**17-2-1 PCMS Policies & Procedures**                                           **December 2022**

### GENERAL

This policy applies to state owned PCMS.  All Portable Changeable Message Signs (PCMS) procured by the Department are solar-powered with a matrix of light-emitting diodes (LED) used to display messages.  These signs are mounted on a portable trailer which contains an array of batteries and a mast capable of raising the sign and turning it to any desired position.  Currently, PCMS are assigned to and deployed by the Regions, typically through county highway departments, for various approved uses. The Traffic Management Center (TMC) can remotely access PCMS, schedule messages, and track general movements of the signs. The use of these signs **shall** conform to the following guidelines.  PCMS are official traffic control devices and NOT a public information tool.

### PCMS USAGE

For PCMS placed on the State Highway System, the PCMS **shall** either be:

1.  Owned and placed by WisDOT

2.  Owned and placed by contractors under contract with WisDOT

3.  Owned, rented, or borrowed and placed by county highway departments under contract or permit with WisDOT

County Sheriff's Departments and other local agencies **shall** work with the County Highway Departments to place the signs and display proper messages consistent with WisDOT policy.  This includes any PCMS purchased by a County Sheriff's Department and other local agencies through funds received from Bureau of Transportation Safety (BOTS).

### APPLICATIONS

Since they are dynamic signs, PCMS must only be used to display "real-time" information such as changing traffic conditions or traffic control information. They are used for traffic incidents and closures, current weather warnings, planned work zone closures and traffic control support, traffic queueing and delay messages, travel times, future weather warnings along with special events that will affect traffic.  They *may* also be used to post advisory speeds and alternate routes. An advanced notice is allowable (up to 7 days) prior to projects or events expected to cause congestion or that will require drivers to use alternate routes.

The WisDOT Regions are responsible for oversight of PCMS purchased by the Bureau of Traffic Operations (BTO).  The Region will determine the deployment location, PCMS operation, and maintenance responsibilities for the signs. Each Region will designate a PCMS coordinator who will engage counties, determine where signs are deployed and enforce the provisions of this policy.

PCMS *should not* be used to replace static warning or regulatory signs; they *may* be considered as a supplemental device to a required static sign. In the case of a ramp or lane closure, the PCMS would supplement the static warning signs informing motorists of the closure. It is at the discretion of the Region whether static or changeable message signs are more appropriate for specific applications. Refer to TEOpS 6-2-55 for use of PCMS in work zones.  Refer to TEOpS 2-10-3 for special event signing applications.

Nonstandard words such as "Danger," "Hazard" or "Caution" **shall not** be used. These words do not contribute any information and *may* overly concern drivers of the changed condition.

Regional PCMS coordinators should document the location of state owned PCMS that the Counties store and maintain, for rapid deployment in case of major incidents. If the Region needs the PCMS, the Counties will be required to move the PCMS to the appropriate State-owned facility.  The Counties **shall** provide an emergency phone number to the Regional PCMS coordinator in case of emergency.

PCMS **shall not** be used to display generic safety messages, public service announcements or any other messages that do not require a roadway user to take action. Examples of generic messages not to be used are "Buckle Up", "Welcome to Wisconsin" or "Drive Safely". Use of these types of generic messages will tend to lead to motorist disregard of critical messages and unnecessarily distract driver attention from the roadway.

WEATHER

Where unusual/hazardous conditions are caused by rain, snow, ice, fog or wind, and have been verified by camera at the TMC, pavement weather sensors, law enforcement or maintenance officials, PCMS *may* be used to warn drivers in advance.  This applies especially if the condition is significantly different on certain features of the highway, such as structures compared to the roadway.  PCMS **shall not** be used for this purpose if the conditions cannot be verified every 2 hours to keep the PCMS message current.  Sample messages are located at the end of this document.  Some Regions have reported sign malfunctions when temperatures drop below zero.

