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Under Oregon Revised Statute 810.200 and authority delegated by the Oregon Transportation Commission, the state traffic-roadway engineer is responsible for adopting standards related to the design and operation of traffic control devices on state highways. Since variable message signs are traffic control devices, their operation is under the authority of the state traffic-roadway engineer.

The original **Guidelines for the Operation of Variable Message Signs on State Highways** were developed by ODOT in 1995. The guidelines are periodically revised and updated and were last updated in 2022. This revision updates the provisions with our Intelligence Transportation Systems (ITS) use of the Response Plan System (RPS), adding missing person use on VMS, and new abbreviations.

Approved by the State Traffic-Roadway Engineer

Mike Kimlinger, State Traffic-Roadway Engineer

Date

Summary of Notable Changes & Clarifications to VMS Guidelines

Section 1 Scope:

- Introduction to Response Plan System (RPS) as part of the automated system to post VMS messages.

Section 5 Message Purpose and Priority:

- Expanded list to include operations and clarifications of the RPS system.

Section 8 Displaying, Altering, and Removing Messages:

- Clarification of the use of flashing beacons.

Section 9 Guidance for Specific Message Types:

- Added qualifications and protocols for placing missing person alerts.

General

- Removal of information about Highway Advisory Radio signs in relation to VMS. Highway Advisory Radio signs are currently being phased out by ODOT.

Supplement C Standard Abbreviations for VMS:

- Approved abbreviation list has expanded to cover small VMS use with the RPS system.

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1: Scope

A variable message sign (VMS) is a traffic control device whose message can be changed manually, electronically, mechanically, or electromechanically to provide motorists with information about:

- Traffic congestion.
- Traffic crashes.
- Maintenance operations.
- Adverse weather conditions.
- Roadway conditions.
- Organized events.
- Other highway features (e.g., drawbridges, toll booths, weigh stations).

A VMS may be referred to as a changeable message sign (CMS) or a dynamic message sign (DMS) in some publications.

Permanent VMS are signs installed on permanent supports or bridge structures.

Portable VMS (PVMS) or changeable message signs (PCMS) are variable message signs that can be moved to a location as required, either mounted on a trailer or on a motor vehicle. They are generally capable of displaying three lines of text with eight characters per line.

In the federal guidelines for traffic control devices, the Manual for Uniform Traffic Control Devices (MUTCD), these signs are referred to as Changeable Message Signs (CMS). Throughout this document the term VMS is synonymous with CMS.

These guidelines are intended to aid ODOT in effectively utilizing permanent VMS on state highways; they may or may not be appropriate for use by local agencies. A separate ODOT document (PCMS Handbook) is available that contains additional guidance that is specific to the placement, protection, and use of PCMS. Both VMS and PCMS must follow the standards found in the MUTCD.

Single purpose signs such as dynamic curve warning signs, blank-out signs, and “Your Speed Is XX” are special types of VMS and are not addressed in these guidelines. These signs are typically much smaller than standard permanent VMS. Variable speed signs, turn restrictions, and over-height signs are other examples of these types of signs. These types of signs are often specifically designed for their intended use and they are not addressed in these guidelines. The state traffic-roadway engineer has authority over placement and operation of these types of traffic control devices on state highways.

The Response Plan System (RPS) is an integrated component within the Transportation Operations Center (TOC) dispatch software that: allows operators to quickly and easily post

and clear VMS messages, automates the management of message priorities, promotes consistency of sign messages statewide, and records sign and message data for each event. RPS uses event type, location, and impact to suggest a sign plan that is reviewed and activated by a dispatcher. A queue manager prioritizes signs messages associated with multiple events. Once an event is closed, all signs in the plan will automatically blank, or play the next message in the queue.

RPS message suggestions are derived from templates and abbreviations that were approved by Traffic, Traffic Operations Center Management, the Maintenance Leadership Team (MLT), and Intelligent Transportation Systems Operations.

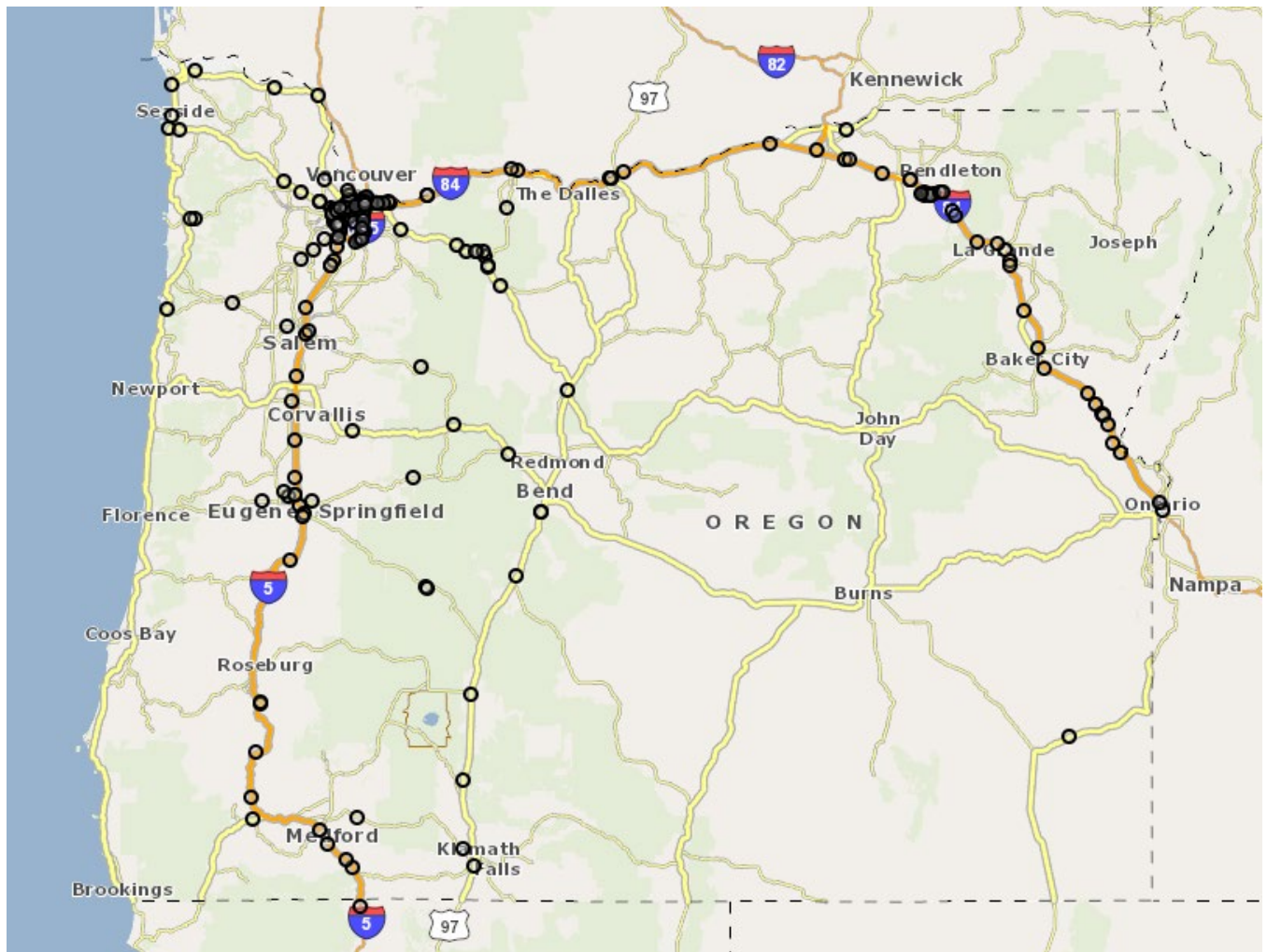
These guidelines clarify the use and operation of VMS on state highways in Oregon and they supplement (not replace) the guidance given in the MUTCD. These guidelines also state the appropriate level of authority within ODOT for decisions related to VMS.

