PCMS MESSAGE: TRAFFIC BACKUPS PRESENT / WATCH FOR SLOW TRAFFIC

1. IF TRAFFIC QUEUES REACH 5.5 MILES, PLACE ADDITIONAL PCMS AT 7 MILES.
2. SEE SMART WORK ZONE SYSTEM (SWZS) SPECIAL PROVISION OR RFP FOR DETAILS.
3. LOCATE PCMSs PER STANDARD SPECIFICATION 1-10.3(3)C. PCMS MAY BE PLACED WITHIN TRANSVERSE TRAFFIC DRUMS OPTIONAL.
4. ADJUST SWZS COMPONENTS TO AVOID CONFLICTS WITH SEQUENTIAL ARROW SIGNS.
5. LOCATE TRAFFIC SAFETY DRUM (OPTIONAL) WITHIN CLOSURE, TRANSVERSE TRAFFIC DRUMS OPTIONAL. WHEN LOCATED BEHIND SIDE FIRE TRAFFIC SENSOR PRIOR TO ANY OPEN RAMPS.
6. MINITURE PCMS (~6' WIDE, 12+ INCH CHARACTERS) ALLOWED FOR PCMS1 & 2.
7. IF SYSTEM FAILS SEE "SMART WORK ZONE SYSTEM FAILURE PROTOCOL" PROVISION.
8. LOCATE SIDE FIRE TRAFFIC SENSOR PRIOR TO ANY OPEN RAMPS.
9. IF TRAFFIC QUEUES REACH 5 MILES PLACE ADDITIONAL PCMS AT 6 MILES.
10. SLOW OR STOPPED TRAFFIC CONDITIONS (NO COMMUNICATION POSSIBLE) USE ZIPPER MERGE HERE TAKE TURNS MINIMIZE DELAYS FOR ALL.

Legend:
- Traffic Safety Drum
- Side Fire Traffic Sensor
- Portable Travel Time Reader
- Sequential Arrow Sign
- Portable Changeable Message Sign
- Plan/Trim/Zoom Camera

6-MILE SMART WORK ZONE SYSTEM
FREEWAY (3 LANES): SINGLE RIGHT LANE CLOSURE
NOT TO SCALE
1. This plan is used in conjunction with applicable 3-lane freeway
   double-right-lane closure traffic control plan (with PCMs in
   advance of lane closure taper removed).

2. See Smart Work Zone System (SWZS) Special Provision or RFP for
details.

3. Modifications to PCMs messages shall be accepted by the engineer
   if their values are based on real-time travel delay times.

4. Adjust signs/components to avoid conflicts with sequential arrow
   signs or other traffic control devices in narrow shoulders and ramps.

5. Locate PCMs per standard specification. 1/10 mile PCMs may be placed
   on opposite shoulder but avoid ramp zones. When located behind
   barriers/guardrail or within closure transverse traffic drums optional.

6. PCMs (12+ inch characters) are required for PCMS1 & 2.
   Optional. Remove PCMs when dissipating queues are less than 5.5
   miles.

7. A list of travel time readers/alternative methods (such as using traffic
   sensor speed data) is acceptable if accurate within 5+/- minutes.

8. Locate side fire traffic sensor prior to any open ramps.

9. If system fails see 'Smart Work Zone System Failure Protocol.'

10. If traffic queues reach 5.5 miles place additional PCMs at 7 miles.
     Locate to remain 0.1+/- mile in advance of queuing truck-mounted
     PCMs with 10+ inch characters (if your transverse traffic safety
     drum is optional, remove PCMs when dissipating queues are less
     than 5.5 miles). PCMs message traffic backups present, watch for slow
     traffic.

