

# Oregon Work Zone Reviews

## Summary Report

# 2021



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# Introduction

As part of ODOT's statewide work zone safety and temporary traffic control program, jointly with the FHWA, the Work Zone Unit travels around the State conducting several, multi-day construction Work Zone Reviews. The 2021 Work Zone Reviews visited and reviewed 40 different highway construction work zones. Due to scheduling constraints and ongoing COVID-19 pandemic complications, FHWA was unable to accompany ODOT staff on this year's Work Zone Review.

The 2021 construction season provided a wide variety of work zones to review. Project locations ranged from the Oregon Coast to Eastern Oregon. Several projects were built in lower-speed urban environments, while others were built in close proximity to high-speed freeway traffic.

In conducting the Work Zone Reviews, a number of Reviewers are invited to participate. Review participants are asked to score the work zones on a wide array of performance measures. Scores and comments are used to focus and heighten awareness of the many standards, practices, procedures and devices used in the design and implementation of ODOT's Traffic Control Plans. This report provides important feedback for statewide TCP Designers, ODOT Engineering Consultants and Region Construction Project Management staff. ODOT benefits from the Work Zone Reviews by realizing measurable improvements in the quality and safety of the temporary traffic control plans used on its highway construction projects.

## Objective

The purpose of the Work Zone Reviews is to:

- Confirm ODOT Temporary Traffic Control Design Standards and Practices are being implemented in the field consistently and uniformly.
- Confirm that the latest Standards and Practices are effective at providing a satisfactory level of safety for the traveling public and construction workers.
- Reveal additional techniques or technologies needed to improve overall safety, traffic flow and construction efficiency.
- Strengthen communication and working relationships between ODOT design and construction staff, consultants, and contractor employees.
- Identify current standard practices that need to be updated based on observations and feedback.

## Methods

Since 2002, ODOT has been conducting detailed work zone reviews in an effort to strengthen the quality, efficiency and safety of its highway construction work zones. The Work Zone Reviews serve as a key element within the Agency's quality control and quality assurance programs. The Work Zone Reviews allow designers, safety staff, project coordinators and construction personnel the opportunity to observe strengths and weaknesses within this unique and dynamic discipline.

Each Reviewer was asked to evaluate the condition and effectiveness of a variety of devices used within the work zone. Over 30 different "measures" are scored for each project visited. Scores are based on a scale of 1 (low) to 10 (high). A score of 4 or less warrants immediate contact with the ODOT Project Manager's office or an on-site agency representative to discuss the issue and possible mitigation strategies.

This year's reviews were conducted over three separate trips:

- Regions 2 and 3
- Regions 1 (night tour)
- Regions 4 and 5

The Work Zone Review Evaluation Form (Figure 1 located on page 6) is used by Reviewers to record scores, notes and comments for each project visited. The amount of information and comments collected allows for a wide array of reports. Please contact the Work Zone Standards Unit in Salem for additional information regarding reporting options and availability.

Evaluation Forms were collected from 17 separate Reviewers for 41 different construction projects resulting in 149 pages of scores and comments.

This year:

- 12 different Reviewers participated, including representatives from:
  - Work Zone Standards Unit
  - Designers from ODOT Region Tech Centers
  - Region Traffic Manager
  - Region Safety Officer

Measures are scored as applicable for each project. If a device or condition was not present on a project at the time of the visit, a score was not given. For example, temporary concrete barrier may have been included in a particular contract, but if not in use on the project site at the time of the visit, "Temporary Concrete Barrier" (and likely, "Temporary Impact Attenuators") would not have been scored for that project.



Each of the following **Measures** are evaluated for each project visited:

**Temporary Signing** – Overall quality (design, condition), placement and spacing (visibility and legibility).

**Channelizing Devices** – Overall quality, condition, placement and effectiveness for tubular markers/ cones, drums, and barricades.

**Pavement Markings & Markers** – Overall quality (condition and visibility), placement and removal of temporary and permanent markings, where applicable.

**Rigid Barrier Systems** – Alignment, crashworthy installations, and quality of the barrier.

**Reflective Barrier Panels** – Condition (cleanliness and installation), effectiveness, and placement.

**Temporary Impact Attenuators** – Proper application and Quality (maintenance and placement).

**Portable Changeable Message Signs (PCMS)** – Effective placement, condition, and message quality.

**Sequential Arrow Panels** – Proper application, placement, and quality of the device.

**Temporary Traffic Signals** – Proper installation (design and layout), operation, and maintenance.

**Bike/Ped/ADA Facilities** – ADA compliance, adequate signing and devices; and, continuity through the project site (detours, diversions), pedestrian channelizing device.