2: Placement and Design of New VMS

Guidance for the placement of new permanent VMS is available in the ODOT Traffic Manual, MUTCD, and from the Intelligent Transportation Systems (ITS) Unit of the Maintenance & Operations Branch. The state traffic-roadway engineer must approve the location of all permanent VMS installations prior to inclusion in the Statewide Transportation Improvement Program (STIP) or commencement of design work.

The ITS Unit maintains the design standards for VMS in conjunction with the Traffic Roadway Section. Contact the ITS Unit for additional information on the available types of signs, design specifications, and mounting considerations for specific applications.

Figure 1: VMS in the State of Oregon on State Owned Highways



3: General Requirements of VMS Use

The display of messages on VMS should follow the guidance of the MUTCD and these guidelines. Messages should meet the guidance for purpose, priority, and composition as described in Sections 5 and 6.

VMS messages typically fall into one of following three general types of messages:

- Standard.
- Non-standard.
- Public Service Announcements.

Standard messages from Supplement A or Supplement B may be used, as deemed necessary by VMS operators in a transportation operations center. Non-standard messages should be approved by the region traffic engineer/manager or their designee. The display of public service announcements (except air quality alerts) on VMS requires the approval of the state traffic-
roadway engineer for each campaign as described in Section 9.

4: Use of Color and Graphics on VMS

The colors used for the legends and backgrounds on VMS shall be as provided in the table of “Common Uses of Sign Colors.” (See Table 2A-5 of the 2009 MUTCD, or equivalent table in superseding MUTCD).

A single VMS phase may be used to display a standard static sign as allowed by the MUTCD. The image shall be a reasonable approximation of the standard MUTCD sign. Text may be combined with an image of a standard MUTCD sign on a single VMS phase.

5: Message Purpose and Priority

Message Purpose

The primary purpose of any VMS is to provide information that supports quick and appropriate decisions by motorists in response to roadway, traffic, or adverse weather conditions. VMS should be used to enhance public safety, which is ODOT's first priority. With a few limited exceptions, VMS messages should only be displayed when some response or decision by motorists is expected. In general, drivers need to know what they should do and the reason for doing it.

Advertising messages, including tourist information, shall not be displayed on any VMS. An advertising message is any wording that promotes an event, place, or product by name and for promotional purposes. For example:

Advertising Message (not allowed):

OREGON STATE FAIR
TODAY THRU SUNDAY
SALEM

Informational Message (allowed):

OREGON STATE FAIR
NEXT 3 EXITS

Message Credibility

Messages should be relevant to the current conditions. Do not display a message if doing so would adversely affect respect for the VMS.

Message Priority For VMS

Daily and seasonal occurrences or site specific operations objectives may alter the priority for displaying messages. The standard priority of displayed messages for VMS is the following:

1. Drawbridge operations, road or ramp closures, and emergency situations.¹
2. Curve warning – dedicated, such as the Myrtle Creek Curves on I-5.
3. Incidents with high impact (greater than 2 hour delay).
4. Chain conditions B, B1, and C.
5. Incidents with medium impact (20 min to 2 hour delay).

¹ Situations involving eminent risk or danger, chain condition D (conditional closures).

6. Incidents with low impact (less than 20 min delay), queue warning messages.
7. Adverse weather or environmental conditions such as icy conditions, high winds, low visibility, flooding and tsunami warnings.
8. General hazard warning.²
9. Chain condition A, chain condition B, B1, and C (non-regulatory) for text based messages generated from Response Plan Software system.
10. Incidents with no to minimum delay or unconfirmed.
11. Construction or maintenance operations that are for information only.
12. Amber Alert messages and Missing Person Messages (see [Section 9](#) for additional information).
13. Traffic operations information associated with special events such as car shows or sports events, future events, and rest area and off-highway system closures (see [Section 9](#) for additional information).
14. Travel time information (see [Section 9](#) for additional information).
15. Special public safety messages and air quality alerts as approved by the region traffic engineer/designee (see [Section 9](#) for additional information).
16. Public service announcements approved by the state traffic-roadway engineer (see [Section 9](#) for additional information).

² Signs dedicated to displaying general hazard warning, e.g. sharp curves next 10 miles.

6: Message Selection, Length, and Units of Information

Messages inform all road users what to expect, where and when to expect it, and how they might react to it – in the simplest way possible. Use the simplest and fewest words possible to clearly convey the message. Traffic Engineering Services Unit staff are available to assist with message development.

Standard Messages

Message familiarity results in faster understanding and response, so the standard RPS messages should be used whenever possible. When the message needs to deviate from the RPS messages, select routine messages for VMS from **Supplement A** or **Supplement B**.

