Be Aware, Be Smart – Safety Starts With You!

CALTRANS / INDUSTRY SAFETY SUMMIT 2021

Summary Report

March 16th & 17th, 2021

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EXECUTIVE SUMMARY

The Caltrans / Industry Safety Summit (Safety Summit) is an annual forum where participants from Caltrans and industry partners come together to network, share information and brainstorm possible safety improvement initiatives. Significant progress has been made on many safety improvement initiatives generated during the 2018 and 2020 Caltrans / Industry Safety Summits. The 2021 Safety Summit primarily focused on discussing Lessons Learned and Best Practices as they relate to five hypothetical case studies, based in part upon general fact patterns and facts from multiple actual incidents, to fortify the Department's overarching goal of eliminating on-the-job fatalities.

Participants included representatives from Caltrans and external partner agencies, including United Contractors (UCONN), Associated General Contractors of California (AGC California), Southern California Contractors Association (SCCA), California Highway Patrol (CHP), Federal Highway Administration (FHWA), Cal/OSHA, and Labor Unions.

In partnership with Caltrans and industry partners, Value Management Strategies, Inc. (VMS) virtually facilitated the 2021 Caltrans / Industry Safety Summit over the course of two, half days on March 16th & 17th, 2021. The primary purpose of this *Summary Report* is to show the progression of activities that took place before, during, and after the Summit, leading to the final list of prioritized safety recommendations present in the *Summit Outcomes* section of this report.

Next steps include submission of this *Summary Report* to the Caltrans Construction Partnering Steering Committee for review and evaluation of outcomes. Members of the CCPSC include construction industry leaders; contractor associations; the Partnering Program team; Caltrans Construction and Design Division Chiefs; District Construction Deputies, and FHWA. Teams will be formed as necessary to work on the prioritized safety ideas and the performance will be tracked.

PROCESS & METHODOLOGY

Participants used a virtual meeting platform and a virtual, collaborative whiteboard space, to share and brainstorm information. Five (5) hypothetical case study scenarios were developed based on general fact patterns that may have also borrowed from multiple real incidents. Information from any real incidents may have been changed to enable the participants to have an open discussion and thoughtful exchange of ideas. These five (5) hypothetical case studies then became small group discussion topics for the Safety Summit.

For each case study presentation, participants were asked to brainstorm ideas that should be considered to reduce the likelihood of similar incidents occurring in the future. Each small group was also asked to reach a consensus on their top recommendation to put forth for prioritization. Prioritization of top recommendations was completed via voting, where each participant was given five (5) votes to indicate their top preferences. Complete voting results from the case study presentations can be found in *Appendix D: Case Study Recommendations Data.*

To kick off each day, participants heard presentations from Caltrans leaders and industry partners. Summaries of each presentation are included on the following page. All presentation slides are included in *Appendix C: Summit Presentations*.

PRESENTATION SUMMARIES

Toks Omishakin, Caltrans Director

Toks Omishakin, Caltrans Director, opened the Safety Summit by welcoming attendees and thanking them for their participation. Mr. Omishakin presented the new Caltrans mission and vision statements, and outcomes from past Safety Summits in relation to the first goal, "Safety First," of the 2020-2024 Strategic Plan. The Safety Summit provided an opportunity for brainstorming ideas to eliminate fatalities, illnesses, injuries, and race-based disparities in safety outcomes.

Peter Tateishi, AGC California

Peter Tateishi, CEO, briefly spoke about the partnership between Industry and Caltrans, noting that Industry considers safety to be their top priority. Everyone who works on projects deserves to go home safely to their families. Mr. Tateishi noted the investment in infrastructure creates 20,000 direct jobs and another 20,000 indirect jobs for every $1 billion in investments. He stated the organization is trying hard to attract youth to the industry, and to establish a viable, trained, and sustainable workforce to meet the needs and demands of SB-1 and the future mobility needs of our state. Results of recent focus groups and interviews with parents indicate they consider the industry unsafe. Mr. Tateishi also indicated there is a need for all to work on changing this image and commit to providing a safe work zone for employees and the traveling public.

Vincent Mammano, FHWA

Vince Mammano, FHWA, reflected on the importance of the Industry and Caltrans partnership, incorporating points Mr. Peter Tateishi highlighted in his presentation. Mr. Vincent Mammano emphasized the significance of the Safety Summit, calling participants to action. To fortify a culture of safety, he encouraged active listening and engagement throughout the summit and thanked the Industry and Caltrans for their efforts.

Lt. Noah Hawkins, CHP

Lt. Noah Hawkins, CHP Headquarters Special Project Section, presented information on CHP's role in Work Zone Safety. Lt. Hawkins first discussed CHP's geographical jurisdiction and the responsibilities of the Special Projects Section. Lt. Hawkins then reviewed various partnership efforts including Traffic Incident Management, the Strategic Highway Safety Plan, CHP's duties in the Transportation Management Centers, Promoting Motorist and Worker Safety, and Interagency Agreements. Lt. Hawkins concluded his presentation by reviewing the Work Zone Action Plan, inclusive of Work Zone speed reduction and joint Work Zone training.

Rachel Carpenter, Caltrans Chief Safety Officer

Rachel Carpenter, Caltrans Chief Safety Officer, spoke on the traffic safety crisis in California and the Four Pillars, California's new approach to advancing safety culture. Ms. Carpenter emphasized the value of conversation, doubling down on what works, accelerating advanced technology, and integrating equity.

Greg Berry & Chuck Suszko, Caltrans Division of Construction

Greg Berry and Chuck Suszko, Caltrans Division of Construction, presented safety initiative updates, highlighting plan and specification changes since the 2018 Safety Summit and included a status report on 2018-2020 safety initiatives in progress.