**Flaggers** – Proper placement, effective devices and equipment; and, performance.

**Pilot Cars** – Appropriate application and performance.

**Mobility** – Effect of construction activities on traffic. Not exceeding specified delay limits.

**Worker Garments & Equipment** – Standard application of safety measures for workers and equipment on the jobsite.

**Site Housekeeping** – Work site cleanliness and orderliness.

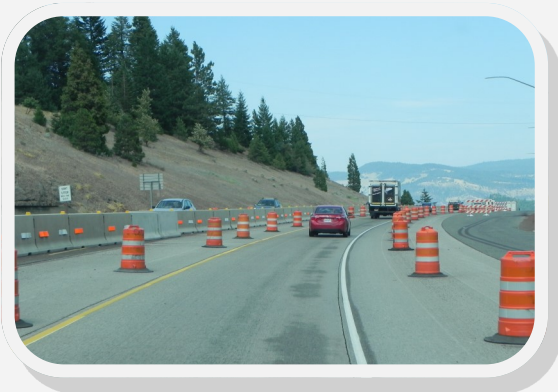


Figure 1—Work Zone Reviews Evaluation Form

PROJECT NAME:		MAP #:	KEY #:	DATE:					
HIGHWAY:		MILEPOST:	REGION:	REVIEWED BY:					
PROJECT MANAGER:		OTHER CONTACTS:							
CONTRACTOR:		TCS							
<b>GENERAL NOTES</b>									
Only score Devices you witnessed on the Project. If a certain device was not present, do not score it.									
<b>SCORING PROCESS: Only Score Devices/Categories witnessed on the project.</b>									
<b>NOTIFY PM (phone/email) or FIELD INSPECTOR !!</b>									
1	2	3	4	5	6	7	8	9	10
<b>CATEGORIES</b>		<b>SCORE</b>	<b>COMMENTS</b>						
<b>TEMPORARY SIGNING</b>	<b>QUALITY</b>								
<i>LOOK FOR:</i> Crashworthy design, supports, placement. Clean and visible. Legible, logical, efficient messages. Proper font size, sign color, design format.	<b>PLACEMENT</b>								
	<b>SPACING</b>								
<b>CHANNELIZING DEVICES</b>	<b>TUBES, CONES</b>								
<i>LOOK FOR:</i> Placement and alignment. Quality and cleanliness. Proper application. Reflectivity. Crashworthiness.	<b>DRUMS</b>								
	<b>BARRICADES</b>								
<b>PAVEMENT MARKINGS</b>	<b>CONDITION</b>								
<i>LOOK FOR:</i> Paint, Tape, Markers. Proper type, Placement, Alignment, Condition, Removal quality.	<b>PLACEMENT</b>								
<b>RIGID BARRIER SYSTEM</b>	<b>CONDITION</b>								
<i>LOOK FOR:</i> Quality, Alignment, Pinned together. Secured to pavement, where necessary.	<b>PLACEMENT</b>								
<b>REFLECTIVE BARRIER PANELS: Y or N</b>	<b>CONDITION</b>								
<b>IMPACT ATTENUATORS</b>	<b>CONDITION</b>								
<i>LOOK FOR:</i> Sand barrels, Narrow-site, TMA. Proper Installation. Maintenance. Correct Design Speed.	<b>PLACEMENT</b>								
<b>PORTABLE CHANGEABLE MESSAGE SIGNS</b> <i>LOOK FOR:</i> Clear, Legible, meaningful Messages. Visible @ Location. Good working order. (Use Back for more)	<b>MESSAGE</b>		PCMS 1: <b>PANEL 1</b>		<b>PANEL 2</b>		PCMS 2: <b>PANEL 1</b>		<b>PANEL 2</b>
	<b>LOCATION</b>								
	<b>CONDITION</b>								
<b>SEQUENTIAL ARROW PANEL ("Arrow Board")</b>	<b>PLACEMENT</b>								
	<b>CONDITION</b>								
<b>TEMP. TRAFFIC SIGNAL (Span wire) ; or PORTABLE TRAFFIC SIGNAL</b>	<b>SET-UP</b>								
	<b>CONDITION</b>								
<b>BICYCLE, PEDESTRIAN, ADA COMPLIANCE</b> <i>LOOK FOR:</i> Signing, PCD or other Channelizers, Smooth surfaces, Adequate widths, Temp. Curb Ramps. Bicycle accommodation where facility impacted.	<b>SIGNING</b>								
	<b>PCD, RAMPS</b>								
	<b>ACCESSIBILITY</b>								
<b>FLAGGERS</b> <i>LOOK FOR:</i> Clean, reflective ANSI Class II garments. Proper hats, radio, Stop/Slow paddle. Hand signals,	<b>VISIBILITY</b>								
	<b>PERFORMANCE</b>								
<b>PILOT CARS</b> <i>LOOK FOR:</i> Driving 35 mph or less. Warning lights. Clean, visible "PILOT CAR FOLLOW ME" sign.	<b>EQUIPMENT</b>								
	<b>PERFORMANCE</b>								
<b>MOBILITY</b> <b>Time Stopped At Flagger or Temp. Signal:</b> Temp. Speed Reduction? FROM: _____ TO: _____	<b>TRAFFIC FLOW</b>								
	<b>Minutes</b>								
	<b>MPH</b>								
<b>WORKER GARMENTS &amp; SAFETY EQUIPMENT</b> <i>LOOK FOR:</i> Clean, Class II vests (If in ROW). Hardhats. Fall protection, Trench shoring (over 5-ft)	<b>GARMENTS</b>								
	<b>EQUIPMENT</b>								
<b>GENERAL SITE HOUSEKEEPING</b>	<b>CLEAN, ORDERLY</b>								
<b>POLICE ENFORCEMENT</b> Is Law Enforcement on site or in WZ? Are there OT Hours?	<b>On-Site? Y or N</b>								
	<b>OT? Y or N</b>								
<b>DRIVER-FRIENDLY WORK ZONE</b> Clearly delineated path through WZ? "Surprises,"? Conditions straining Driver Expectancy?	<b>Meet Driver Expectancy?</b>								
	<b>Ease of Navigation</b>								
<b>FINAL SCORE =</b>			÷		=	<b>AVG. SCORE of</b>			