Non-standard Messages

Unusual circumstances may require composing unique messages. If a situation requires a message not within RPS or on the lists of standard messages, the district manager, region traffic engineer or their designee should approve the message. For statewide or multi-regional events, the state maintenance and operations engineer may approve non-standard messages. The following factors should be considered:

1. All messages should relate to the reasons listed in [Section 5, Message Purpose and Priority](#).
2. A message should consist of only the following items. The list is generally in order of importance. Choose the most important information to display given the circumstances, message size limit, and desired driver response:
 - a. The problem statement (e.g., crash ahead, road work, left lane closed).
 - b. The location statement (e.g., ahead 1 mile, exit 214, Brucker St).
 - c. An action statement (e.g., exit, prepare to stop) if needed.
 - d. A time period if needed (e.g., Tu – Fri, 8 PM – 6 AM).
 - e. An attention statement if the message is being directed at a segment of drivers (e.g., through traffic, all trucks).

For instance, if the road is closed to all over-width trucks but not to other vehicles, an attention statement (item e) is needed plus the road closure announcement and directions for the detour.

If the road ahead is now closed to all vehicles, the first three items of information (road closed ahead 1 mile, exit at Brucker St.), would be enough information.

3. Unnecessary words (e.g., 'a', 'an', 'the') should be eliminated unless the intent of the message becomes unclear without them.
4. Use abbreviations only when necessary to fit the message properly on the display type.
 - a. Only abbreviations listed in Supplement C should be used.
 - b. For abbreviations not listed, use the most common abbreviation or form an abbreviation by removing letters from the end of the word.
 - c. All abbreviations are displayed without a period.

Messages should be displayed on one phase, if possible. If a second phrase is necessary, each phase shall consist of meaningful pieces of information that is clear on its own. There are pre-approved exceptions for specific messages such as snow zone chain condition messages on PCMS where up to three phases may be used. See the example below for examples.

5. Leave out expected, non-essential, or implied actions or information to keep the message short and simple. Examples:
 - a. Drivers expect to have to merge right when they see LEFT LANE CLOSED.
 - b. CRASH AHEAD implies the need for caution.
 - c. FOLLOW DETOUR rather than FOLLOW DETOUR ROUTE displays the essential information with fewer words.
 - d. LEFT LANE CLOSED AHEAD is more essential information than ROAD WORK AHEAD.

Figure 2: Examples of good and poor messages of information contained in each phase

	Example 1 (good)	Example 2 (poor)
Phase 1	LEFT LANE CLOSED AT EXIT 214	LEFT LANE CLOSED AHEAD
Phase 2	TRUCKS RIGHT LANE ONLY	AT EXIT 214 TRKS RT LANE ONLY

Message Length and Units of Information

The maximum length of a message is dictated by the number of units of information contained in the message, in addition to the size of the VMS. A unit of information is a single answer to a single question that a driver can use to make a decision.

Examples of a unit of information are “CRASH AHEAD” and “PREPARE TO STOP.” The maximum recommended number of units of information in a message is limited by the:

- Size of the VMS.
- Lighting conditions.
- Visibility of the VMS.
- Speed of approaching drivers.

When designing and displaying messages on VMS, the following requirements and preferences apply:

1. Each message shall consist of no more than two phases.
2. A phase shall consist of no more than three lines of text.
3. Each phase shall be understood by itself regardless of the sequence in which it is read.
4. Only one unit of information should appear on each line of the VMS.
5. A unit of information should not be more than four words.
6. The time that an individual phase is displayed should be 2 seconds.
7. The maximum cycle time of a two-phase message should be 8 seconds.
8. The duration between the display of two phases should not exceed 0.3 seconds.
9. A unit of information consisting of more than one word may be displayed on more than one line.

It is important to have brief, succinct messaging. Having messages limited in information helps drivers comprehend messages in a manner that is conducive to the driving task. To prevent information overload, the criteria above have been developed.

(https://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_600C.pdf)

7: Display of Speed, Location and Time Within a Message

Display of Speed

Speeds displayed on a VMS are advisory or warning, (similar to a curve warning sign) rather than regulatory unless there is a speed zone order from the state traffic-roadway engineer that specifically states the speed will be posted by variable message sign.

- Messages like “SLOW,” “REDUCE SPEED,” etc., are preferred to numeric speeds because they tell the driver what action they should take.
- Avoid using numeric speeds in the message unless the use is specifically approved by the region traffic engineer or their designee.
- The posted speed may be displayed to reinforce the ground signs.

Display of Location

Display the distance to a location such as a road work area, detour start or lane closure in miles. Distances may incorporate the fractions $\frac{1}{4}$, $\frac{1}{2}$, or $\frac{3}{4}$ mile. Distances less than $\frac{1}{4}$ mile should be shown in feet (rounded to the nearest 100 feet).

If the exit numbers or place names are shown on guide signs before or just after the VMS, the exit number or place name such as Ashland or Santiam Pass may be used in place of “NEXT EXIT,” especially if the sign is located farther than two miles from the exit.

- Exit numbers are preferred on interstate highways since they are prominently posted both before and at the exits.
- When place names are used, they should be the same as those shown on guide signs in the vicinity of the VMS.
- Local names or landmarks should be avoided unless the name is shown on the permanent guide signs on the highway.
- Reference to “NEXT EXIT,” “2ND EXIT,” etc. may be preferable to actual distances or exit numbers when there are multiple exits.
- “AHEAD” can be dropped from messages such as “LANES NARROW” if the action needed is immediate.

Display of Time

1. Time displayed in the VMS message shall relate to the standard 12-hour format using “AM” and “PM” designation, and express local time. “A” or “P” can be used at the

discretion of the person posting the message. The abbreviations “MIN” and “HR” should be used.

2. For an entire day or number days, the time period shall be displayed in days of the week. Include dates only if the advisory is for an event in a future week. For instance:
 - a. A message about a road impact next Tuesday would read:
ETHAN AVE CLOSED
TUESDAY – THURSDAY
 - b. But if the closure is two weeks away the message would read:
ETHAN AVE CLOSED
JULY 12-14
TUES – THURS.
 - c. Travel time displays should include a destination. For example:
TRAVEL TIME
TO FRONT AVE
20 MIN

8: Displaying, Altering, and Removing Messages

Line and Character Dimensions

1. VMS messages have to be limited to the space available on the VMS. VMS in Oregon have between 8 to 18 characters per line, depending on the VMS. Spaces between words may be included in this limit.
2. Refer to the 2009 MUTCD (Section 2L.04) for guidance on character heights, widths, stroke widths, and spacing.
3. Word messages on VMS should be composed of all upper-case letters.
4. Messages should be centered line by line.