SUMMIT OUTCOMES

CASE STUDY RECOMMENDATIONS

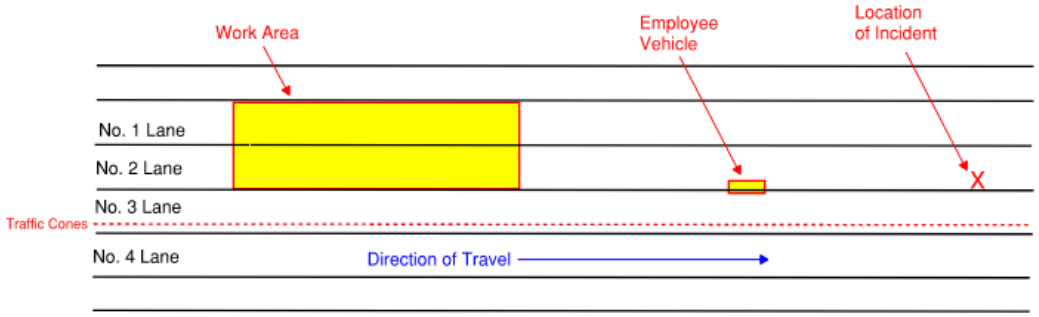
The following case studies were presented to the participants. All case studies contained general fact patterns that may have borrowed from multiple real incidents but have been changed to enable the participants to have an open discussion and thoughtful exchange of ideas. The intent was to keep the case studies general enough so that the breakout groups could "fill in the blanks" and bring their own experiences and assumptions into the discussions. The goal of the breakouts was to brainstorm and identify ideas and potential solutions rather than pass judgment on real incidents.

Case Study 1

An employee was struck inside a lane closure by another employee while laying out pavement slabs between lanes 2 and 3.

Assumptions:

- The closures were set per standard plan T-10
- CHP was on site
- Not much lighting in the area



Group Recommendations:

1. Add positive barrier (impact attenuator vehicle, vehicle movable barrier, mobile barrier)
2. Training (do not be complacent, working in pairs, stay near work zone)
3. Shadow vehicle
4. Buddy system or spotter

Case Study 2 (Flagger)

One flagger was struck while working on a flagging operation on a one-lane, two-way traffic control near an intersection on a highway, controlled by a flagger on each side.

Assumptions:

- The closures were set per standard plan T-13
- CHP was on site
- The work was at the intersection (T section)
- Work was at night with good visibility

Group Recommendations:

1. Use Automated Flagger Assistance Devices (AFADs)
2. DUI check points before work zone
3. Switch night work to daytime if possible
4. Proper setup of flagger station to include barrier protection for flagger, lighting, temp rumble strips. COZEEP present near flagger station

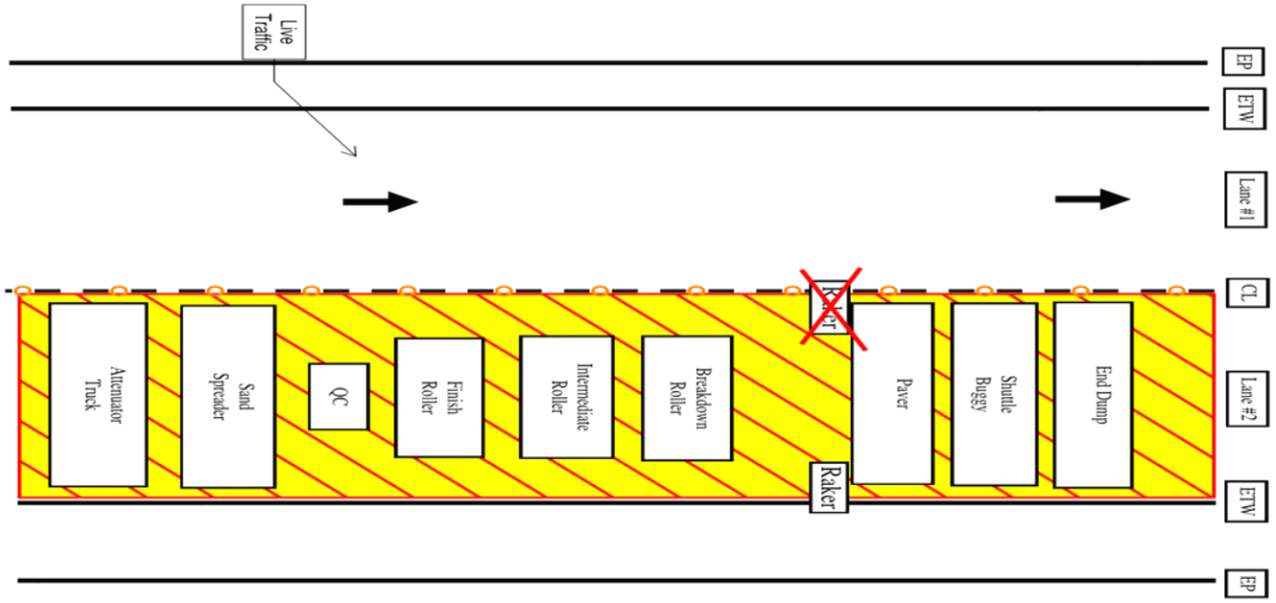
Case Study 3 & 4 (Intrusion)

Case Study 3

An employee was struck by a motorist during the paving operation as shown by the figure below. This is a 4-lane highway, 2 in each direction divided by a median barrier.

Assumptions:

- The closures were set per standard plan T-10
- CHP was on site
- Work was at night with good visibility