SPECIAL EVENTS

Local agencies *may* request to have special event messages displayed on the state highway system. Requests should be made to the Regional PCMS Coordinator. They *may* request to have the Region supply the PCMS or *may* request to station their own or contractor-provided equipment on our system. Any of these options are acceptable, provided the following provisions are met:

1. The event **shall** be open to the public and will generate enough traffic to cause congestion and/or guidance problems.

2. The message **shall** be made up of advisory traffic management content, not advertising for the event.

    a. No commercial advertising is allowed on the signs. The inclusion of a brand name within the name of an event, such as "Brand X Racing Event" is not acceptable unless it provides better understanding for attendees. For example, use "Horse Show" rather than "Midwest Horse Show" or use "Golf Event" rather than "PGA Tour Event".

    b. The sign message *may* include the word "Event" or "Parking".

    c. Event names on signs *should* be as clear and concise as possible.

3. Attendance criteria *should* be considered in order to justify use of PCMS. Due to population differences throughout the state, minimum special event attendance thresholds have been established as a guide. Agencies requesting the use of PCMS for a special event shall provide the anticipated attendance to the Regional PCMS coordinator.  Refer to Table 1 for minimum attendance recommendations.

**Table 1**. Special Event Attendance Criteria vs. Location

| Location of Special Event | Population of Influence Area | Minimum Attendance (per day) |
|---|---|---|
| Major Metropolitan Area | Over 500,000 | 30,000 |
| Urbanized Area I | 50,000 – 500,000 | 15,000 |
| Urbanized Area II | 20,000 – 50,000 | 10,000 |
| Rural Area | Under 20,000 | 5,000 |

    a. If attendance recommendations are not met, PCMS *may* be used to address special traffic movements to inform motorists. Use of PCMS in this case, is at the discretion of the Regional PCMS Coordinator or Traffic Engineer.  Factors for determining the use will include, but are not limited to, safety of the traveling public, unique geometry or roadway conditions, potential congestion, unfamiliar drivers, different vehicle types that require special directional information, or potential changes in traffic patterns. It is also important that the Regional PCMS Coordinator or Traffic Engineer look at the capacity of the roadway system in case major congestion and delays are anticipated and PCMS will provide motorist information.

4. The State-owned devices are available and not being used elsewhere for incident management purposes.

5. The local agency has given the Region ample notice, to approve the locations, messages and other details.

6. When the local agency is to supply the PCMS, the locations, messages, and other details are to be approved by the Region beforehand, and the PCMS **shall** be placed by the county highway department, approved traffic control contractor, or by WisDOT.

7. It is the Region's discretion to charge for time spent establishing locations and other conditions of use.

See TEOpS 2-10-3 for the guidelines on Special Event Signing.  Any Region *may* elect not to allow this type of activity, for reasons such as lack of personnel to make arrangements, to monitor usage, etc.

For special events with significant traffic impacts and/or duration that will introduce slowed or stopped traffic on interstates, queue warning systems should be investigated for potential deployment through the Bureau of Traffic Operations.

INCIDENT MANAGEMENT/ FLOODING CLOSURES / EMERGENCY EVENTS

PCMS *may* be used to advise travelers of alternate routes around construction or maintenance projects, incidents with closures over 2 hours, emergency events that are long-term closures, or to notify of traffic stoppages, delays, closures or other conditions that *may* require a roadway user to take action. General rules of the road messages *should not* be used (e.g., "Be prepared to stop"); drivers *should* always be prepared for adverse driving conditions. Refer to TEOpS 6-2-55 for more information on the use of PCMS in smart work zone systems.

EMERGENCY BURN RESTRICTIONS OR FIRE DANGER

Upon declaration of an emergency burn restriction or a gubernatorial executive order, PCMS *may* be placed on the highway right of way to warn drivers of extreme fire danger or fire/smoke conditions affecting the roadway. The use of PCMS and the message **shall** be approved by the Director of The Bureau of Traffic Operations and **shall** be remotely accessible to the TMC.  When operational issues occur due to low visibility caused by smoke/fire, a gubernatorial executive order is not needed to deploy messages warning drivers of possible traffic impacts. See pages 6 through 7 for acceptable messages.