Message Displays

1. All messages displayed on a VMS shall conform to the priority listing given in [Section 5. Message Purpose and Priority](#).
2. All messages displayed on a VMS should conform to the guidance given in [Section 6. Message Selection, Length, and Units of Information](#).
3. Techniques of message display such as fading, exploding, dissolving, or scrolling shall not be used. The text of messages shall not flash. This includes the simulation of beacons within the message. It is important for VMS messages to look like static messages in order for software applications used by autonomous vehicles to be able to understand the message. Arrows can be flashed.
4. Warning beacons should not be installed on VMS for the purpose of drawing attention to certain types of messages over others. ODOT's software systems do not support the usage of beacons.
5. Single phase messages should be continuously displayed. Alternatively displaying a single phase message and a blank phase implies to the observer that new information may be displayed. It also gives the drivers less time to read the message.
6. Each message, including all phases, should be displayed so it can be read at least twice by drivers traveling at the posted speed. See [Section 6 regarding Units of Information](#).
7. Avoid messages that could adversely impact a facility operated or maintained by another jurisdiction. Contact the road authority of the affected jurisdiction prior to displaying such a message. When an emergency plan or other interagency agreement exists about rerouting traffic, follow the procedures in that plan or agreement.

8. Messages that could impact traffic at another VMS location should not be displayed or removed without first contacting the VMS operator at the affected location.
9. Information on extended road or lane closures for construction or maintenance activities should be displayed beginning two weeks in advance of the closure unless directed otherwise by the region traffic engineer, construction project manager, district manager, or project traffic control plans as appropriate for the situation.
10. When a message display is ended, restore the earlier message if it is still relevant.
11. Prior to the display of non-standard messages, the message spelling, layout, and intent should be verified by the TOC manager, region traffic engineer, district manager or their designee.

9: Guidance for Specific Message Types

Adverse Weather Conditions and Chain-up Requirements

It is not possible to display messages regarding adverse weather conditions (high winds, icy conditions, etc.) everywhere or every time they occur. District maintenance personnel are generally in the best position to determine the need for chain-up requirements or to post other messages related to adverse weather conditions.

Ice

Messages related to icy conditions should only be posted if conditions are unusual and not normally experienced on that section of roadway. Black ice or ice that develops rapidly are examples of unusual conditions. Previous ice-related incidents or crashes at the location could provide additional support for providing motorists information about the current situation.

If needed, a VMS can be used to display an ice-related message. An acceptable message is “WATCH FOR ICE” which may be followed by the additional message “NEXT xx MILES.”

The message “ICE” on a single static phase may also be used in the same manner as sign OW 15-13 in the State Sign Policy & Guidelines.

The message should not project anticipated road conditions due to expected extreme weather more than 24 hours in advance. The message should be removed when the conditions no longer require its display.

Wildfires

Messages to warn drivers of unusually high wildfire conditions may be displayed on selected VMS when the US Forest Service, the Oregon Department of Forestry, or the Bureau of Land Management determine that fire danger is extreme (Industrial Fire Precaution Level 4) and there is the potential for operation of the highway to be affected.

Fire danger levels may be viewed on the Oregon Department of Forestry webpage. The need for posting such messages is higher when there are more travelers in a rural area who may be unfamiliar with the local fire risk (e.g. opening weekend of hunting season). Each posting of these types of messages requires the approval of the state traffic-roadway engineer. The Oregon Department of Forestry must validate the request.

Amber Alerts

The Amber Plan, established in 2002 by Executive Order No. 02-22, uses the Emergency Alert System, television, radio, and the state highway variable message system to provide timely

emergency information to the public regarding a child abduction. The messages posted on a VMS are referred to as Amber Alert messages.

Operation

- A. An Amber Alert message shall only be posted when there is verification of a legitimate Amber Alert activation from the Oregon State Police (OSP) Northern Communications Center.
- B. No Amber Alert message shall be displayed on an ODOT VMS at the request of any other law enforcement offices.
- C. When an Amber Alert is active, ODOT Transportation Operations Centers will activate all fixed VMSs unless otherwise directed in the Amber Alert activation notice.
- D. When a sign is needed to warn motorists of conditions on the highway needing their immediate attention, an Amber Alert message should not be displayed.
- E. VMS messages follow a priority listing. Amber Alerts will not supersede the priority of other messages above it in the priority list. See [section 5 for the priority lists](#).
- F. Unless the Amber Alert is updated with additional vehicle information, or reissued, the message should be displayed for no more than eight hours or until the Amber Alert is officially called off, whichever occurs first. Exceptions are:
 - a. Extension: If the issuing agency requests an extension, two hours will be added to the remaining display time. If still needed, an additional 2-hour extension may be given at the request of the issuing agency.
 - b. Update: If an update is needed such as new color, make or model of the vehicle or license plate information, any VMS previously activated will be updated with the new information. If the update is within the first four hours of the Amber Alert, the message will continue to be activated for the original eight hour period. If the update occurs after the first four hours of an Amber Alert, the updated message will be extended two hours beyond the original eight hour period.
 - c. If the Amber Alert occurs between 8:00 p.m. and 1:00 a.m., the Amber Alert will remain active until 9:00 a.m. the following morning or until the Amber Alert is officially called off, whichever occurs first.
- G. Any information regarding vehicle updates, extensions and/or cancellations will be shared with all other TOCs.

Approved Amber Alert Messages

- A. No phone numbers are to be placed on VMS.
- B. Two phase Amber Alert message:

- a. Phase A:
 AMBER
 ALERT
- b. Phase B:
 [VEHICLE DESCRIPTION]
 [LICENSE PLATE NUMBER]
- C. If an Amber Alert is activated and there is no vehicle license plate information, the message will be placed as follows:
 AMBER ALERT
 TUNE TO
 LOCAL NEWS
- D. Examples:
 - a. Vehicle descriptions:
 - i. 18 character sign: BLACK CHEVY PU
 - ii. 12 character sign: BLACK PICKUP
 - b. License plate number:
 - i. 12 or 18 character sign: OR PLATE XYZ 123

Missing Person Alerts

Missing person messages may be approved for posting on ODOT VMS in support of a missing vulnerable adult, per ORS 181A.320. When a missing vulnerable adult, (as defined in ORS 181A.320 section (1)) is known to be operating a vehicle on the highway system, the state highway variable message system may be activated, to provide timely emergency information to the public. Requests should be made within 72 hours of the person missing.

The messages posted on a VMS are referred to as missing person messages.

Qualifications for Posting a Missing Person Alert

The missing vulnerable adult must be thought to be operating a vehicle on the highway system and have the following to qualify for a VMS message on ODOT highways system:

- A vehicle description to include make, model, color, year, and either a license plate or other unique feature to identify the vehicle by;
- An impaired mental condition, such as dementia; or
- An intellectual or developmental disability; or

- A brain injury.