11. Taper traffic too close to merge points.

12. Use all lanes.


14. Here:

Legend:
- Traffic Safety Drum
- Portable Travel Time Reader
- Sequential Arrow Sign
- Portable Changeable Message Sign
- Pan/Tilt/Zoom Camera

6-MILE SMART WORK ZONE SYSTEM

FREeway (3 LANES): SINGLE RIGHT LANE CLOSURE

Not To Scale
### 6-MILE SMART WORK ZONE SYSTEM

**Freeway (3 Lanes): Single Right Lane Closure**

**NOT TO SCALE**

<table>
<thead>
<tr>
<th>Location (miles)</th>
<th>PCMS 8</th>
<th>PCMS 7</th>
<th>PCMS 6</th>
<th>PCMS 5</th>
<th>PCMS 4</th>
<th>PCMS 3</th>
<th>PCMS 2</th>
<th>PCMS 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0 SEC</td>
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<tr>
<td>0.5 TO 1.4</td>
<td>FF FF FF FF FF</td>
<td>FF FF FF FF FF</td>
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<tr>
<td>1.41 TO 2.4</td>
<td>FF FF FF FF FF SL</td>
<td>FF FF FF FF FF SL</td>
<td>FF FF FF FF FF SL</td>
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<td>FF FF FF FF FF SL</td>
<td>FF FF FF FF FF SL</td>
<td>FF FF FF FF FF SL</td>
</tr>
</tbody>
</table>

**Legend**

- **PCMS**: Portable Changeable Message Sign
- **SL**: Side Fire Traffic Sensor
- **FF**: Traffic Safety Drum
- **TP**: Portable Travel Time Reader
- **SP**: Side Fire Traffic Sensor
- **SF**: Sequences Arrow Sign
- **SS**: Portable Changeable Message Sign
- **SS**: Portable Changeable Message Sign
- **TTR**: Traffic Time Reader

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### Notes:

1. This plan is used in conjunction with applicable lane-freeway single right lane closure traffic control plan (with PCMS in advance of lane closure taper removed).
2. See Smart Work Zone System (SWZS) Special Provision or RFP for details.
3. Modifications to PCMS messages shall be accepted by the engineer. PMs and changeable values used in this plan are based on real-time travel delay times.
4. This plan is used in conjunction with applicable 3-lane freeway single right lane closure traffic control plan (with PCMS in advance of lane closure taper removed).
5. Locate PCMSs per standard specification 1-10.3(3)C. PCMS may be placed before barrier/gasoline or within closure transverse traffic drums optional.
6. Locate PCMSs (4 to 6 per lane) allowed for PCMS 1 & 2.
7. In lieu of travel time readers, alternative methods (such as using traffic sensors) are acceptable when accurate within 5+/-minutes.
8. Locate side fire traffic sensor prior to any open ramps.
9. If traffic queues reach 5+/-miles, place additional PCMS at 7 miles.
10. If traffic queues reach 5+/-miles, place additional PCMS at 7 miles. Relocate to remain 0.5+/- mile in advance of queue. Truck-mounted PCMS with 10+/-inch characters acceptable. Transverse traffic safety drums optional. Remove PCMSs when dissipating queues are less than 5+/-miles. PCMS messages traffic backups present/traffic flow low traffic.

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### Traffic Conditions

- **Slowed Traffic**: Traffic is slowed or stopped due to traffic backups or traffic control measures.
- **Traffic Condition**: Traffic condition is either single lane closure, traffic merging, or traffic condition.
- **MINIMIZE DELAYS FOR ALL**: Measures are taken to minimize delays for all traffic.
- **TAKE TURNS**: Measures are taken to take turns for all traffic.
- **ZIPPER MERGE HERE**: Measures are taken to zipper merge here for all traffic.
- **TAKE ZIPPER MERGE DELAYS FOR ALL**: Measures are taken to take zipper merge delays for all traffic.

---

### Typical Traffic Control Plan

- **PCMS**: Portable Changeable Message Sign
- **SL**: Side Fire Traffic Sensor
- **FF**: Traffic Safety Drum
- **TP**: Portable Travel Time Reader
- **SF**: Sequences Arrow Sign
- **SS**: Portable Changeable Message Sign
- **TTR**: Traffic Time Reader

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### PCMS Message:

- **TRAFFIC BACKUPS PRESENT**
- **SLOW OR STOPPED TRAFFIC**
- **SLowed Traffic**: Traffic is slowed or stopped due to traffic backups or traffic control measures.