Case Study 4

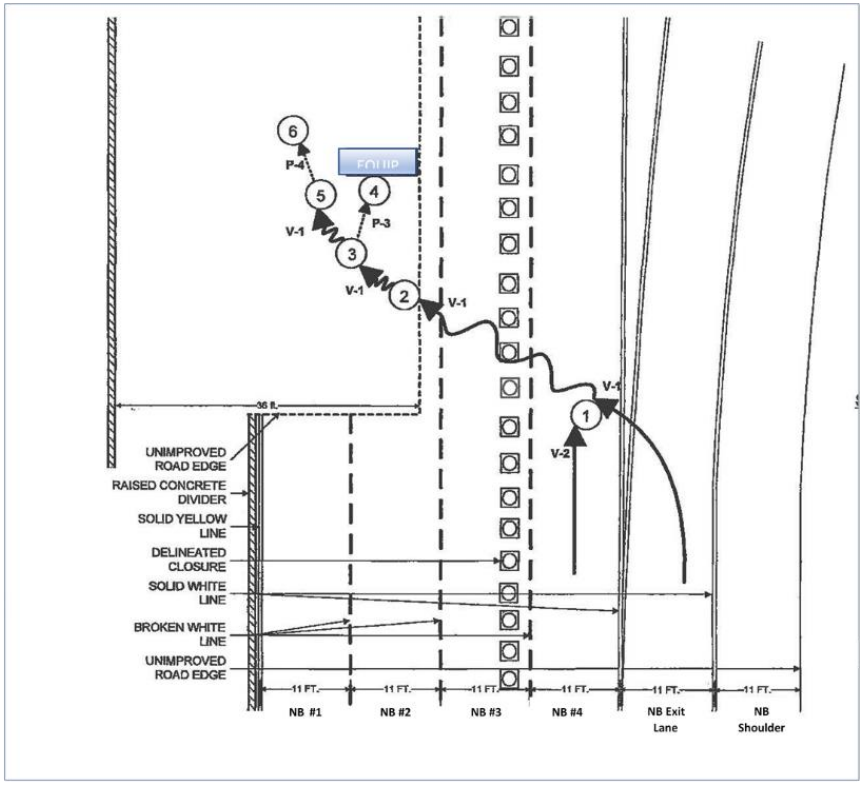
An out-of-control vehicle, trying to avoid debris, entered the activity area where crews and equipment were actively working and came to rest within the excavation striking an employee in the excavation area (see diagram below). The contractor had lanes 1, 2, and 3 closed on the NB and maintained lane 4 open to traffic.

Assumptions:

- The closures were set per standard plan T-13
- 2 CHP units were on site
- Work was at night with good visibility

Group Recommendations:

1. Full Closure
2. Add positive barrier
   (impact attenuator vehicle, vehicle movable barrier, mobile barrier)
3. More day work than night



Case Study 5 (CT Maintenance)

While a Caltrans maintenance employee was working in wide median area of freeway (approximately 25’ to 30’ with cross hatch striping), an errant vehicle entered the work zone and veered into the median, hit the attenuator climbing on to median barrier, and struck the employee, causing minor injuries. The errant vehicle continued between the shadow and median barrier striking the employee with no signs of braking. The employee was returning to the driver’s side when she was hit.

Assumptions:

- Adequate sight distance for approaching traffic
- Road was clear, dry with good visibility
- Accident occurred in wide median
- Freeway curves to the right
- The maximum speed is 55 MPH

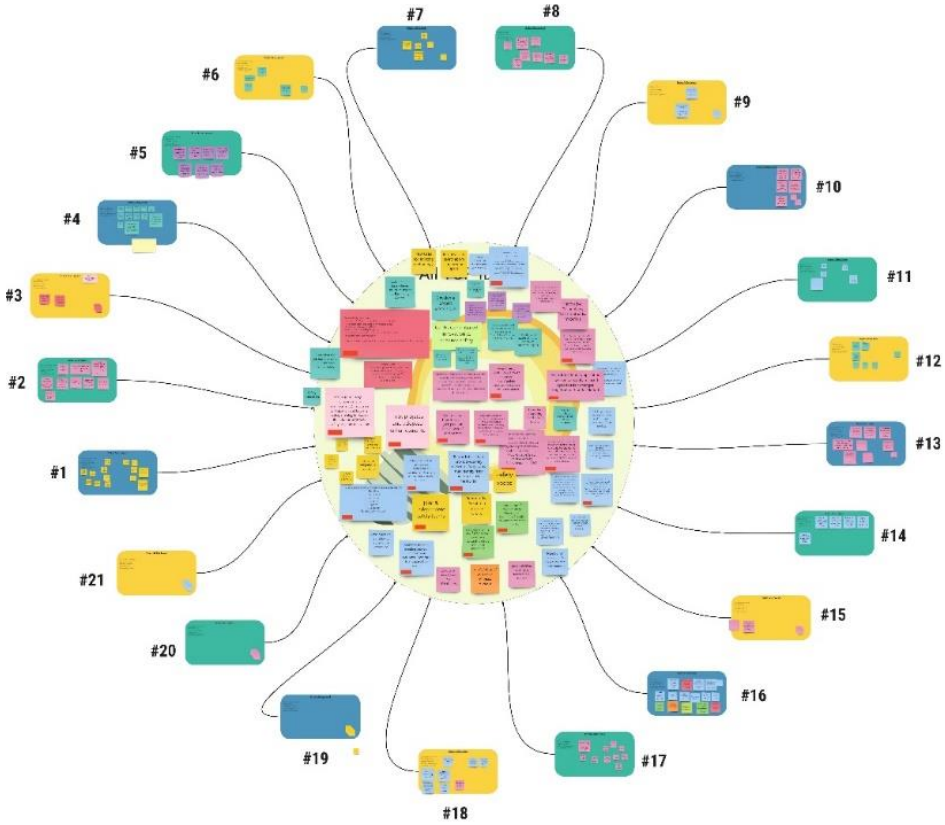
Group Recommendations:

1. Automated equipment for removal of debris
2. Use CHP for traffic break
3. Train employees on how best to utilize the impact attenuator

PROJECT SAFETY AWARD

Project Safety Awards are proposed to be presented at future safety summits to recognize project teams who excel at safety performance and have shown a strong commitment to a safe jobsite environment, including going above and beyond the required contract specifications and state / federal regulations, and implementing innovative safety measures. Joint project safety reviews are one of the safety initiatives from the 2018 Safety Summit. These reviews are to be performed jointly by the contractor and Caltrans field staff on construction projects and could serve as one means to evaluate a project team's safety efforts

During the 2021 Safety Summit, breakout groups of participants brainstormed and discussed items they thought should be considered in evaluating projects for safety awards. They discussed specifications and regulations related to project safety including, but not limited to: safety-related incident rates; traffic control / lane closures; safety enhancement proposals; innovative ideas implemented; partnering efforts related to safety; project public awareness campaigns; and public feedback. The top three criteria, with at least one tied to project specifications, were ranked, and presented by the breakout groups. Following the Safety Summit breakouts, the Division of Construction will evaluate the items presented by the breakout groups, and in cooperation with an industry working group, establish the criteria to classify these items in tiering system for awards such as bronze, silver, gold and "best in class" awards. Some ideas for these project safety awards include "success in motion" for on-going (active) projects and an "excellence" award for completed projects like our partnering awards.