# Results

Results from the scores of the different Reviewers for the 41 projects are used to develop the project and measure scores. Project scores are combined and averaged based on the number of participants submitting an Evaluation Form. Overall average project scores are calculated for each Region and are compared to scores collected since 2010 (Figures 3 through 6).

## Measure Scoring Summary

Figure 2 shows the statewide average score for each Work Zone Measure. Figure 2 can be used to identify measures (devices, practices) needing additional attention at the design and/or implementation phase of the project. It also identifies measures that are meeting or exceeding road users' expectations.

All of Work Zone Measures received a statewide averaged score of at least 5.0. A score of 5.0 pertains to the median score rating and the threshold which warrants immediate contact with the ODOT Project Manager's office or an on-site agency representative to discuss the issue and possible mitigation strategies. Of the 31 Measures, the average score for the data set was determined to be 6.4, leaving 11 measures being rated below average and 20 measures being rated at or above average.

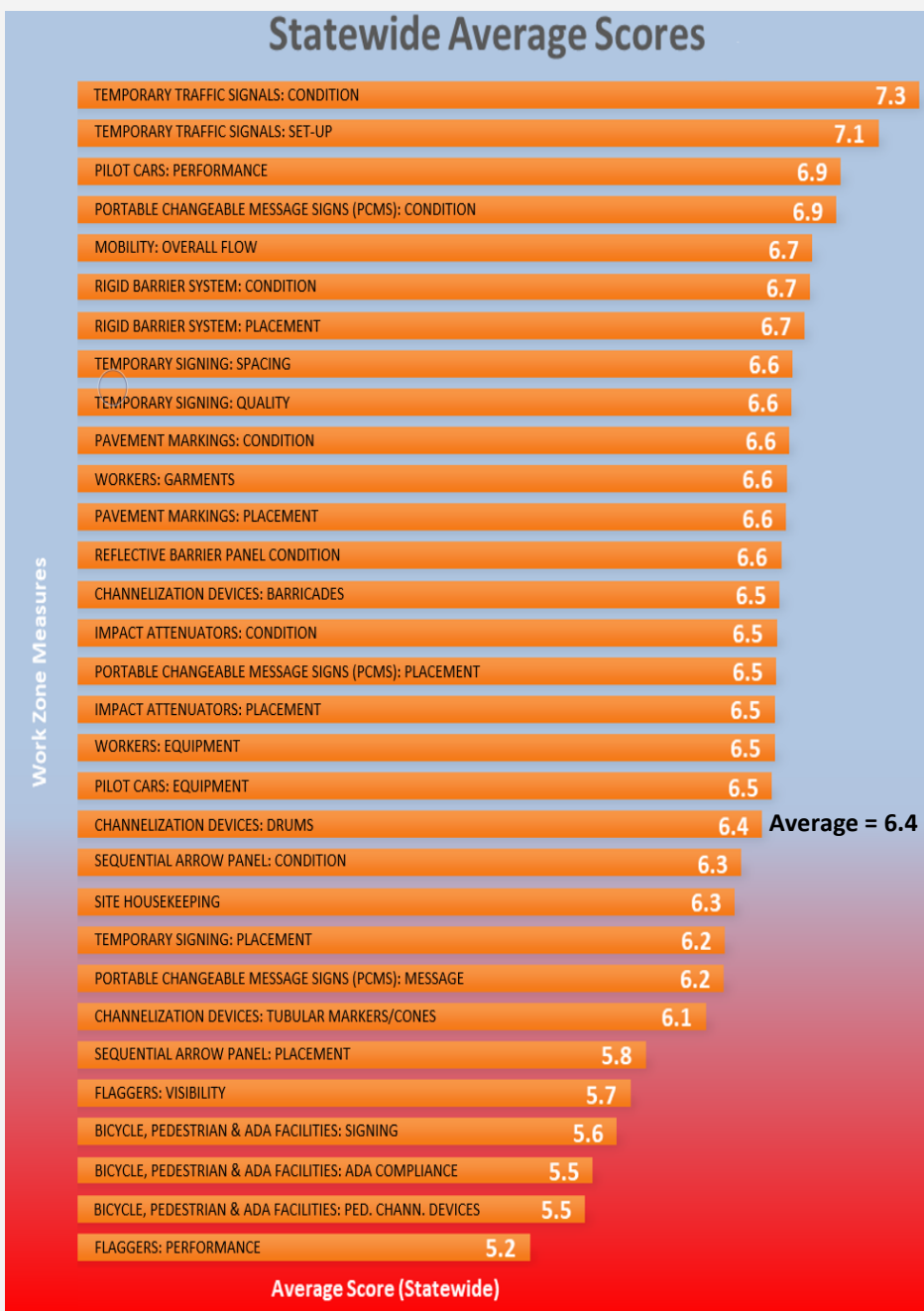


Figure 2—Statewide Averaged Measure Scores

## Statewide Comparison Summary

The 2021 Work Zone Review Tour reviewed 41 projects. The Measures scored during the Work Zone Reviews are averaged and ranked by project, then converted to scores based on 100 for annual comparison purposes (see Figure 3). The statewide average project score decreased compared to