



भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

(पोत परिवहन, सड़क परिवहन और राजमार्ग मंत्रालय)

National Highways Authority of India

(Ministry of Shipping, Road Transport and Highways)

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POLICY MATTERS : TECHNICAL (57 / 2010)

(Decision taken on TIC division's file No. NHAI/TIC/VMS/2010)

Sub.: Specification for Variable Message Signs (VMS)

Traffic signs and markings are the basic tools for enhancing safety on road system. Traditionally fixed message are commonly used which could be either kerb mounted or gantry mounted. With extensive use of information and communication technologies in various aspects of road transport and increase in trips with demand for information on real time basis, the signs could be varied as per the traffic conditions. These are called Variable Message Signs. With the advancement of road transport system in the country, it has now become necessary that Variable Message Signs (VMS) are also used on National Highway network as and when and where considered required.

2. Variable Message signs (VMS) are quite useful in conveying the traffic conditions ahead to the drivers on real time basis as well as to display messages to support national road safety campaigns. It may also include the variable traffic speed limit depending upon the requirements.

3. The Variable Message Signs (VMSs) provide to road users the advance en-route traveler information of road conditions ahead in real time. VMS shall be helpful in the following situations:

- (i) Providing advance information on incidents such as accidents, traffic diversions, incident management and notice for road work, adverse weather and road conditions and operation with lane control signals;
- (ii) Providing traveler information such as display of road construction activity in near future, messages for testing of the system and special events that affect the traffic flow;
- (iii) Providing Public service announcements like messages relating to driver safety campaign.

4. Ministry of Road Transport & Highways had constituted a Committee to prepare interim guidelines for variable Message Signs. The report of the Committee was circulated by the Ministry vide letter No.RW/NH-33044/1/2007-S&R(R) dated 24.10.2007 with the request that variable message signs as per the interim guidelines may be provided in selected projects on experimental basis. Now detailed specifications on VMS (incorporating the interim guidelines issued vide letter dated 24.10.2007) have been proposed in the 5th revision of "Specification for Road and Bridge Works". It has been decided to follow the detailed specifications for Variable Message Signs proposed for inclusion in the 5th Revision of "Specification for Road and Bridge Works", until 5th Revision of "Specification for Road and Bridge Works" is published by IRC.

5. A copy of the detailed specifications to be followed as downloaded from IRC web-site is enclosed for information and compliance.

6. This issues with the approval of Chairman.



(M. Chandrashekhar)
General Manager (TIC)

To:
All NHAI

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the call modes of individual call, group/all-call and call to mobiles listed in the queue. The system shall use primary channels for calling from mobiles to the Control Centre and vice versa whereas the secondary channels shall be used for mobile to mobile connection. The system shall have the facility to terminate the mobile to mobile connection under the following conditions:

- a) One of the two parties hangs up
- b) One of the two parties receives a call from the Control Centre
- c) The duration of the conversation exceeds 5 minutes limit.

In case of emergency, the system shall have the facility to receive alarm calls from mobile radio. The mobile radio shall be integrated with the Fibre Optic Communication system. The system shall use frequencies to be obtained by the contractor from WPC in the complete stretch as per scope. The system shall have the provision for communication on the PSTN Network. The system shall have suitable voting system to select the better signal at base stations as well as mobile units. The system shall have provision to handle calls from/to at least 20 mobile sets. The system shall have self-diagnostic features. The system shall be protected against any damage due to power supply fluctuations, transients and surges.

815.11 Variable Message Signs

815.11.1 Function

The Variable Message Signs (VMSs) shall provide to road users the advance en-route traveler information of road conditions ahead in real time. VMS shall generally provide :

- i) Advance information on incidents such as accidents, traffic diversions; incident management and notice for road work, adverse weather and road conditions and operation with lane control signals;
- ii) Traveler information such as display of road construction activity in near future, messages for testing of the system and special events that affect the traffic flow;
- iii) Public service announcements like messages relating to driver safety campaign.

815.11.2 Fixed VMS

Fixed VMS shall be mounted on a sturdy and aesthetically pleasing gantry structure whereby the vertical clearance of at least 5.5 m is available from the road. Safety barriers shall be provided at gantry support column(s) for their protection and for safety of road users. The concrete pedestal for support column should be flushed with ground but in no case should protrude for more than 1.5 m.

815.11.2.1 The minimum distance of VMS on expressways should be 1.5 km prior to decision point and that for National Highways it should be 1 km. The signs should be visible from a distance of 250 m. It should not be located on a curvet and on a highway sections having grade exceeding 4 percent.

815.11.2.2 There should be clear distance between existing sign and VMS. The minimum distance between road signs and VMS should be at least 250 m on expressways and 150 m on National Highways.

815.11.3 Portable VMS

815.11.3.1 Portable signs can be mounted at the back of the truck or similar vehicle. The portable VMS signs mounted on a truck could be powered by solar energy or battery and show the sign of 'men at work' and/or speed limits in the construction zone. They shall be so placed that they are effective. The placement must give adequate time to the motorists to react to the message and take corrective action. On Expressways and National Highways placement of these at 2 km prior to the decision points should be done with repetition at every 500 m. It should provide a sight distance of 300 m and should not interfere with other traffic control devices. If the portable VMS set-up and a message is not to be required for a period of next four hours or more, the sign panel should be turned away from the traffic, parallel to the road centre line. Non blank signs should be facing the drivers for an extended period.