Project Safety Award Breakout Session

Future Action Plan

Though many ideas came out of the Safety Summit group activities, the top two safety ideas need a special mention as they have the potential to make significant improvements to the construction safety program. These two safety ideas are to implement positive protection devices and full closures. These ideas are not new as the Department is already working towards their full implementation. These ideas being implemented supports the fact that the Department is moving in the right direction to improve the safety of highway workers and validates the Department's approach on doubling down on what works. Each idea is in a different phase and is discussed in detail below.

1. Positive Protection Devices

Positive Protection devices can contain and/or redirect vehicles and meet the crashworthiness evaluation criteria contained in National Cooperative Highway Research Program (NCHRP) Report 350 and Manual for Assessing Safety Hardware (MASH). These devices include temporary concrete barriers, steel barriers, movable barrier system, mobile barrier system, and stationary impact attenuator vehicle.

The Department has developed new specifications for the positive protection devices. The Department has also issued a Construction Procedure Directive, CPD 21-4, on March 15, 2021, which has provided guidance on use of positive protection devices in construction work zones for ongoing projects. Resident engineers and contractors will be evaluating whether positive protection devices could reduce serious injuries and deaths to highway workers and traveling public. If positive protection devices are deemed beneficial in the evaluation, they can be implemented through a change order. Further, the Department is developing a Design Information Bulletin, DIB-91, which provides guidance to the project engineers on the use of positive protection devices on future projects. DIB-91 shall be approved by June 30, 2021.

2. Full Closures

Deputy Directive 60 (DD-60-R2), states that project development teams shall consider various alternative expanded work windows on construction projects and strike a balance between reducing the overall construction duration and minimizing disruption to the traveling public. These work windows include full closures, longer period lane closures, off-peak closures (midday), or longer length closures. Resident engineers are entertaining any Value Engineering Change Proposals (VECPs) on ongoing projects that are proposed by the contractors. These VECPs are reviewed by the District Lane Closure Review Committees in accordance with DD-60-R2. Efforts are ongoing to educate and encourage the project development teams to thoroughly consider the various work window alternatives for all future projects as directed in the DD-60-R2.

3. Remaining Safety Ideas

The rest of the safety ideas will go through the Caltrans Contractor Partnering Steering Committee for evaluation. Once these ideas are prioritized, working groups will be formed as needed to work on various ideas with specific milestones and their due dates. The progress will be tracked to identify any challenges on individual safety ideas.

APPENDICES

Appendix A: Summit Attendees

Appendix B: Summit Agenda

Appendix C: Summit Presentations

Appendix D: Case Study Recommendations Data

Appendix E: Safety Award Recommendations Data

2021 Caltrans / Industry Construction Safety Summit

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Patrick	Bishop	pbishop@dot.ca.gov	Caltrans	DDDM
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Paul	Schneider	paul.schneider@dot.gov	FHWA	DDA
Paul	Grant	paul.grant@lindsay.com	Lindsay	Business Development Manager
Paul	Von Berg	pvonberg75@gmail.com	SCCA	Vice President
Peter	Tateishi	almanzaj@agc-ca.org	AGC of California	CEO
Peter	Tateishi	tateiship@agc-ca.org	AGC of California	CEO
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Rachel	Carpenter	rachel.carpenter@dot.ca.gov	Caltrans	Chief Safety Officer
Ramon	Hopkins	ramon.hopkins@dot.ca.gov	Caltrans	Division Chief
Randy	Franklin	rfranklin@griffithcompany.net	Griffith Company	Corporate Safety Director
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Robert	Chrisp	rchrisp@chrispco.com	Chrisp Company	CEO
Robert	Sabin	Rsabin@harborlinx.com	McGuire and Hester	Safety Engineer
Roberto	Sanchez	rsanchez@gobats.net	Bay Area Traffic Solutions	Safety manager
Roy	Vlaovich	rvlaovich@flatironcorp.com	Flatiron	Safety Manager
Ryan	Aukerman	raukerman@griffithcompany.net	Griffith Company	Executive Vice President
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Sam	Hassoun	Sam@GLA.World	GLA Corp.	President
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Ashley	Carson	ashley@vms-inc.com	VMS	Facilitator
Giuseppe	Nespoli	giuseppe@vms-inc.com	VMS	Facilitator
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Samantha	Louie	Samantha.louie@vms-inc.com	VMS	Facilitator

2021 CALTRANS / INDUSTRY SAFETY SUMMIT

MARCH 16th, 2021 | **March 17th, 2021**

8 AM – 12 PM | 8 AM – 12 PM

AGENDA – DAY 1

8:00	**WELCOME REMARKS**
8:10	**DIRECTOR'S SAFETY VISION**
8:40	**TECHNOLOGY 101 & GROUND RULES**
9:20	**BREAK**
9:30	**PARTNERS' PRESENTATIONS**
10:30	**BREAK**
10:40	**CASE STUDY DISCUSSIONS**
12:00	**ADJOURN**

Be Aware, Be Smart – Safety Starts With You!

2021 CALTRANS / INDUSTRY SAFETY SUMMIT

MARCH 16th, 2021 | **March 17th, 2021**

8 AM – 12 PM | 8 AM – 12 PM

AGENDA – DAY 2

8:00	**WELCOME REMARKS**
8:15	**WORK ZONE SAFETY – A COLLABORATIVE APPROACH**
	2018 & 2020 SAFETY SUMMIT INITIATIVE UPDATES
9:00	**CASE STUDY DISCUSSIONS**
9:50	**BREAK**
10:00	**CASE STUDY DISCUSSIONS, CON'T.**
10:35	**BREAK**
10:45	**PROJECT SAFETY AWARD DISCUSSIONS**
11:40	**CLOSING REMARKS**
12:00	**ADJOURN**

Be Aware, Be Smart – Safety Starts With You!

