign or legend has to fit within the display surface as explained in the opening paragraph and not span over two or more pages.

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.

Highways England’s (HE) publication “Policy for the use of Variable Signs and Signals (VSS)” version 3 June 2018 states at the end of Clause 1.1

## Everyone who sets VSS on the Highways England network must adhere to this policy

and re-enforces the precepts of TSRGD about where and when permanent, mobile and temporary VMS should be recommended and used. Clause 2.2 it says:

## Portable VMS shall be set, monitored and used under the direction of the relevant control room.

Clause 2.7 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.

Let’s think more about question 1. The protocol for displaying messages on permanently installed VMS has been and is clearly understood so you have to wonder why mobile and temporary VMS message setting has taken a different course. 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 June 2018 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.

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 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.

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 are 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.

Together Annex N and Annex P provide guidance and information to help users.

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

Question 2 is more problematic. The simplest explanation 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

- (d) 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
- (e) 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
- (f) 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 (e) and (f) were the case. Unfortunately, there are instances where local authorities set paging messages on VMS in full knowledge of TSRGD regulations and when challenged respond along the lines that:

## Who is going to know and who can or will do anything to stop me?

Fearing loss of business if they do not comply with demands from users, members of ARTSM have proposed that the restrictions on paging messages on VMS could be reviewed. On their behalf ARTSM asked the DfT to examine if paging messages could be permissible. Practice in the USA was cited where the US Manual on Uniform Traffic Control Devices permits paging messages under certain circumstances. It was noted that the Federal Highway Administration in the US required the character height to be at least 18" (457 mm) if the speed limit was 45 mph or more. 320 mm (12.5") characters would not therefore be permitted in the US where the speed limit was 45 mph or above. There are endless examples outside the UK where VMS display paging, scrolling and flashing messages all of which adds to questioning why and under what circumstances such messages should not be used in the UK.

The DfT referred to paging messages trial in Scotland that had found that drivers didn't 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. Highways England (HE) had in fact investigated the use of paging messages as part of the "Orange Zone" safety pilots recently. They found that when the character height was only 320mm, drivers didn't have time to read the second screen. HE therefore decided not to pursue the possibility of using paging messages. Basically, the results of these two trials confirmed the viewing trials undertaken in 2002 at Transport Research Laboratories (TRL) prior to the Highways England (then Highways Agency) roll out of the MS4 dual colour high resolution signs programme. Research carried out in 2018 by TRL on behalf of HE has shown that drivers can recall on average 4 or 5 pieces of information. A paging message would probably exceed 4 or 5 pieces of information.

The DfT responded that currently they had "no appetite to review this" and there are no plans to look at or revise the regulations regarding messages on mobile and temporary VMS. 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.

**Table 1**

Definitions, requirements and standards	Information to be obtained
Display surface	BS EN 12966:2014 clause 3.8 Terms and definitions The words legend, aspect and display are often used to mean display aspect.
TR0154, TR2136 and 2516A, B and C	Technical requirements for VMS now obsolete
TR2136	Technical requirements for VMS now obsolete
TR2516 A, B and C	Technical requirements for VMS now obsolete
TOPAS 2516B	Refer to TOPAS website <a href="http://www.topasgroup.org.uk">www.topasgroup.org.uk</a>
TOPAS	Traffic Open Products and Specifications Refer to <a href="http://www.topasgroup.org.uk">www.topasgroup.org.uk</a> for details.
TSRGD 2016	Traffic Signs Regulations and General Directions Statutory Instruments available from the Stationery Office.
TSRGD 2016 Schedule 16 Part 1	Requirements in relation to Variable Message Signs and leg for use on them.
TSRGD 2016 Schedule 16 Part 2	Signs automatically activated by vehicular traffic
TSRGD 2016 Schedule 16 Part 3	Legends giving warnings of adverse weather or other temporary hazards or incidents
TSRGD 2016 Schedule 16 Part 4	Legends indicating location of temporary hazard or incident
TSRGD 2016 Schedule 16 Part 5	Additional information
TSRGD 2016 Schedule 16 Part 6	Other legends
TAL 01/15	Traffic Advisory Leaflet 01/15 Variable Message Signs

	Department for Transport publication
BS EN 12966:2014 incorporating corrigendum June 2018	Road vertical signs-Variable message traffic signs BSI standards publication
BS EN 12966:2014 Annex N	Guidance on the dimensions, luminance, beam width, legibility and efficiency for discontinuous VMS Annex N provides information on; character heights legibility distances recognition times beam widths luminance luminance ratio
BS EN 12966:2014 Annex P	Guidance for the design of VMS messages Annex P provides information on: design of VMS messages specifying text dimensions inter word spacing inter character spacing inter line spacing
Highways England  Clause 1.1 Clause 1.4 Clause 2.2  Clause 2.7 Clause 2.9	“Policy for the use of Variable Signs and Signals (VSS)” version 3.0 June 2018 Adherence to policy Key definitions Portable VMS shall be set, monitored and used under the direction of the relevant control room. Flashing and scrolling VMS legends Units of information on portable VMS

ARTSM guidance documents are produced for advisory purposes to clarify official guidance, standards and legislation. They are published in good faith but without liability and should not be taken as definitive legal advice. This document is believed to be correct at the time of publication, but ARTSM cannot accept any responsibility for the consequences of any error, or if official guidance or legislative provisions change.

Copyright © 2018 Association for Road Traffic Safety and Management.