previous years to an average score of 63. The low score also decreased compared to previous years. On the other hand, the statewide high score remained stable when compared to previous years. Although a statewide average project score decrease was measured during the 2021 Work Zone Review tour, a single years data is not enough to suggest that TCP Standards and Practices are losing their effectiveness. There are a plethora of reasons why a decrease may be measured over a singular year. For instance, the ongoing complications in regards to the COVID-19 response over the last 18-months and how it has affected the ability to onboard and train new employees. The above average rating confirms that the TCP Standards and Practices are mostly effective and being implemented a majority of the time, but should be monitored in future years to ensure a continuous decrease is not measured.

WORK ZONE SAFETY AUDIT SUMMARY REPORT - SCORING STATISTICS												
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
# PROJECTS REVIEWED	42	43	29	29	-	39	-	30	-	31	-	41
HIGH SCORE	74	75	80	76	-	80	-	76	-	82	-	82
AVERAGE SCORE	67	69	71	67	-	69	-	66	-	72	-	63
LOW SCORE	53	57	57	50	-	30	-	49	-	67	-	45

Figure 3—Annual Scores (raw scores “out of 10” are converted to scores based on 100 for annual comparison purposes)

NUMBER OF PROJECTS SCORED IN REGION	
Region 1	4
Region 2	9
Region 3	11
Region 4	5
Region 5	12

Figure 4 - 2021 Number of Projects

Project Average Score	# of Projects	% of Projects
≥ 8.0	1	2%
7.5 - 8.0	1	2%
7.0 - 7.5	5	12%
7.0 - 6.5	10	24%
6.5 - 6.0	11	27%
6.0 - 5.5	8	20%
< 5.5	5	12%