In order to maintain efficacy, messages *should* be displayed for a limited duration (less than two weeks) and during peak traffic volume periods.

**PURCHASE**

With limited exceptions, the temporary use of PCMS and portable ITS devices on improvement projects *should* always be included as a bid item in all construction projects, when needed. This equipment *should* be contractor-provided and the equipment **shall** meet all TMC specifications.

On an exception-only basis, any purchase of capital equipment temporarily used on an improvement project, like PCMS, **shall** never be charged as a direct cost to that specific improvement project. "Temporarily used" means equipment whose useful life extends beyond the service period for a particular improvement project. Because this equipment will have a useful life extending beyond the service period of a particular project, it cannot be capitalized as part of the overall infrastructure cost of that initial project.

Instead, the device *should* be accounted for in the manner in which the Department accounts for acquisition of permanent personal property. For any assets to be used exclusively on highway improvement projects and purchased with highway improvement funds, these assets *should* be charged to a construction non-participating ID (e.g., 0657-xx-xx) using an object cost (e.g., 4321) for permanent property acquisition in excess of $5,000. Prior to this kind of acquisition, the purchasing Region or Bureau must also have budget authority on the contractual service line of its operating budget.  When the procurement exceeds $10,000, the DTSD

Administrator's Office must approve it and the purchasing Region or Bureau *should* work with the DTSD budget office to secure the operating budget approval.

Furthermore, the acquisition of PCMS and portable ITS devices under a non-participating improvement ID *should* be a rare occurrence and it **shall**:

(a) Be recognized as either a planned element of the Traffic Operations Infrastructure Plan (TOIP) or as a necessary extension of the TOIP;

(b) Meet all the statewide network needs identified and managed by the TMC; and,

(c) Be approved jointly by DTSD Bureau Director of Highway Maintenance and Bureau Director of Traffic Operations.

In the instance where a PCMS or a portable ITS device is already owned by WisDOT and is provided and deployed on an improvement project, the cost of operating this equipment *may* be charged to the improvement project.  However, the cost to maintain or repair this equipment, which extends its useful life, *should* be charged to a nonparticipating project ID. Refer to Program Management Manual 6-10-45, ITS and the TOIP Project Setup for more information regarding the funding of ITS incidental items.

Specification and standards are to be developed by the Department to conform with Federal ITS Architecture requirements.  All PCMS provided by contractors for various applications *should* also comply with this requirement, if warranted.

**MAINTENANCE**

A Memorandum of Understanding (MOU) **shall** be developed for any county highway department operating State-owned PCMS on the state facilities.  A sample MOU is included at the end of this policy. Counties who are provided signs are required to provide routine maintenance of the sign trailers including tires, structure and mechanical systems. Inspections of the sign and all components shall be performed every year.  The Department will provide technical maintenance for sign electronics, controllers and battery replacements.

**LONGITUDINAL PLACEMENT**

The longitudinal placement of PCMS, as recommended from the Federal Highway Administration is described below to assist in the driver's ability to read the PCMS and act in a reasonable time frame.

*The placement of a PCMS depends on how far upstream it needs to be placed and whether the upstream location has a sufficient sight distance for the PCMS to be viewed before motorist action is required.*

*The upstream location from the decision point depends on what type of action is required of the motorist. An example of a minor action is a lane change by the motorist. A major action would be the motorist having to make a detour from the current road.*

*For a minor action, the PCMS should be placed from 500 ft to 1,000 ft upstream of the decision point, regardless of speed.*

*For a major action, if the speed is less than or equal 40 miles per hour (mph), the PCMS should be placed at least 1,000 ft upstream of the decision point. If the speed is greater than or equal to 45 mph, then the PCMS should be placed at least 1 mi upstream of the decision point.*

*There should be a minimum spacing of at least 1,000 ft between PCMS units or a PCMS and an arrow panel. Multiple PCMS units should be placed on the same side of the roadway.*

If a PCMS is used to provide information on delays, current ramp closures or to inform of alternate routes, place the PCMS in advance of exits to alternate routes so drivers have adequate time to decide whether to exit without making erratic maneuvers.

