MDOT
Michigan Department of Transportation

OFFICE MEMORANDUM

DATE: February 10, 2011

TO: Region Engineers
Associate Region Delivery Engineers
Associate Region Development Engineers
Region Delivery Engineers
TSC Managers
Resident/Project Engineers
Region Construction Engineers
Region/TSC Development Engineers

FROM: Gregory C. Johnson
Chief Operations Officer

SUBJECT: Bureau of Highway Instructional Memorandum 2011-02
Portable Changeable Message Sign Guidelines
(Supersedes BOH IM 2004-19)

The Michigan Department of Transportation's Portable Changeable Message Sign Guidelines have been revised and approved by the Traffic Recommendations Committee as of January 2011. The revisions have added requirements from the 2009 Manual for Uniform Traffic Control Devices, additional standard abbreviations, and guidance for displaying real-time travel messages.

Attached are the guidelines, which should be used for all construction projects that have not been turned in for advertising.

If you have any questions, please contact Julie Johnston, Work Zone Delivery Engineer, System Operations & Management Section, at 517-373-6281 or JohnstonJu@michigan.gov.

Chief Operations Officer

Attachment
BOHD:DO:SOM:JJG:ksk
Index: Traffic Control
cc: K. Steudle
Bureau Directors
Division Administrators
TSC Traffic and Safety Engineers
J. Gutting
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K. Zachary, FHWA, Michigan Division

ACM
ACEC
APAM
CRAM
MAA
MCPA
MITA
MML

MICHIGAN DEPARTMENT OF TRANSPORTATION
Portable Changeable Message Sign Guidelines
Revised January 2011

APPLICATION GUIDELINES FOR PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

PCMS have a variety of functions including:

1. Ramp, lane, and road closures
2. Traffic pattern changes such as temporary crossovers and width restrictions
3. Advisories on roadwork scheduling
4. Traffic management and alternate routing
5. Incident management
6. Warning of adverse road conditions
7. Traffic operations control
8. Real-time travel time messages
9. Safety messages

Listed below are PCMS applications in priority order:

ADVANCE TIME NOTIFICATION

- Ramp Closures: It is recommended that the message be displayed three to seven days prior to the closure. For weekend closures on freeways with high recreational/tourist travel, the message should be displayed longer, up to ten days, which would include two Thursdays prior to closures. The message should include the opening of the closure.

- Lane Closures: Same as Ramp Closures above.

- Roadway Closures: The advance notice message, displayed seven to ten days prior to closure, addresses the temporary closure (short duration) of roadways for planned work such as truss or bridge beam installations. For long-term closures, see Ramp Closures above.

- Planned Maintenance Work: It is recommended that the message be displayed seven to ten days prior to the planned work and include the estimated completion date.

The message(s) during the actual closure/work will differ from those displayed prior to the event.

INFORMATION DURING EXISTING EVENTS

- Detour/Alternate Routes: The message should recommend detours/alternate routes during ramp/lane/roadway closures.

- Incident Management: Post roadway closures due to crashes and/or incidents which cannot be addressed alone with static signing.

- Work Zone Traffic Backups: This involves monitoring congestion and backups (real-time). This is potentially an ideal use for PCMS, but requires constant updating and extensive resources. The traffic backup must be monitored every 15 to 30 minutes, depending on the situation. PCMS messages on delay times must be accurate.

- Special Event Traffic Conditions: Unusual vehicle and/or non-motorized traffic patterns generated by sporting or charity events are examples for PCMS use. Under no circumstances shall PCMS be used to advertise special events. Messages for special events should be designed such that advertising is not embedded in the message. The message shall identify traffic conditions and a suggested remedy for those attending the special event and those using the same roadway to pass by the special event location.

- Real-time Travel Time Messages: It is recommended that real-time travel time messages, if available, be displayed when no other higher priority message is available. This message will provide useful information on current roadway conditions, providing the motorist with real-time information to make informed decisions.

- Traffic Calming: LIMITED USE of messages to inform motorists of closures are permitted. Such messages would indicate why a lane is closed (if not obvious) or when a lane will be reopened. For example, messages notifying of an estimated opening may be displayed during the life of the closure.

- Notice of Operations: Within unusual roadway geometrics, PCMS devices may be used as an advanced warning device in conjunction with static signing for stationary or moving operations. Unusual geometrics, such as curves or hills, provide an obstructed view to motorists coming upon the operation and PCMS may provide additional notice.

- Safety Messages: Are completed in cooperation with the Office of Highway Safety Planning to promote motorist safety awareness.

PROHIBITED PCMS USE

- Replacement of Michigan Manual of Uniform Traffic Control Devices (MMUTCD) required static signing or pavement markings.
- Lighted arrow replacement.
- Advance notice of new traffic signal or sign.
- Advertising of any kind.
- The display shall not include animation or rapid flashing symbols or text.