Operation

- A. A missing person message may be posted when there is verification of a legitimate missing vulnerable adult request from an Oregon law enforcement agency.
- B. A missing person message shall only be posted when the adult is known to be driving a vehicle on the highway system.
- C. When a missing person alert is active, ODOT Transportation Operations Centers will activate all fixed VMSs with at least 18 characters available, unless otherwise directed in the missing person activation notice.
- D. When a sign is needed to warn motorists of conditions on the highway needing their immediate attention, a missing person message should not be displayed.
- E. VMS messages follow a priority listing. Missing person alerts will not supersede the priority of other messages above it in the priority list. See [section 5 for the priority lists](#).
- F. Unless the missing person alert is updated with additional vehicle information, or reissued, the message should be displayed for no more than 72 hours or until the missing person alert is officially called off, whichever occurs first.
- G. Any information regarding vehicle updates, extensions and/or cancellations will be shared with all other TOCs.

Approved Missing Person Alert Messages

- A. 911 will be the default number to be placed on the VMS. *OSP may be used in lieu of 911 at the request of the Oregon State Police.
- B. Two phase missing person message:
 - a. Phase A:
MISSING PERSON
JOHN [JANE] DOE
 - b. Phase B:
[VEHICLE DESCRIPTION]
[LICENSE PLATE NUMBER]
IF SEEN CALL *OSP/911
- C. Examples:
 - a. Vehicle descriptions:
BLACK CHEVY PICK-UP or

GREEN NISSAN SENTRA

b. License plate number:

OR PLATE XYZ 123

Special Events Messages

If a special event is likely to impact traffic operations, a message may be displayed on a VMS to inform drivers about exit and parking information.

If an attraction qualifies as a “destination,” a message may be appropriate but should avoid direct mention of a specific private establishment or event.

Travel Time Information

FHWA encourages the posting of travel times on VMS during non-incident periods. Posting travel time messages on VMS not only provides useful information to the motorist, it also assists them in planning their routes. Motorist may divert away from the congested highway. Thus, posting travel time messages provides critical capacity and assists in the management of congestion.

Messages relating to travel time information may be displayed at the discretion of the region traffic engineer. When displaying travel time information consider the following:

1. There shall be an established program for disseminating travel time information on the corridor or route on which the sign is situated.
2. There shall be a means for determining travel time to ensure the information is accurate and real time.
3. Display of a message of a higher priority must be able to override the travel time message display.
4. Strobe or flashing lights shall not be used in conjunction with travel time information.
5. Travel time information displayed should not be for more than two highway sections or corridors. Normally, the highways should be alternate route choices to each other and should be routes that are in close proximity to the sign.

Air Quality Alerts

Messages related to air quality or alternative transportation options may be displayed during the 24-hour period preceding an air quality alert day as determined by the region traffic engineer/manager or designated representative in cooperation with the Oregon Department of Environmental Quality.

An example of an air quality alert is: SMOG ADVISORY / SAT-MON / DRIVE LESS.

Public Service Announcements

A Public Service Announcement (PSA), as it pertains to display on a VMS on the public roadway, is a brief message that does not require an immediate response, but encourages the driver to change a future behavior. PSA messages shall be transportation-related messages such as “DRIVE SOBER, SAVE LIVES” or “CLICK IT OR TICKET.” They may be related to new transportation-related laws, as well.

In general, VMS are used to provide critical information to warn the driver of situations ahead. PSA messages, on the other hand, try to influence drivers to change driver behaviors. Limited research has been performed on the effectiveness of road safety messages displayed on VMS.

One study suggested that PSA's provide a small, short term effect on driver behavior, but messages must not overload the driver. It has been suggested that a constant airing of PSA messages may result in some drivers ignoring more important messages.

Additionally, messages on VMS can distract drivers from the driving task to the point where drivers may be seen to brake when a message is displayed. Decreased spacing and increasing lane change behavior has been observed.

Despite the lack of conclusive research and the debate over the use of VMS, limiting the use of PSA messages to short time periods and short clear messages provides some balance to possible detriments. It provides a certain amount of use for road safety messages yet maintains the integrity of the VMS for messages that require a more immediate response from drivers.

When displaying a PSA on a VMS, the following limits and guidance apply:

1. The state traffic-roadway engineer shall approve the text of all PSA messages prior to each period of their use. The state traffic-roadway engineer may approve an annual schedule of approved messages in cooperation with agency partners.
2. A PSA shall have the lowest message priority and shall be displayed only at the discretion of the state traffic-roadway engineer.
3. A PSA shall be limited to a single phase containing no more than eight words (about four to eight characters per word).
4. Strobe or flashing lights shall not be used in conjunction with a PSA.
5. A PSA shall be related to a driver behavior, a new law, driver safety or a related transportation issue, such as seat belt use, drinking and driving, distracted driving, aggressive driving, speeding, drowsy driving, or advocating another mode of travel during periods of air quality concerns. These messages are typically approved in conjunction with an enforcement campaign.
6. A PSA should be relevant to and understood by most drivers.
7. Except for high-travel holidays, PSA messages shall be displayed only as supplementary to currently active local or statewide transportation safety media campaigns that are

accompanied by enforcement campaigns on the same topic. During high-travel holidays, PSA messages may be displayed in conjunction with enforcement-only campaigns.

8. The total duration of the display should not exceed more than five days per month at any VMS location.
9. Consideration should be given to limit transportation safety PSA messages to certain areas of the state where most applicable.
10. The workload associated with posting PSA messages is significant. It is recognized that PSA messages will only be posted as staff workload permits.

Example PSA messages.

- DON'T DRINK / AND DRIVE
- DRIVE SOBER OR / GET PULLED OVER
- DESIGNATE A DRIVER / AVOID \$\$\$ FINE
- CLICK IT OR TICKET
- BUCKLE UP FOR SAFETY
- TEXTING & DRIVING / \$\$\$ FINE
- WORK ZONE / SAFETY MONTH / DRIVE SAFELY

Recent research has found PSA's are more effective when they have an explicit reference to some consequence for poor driver behaviors such as the number of recent crashes or the cost of a DUII fine.

Test Messages

Test messages on a permanent VMS should be clear. Test messages should be tailored to the size of the sign but the messages should be the similar.

Example 1 for large VMS:

OREGON DEPARTMENT
OF TRANSPORTATION
SIGN UNDER TEST

Example 2 for medium VMS:

ODOT SIGN
UNDER TEST
SYSTEMS TEST

Example 3 for small VMS:

ODOT

SIGN

TEST

Recordkeeping

Files of messages, display times, and the operator who posted the message should be maintained. Records may be electronic or other media and should be secure and accessible for review, retrieval, and printing.