It is possible to use multiple PCMS for adequate warning or if one PCMS cannot safely display enough information.

**LATERAL PLACEMENT**

Signs *should* be placed as far away from the live traffic lanes as possible without hampering visibility. In advance of interstate construction projects, the signs *should* be placed on the backslope beyond the ditch. The location selected *should* be at or slightly above the elevation of the roadway. This placement improves visibility, minimizes the chance of a vehicle hit. Where site conditions do not allow otherwise, the signs *may* be placed on the shoulder. The site *should* be reviewed to assure visibility, safety and maintenance considerations.  A taper of reflectorized drums **shall** be placed ahead of PCMS placed on the shoulder if it is not shielded by a barrier.

**CONTROL**

State-owned PCMS are capable of being programmed manually or controlled remotely by the TMC. Manual setup allows a designated user to program the sign using the on-board computer keyboard.  Remote control of PCMS is performed by operators located in the control room at the TMC.  State-owned PCMS that have a cellular connection and are in good working condition can be programmed and scheduled to display messages remotely.  Messages programmed remotely on PCMS should be verified in the field by personnel if camera verification is not available.

**PCMS COORDINATION WITH THE TRAFFIC MANAGEMENT CENTER (TMC)**

If cellular communication is available and the PCMS is in working condition, a message can be activated remotely.  In addition, the GPS coordinates are relayed to the ATMS and the PCMS location can be seen. Messages can be scheduled to display at a future date and scheduled to expire.  This is particularly helpful for special events with challenging schedules or locations. When coordinating the use of a PCMS for the TMC to activate messaging, please follow the guidelines listed below:

**GUIDELINES: PCMS DEPLOYED ON STATE FACILITIES**
Prior to field deployment, call the TMC to put up a test message to confirm PCMS communications are working properly and that the display is in working order.
When the PCMS is deployed, call the TMC with the following information:
    a.   PCMS number(s) that are going to be used.
    b.   Roadway name, direction and approximate location of the PCMS.

c. Provide a brief description to the operator about why a PCMS is needed (e.g., lane closure, full closure, special event, road work, flooding, utility/weather closure)
d. Provide contact information for the County Highway Department.
e. Provide start time and end time for the messaging.  The TMC can schedule the messages to display at a time in the future and be removed when the event is concluded. Contact TMC with any changes to the schedule or messaging needs (finished earlier or extended).
If the TMC is requested to activate a message on a PCMS and it is powered off in the field without the control room being notified, communications will indicate an error.  **It is requested that if you shut off a PCMS, a call be made to the TMC, so an operator can remove the message and incident/closure from their system and not have to trace a communication error.**

## TRAINING

Training for staff deploying, maintaining or operating signs is available through the TMC. Training may also be available directly from PCMS vendors under contracts or with special arrangements.

Regional PCMS coordinators are responsible for managing PCMS passwords.  Password requirements may be different per PCMS manufacturer and shall be changed from their standard presets, as provided by the manufacturer.

## ACCEPTABLE MESSAGES FOR SPECIAL EVENTS, WEATHER, and INCIDENTS

For driver comprehension, messages **shall** be limited to one or two frames (see MUTCD Section 6F.55). Blank or other filler frames between the two frames of text **shall not** be used.  It is desirable for the driver to be able to read the entire message sequence twice as they pass by the sign. For an interstate highway application, the total viewing time is about seven seconds. Each frame is usually displayed for 2.0 seconds or less.  Do not flash any part of a message.

