1. This plan is used in conjunction with applicable 2-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. **[4]**

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

5. Locate PCMS for standard specification 1+/- 12” PCMS may be placed on opposite shoulder but avoid PCMS poles when located behind barriers/guardrail or within closure/transverse traffic drums optional.

6. Mixture PCMS (5 wide, 12” characters) allowed for PCMS1.

7. Instead of travel time readers, alternative methods (such as using traffic sensors, speed data) is acceptable when accurate within ±5+/-.1 minutes.


9. If System fails see "Smart Work Zone System Failure Protocol" provision.

10. If traffic queues reach 8 miles place additional PCMS at 0.5 miles remote to remain 0.5+/- mile in advance of queue. Truck-mounted PCMS with 1+/- characters acceptable. Transverse traffic delays may be optional. Remove PCMS when dissipating queues are less than 8 miles.

PCMS Message: Traffic backups present. Watch for slow traffic.

NOTE:
- Traffic conditions are changeable based on real-time travel delay times.
- Use left lane to merge 4.5 miles.
- Use left lane to merge 1.5+/- mile.
- Use left lane to merge 0.1+/- mile.

TRAFFIC CONDITIONS:
- Slowed
- Stop

TRAFFIC CONDITION:
- Slow or stopped traffic
- Traffic backups present
- Single lane closure

QUALITY LOCATION:
- Quality measured from here
- Traffic control devices, narrow shoulders, and ramps.

9-MILE SMART WORK ZONE SYSTEM:
- Freeway (2 lanes); Single right lane closure
- Not to scale

LEGEND:
- Traffic Safety Drum
- Traffic Sensor
- Side fire traffic sensor
- Portable travel time reader
- Portable changeable message sign
- Panel/tilt/zoom camera
**NOTES:**

1. This Plan is used in conjunction with applicable 2-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 **if** changeable values based on real-time travel delay times.

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

5. Locate PCMSs per standard specification 1-10.3(3)C. PCMS may be placed on opposite shoulder but avoid ramp shoulders when located behind barriers/guardrail or within closure, transverse traffic drums optional.

6. Minimum PCMs (5 wide, 12-inch characters) allowed for PCMS1.

7. In lieu of travel time readers, alternative methods (such as using traffic sensors/speed 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' provision.

10. If traffic queues reach 8 miles place additional PCMs at 0.5 miles. Reduce to remain 3+/- mile in advance of queue. Truck-mounted PCMs with 1+/- inch characters acceptable. Transverse traffic sensors/trails optional. Remove PCMs when dissipation queues are less than 8 miles. Pueblo message traffic backups present / watch for slow traffic.

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**9-MILE SMART WORK ZONE SYSTEM**

**FREEWAY (2 LANES): SINGLE RIGHT LANE CLOSURE**

**NOT TO SCALE**

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<table>
<thead>
<tr>
<th>QUEUE LOCATION (miles)</th>
<th>TRAFFIC SENSORS</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>
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</table>
| 1.5 +/- MILE           | FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
**DESIGNER NOTES:**

Region traffic offices will determine if Smart Work Zone systems are needed for each project using Work Zone Traffic Analysis. More information can be found in Traffic Manual Section 5-17A “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(OPT1)FR1 Specifications
- 1-10.4(OPT5)GR1 Measurement (Traffic Control as Bid Items)
- 1-10.4(OPT2)GR1 Measurement (Traffic Control as Lump Sum)
- 1-10.5(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 9 MILES, THIS SMART WORK ZONE SYSTEM SHOULD BE MODIFIED.** Contact State Work Zone Engineers (HQWORKZONE@WSDOT.WA.GOV) for guidance.

**D. TO MATCH THE GENERAL SPECIAL PROVISIONS, TRAFFIC SAFETY DRUMS SHOULD BE USED AS SHOWN IN THE TRAFFIC CONTROL PLAN. HOWEVER, THE GSP 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.