10: Appendix & Supplements

Glossary

The following definitions are included here for reference to terms used in this document only. These definitions do not apply to terms found in Oregon Revised Statutes, Oregon Administrative Rules, MUTCD, or any other design guide or policy.

Air Quality Alert – a message posted to warn the public of a high concentration of pollutants in the air.

Amber Alert – a message posted on a VMS or broadcast on local television and radio stations to inform the public regarding a child abduction.

Phase – the set of words displayed and visible at a particular moment in time on a VMS board. A phase may be referred to as a “panel” or a “page” in some reference documents.

Public Service Announcement (PSA) – a message that does not require an immediate response but encourages the driver to change a future behavior. They may be related to driving under the influence of alcohol or drugs, new transportation-related laws, seat belt use.

Unit of information – the set of words that form a single answer to a single question that a driver can use to make a decision.

References

Changeable Message Sign Operation and Messaging Handbook, Federal Highway Administration. 2004 .

Effectiveness of Safety and Public Service Announcement Messages on Dynamic Message Signs. Federal Highway Administration. 2014.

Public Perception of Safety Messages and Public Service Announcements on Dynamic Message Signs in Rural Areas, Federal Highway Administration. 2016.

Manual for Traffic Control Devices, Federal Highway Administration, 2009.

Human Factors Guidelines for Road Systems. NCHRP Report 600, 2012.

Supplement A – Typical Messages for VMS Traffic Management

Table 1: VMS messages that are not part of the RPS system for Traffic Management

VMS Message	Abbreviations and Notes
ABRUPT / EDGE / LEFT	
ABRUPT / EDGE / RIGHT	
DO NOT PASS / STAY IN LANE	
DO NOT STOP / NO PARKING / ON SHOULDER	
EXIT CLOSED AHEAD / USE NEXT EXIT	
LEFT EXIT OPEN	
HEAVY TRAFFIC / AHEAD / PREPARE TO SLOW	
HEAVY TRAFFIC / AHEAD / PREPARE TO STOP	
LANE / NARROWS / AHEAD	
LANES SHIFT LEFT / AHEAD	
LANES SHIFT RIGHT / AHEAD	
LANE ENDS / MERGE LEFT	
LEFT EXIT OPEN	
LEFT LANE CLOSED / MERGE / RIGHT	
LEFT LANE CLOSED / 1000 FT	
LEFT LANE CLOSED / X MILE / MERGE RIGHT	
LEFT LANE NARROWS / NO TRUCKS	
LEFT 2 LANES / CLOSED / USE RIGHT LANE	
MERGE / LEFT	
MERGE / RIGHT	
MERGE AHEAD / TRAFFIC ENTERS / ON LEFT	
MERGE AHEAD / TRAFFIC ENTERS / ON RIGHT	
NO CENTER STRIPE / KEEP RIGHT	
NO LANE LINES / USE CAUTION	
NO LANE LINES / KEEP RIGHT / EXCEPT TO PASS	
NO SHOULDER / DO NOT STOP	
RIGHT EXIT OPEN	
RIGHT LANE CLOSED / MERGE LEFT	

VMS Message	Abbreviations and Notes
RIGHT LANE CLOSED / 1000 FT	
RIGHT LANE CLOSED / X MILE / MERGE LEFT	
RIGHT LANE NARROWS / NO TRUCKS	
RIGHT 2 LANES / CLOSED / USE LEFT LANE	
ROAD CLOSED AHEAD / LOCAL TRAFFIC ONLY	
ROAD CLOSED AHEAD / USE DETOUR	
ROAD CLOSED X MILE(S) / USE DETOUR	
ROAD NARROWS / AHEAD	
ROUGH PAVEMENT / AHEAD / PREPARE TO SLOW	
ROUGH ROAD AHEAD / SLOW	
SHARP CURVE AHEAD / SLOW	
SLOW TRAFFIC AHEAD / PREPARE TO SLOW	
SOFT SHOULDER / USE CAUTION	
STAY IN LANE / NO LANE CHANGES	
STEEP GRADE	
SUNKEN PAVEMENT / SLOW	
TRAFFIC DELAYS / PREPARE TO SLOW	
TRAFFIC DELAYS / PREPARE TO STOP	
TRUCKS CROSSING RD / USE CAUTION	XING; CROSSNG
TWO-WAY / TRAFFIC / AHEAD	2 WAY
WARNING / CROSS TRAFFIC / AHEAD	
WATCH FOR TRUCKS / TRUCKS ENTER RIGHT	
YIELD AHEAD	
YIELD AHEAD / YIELD TO ONCOMING	

Work Zone Management

Table 2: VMS messages that are not part of the RPS system for WORK ZONE MANAGEMENT

VMS Message	Abbreviations and Notes
CREW PAINTING / CENTER LINE / KEEP TO RIGHT	
DETOUR AHEAD / FOLLOW / DETOUR SIGNS	
DETOUR NEXT LEFT / FOLLOW / DETOUR SIGNS	
DETOUR 1000 FT / FOLLOW / DETOUR SIGNS	

VMS Message	Abbreviations and Notes
DETOUR / X MILE(S) / AHEAD	
FLAGGER AHEAD / 1 MILE / PREPARE TO STOP	
FRESH OIL / ON ROAD	
FRESH TAR / ON ROAD / SLOW	
MEDIAN WORK AHEAD / USE RIGHT LANE	
MEDIAN WORK / KEEP RIGHT	
MOWERS IN MEDIAN / MOWING / NEXT ¼ MILE	
MOWERS IN MEDIAN / MOWING / NEXT X MILE(S)	
RAMP CLOSED AHEAD / USE NEXT EXIT	
PILOT CAR / 1 MILE / PREPARE TO STOP	
PILOT CAR AHEAD / PREPARE TO STOP	
ROAD WORK AHEAD / NEXT X MILE(S)	
ROAD WORK AHEAD / USE LEFT LANE	
SHOULDER WORK / WORK ON SHOULDER	
SHOULDER WORK / SHOULDER CLOSED / X MILES	
SHOULDER WORK / AHEAD / USE CAUTION	
SHOULDER WORK / AHEAD / USE LEFT LANE	
SHOULDER WORK / WORKERS / ON SHOULDER	
SLOW MOVING WORK / PREPARE TO SLOW	
SLOW MOVING WORK / LEFT LANE CLOSED	
SLOW MOVING WORK / KEEP RIGHT	
SLOW MOVING WORK / SHOULDER CLOSED	SHOULDR
SLOW MOVING WORK / MEDIAN CLOSED	
SNOW BLOWERS AHEAD / DO NOT PASS	
SNOW BLOWERS AHEAD / PLEASE USE CAUTION	
SNOW BLOWERS AHEAD / USE LEFT LANE	
SNOW PLOW AHEAD / DO NOT PASS	
STRIPING TRUCKS / AHEAD / CENTER LANE CLOSED	STRIPNG or PAINT
STRIPING WORK / RIGHT / USE LEFT LANE	STRIPNG or PAINT
STRIPING WORK / CENTER / KEEP RIGHT	STRIPNG or PAINT
SURVEY WORK AHEAD / PREPARE TO STOP	
SURVEY WORK AHEAD / PREPARE TO SLOW	
SURVEY WORK AHEAD / USE LEFT LANE	