It is recommended that the first frame describe the traffic condition or problem ahead, which the motorist *may* encounter, and the second frame advises the driver of an appropriate action. Message content should be approved by the WisDOT Regional PCMS coordinator or Traffic Operations Engineer. The message must make sense read in any order.

### PROBLEM/DISTANCE

| | | | | | |
|---|---|---|---|---|---|
| ALL LANES BLOCKED | DELAYS | FLASH FLOODING AHEAD | ICY BRIDGES AHEAD | NO OVERSIZE LOADS | |
| BRIDGE CLOSED | DENSE FOG | FRESH OIL | LEFT 2 LANES CLOSED | RIGHT 2 LANES CLOSED | SINGLE LANE |
| BRIDGE SLIPPERY | DISABLED VEHICLE | GRASS FIRE | LEFT SHOULDER CLOSED | RIGHT LANE NARROWS | SLIPPERY ROAD |
| CENTER LANE CLOSED | DUST STORM | HIGH WINDS | MAJOR DELAYS | RIGHT SHOULDER CLOSED | STALLED VEHICLES AHEAD |
| COLBY ROAD CLOSED | EMER VEHICLES ONLY | ICE | NEXT EXIT CLOSED | ROAD CLOSED | TOW TRUCK AHEAD |
| CRASH ROAD CLOSED | EVENT PARKING | ICE ON BRIDGES | ONE-WAY TRAFFIC AHEAD | ROAD CLOSED 6 MILES | VEHICLE FIRE |
| CRASH 4 MILES AHEAD | EXIT 45 CLOSED | INCIDENT AHEAD | RAMP CLOSED | ROAD FLOODED AHEAD | WATER ON ROAD |
| CRASH NEAR I-94 | FOG 3 MILES | LANE SHIFT | RAMP SLIPPERY | ROAD SLIPPERY | |
| DEBRIS AHEAD | FREEWAY CLOSED | LEFT LANE CLOSED | RIGHT LANE CLOSED | SHOULDER BLOCKED | |

### ACTION

| | | | | |
|---|---|---|---|---|
| ALL TRAFFIC EXIT RT | DO NOT PASS | ONE-WAY TRAFFIC | STOP AHEAD | USE DETOUR ROUTE |
| ALT ROUTE EXIT 25 | FOLLOW ALT ROUTE | PASS TO LEFT | STOP 5 MILES | USE LEFT LANE |

| | | | | |
|---|---|---|---|---|
| AVOID DELAYS USE US53 | FOLLOW DETOUR | PASS TO RIGHT | TUNE RADIO 1510 AM | USE NEXT EXIT |
| BEST ROUTE TO I-94 | FOLLOW SIGNS | STAY IN LANE | USE LEFT LANE | USE RIGHT LANE |
| DETOUR 2 MILES | MERGE RIGHT 2 MILES | STAY ON US 45 | USE COLBY ROAD | WATCH FOR FLAGGER |

| EVENT | PANEL 1 | PANEL 2 |
|---|---|---|
| Access | CRASH AHEAD | USE ACCS RD NEXT RIGHT |
| Blocked | RIGHT 2 LANES CLOSED | AHEAD X MILES |
| Center | I-39 NB TRAFFIC | USE CENTER LANE |
| Commercial | OVERSIZE TRUCKS | USE EXIT 120 |
| Congestion | MAJOR DELAY | NEXT 3 MILES |
| Emergency | EMER VEHICLES AHEAD | |
| Event Parking | EVENT PARKING AHEAD | USE NEXT RIGHT |
| Fire/Smoke Hazard | EXTREME FIRE HAZARD | NO OPEN BURNING |
| | EXTREME FIRE HAZARD | BURN BAN IN EFFECT |
| | SMOKE OVER ROAD | REDUCE SPEED |
| | FOREST (GRASS) FIRE AHEAD | TRAFFIC STOPPED |
| Freeway Closed | I-90 CLOSED | DETOUR EXIT 10 |
| Hazmat | HAZMAT SPILL EXIT 130 | USE EXIT 125 |
| Traffic Information | TUNE TO 1240 AM | FOR TRAFFIC INFO |
| Oversize Vehicles | OVER SIZED TRUCKS | USE NEXT EXIT |
| Prepare | CRASH 3 MILES AHEAD | |
| Slippery | SLIPPERY ROAD | REDUCE SPEED |
| Speed | REDUCED SPD ZONE AHEAD | |

**PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)**
**MEMORANDUM OF UNDERSTANDING**

This MEMORANDUM OF UNDERSTANDING; issued _____ is designed to establish certain principles and procedures that the County of _____, (COUNTY) and the Wisconsin Department of Transportation (DEPARTMENT) agree to follow for the application, storage and maintenance of the PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) owned by the DEPARTMENT. This MEMORANDUM OF UNDERSTANDING **shall** expire TWO (2) years after the issue date.

PROVISIONS

- The COUNTY will follow the procedures and guidelines in the STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION'S TRAFFIC ENGINEERING, OPERATIONS AND SAFETY MANUAL CHAPTERS 17-2-1 AND 6-2-55 (ATTACHED) AND THE WISCONSIN DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

- The COUNTY will be responsible for maintenance, storage, minor repair and troubleshooting of the PCMS. A DEPARTMENT supplied maintenance checklist *shall* be performed and submitted by the COUNTY annually. The PCMS will be stored inside a secure location when not in use on the highway. Storage *should* provide cover and protection from weather if at all possible. The DEPARTMENT will respond to functional problems that cannot be solved by the COUNTY during normal business hours.

- If the State-owned PCMS are not being used on State-owned facilities, the Counties *may* contact the Regional PCMS coordinator for permission to use the PCMS on County roads for maintenance or construction activities being done by County forces. It will be up to the discretion of the Region whether or not to allow the usage of the State-owned PCMS for these instances. Counties **shall** keep the Regional PCMS coordinator aware of the PCMS locations at all times. At any given time, the Region has the authority to remove the PCMS in the case of emergency or need elsewhere on State-owned facilities. The Counties are responsible for pick-up, delivery, maintenance and return of the PCMS.

- The COUNTY will be responsible to repair/replace PCMS that are damaged while being used for COUNTY purposes.

- The DEPARTMENT will be responsible to repair/replace PCMS that are damaged while being used for DEPARTMENT purposes.

- The DEPARTMENT **shall** have access to the PCMS at all times. Keys to locks for any secure locations or sign **shall** be provided to the authorized DEPARTMENT personnel.

- The COUNTY will be reimbursed for all expenses related to the use and maintenance of the PCMS for the DEPARTMENT purposes through the Routine Maintenance Agreement (RMA) or other DEPARTMENT agreements.

- The COUNTY **shall** inform the DEPARTMENT contact person when and where the PCMS are in use or scheduled to be used.

- The DEPARTMENT will retain the authority to change messages on the PCMS and move PCMS. The DEPARTMENT will notify the COUNTY prior to the message change or move if time permits.

- The DEPARTMENT **shall** have access to the PCMS by remote telecommunications whenever they are deployed.

- The DEPARTMENT **shall** provide training on use, maintenance, storage, hauling, setup and minor problem troubleshooting. The COUNTY **shall** send a minimum of TWO (2) representatives for training.

- The COUNTY will be responsible for emergency deployment. The DEPARTMENT will decide on emergency deployment if time permits.

- The COUNTY contact for coordination of the PCMS is _____

- The DEPARTMENT contact for coordination of the PCMS is _____

The parties agree to all provisions, which are made a part of this Memorandum of Understanding.

For the DEPARTMENT                                    For the COUNTY

By: _____          By: _____
    Systems Operations Manager                         County Highway Commissioner