Presentation 1 – Toks Omishakin, Caltrans Director

Past Safety Summits

Caltrans Strategic Plan 2020-2024

Our Mission

Provide a safe and reliable transportation network that serves all people and respects the environment

Our Vision

A brighter future for all through a world-class transportation network

Caltrans Strategic Plan 2020-2024

Safety First - #1 Goal

Intended Outcomes:

Eliminate fatalities and serious injuries

Eliminate employee fatalities and serious injuries "in the line of duty"

Reduce employee illnesses and injuries

Eliminate race-based disparities in safety outcomes

December 2020 CTC Meeting

https://youtu.be/Xfj8nVz09A0?t=2695

Public Awareness Campaigns

Be Work Zone Alert Campaign

http://beworkzonealert.com/campaign.html

Where Do We Go Next...

Thank You!

AGC of California

Peter Tateishi, CEO

March 16, 2021

CALTRANS & AGC OF CALIFORNIA

Quotas don't automate safety – it is ongoing

Action & Advancement

Thank You!

Peter Tateishi, CEO
Tateiship@agc-ca.org
(916) 600-7423

Presentation 3 – Vincent Mammano, FHWA

Please see *Presentation Summaries* for the description of Vincent Mammano's presentation.

CHP's Role in Work Zone Safety

Noah Hawkins, Lieutenant

March 16, 2021

MISSION

Provide the highest level of Safety, Service, and Security

STRATEGIC PLAN

(2020-2024)

ORGANIZATIONAL VALUES

Fairness, Respect, Ethical Practices, Equitable Treatment

PROFESSIONAL VALUES

CHP PRIDE

Geographical Jurisdiction

Coverage

- "All roads, all codes"
- 8 Field Divisions, 103 Areas

Staffing

- Uniformed
- Non-uniformed
- Academy & Headquarters

Northern Division	(530) 242-4300
Valley Division	(916) 731-6300
Golden Gate Division	(707) 917-4300
Central Division	(559) 277-7250
Southern Division	(818) 240-8200
Border Division	(858) 650-3600
Coastal Division	(805) 549-3261
Inland Division	(909) 806-2400

Special Projects Section

MISSION

Provide quality service without limits to meet internal and external needs in support of the CHP's mission.

GOALS

Be innovative, Be effective, Be efficient

RESPONSIBILITIES

Internal and External

Promoting Partnerships
Traffic Incident Management

Strategic Highway Research Program 2 (SHRP2)

Traffic Incident Management (TIM)

- What is it?
- Who's trained?
- When was it rolled out?

Promoting Partnerships
Traffic Incident Management

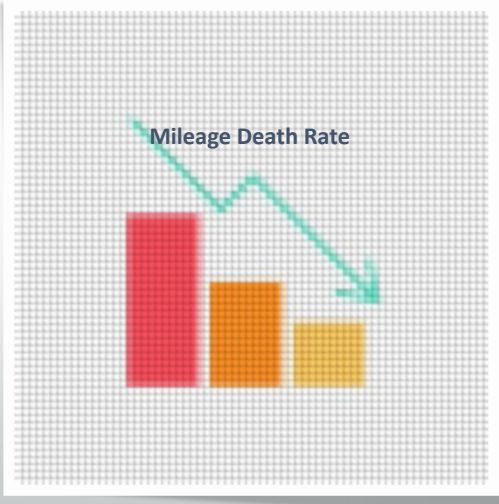
Promoting Partnerships
Strategic Highway Safety Plan

Strategic Highway Safety Plan

- Definition
- Mission

CHP's role

- Challenge Areas



Promoting Partnerships
Strategic Highway Safety Plan

Emerging Technologies

Education

Emergency Response

Enforcement

Engineering

CHP - Caltrans Collaboration

2015-2019 SHSP Work Zone Challenge Area

- ✔ Evaluated and promoted best work zone practices
- ✔ Improved safe driving with education and enforcement
- ✔ Applied advanced technology
- ✔ Improved data collection
- ✔ Completed action items

Promoting Partnerships Strategic Highway Safety Plan

Transportation Management Centers

Traffic Management Center (TMC)

- Purpose…
- Staffing…
- Services…
- Benefits…

CHP Duties in the TMC

- Take stolen vehicle reports
- Maintain & Update the CAD
- Operate/Monitor CCTV equipment
- Prepare correspondence, issue sigalerts
- Coordinate scene management with field personnel
- Develop and Implement TMC strategies
- Answer media inquires and conduct live interviews
- Provide prompt dispatch of resources

Promoting Motorist and Worker Safety

Training
Outreach
Resources
Legislation
Internal (CHP)
Interagency Agreements
Methods of promoting safety

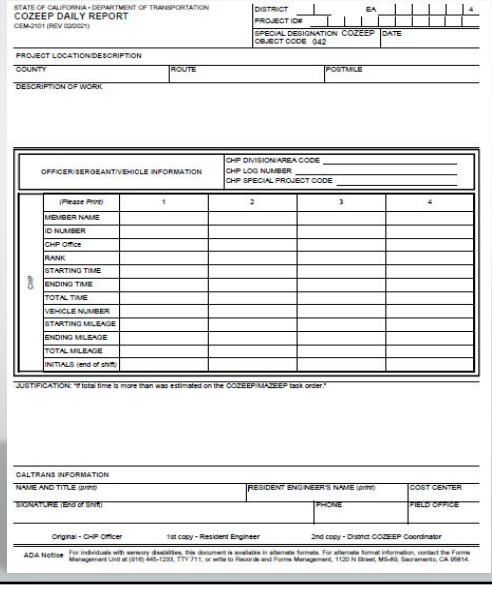
Interagency Agreements

Services

&

Cost

COZEEP/MAZEEP TASK ORDER



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
COZEEP DAILY REPORT
CEM-2161 (REV 02/2021)

DISTRICT | EA | 4
PROJECT ID#
SPECIAL DESIGNATION COZEEP
OBJECT CODE 042
DATE

PROJECT LOCATION/DESCRIPTION
COUNTY | ROUTE | POSTMILE
DESCRIPTION OF WORK

OFFICER/SERGEANT/VEHICLE INFORMATION
CHP DIVISION/AREA CODE
CHP LOG NUMBER
CHP SPECIAL PROJECT CODE

CHP

(Please Print)	1	2	3	4
MEMBER NAME				
ID NUMBER				
CHP Office				
RANK				
STARTING TIME				
ENDING TIME				
TOTAL TIME				
VEHICLE NUMBER				
STARTING MILEAGE				
ENDING MILEAGE				
TOTAL MILEAGE				
INITIALS (end of shift)				

"JUSTIFICATION: "If total time is more than was estimated on the COZEEP/MAZEEP task order."