Figure 5 – 2021 Project Average Score Statistics

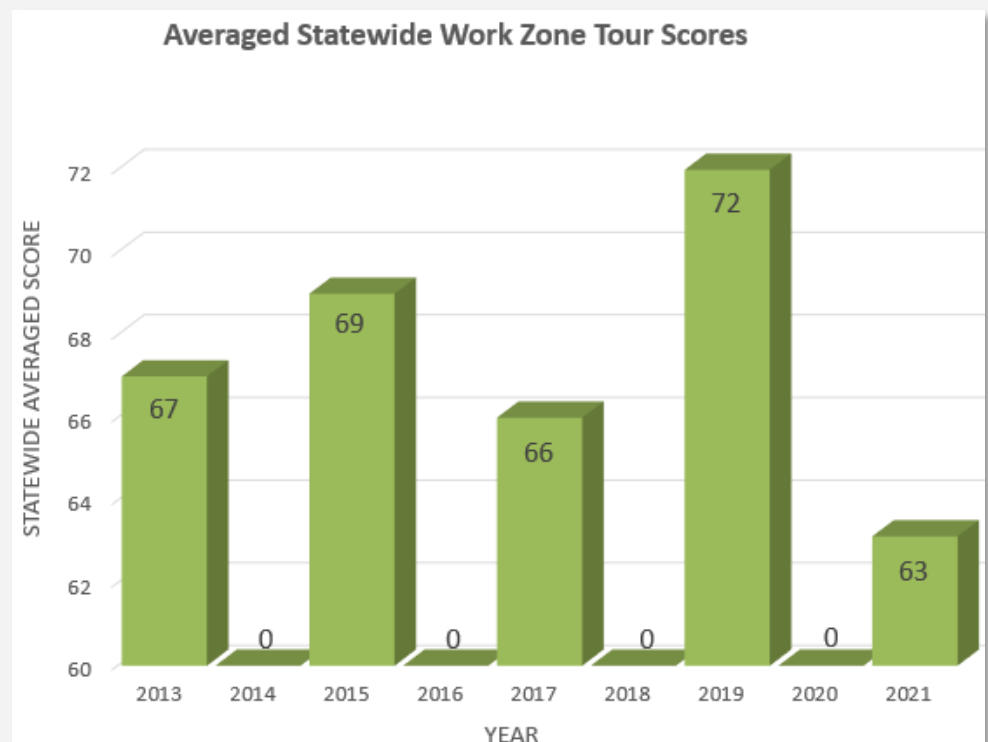


Figure 6—Annual Scores graph



## Work Zone Traffic Control Contract Review

### Traffic Control Supervisor (TCS)

For the eighth year, measure scores were examined to determine if the average score of a given performance measure was affected by the inclusion of a TCS in the contract. As seen in Figure 7, 2021 results slightly favored the inclusion of a TCS in a contract. Over the past three reports (2015 - 2019), the projects with no TCS in the contract have scored higher. As project continue to get more complex, especially ADA specific projects that will require frequent maintenance of devices, it is anticipated that the inclusion of a TCS will be favorable. Results do not take into account that TCS are generally reserved for complex projects or projects with frequent changes in traffic control.

MEASURE	TCS	NO TCS
TEMPORARY SIGNING	6.62	6.37
CHANNELIZATION DEVICES	6.44	6.34
PAVEMENT MARKINGS	6.52	6.71
CONCRETE BARRIER	6.72	6.67
IMPACT ATTENUATORS	6.71	6.20
PCMS	6.49	6.61
SEQUENTIAL ARROW PANEL	6.31	5.78
TEMP. TRAFFIC SIGNALS	6.75	7.53
BICYCLE/PED/ADA	5.79	5.33
FLAGGERS	6.71	4.69
PILOT CARS	7.13	--
MOBILITY	6.59	6.87
WORKER GARMENTS	6.86	6.35
SITE HOUSEKEEPING	6.47	6.16

Figure 7 -TCS Statistics Comparison

### Project-Specific Plan Sheets vs. Standard Drawings

It should be noted that some projects would not warrant the development of project-specific TCP sheets, nor would those projects that clearly demand TCP sheets benefit from relying solely on Standard Drawings. Some TCP measures are almost always shown on a plan sheet due to the nature and function of the device (e.g. concrete barrier, temp. traffic signals). Further, this comparison is being made to examine the relationship between the level of detail in the TCP and its effectiveness during implementation. Resulting data may determine if individual measure effectiveness could be improved with more detail or clarity provided by project-specific plan sheets.