VMS Message	Abbreviations and Notes
SWEEPER AHEAD / USE CAUTION	
SWEEPER AHEAD / USE LEFT LANE	
TUNNEL CLOSED / AHEAD / EXPECT DELAYS	
TUNNEL CLOSED / AHEAD / DETOUR NEXT LEFT	
TUNNEL CLOSED / AHEAD / USE OTHER ROUTE	
TUNNEL CLOSED / AHEAD / PREPARE TO STOP	
USE DETOUR ROUTE / FOLLOW DETOUR / SIGNS	
USE DETOUR ROUTE / TURN NEXT RIGHT	
WET PAINT / STAY IN LANE	
WORKERS AHEAD / WATCH FOR WORKERS	
WORKERS IN MEDIAN / WATCH FOR WORKERS	
WORKERS IN ROAD / PLEASE SLOW	
WORKERS IN TUNNEL / PLEASE SLOW	

Incident Management – Weather Related

Table 3: VMS messages that are not part of the RPS system for weather related incident management

VMS Message	Abbreviations and Notes
ACTIVE SLIDES AHEAD / REDUCE / SPEED	
BLACK ICE LIKELY / USE / CAUTION	
BLOWING DUST AHEAD / NEXT X MILE(S)	
BLOWING DUST AHEAD / SLOW / TURN ON LIGHTS	
BLOWING SNOW AHEAD / NEXT X MILE(S)	
BLOWING SNOW AHEAD / SLOW / TURN ON LIGHTS	
DENSE FOG AHEAD / SLOW / TURN ON LIGHTS	
FREEZING FOG AHEAD / SLOW TURN ON LIGHTS	FREEZNG
FREEZING FOG LIKELY / USE CAUTION	FREEZNG
ICE ON BRIDGES / SLOW / USE CAUTION	
ICE ON ROAD / SLOW / USE CAUTION	
ROAD FLOODED / SLOW	
ROCKS ON ROADWAY / USE CAUTION	

VMS Message	Abbreviations and Notes
SLIDE BLOCKS ROAD / PREPARE TO STOP	
SLIDE ON ROAD / KEEP RIGHT	
SNOW BLOWERS AHEAD / DO / NOT / PASS	
SNOW BLOWERS AHEAD / USE CAUTION	
SNOW BLOWERS AHEAD / USE LEFT LANE	
SNOW PLOW AHEAD / DO NOT PASS	
SNOW ZONE / CHAINS REQUIRED / ALL VEH	REQUIRD
SNOW ZONE / CHAINS REQUIRED / OVER 10,000 LBS	REQUIRD, OVER 10K
SNOW ZONE / CARRY CHAINS	
WATCH FOR ICE / NEXT X MILE(S)	
WATER ACROSS ROAD / USE CAUTION	

Incident Management – Non-Weather Related Events

Table 4: VMS messages that are not part of the RPS system for non-weather related incident management

VMS Message	Abbreviations and Notes
BURN AREA AHEAD / SLOW / TURN ON LIGHTS	
DEBRIS ON ROAD / KEEP LEFT	
DEBRIS ON ROAD RIGHT / LANE / CLOSED	
DEBRIS ON ROAD / PREPARE TO STOP	
DEBRIS ON ROAD / EXPECT DELAYS	
DENSE SMOKE AHEAD / STOP ON / SHOULDER ONLY	SHOULDR
DENSE SMOKE AHEAD / SLOW / TURN ON LIGHTS	
DENSE SMOKE AHEAD / PREPARE TO SLOW	
DENSE SMOKE AHEAD / PREPARE TO STOP	
EXTREME FIRE DANGER / USE CAUTION	
FIRE AHEAD / PREPARE TO SLOW	
FIRE AHEAD / PREPARE TO STOP	
FIRE AHEAD / STOP ON / SHOULDER ONLY	SHOULDR
FREEWAY BLOCKED / AHEAD / PREPARE TO STOP	

VMS Message	Abbreviations and Notes
FREEWAY CLOSED / AHEAD / ALL VEH MUST EXIT	
FREEWAY CLOSED / USE NEXT EXIT	
FREEWAY CLOSED / FOLLOW / DETOUR SIGNS	
SIGNAL OUT / ALL-WAY STOP AHEAD	
SIGNAL OUT / YIELD TO VEHICLE / ON RIGHT	
STALLED VEHICLE / PREPARE TO STOP	
STALLED VEHICLE / AHEAD / SHOULDER CLOSED	SHOULDR
STALLED VEHICLE / AHEAD / RIGHT LANE CLOSED	
STALLED VEHICLE / ON RAMP / KEEP LEFT	ON EXIT
CRASH AHEAD / CENTER LANE CLOSED	
CRASH AHEAD / EXPECT DELAYS	
CRASH AHEAD / LEFT LANE CLOSED	
CRASH AHEAD / LEFT 2 LANES / CLOSED	
CRASH AHEAD / KEEP RIGHT	
CRASH AHEAD / PREPARE TO STOP	
CRASH AHEAD / USE CAUTION	
CRASH AHEAD / USE CENTER LANE	

Bridges

Table 5: VMS messages related to bridges

VMS Message	Abbreviations and Notes
BRIDGE CLOSED / AHEAD / USE DETOUR	
BRIDGE CLOSED / AHEAD / FOLLOW DETOUR	
BRIDGE OUT / AHEAD / USE DETOUR	
BRIDGE OUT / AHEAD / USE OTHER ROUTE	
BRIDGE WORK / AHEAD / LANES NARROW	
BRIDGE WORK / AHEAD / PREPARE TO STOP	
BRIDGE WORK / AHEAD / USE CENTER LANE	
BRIDGE WORK / AHEAD / WORKERS ON ROAD	
BRIDGE WORK / AHEAD / SLOW	
ONE LANE BRIDGE / PREPARE TO STOP	