---

### Typical Traffic Control Plan

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PCMS MESSAGE: TRAFFIC BACKUPS PRESENT / WATCH FOR SLOW TRAFFIC

1. If traffic queues reach 5.5 miles, place additional PCMS at 7 miles.

7. In lieu of travel time readers, alternative methods (such as using traffic sensor output data) is acceptable when accurate within 5-10 minutes.

8. Locate side fire traffic sensor prior to any open ramps.

10. If traffic queues reach 5.5 miles place additional PCMs at 7 miles. Relocate to remain 0.5-1 mile in advance of queue. Truck-mounted PCMs are recommended for use in this application.

PCMS 8

LOCATION PCMS 8

TRAFFIC CONDITIONS

None

FF FF FF FF FF FF FF FF

< 0.5

FF FF FF FF FF FF FF SL

0.5 TO 1.4

FF FF FF FF FF FF FF SL

1.41 TO 2.4

FF FF FF FF FF FF FF SL

2.41 TO 3.4

FF FF FF FF FF FF FF SL

3.41 TO 4.4

FF FF FF FF FF FF FF SL

4.41 TO 5.4

FF FF FF FF FF FF FF SL

5.41 TO 6.4

FF FF FF FF FF FF FF SL

6.41+

SL SL SL SL SL SL SL SL

5.5 MILES

1+/- MILE

2.5 MILES

3.5 MILES

4.5 MILES

5 MILES

6 MILES

NOT TO SCALE

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

6-MILE SMART WORK ZONE SYSTEM

FREEWAY (3 LANES): SINGLE RIGHT LANE CLOSURE

NOT TO SCALE

PLAN REF NO. TC166

NOTES:

1. THIS PLAN IS USED IN CONJUNCTION WITH APPLICABLE 3-LANE FREEWAY DOUBLE RIGHT LANE CLOSURE TRAFFIC CONTROL PLAN (WITH PCMS IN ADVANCE OF LANE CLOSURE TAPER REMOVED).

2. SEE SMART WORK ZONE SYSTEM (SWZS) SPECIAL PROVISION OR RFP FOR DETAILS.

3. MODIFICATIONS TO PCMS MESSAGES SHALL BE ACCEPTED BY THE ENGINEER. VM ARE CHANGEABLE VALUES BASED ON REAL-TIME TRAVEL DELAY TIMES.

4. ADJUST SIZES OF SIZE COMPONENTS TO AVOID CONFLICTS WITH SEQUENTIAL ARROW SIGNS OR OTHER TRAFFIC CONTROL DEVICES NARROW SHOULDER AND RAMPS.

5. LOCATE PCMS PER STANDARD SPECIFICATION 5-10.3PCMS MAY BE PLACED ON OPPOSITE SHOULDER BUT AVOID SHARP BENDS WHEN LOCATED BEHIND BARRIERS/STATIONARY OR WITHIN CLOSURE TRANSVERSE TRAFFIC DRUMS OPTIONAL.

6. MINIATURE PCMS (~6' WIDE, 12-INCH CHARACTERS) ALLOWED FOR PCMS1 & 2.

7. IN LIEU OF TRAVEL TIME READERS ALTERNATIVE METHODS SUCH AS USING TRAFFIC SENSOR OUTPUT DATA IS ACCEPTABLE WHEN ACCURATE WITHIN 5 MINUTES.

8. LOCATE SIDE FIRE TRAFFIC SENSOR PRIOR TO ANY OPEN RAMPS.

9. IF SYSTEM FAILS SEE SMART WORK ZONE SYSTEM FAILURE PROTOCOL PROVIDED.

10. IF TRAFFIC QUEUES REACH 5.5 MILES PLACE ADDITIONAL PCMS AT 7 MILES. RELocate TO REMAIN 0.5-1 MILE IN ADVANCE OF QUEUE TRUCK-MOUNTED PCMS WITH 10- INCH CHARACTERS ACCORDING TO TRANSVERSE TRAFFIC SAFETY DRUMS OPTIONAL. REMOVE PCMS WHEN OBSERVING QUEUES ARE LESS THAN 5.5 MILES PCMS MEASURED TRAFFIC BACKUPS PRESENT / WATCH FOR SLOW TRAFFIC.
REGION TRAFFIC OFFICES WILL DETERMINE IF SMART WORK ZONE SYSTEMS ARE NEEDED FOR EACH
PROJECT USING WORK ZONE TRAFFIC ANALYSIS FOR MORE INFORMATION SEE TRAFFIC MANUAL
SECTION 5-17 A "Work Zone Queueing Mitigation" AND SECTION 5-9 "Work Zone Traffic Analysis"