As is evident in Figure 8, there are some measures where the relationship between the measure itself and the presence or lack of plan sheets, seems ambiguous – e.g. Worker Garments, Mobility, Site Housekeeping. However, for the remaining measures, 2021 data suggests an appreciable increase in measure scores can be attributed to the presence of project-specific plan sheets in the TCP. The most notable scores were for Flaggers and Bicycle/Ped/ADA. Albeit, scores for some devices are seen to do better on projects without plans, which may be attributable to complexity of the project. The more complex a project is, the more likely it is to have plan sheets. The Work Zone Unit will continue to engage with Region managers to encourage field visitations for Designers working on projects. For most of the devices the scores increased dramatically with the inclusion of plan sheets.

MEASURE	PLANS	NO PLANS
TEMPORARY SIGNING	6.69	6.09
CHANNELIZATION DEVICES	6.54	6.07
PAVEMENT MARKINGS	6.61	6.13
CONCRETE BARRIER	6.68	6.88
IMPACT ATTENUATORS	6.50	6.83
PCMS	6.54	6.55
SEQUENTIAL ARROW PANEL	5.76	6.92
TEMP. TRAFFIC SIGNALS	7.26	6.83
BICYCLE/PED/ADA	5.89	4.93
FLAGGERS	6.59	4.38
PILOT CARS	7.13	--
MOBILITY	6.72	6.78
WORKER GARMENTS	6.79	6.06
SITE HOUSEKEEPING	6.47	5.96

Figure 8 - Plans Comparison

# RECOMMENDATIONS

The annual Work Zone Reviews revealed a number of consistencies, improvements and positive comments. However, substandard quality control issues were observed – some new, some recurring. Comments and Measure scores from this year, and comparative 2019 measure rankings, were used to identify TCP strengths and deficiencies for 2021. Measures from all projects are averaged and ranked in order from least to greatest before being compared with the prior year scores. Measures within a +/-2 buffer from the previous years score are shown in yellow. Scores that increased are shown green and scores that decreased are shown red.

**TCP Strengths** for 2021 included Temporary Traffic Signals, Mobility, Rigid Barrier Systems and Pavement Markings. Of the strengths, Temporary Traffic Signals and Pavement Markings were revealed as having the most increase in quality and effectiveness as compared to 2019.

**TCP Deficiencies** for 2021 included Flaggers, Bicycled/Ped/ADA, and Sequential Arrow Panels. Of the deficiencies, Site Housekeeping and Bicycle/Ped/ADA were revealed as having the highest overall decrease in quality and effectiveness as compared to 2019. Aside from these deficiencies during the reviews, only one isolated project required immediate contact with the ODOT Project Manager’s office or an on-site agency representative to discuss seen issues and possible mitigation strategies. Project Management staff were prompt and cooperative in responding to needed changes.

MEASURE	Statewide Ranking		+/-
	2019*	2021	
TEMP. TRAFFIC SIGNALS	12	1	+
MOBILITY	1	2	
PILOT CARS	-	3	
RIGID BARRIER SYSTEM	2	4	
PAVEMENT MARKINGS	10	5	+
APPAREL	3	6	-
PCMS	6	7	
IMPACT ATTENUATORS	7	8	
TEMPORARY SIGNING	4	9	-
CHANNELIZATION DEVICES	8	10	
SITE HOUSEKEEPING	5	11	-
SEQUENTIAL ARROW PANEL	11	12	
BICYCLE/PED/ADA	9	13	-
FLAGGERS	13	14	

\*No data for 2020

Figure 9—Measure Ranking Comparison

Several extraordinary examples of temporary traffic control measures were encountered during the safety reviews, as shown below:

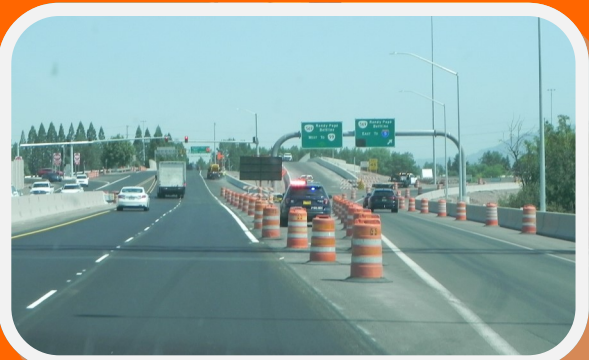


(Above) Portable Rumble Strip use with flagger operation.



Statewide: Efforts to accommodate pedestrians in work zones.