MESSAGE GUIDELINES

Drivers must be able to see, read, and comprehend the message on PCMS. The basic principles to insuring the proper operation (read) and providing the proper messages (comprehend) are message objective, message timing, and the message.

MESSAGE OBJECTIVE

PCMS should clearly establish the objective of the message by considering the following questions:

QUESTIONS	EXAMPLE MESSAGE
What Happened?	(CRASH)
Where?	(AT LIVERNOIS)
What is the effect?	(LEFT LANE BLOCKED)
Who is affected?	(THRU TRAFFIC)
What is advised?	(EXPECT DELAYS)

The message should be designed to display the most important information and be condensed, as much as possible, to meet the requirements of message timing.

MESSAGE TIMING

Sequencing messages are typically used when situations dictate the need for more message than can be displayed at one time on PCMS. The cycle time and duration of the message is related to the operating speed of the highway. All message sequences shall consist of a maximum of two messages and with a two-second minimum display time for each message. If additional sequences are needed, a second PCMS shall be placed on the same side of the roadway, separated by at least 1000 feet.

MESSAGE

When operating PCMS, it is essential to use messages that are easily understood by drivers and accurate. It is also important to properly describe the roadwork or incident location based on the expected audience. The public should believe that our PCMS boards contain important, useful, and accurate information, so they read every message. Providing inaccurate, confusing, non-priority messages will reduce motorists' interest in reading PCMS messages, thus the department losing credibility.

PCMS shall provide an 18-inch character height, with a maximum eight characters per line and three lines of text. Commuters are typically familiar with street names. However, tourists are not, but should be able to identify route numbers. When providing dates, use words for numbers whenever possible, because they are easier to read and comprehend. For example, use the format "NOV 24" instead of "11/24/11". Also, when possible, use days instead of dates for upcoming construction. "SAT-SUN" is easier to understand than "4/13 – 4/14."

PCMS NOT IN USE

When PCMS is not needed for a message as contained in these guidelines, it shall be turned off and removed from the immediate traffic area, as indicated in the Standard Specifications for Construction.

ABBREVIATIONS

Due to limitations of PCMS size or the message length, it is sometimes necessary to abbreviate words. However, the use of abbreviations should be minimized. The following are nationally recognized abbreviations for frequently used words:

STANDARD ABBREVIATIONS

WORD MESSAGE	STANDARD ABBREVIATION
Afternoon/Evening	PM
Alternate	ALT
Avenue	AVE, AV
Bicycle	BIKE
Boulevard	BLVD
Cannot	CANT
Center	CNTR
Circle	CIR
Civil Defense	CD
Court	CT
Crossing (other than highway-rail)	XING
Do Not	DON'T
Drive	DR
Emergency	EMER
Entrance, Enter	ENT
Expressway	EXPWY
Feet	FT
FM Radio	FM
Freeway	FWY
Friday	FRI
Hazardous Material	HAZMAT
Highway	HWY
Highway-Rail Grade Crossing Pavement Marking	RXR
Hospital	H
Hour(s)	HR
Information	INFO
It Is	ITS
Junction/Intersection	JCT
Lane	LN
Left	LFT
Maintenance	MAINT
Mile(s)	MI
Miles Per Hour	MPH

WORD MESSAGE	STANDARD ABBREVIATION
Minute(s)	MIN
Monday	MON
Morning/Late Night	AM
Normal	NORM
Parking	PKING
Parkway	PKWY
Pedestrian	PED
Place	PL
Pounds	LBS
Right	RHT
Road	RD
Saturday	SAT
Service	SERV
Shoulder	SHLDR
Slippery	SLIP
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Terrace	TER
Thursday	THURS
Traffic	TRAF
Trail	TR
Travelers	TRAVLRS
Tuesday	TUES
Two-Way Intersection	2-WAY
Two-Wheeled Vehicles	CYCLES
US Numbered Route	US
Vehicle(s)	VEH
Warning	WARN
Wednesday	WED
Will Not	WONT

ABBREVIATIONS USED WITH PROMPTS

Other abbreviations are easily understood when they appear a prompt word commonly associated with it. The prompt word must be spelled out when used with the abbreviated word. The prompts and abbreviations are as follows:

WORD	ABBREVIATION	PROMPT WORD
Access	ACCS	Road
Ahead	AHD	Fog*
Blocked	BLKD	Lane*
Bridge	BRDG	(Name)*
Chemical	CHEM	Spill
Condition	COND	Traffic*
Congested	CONG	Traffic*
Construction	CONST	Ahead
Downtown	DWNTN	Traffic
Exit	EXT	Next*
Express	EXP	Lane
Frontage	FRNTG	Road
Hazardous	HAZ	Driving
Interstate	I	[Number]
Local	LOC	Traffic
Major	MAJ	Accident
Minor	MNR	Accident
Minute(s)	MIN	(Number)*
Oversized	OVRSZ	Load
Pavement	PVMT	Wet*
Prepare	PREP	To Stop
Quality	QLTY	Air*
Roadwork	RDWK	Ahead [Distance]
Route	RT, RTE	Best*
Township	TWNSHP	Limits
Turnpike	TRNPK	(Name)*
Cardinal Directions	NB, EB, SB, WB	(Number)
Upper, Lower	UPR, LWR	Level
Work	WRK	Road*