CALTRANS INFORMATION
NAME AND TITLE (print) | RESIDENT ENGINEER'S NAME (print) | COST CENTER
SIGNATURE (End of Shift) | PHONE | FIELD OFFICE

Original - CHP Officer | 1st copy - Resident Engineer | 2nd copy - District COZEEP Coordinator

ADA Notice: For individuals with sensory disabilities, this document is available in alternate formats. For alternate format information, contact the Forms Management Unit at (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

SWITRS DATA

In 2020, there were 3,109 persons killed in California in traffic crashes

California's 2019 Mileage Death Rate (MDR) is 1.02 (provisional). The MDR is the number of fatalities per 100 million miles traveled

The MDR national average for 2019 is 1.10

* 2019 and 2020 SWITRS data are provisional

2020 SWITRS DATA

Construction/Repair Zones
- 7,889 crashes
- 3,782 victims injured

Work Zones
- 52 fatal crashes
- 54 victims killed

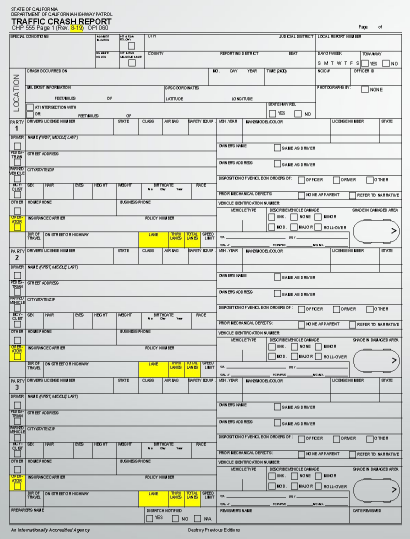
Unsafe Speed
- 8 fatal crashes
- 8 victims

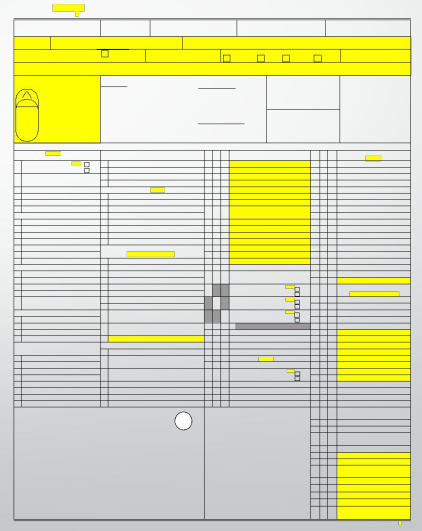
DUI
- 14 fatal crashes
- 15 victims

Improper Turning
- 9 fatal crashes
- 10 victims

Unsafe Lane Change
- 1 fatal crash
- 1 victim

CHP 555 Traffic Crash Report Form


TRAFFIC CRASH REPORT



Work Zone Speed Reduction

CVC 21367

Allows Caltrans the authority to temporarily reduce speed in work zones whenever traffic would endanger worke or the work being done would endanger the movement of traffic through the wor zone

CVC 22362

May apply with a few caveats

MOVE OVER

Joint Work Zone Training

training

['trāniNG]

NOUN

the action of teaching a person or animal a particular skill or type of behavior.
"in-service training for staff"

synonyms: instruction · teaching · coaching · tuition · tutoring · tutelage · [more]

Questions?

Thank you for your kind attention.

Lt. Noah Hawkins

CHP Headquarters-Special Projects Section

NHawkins@chp.ca.gov

(916) 843-3370

Work Zone Safety, A Collaborative Approach

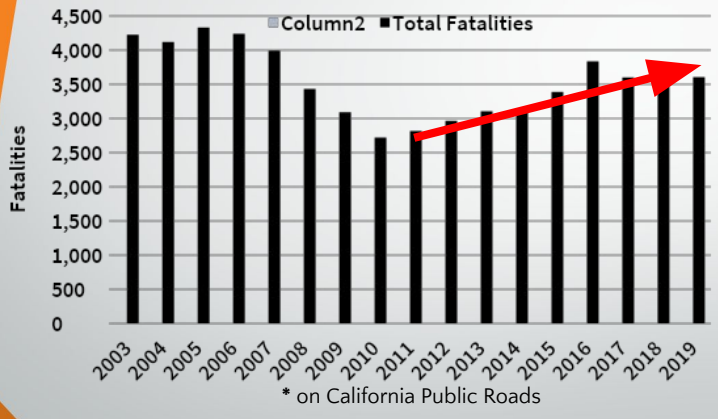
Rachel Carpenter, Chief Safety Officer, Caltrans

March 17, 2021

Overview

- The Traffic Safety Crisis in California
- California's New Approach – Four Pillars
- Lead Safety Culture Change
- Doubling Down on What Works
- Accelerate Advanced Technology
- Integrate Equity

The Traffic Safety Crisis in California



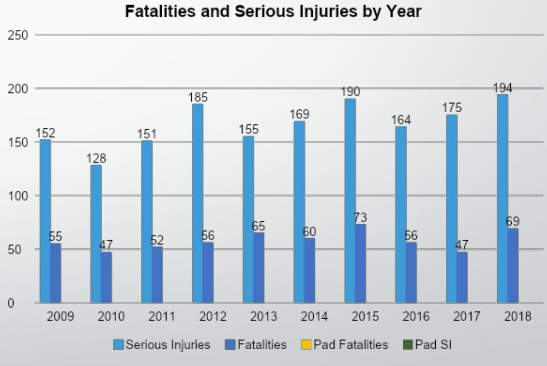
3,606
lives lost on CA roads in 2019

972
pedestrians killed on CA roads in 2019

Work Zone Fatalities and Serious Injuries

Why?