Trucks

Table 6: VMS messages related to trucks

VMS Message	Abbreviations and Notes
ALL TRUCKS / EXIT RIGHT	
ALL OVERSIZE / VEHICLES / MUST EXIT	OVRSIZE
ALL TRUCKS / USE RT LANE	LEFT/CNTR LN
ALL TRUCKS / KEEP RIGHT	
ALL TRUCKS / USE LOW GEAR	
ESCAPE RAMP 1 / CLOSED / TRUCKS USE RAMP 2	
ESCAPE RAMP / CLOSED	
OVERSIZE MUST EXIT / NEXT EXIT X MILE(S)	OVRSIZE, XX MI
TRUCKS OVER 80,000 / MUST EXIT	
TRUCKS OVER 80,000 / USE NEXT EXIT	

Supplement B – Additional Typical Messages for Display on Permanent VMS

Below is a list of sample standard messages that are most often displayed on permanent VMS. These messages may be modified and new messages may be composed, as deemed necessary by the region traffic engineer/manager or his/her designee.

Consult Table 1A-1 in the MUTCD for a listing of acceptable abbreviations.

Table 7: VMS messages

Phase 1	Phase 2
FREEWAY CLOSED AT EXIT nn	I-84 BOISE USE EXIT yyy DETOUR ROUTE OR203
FREEWAY CLOSED xx MILES	I-5 SEATTLE USE NEXT EXIT FOLLOW DETOUR SIGNS
FREEWAY BLOCKED KEEP RIGHT PREPARE TO STOP	
BRIDGE CLOSED xx MILES	ALL TRAFFIC USE I-405 LEFT LANES
SNOW ZONE	CARRY CHAINS OR TRACTION TIRES
SNOW ZONE	CHAINS REQUIRED ON VEHICLES TOWING OR OVER 10000 GVW
SNOW ZONE CHAINS REQUIRED	TRACTION TIRES ALLOWED ON VEH UNDER 10000 GVW
DENSE FOG AHEAD LOW VISIBILITY	
EXTREME HAZARD FREEZING FOG	
WATCH FOR ICE	

Phase 1	Phase 2
NEXT xx MILES	
CRASH AHEAD USE RIGHT LANE	
CRASH AHEAD PREPARE TO STOP	
CRASH xx MILES AHEAD LEFT LANE CLOSED	
CRASH xx MILES AHEAD	I-5 SEATTLE USE I-405 LEFT LANES
CRASH xx MILES AHEAD	CITY CENTER EXIT LLOYD BLVD
CRASH xx MILES AHEAD	FWY CLOSED AT NE 43RD AVE

Supplement C – Standard Abbreviations for VMS

Due to limitations in the number of characters, abbreviations may occasionally be necessary on VMS.

The following tables are to be used to determine the right abbreviation whenever one is needed. This table includes abbreviations from the MUTCD tables (1A-1, 1A-2), plus abbreviations needed for the RPS system to fit on smaller VMS around the state.

Where multiple abbreviations for a word are permitted in the table, the same abbreviation should be used throughout a single jurisdiction.

Table 8: Acceptable abbreviations

VMS Message	Abbreviations	Preceding or Proceeding prompt word needed
Afternoon / Evening	PM	
Ahead	AHD	
Alternate	ALT	
Avenue	AVE, AV	
Bicycle	BIKE	
Boulevard	BLVD*	[Name]
Bridge	BR	[Name]
CB Radio	CB	
Center (as part of a place name)	CTR	
Center (used with center lane)	CNTR	
Circle	CIR*	[Name]
Civil Defense	CD	
Closed	CLSD	
Compressed Natural Gas	CNG	
Conditions	CONDS	
Controlled	CONTRLD	
Court	CT*	[Name]
Crossing (other than highway-rail)	X-ING	
Drive	DR*	[Name]
East	E	
Eastbound	EB	
Electric Vehicle	EV	

VMS Message	Abbreviations	Preceding or Proceeding prompt word needed
Exit	EX	
Expressway	EXPWY*	[Name]
Feet	FT	
FM Radio	FM	
Freeway	FRWY, FWY*	[Name]
Friday	FRI	
Hazardous Material	HAZMAT	
High Occupancy Vehicle	HOV	
Highway	HWY*	[Name]
Hospital	HOSP	
Hour(s)	HR, HRS	
Information	INFO	
Inherently Low Emission Vehicle	ILEV	
International	INTL	
Interstate	I-	[Number]
Junction / Intersection	JCT	
Lane	LN	Right, Left, or Center
Lanes	LNS	Right, Left
Left	LFT	
Liquid Propane Gas	LP-GAS	
Maximum	MAX	
Mile(s)	MI	
Miles Per Hour	MPH	
Minimum	MIN	
Minute(s)	MIN	
Monday	MON	
Morning / Late Night	AM	
Mount	MT	
Mountain	MTN	
National	NATL	
North	N	
Northbound	NB	
Parkway	PKWY*	[Name]
Pedestrian	PED	

VMS Message	Abbreviations	Preceding or Proceeding prompt word needed
Place	PL*	[Name]
Pounds	LBS	
Prepare	PREP	
Right	RT	
Road	RD	[Name]
Roadway	RDWY	
Roadwork	RDWK	
Route	RT, RTE	
Saint	ST	
Saturday	SAT	
Shoulder	SHLDR	Right, Left
South	S	
Southbound	SB	
Speed	SPD	
State Route	OR	[Route Number]
Street	ST*	[Name]
Sunday	SUN	
Telephone	PHONE	
Temporary	TEMP	
Terrace	TER*	
Thursday	THURS	
Thruway	THWY*	[Name]
Tons of Weight	T	
Trail	TR*	[Name]
Tuesday	TUES or TU	
Turnpike	TPK*	[Name]
Two-way Intersection	2-way	
US Numbered Route	US	[Route Number]
Vehicle(s)	VEH, VEHS	
Warning	WARN	
Wednesday	WED	
West	W	
Westbound	WB	

*These abbreviations should only be used for names of the road or entity.

Unacceptable Abbreviations

These are the abbreviations that are labeled unacceptable in the MUTCD, table 1A-3. They are commonly confused with other traffic related words and should not be used on VMS.

Table 9: Unacceptable Abbreviations

Abbreviation	Intended Word	Common Misinterpretation
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong

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