* = Prompt word given first

Caution should be used in employing these abbreviations with other prompt words, since their high level of understanding has been established only with the words given in the table. For example, drivers very easily interpret BLKD as BLOCKED when it appears with LANE in the form LANE BLKD. CHEM is interpreted by drivers as CHEMICAL when used in the message as CHEM SPILL.

UNACCEPTABLE ABBREVIATIONS

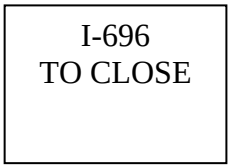
ABBREVIATION	INTENDED WORD	COMMON MISINTERPRETATIONS
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane (Merge)
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution (Index)	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong

EXAMPLES BY APPLICATION

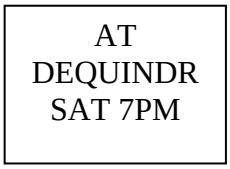
Advance Time Notification

Ramp Closure

Seq #1



Seq #2



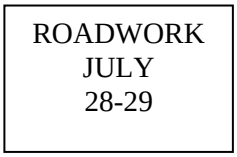
Lane Closure

Seq #1

Seq #2

Planned Maintenance Work

Seq #1



Seq #2

INFORMATION DURING EXISTING EVENT

Detours/Alternate Routes

Seq #1	Seq #2	Seq #1	Seq #2
TRAFFIC BACKUPS AHEAD	USE SERVICE DRIVES	INKSTER EXIT CLOSED	USE MIDDLBLT EXIT

Incident Management

Seq #1	Seq #2	Seq #1	Seq #2
CRASH AT LIVERNOIS	RIGHT 2 LANES BLOCKED	CAUTION FREEWAY CLOSED	USE COLUMBIA RD EXIT

Special Event Traffic Conditions

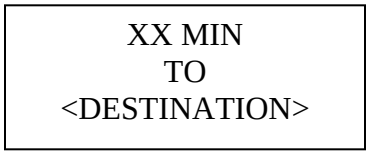
Seq #1	Seq #2	Seq#1	Seq#2
CROSS WALK AHEAD	CAUTION PEOPLE CROSSING	BIKE EVENT NOV 24	SHARE THE ROAD

Traffic Calming

Seq #1	Seq #2	Seq #1	Seq #2
ROADWORK AT M-5/M-10	10 MILE EXIT NOW OPEN	CONCRETE CURING	LANE RE-OPEN JULY 24

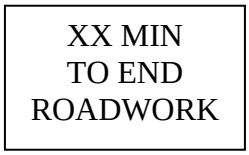
Real-Time Travel Times

Seq#1

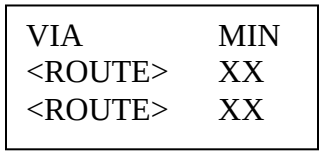


Destinations should be well known landmarks or interchanges

Seq#1



Seq#1 Seq#2



USE OF PCMS ON MDOT CONSTRUCTION PROJECTS

Whenever the following bid items are included in a Michigan Department of Transportation proposal, use of PCMS shall be defined in the Special Provision for Maintaining Traffic.

Sign, Portable, Changeable Message, NTCIP-Compliant, Furn
Sign, Portable, Changeable Message, NTCIP-Compliant, Oper
Sign, Portable, Changeable Message, NTCIP-Compliant, Full-Matrix, Furn
Sign, Portable, Changeable Message, NTCIP-Compliant, Full-Matrix, Oper

The use of PCMS will be per the proposed locations and messages as shown in the plans/proposals or as directed by the engineer.

The use of the Sign, Portable, Changeable Message, NTCIP-Compliant, Full-Matrix, Furn, and Oper must be approved on a project-by-project basis by the Region Engineer. Projects that may warrant the use of these pay items include locations where messages may require more than eight characters per line (with a 10 character maximum), on projects utilizing real-time travel time messages and unique messaging situations as determined appropriate.

PCMS PLACEMENT

PCMS should be visible from at least 1/2 mile under both daytime and nighttime conditions. Placement in advance of the work zone or incident should take into account the following factors:

- Where used for route diversion, PCMS should be placed far enough in advance to allow traffic ample opportunity to exit the affected roadway.
- PCMS are normally placed level on the shoulder of the roadway, perpendicular to traffic. If practical, placement further from the traveled lane is strongly suggested.
- Delineate PCMS with two plastic drums.

Revised January 2011