Unsafe speed is the most common primary collision factor involved in Work Zone crashes.



California's New Approach - Four Pillars

- Double Down on What Works
- Accelerate Advanced Technology
- Implement a Safe System Approach
- Integrate Equity

Implement a Safe System Approach

Changing our Organization

2020

Jan — Caltrans establishes new Chief Safety Officer (CSO) position

Feb

Mar

Apr

May — Caltrans reorganizes staff under new Division to elevate safety

Jun

Jul — Four pillars formally incorporated into Strategic Highway Safety Plan

Aug

Sep — Four pillars formally incorporated into Caltrans Strategic Management Plan

Oct

Nov — Caltrans creates new Division of Safety Programs and creates new management positions devoted to safety

Sharing Ideas and Perspectives

- Annual Safety Summits
- Coordination and outreach with industry
- Best practices for safety

Changing the Conversation

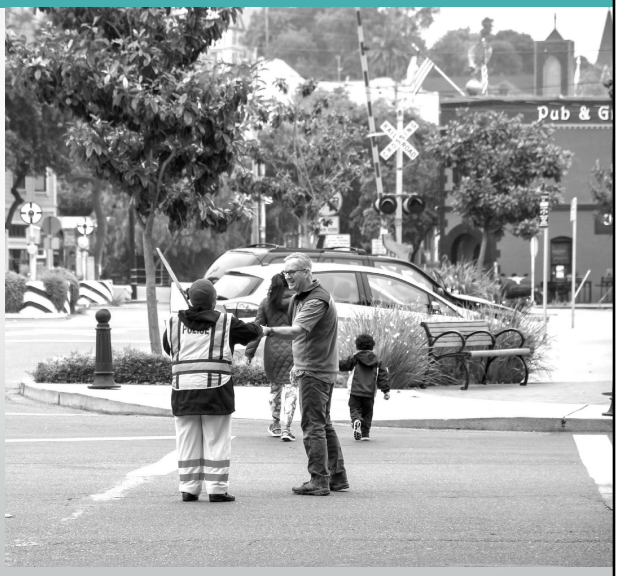
- Use the term “crash” instead of “accident”
- Identify “near misses”
- WZ Training Efforts (Flagger Certification, Traffic Control Technician Certification, Traffic Control Supervisors Certification)
- One stop shop

Changing the Conversation

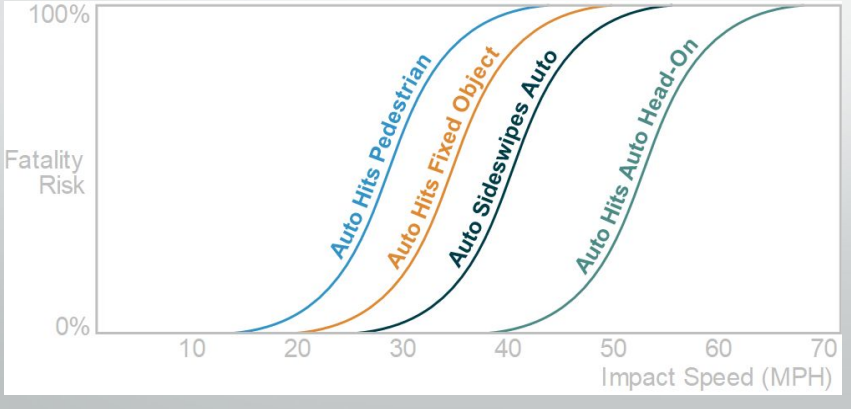
Be Work Zone Alert Campaign

http://beworkzonealert.com/campaign.html

Double Down on What Works



Human bodies are vulnerable in crashes.



Source: Roads and Traffic Authority of New South Wales

Double Down on What Works

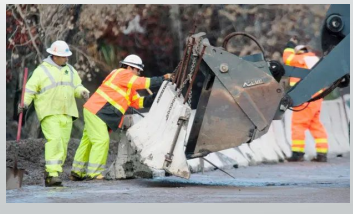
Our crews are especially vulnerable.

Source: Seattle Department of Transportation

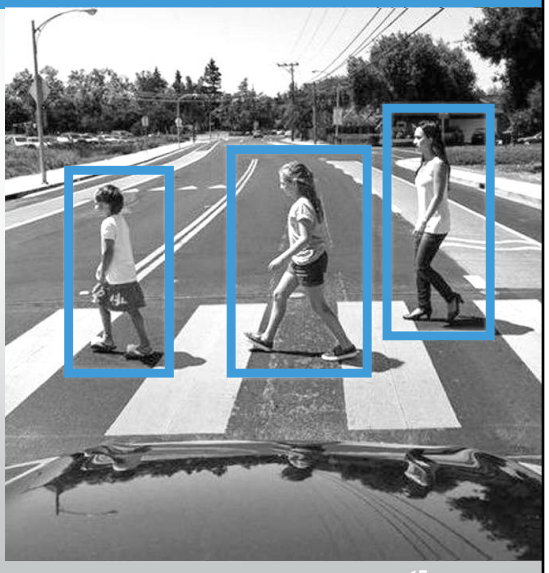
Double Down on What Works

Positive Protection for Work Zones

- Guidelines on the Use of Positive Protection in Work Zones
- Including use of:
  - Impact Attenuator Vehicles
  - Temporary Barriers
  - Use of Mitigation Measures



Accelerate Advanced Technology



Critical for Consideration in California: Speed Safety Cameras (SSC)

- **Harnesses technology** to reduce speeding
- **Used and studied worldwide** for over two decades
- **Demonstrated safety improvements**
- **Effective countermeasure** for reducing crashes and injuries