(Below) work zone Police enforcement being utilized along the OR569 Beltline in Eugene.



## 2019 Work Zone Reviews — Action Items

### Flaggers

A 2019 Work Zone review Action Item was to address the decline in Flaggers performance. The TCP Unit Action Item was to review training materials and ensure it was up-to-date and satisfactory in its coverage. Additionally, the TCP Unit was going to continue to educate ODOT staff of the standards for flagging operations and what they should be doing to make sure flaggers are operating safely. As a final effort, education and use of Automated Flagger Assistance Devices (AFADS) has been strongly encouraged to aid in lessening the reliance and dangers associated with Flagging.

Since the 2019 Work Zone Tour, the TCP Standards unit has put out a technical advisory bullet (TR20-1(a)) for using AFADs as the preferred option when flagging. This was part of a larger industry effort to help reduce the inherent risks flaggers encounter when being in close proximity to traffic. A standard detail was developed for AFAD use and included additional enhancements such as channelizing devices on center line and “DO NOT PASS” signs for improved compliance and yielding to AFADs. Additionally, a maintenance specific AFAD detail was created and new AFAD product have been reviewed and added to the ODOT QPL approved products list.

### Sequential Arrow Panels

A 2019 Work Zone review Action Item was to review our technical guidance to ensure adequate coverage and to educate designers and construction staff on the ideal placement and alignment of the arrow panels. Additionally, educate inspectors on when it is acceptable to require a panel to have maintenance before it can be used on a project.

To work towards completing this action item, the TCP Unit commenced outreach to TCP designers in order to discuss tangent vs curve placement of sequential arrow boards and with construction staff in regards to inspecting and when to require maintenance of the sequential arrow boards. In addition, ODOT Research has approved a study *Piloting Smart Work Zone Technologies to Improve Oregon Highway Safety and Mobility* that looks to use Smart Sequential Arrow Panels that will populate Oregon’s TripCheck webpage with lane closure data in real-time. The study is anticipated to be completed in April 2024 .

## Work Zone Traffic Control Safety Review “Strengths”

### 1. Temporary Traffic Signals

Temporary Traffic Signals are used to control traffic through a work zone or at an intersection in a work zone. The signals can be portable, a temporary setup of a permanent signal components, some are hard-wired and some are wireless. The choice of a certain type of signal and how it is used depends greatly on the existing roadway configuration, duration of need, traffic volumes, and location. The signals encountered this year were a mix of both portable and temporary. The temporary traffic signals encountered this year functioned well and were generally setup properly. The use of a temporary signal requires a significant review and approval process, so a good design is expected. In addition to routing traffic through the work zone, a handful of the temporary signals encountered this year also accommodated for pedestrian and bicycle traffic through button activated specific phasing and timing.



### 2. Mobility

ODOT continues to place strong emphasis on Mobility through its work zones. Mobility is actively managed by setting and modifying lane closure restrictions. The coordination of travel delay within the Region also plays an important piece of the mobility puzzle.

ODOT's emphasis on mobility was evident in the majority of projects visited during the Safety Review. Most freeway projects had minimal delays, even when they included temporary speed reductions. The majority of work zones controlled by flaggers had minimal delays as well.

Mobility was a strength in the 2017 and 2019 Work Zone Report as well. Mobility continues to be one of ODOT's strengths through the construction process. The balance of mobility, safety, and productivity will continue throughout projects in the future.



# Work Zone Traffic Control Safety Review “Deficiencies”

## 1. *Flaggers*

Flaggers are used on a wide variety of projects to control the flow of traffic in and around the work zone. Flaggers were used for the following activities on this years tour: mainline full depth reconstruction and paving, culvert replacement, bridge rehabilitation, and ADA curb ramp projects.

This is the second year that flaggers have placed in the bottom end of the score ratings. There seems to be a lack of quality control on flaggers in the field. Some of the deficiencies of the flaggers were the flagger being distracted (i.e., dancing, not facing approaching traffic, etc.), no escape route for the flagger, flagger not clearly visible, and improper or lack of proper flagger equipment.

There were multiple occurrences of each of these deficiencies around the state. There operations were all being run successfully, but there is room for improvement in the quality of the operation. When any of these deficiencies are present, the safety of the flagger and operation of the project are decreased. It is important that the flagger is visible, paying attention, and has an escape route available.