815.11.3.2 Under no circumstances shall VMS be used for advertising of any kind. It would be in blank mode when traffic, roadway, environment or pavement conditions or public service announcements do not warrant the display of message or messages.

815.11.4 Type of messages through VMS

815.11.4.1 The average driver or motorized vehicle at high speed can comprehend two message panels. Each panel should be complete phrase and each phrase should be independent of the other. The messages should consist of :

Type of Statement	Example
• A problem statement	- Road work/accident ahead
• An effect statement	- Delay/congestion
• An attention statement for certain group	- Motorist
• An action statement	- Take the next carriageway

815.11.4.2 Some typical messages are as given below:

- Accident Ahead, Road Closed, Take Diversion;
- 'Accident Ahead' followed by some typical messages like 'Expect Delays', 'Merge Right', 'Merge Left', 'All Traffic Exit' can be displayed.
- Maximum Speed:—————kmph
- Speed Limit Strictly enforced;
- Construction Work, Road Closed;
- Signal Ahead;
- Sharp Curve Ahead;
- Congestion Ahead;
- Bad weather conditions like 'Heavy Fog Ahead', 'Poor Visibility Ahead';
- Trucks use Left Lane;
- Watch for Stopped Traffic;
- Watch your speed;
- Watch for Falling Rocks: (In the case of landslide prone areas);
- Two Way Traffic Ahead (this message can be displayed where the road section abruptly changes from four/six lane divided section to two lane bi-directional carriageways);
- No Mobile When Mobile;
- Drunken Driving Prohibited;

815.11.5 Technical requirements

The design of the system shall be modular. The system shall use LEDs/high gain Trans reflective LCDs for outdoor full sunlight. The failure of one LED module should not affect the output of any other LED-cluster. Its design shall be such that the display is legible from a distance of 300 m on Expressways and from 250 m on other highways.

The equipment will comply with the following:

- | | | |
|----|--------------------|--|
| i) | Overall Size Board | Length minimum 3000 mm
Height minimum 1800 mm
Depth 200 mm |
|----|--------------------|--|

ii)	Number of Display Lines	3
iii)	Number of Characters per line	15
iv)	Height of Characters	minimum 400 mm
v)	Language	Bilingual
vi)	Contrast Ratio	> 30:1 perpendicular to the board face >10:1 at an angle of + 70° to perpendicular.
vii)	Memory	Capable of storing minimum 10 frames that can be triggered on receiving the tele-command.
viii)	Housing or other	Powder coated housing with IP54 equivalent international standard for protection against dust, sprayed water and winds.
ix)	Mounting	Pole mounted as gantry and or cantilever with vertical clearance of 5.5 m from the surface.
x)	Interface Standard	RS422 and RS485 interfaces with compatibility on Ethernet.
xi)	Special Features	Automatic diagnostic and reporting of failure/fault of arrays/ rows.
xii)	Additional Features and humidity sensor.	Incorporation of temperature sensor
xiii)	Luminous Intensity (LED)	> 3000 mcd
xiv)	Life of Components of VMS	> 10 years

Elaborate Fault diagnostics shall be provided as per EN 12966 or other equivalent international standards. Each pixel shall be monitored and feed back shall be provided for the health status. Minimum of following shall be provided:

- i) Power Failure at VMS
- ii) Processor PCB Failure
- iii) LED Cluster Failure
- iv) Loss of incoming message/data not properly received.
- v) Temperature monitoring.

The controller unit shall provide brightness control facility, monitoring of ambient temperature of the housing. The controller shall be capable of automatically diagnosing and reporting component failure or any electronic fault. The controller shall be provided with a test port for local diagnostics via laptop. It shall be possible to perform fault diagnostics from the central control room via the software. The LED Clusters shall be mounted suitably for providing better viewing angle. Each display module shall have its own display interface to the Central processor. VMS shall be designed to comply with the following protocols:

NMCS2, MESSAGE CONTROL, TR2070D, NTCIP Version 2 or other equivalent international protocols.

815.11.6 Testing

The equipment shall be tested for functional requirements as below :

Messages shall be displayed using the central software and local terminal. The fault conditions shall be simulated. Messages/fault logs shall be checked for:

- a) LED FAULT
- b) Communication failure
- c) Power failure
- d) Brightness of Pixels

815.11.7 Installation requirements

The structure on which the VMS is mounted shall be sturdy and aesthetically looking and capable of bearing wind loads up to 200 kmph. The lowest hung part of the display board shall have vertical clearance of at least 5.5 m from the road level. It shall be provided with a walkway to allow at least six persons to carry out maintenance of the VMS without obstructing the carriageway.

815.12 Transmission System

815.12.1 General

The Transmission system provides connectivity between Control Centre and outdoor equipment such as Emergency Call Boxes, Variable Message Signs, Meteorological Data System, Video Cameras, Traffic Sensors, etc. The system shall comprise Cable System, Interface System and Optical Fibre Transmission System.

815.12.2 Cable system : The system shall comprise copper cable, Backbone Optical fibre cable (for connectivity between the sub-centers and main control centre) and auxiliary