A. FOR DESIGN-BID-BUILD PROJECTS, INCLUDE 3 OF THE "SMART WORK ZONE SYSTEM" GENERAL SPECIAL
PROVISIONS LISTED BELOW:
- 1-10.3(3).OPT1.FR1 Specifications
- 1-10.4(2).OPT5.GR1 Measurement (Traffic Control as Bid Items)
- 1-10.4(3).OPT2.GR1 Measurement (Traffic Control as Lump Sums)
- 1-10.5(2).OPT3.GR1 Payment

B. FOR DESIGN-BUILD PROJECTS: EMAIL STATE WORK ZONE ENGINEERS (HQWORKZONE@WSDOT.WA.GOV) FOR
RFP SPECIFICATIONS UNTIL THEY ARE INCLUDED IN THE STATE-WIDE RFP TEMPLATE (ESTIMATED 2023).

C. IF ACTUAL QUEUES REGULARLY EXCEED 6 MILES, THEN USE THE 9-MILE SMART WORK ZONE SYSTEM
(TC176). CONTACT STATE WORK ZONE ENGINEERS (HQWORKZONE@WSDOT.WA.GOV) FOR GUIDANCE.

D. TO MATCH THE GENERAL SPEICAL PROVISIONS, TRAFFIC SAFETY DRUMS SHOULD BE USED AS SHOWN IN
THE TRAFFIC CONTROL PLAN. HOWEVER, THE GPS AND TYPICAL TRAFFIC CONTROL PLAN CAN BE
MODIFIED TO REFLECT REGION'S STANDARD PRACTICE REGARDING CHANNELIZATION DEVICES.

E. EXCEPT FOR DESIGN-BUILD PROJECTS WHEN THE RFP REQUIRES THEM, PAN-TILT-ZOOM CAMERAS
(PTZ CAMERAS) ARE OPTIONAL AND MAY BE DELETED OR RELOCATED TO DIFFERENT PCMS AS DESIRED.
THE PTZ CAMERAS ARE INTENDED TO BE USED REMOTELY BY THE REGION TRAFFIC MANAGEMENT
CENTER TO MONITOR INCIDENTS AND QUEUING IN REAL TIME.

F. THE SIDE-FIRE RADAR IS USED TO OBTAIN VOLUME AND SPEED DATA PER GSP/RFP REQUIREMENTS. THE
TRAFFIC SENSORS ARE TYPICALLY DOPPLER RADAR AND USED TO CONTROL THE PCMS MESSAGE
DISPLAYS.

MODIFYING SMART WORK ZONE SYSTEM TRAFFIC CONTROL PLANS

THESE TRAFFIC CONTROL PLANS ARE TYPICAL AND MAY BE MODIFIED FOR SITE SPECIFIC SITUATIONS
AND/OR WSDOT REGION TRAFFIC PRACTICES. CONTACT STATE WORK ZONE ENGINEERS
(HQWORKZONE@WSDOT.WA.GOV) FOR ADDITIONAL GUIDANCE IF NEEDED.

THESE SMART WORK ZONE SYSTEMS ARE VERY ADAPTABLE TO A VARIETY OF SITUATIONS, INCLUDING
BEING USED ON MULTIPLE ROADWAYS CONCURRENTLY LEADING INTO A QUEUED WORK ZONE.

6-MILE SMART WORK ZONE SYSTEM
FREEWAY (3 LANES): SINGLE RIGHT LANE CLOSURE
NOT TO SCALE