### TCP Action

To address this action item the TCP unit will review the training that is being provided to flaggers and make sure it is up to date and covers all of the above deficiencies. The TCP Unit will also meet with the ODOT Project Managers and Inspectors to review what the standards are for a flagging operation and what inspectors should be doing to ensure the flaggers are operating safely. Additionally, ODOT is highly encouraging the use of Automated Flagger Assistance Devices (AFAD’s) where applicable to aid in increasing flagger safety in work zones.



## 2. *Bicycle, Pedestrian & ADA Facilities*

ODOT has recently emphasized accommodating all modes of traffic in work zones, including Bike/Pedestrian/ADA traffic. Despite this emphasis the Bicycle/Pedestrian/ADA measures scored relatively poorly compared to the other measures. The effort to design and construct project to Bike/ Pedestrian/ADA standards has been implemented in most projects but the effort hasn’t been comprehensive. The TCP unit expects to see a significant increase in scores as the implementation of accommodation all modes of traffic becomes more prevalent. The MUTCD and ODOT TCP Design Manual include standards requiring projects to include pedestrian accommodation at the same (or better) level as the existing facilities, or provide appropriate alternative routes. There was some projects that did an outstanding job of accommodation Bike/Pedestrian/ADA traffic, but there was also a lot of room for improvement. Observations this year included, unclear pedestrian detours/ guidance and lack of a comprehensive strategy to accommodate bike/ pedestrian/ADA.

### TCP Action

The TCP Unit has implemented many new measures for accommodation of all modes of traffic in work zones. The TCP Unit needs to continue to educate ODOT staff on the proper use of the new measures. The TCP Unit also needs to try and make it easier for designers/construction staff to use and implement the new standards. ODOT design and construction staff need to implement the new standards and provide feedback to the TCP Unit to provide guidance on how to better the measures.



## CONCLUSION

The 2021 Work Zone Reviews were again a success in identifying strengths and weaknesses within ODOT's TCP standards and practices and the implementation of those practices in our contracts. The Reviews gave us the opportunity to review 41 different State highway construction work zones. The action items of the 2019 reviews were accomplished, and ODOT continues to improve the practice of temporary traffic control across the State of Oregon.

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The Reviews helped us meet some important goals:

- Confirmed ODOT Temporary Traffic Control Design Standards and Practices are largely being implemented in the field with consistency and uniformity.
- Confirmed the latest Standards and Practices are effective at providing a satisfactory level of safety for the traveling public and construction workers.
- Revealed additional techniques and technologies needed to improve overall safety, traffic flow, and construction efficiency.
- Strengthened communication and working relationships between ODOT design and construction staff, consultants, and contractors.
- Identified current standard practices that need modifications based on observations and feedback.

An important additional benefit from the Work Zone Reviews is seeing recurring "Deficiencies." We can prioritize and more closely analyze these features for solutions to improve the overall design and implementation of our work zone traffic control plans. 'Lessons learned' can be shared between all TCP designers and construction personnel in efforts to reduce repeat "weaknesses."

The Traffic Control Plan Unit would like to thank each of the Reviewers, Inspectors and Contractors who helped with the monumental task of improving safety in Oregon work zones. Thank You.





## Oregon Department of Transportation Traffic Control Plans Unit

Traffic Standards & Asset Management Unit, MS #5  
4040 Fairview Industrial Drive SE  
Salem, Oregon 97302-1142

**Justin King, PE**  
State Traffic Work Zone Engineer  
503.986.3584  
[Justin.s.king@odot.state.or.us](mailto:Justin.s.king@odot.state.or.us)

**Brendan Baggett, EIT**  
Traffic work Zone Analyst  
503.986.4448  
[Brendan.baggett@odot.state.or.us](mailto:Brendan.baggett@odot.state.or.us)

**Fahad Alhajri, PE**  
Traffic Work Zone Standards Engineer  
503.986.3788  
[Fahad.alhajri@odot.state.or.us](mailto:Fahad.alhajri@odot.state.or.us)

**Kevin Haas, PE**  
Traffic Standards Manager/Engineer  
503.986.3583  
[Kevin.J.Haas@odot.state.or.us](mailto:Kevin.J.Haas@odot.state.or.us)



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## Federal Highway Administration

FHWA Oregon Division  
530 Center Street NE, Suite 420  
Salem, Oregon 97301  
<http://www.fhwa.dot.gov/ordiv/index.htm>

**Nick Fortey, PE**  
FHWA( Oregon) Programs Manager  
503.316.2565. [Nick.Fortey@dot.gov](mailto:Nick.Fortey@dot.gov)