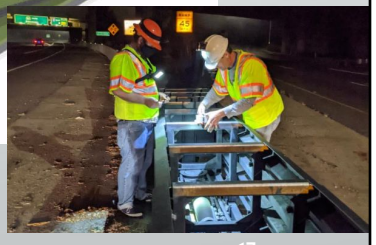
Accelerate Advanced Technology

Implement a Safe System Approach

Innovative Traffic Safety Pilots in WZs

IMPACT DETECTION PILOTS

COMPANY NAME	PRODUCT NAME
3M / Pi-Lit D7, 8 & 10	AIMS
TrafFix Device Inc. D3, 4 & 11	Sentinel
Lindsay D7, 8 & 11	ImpactAlert

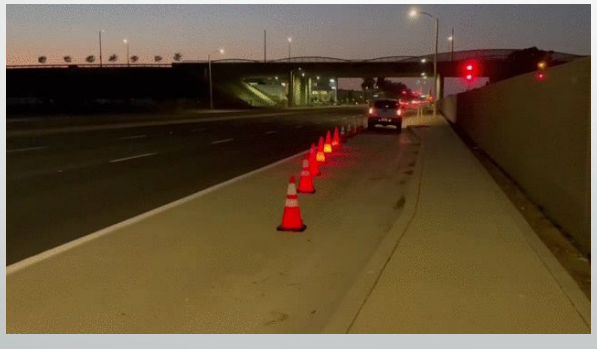


Accelerate Advanced Technology

Implement a Safe System Approach

Innovative Traffic Safety Pilots in WZs

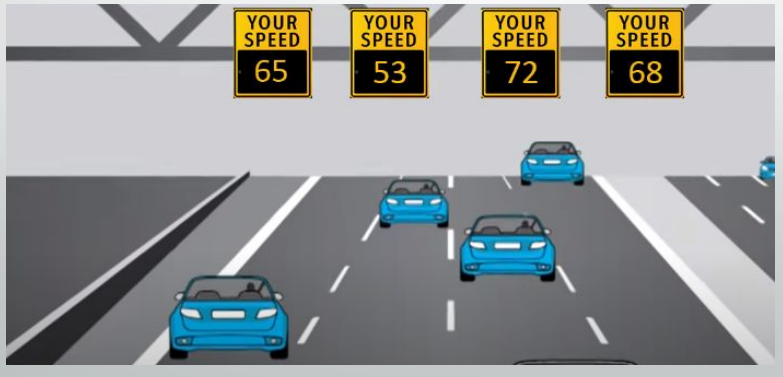
SMART SEQUENTIAL ROAD FLARES



Accelerate Advanced Technology

Innovative Traffic Safety Pilots in WZs

OVERHEAD SPEED DETECTION SIGNS IN WZs



California's New Approach - Four Pillars

1. Doubling Down on What Works
2. Accelerate Advanced Technology
3. Implement a Safe System Approach
4. Integrate Equity

Integrate Equity

Awareness of Work zone Impacts

- Gather and review data
- Work zone activity
- Multi-modal traffic management
- Temporary Bicycle, Pedestrian, and ADA access around a work zone

Key Takeaways

We are shifting our safety paradigm by changing our organization, our conversation, and the way we work.

GOAL

0 lives lost on CA roads

0 pedestrians killed on CA roads

Contact:

rachel.carpenter@dot.ca.gov

Thank You!

Presentation 6 – Greg Berry & Chuck Suszko, Caltrans Division of Construction

Safety Initiatives Update

Greg Berry & Chuck Suszko
Caltrans Division of Construction
March 17, 2021

Specification and Plan Updates (since 2018 Safety Summit)

Standard	Subject	Description
EXPANDED WORK WINDOWS		
SSP 12-3.39	"Temporary Automated End of Queue Warning System for TTCD"	Specifications for furnishing, maintaining, and removing a temporary automated end of queue warning system.
RSS Section 12-4.02C(10)	"End of Queue Monitoring and Warning with Truck Mounted Changeable Message Sign"	Specifications for placing, operating, maintaining, and removing portable changeable message sign truck (PCMST), monitoring the traffic end of queue, and warning approaching traffic.
RSP T26 – T27	"Temporary Automated End of Queue Warning System Type 1) Queue <= 3.5 miles" "Temporary Automated End of Queue Warning System Type 2) Queue <= 7.5 miles"	New Standard Plans for End of Queue Warning Systems
WORK ZONE SPEED REDUCTION		
RSS 12-3.37 RSS 87-20	"Temporary Radar Speed Feedback Sign"	The LED character display must remain blank when no vehicles are detected or when the detected vehicle speed is 10 miles less than the preset speed.
SSP 12-4.02C(12)	"Construction Work Zone Speed Limit Reduction"	Specifications for providing, installing, maintaining, and removing traffic control devices for reducing the speed limit for the construction work zones.
RSP T18 - T21	Construction Work Zone Speed Reduction: "Freeways and Expressways" "Conventional Highways," "Details," "24/7"	New Standard Plans for Work Zone Speed Reduction

Specification and Plan Updates (since 2018 Safety Summit)

Standard	Subject	Description
WORKER PROTECTION ENHANCEMENTS		
RSS 12-3.23 & RSS 12-4.02C(7)	"Impact Attenuator Vehicle (IAV)" (April 2021)	Use a stationary impact attenuator vehicle to protect workers on foot within the work area when the posted speed limit is 55 mph or greater and workers are not protected by a longitudinal positive barrier system.
RSS 12-4.02	"Buffer Lanes"	Close the lane adjacent to your work area in accordance with the lane requirement charts, to provide a buffer lane for public and worker safety between the work area and the traffic
RSS 12-3.24	"Mobile Barrier Systems" (April 2021)	Use with a stationary closure for work activities that may include, but are not limited to pavement and approach slab replacement, guardrail and barrier repair, bridge deck and joint repair, loop detector installation, and full ramp closures preventing vehicles from entering.
RSS 12-3.25	"Movable Barrier Systems" (April 2021)	Use where lanes shifts are required daily to accommodate directional traffic volume demand or between motorists and construction work to create additional work space for construction activities.

Specification and Plan Updates (since 2018 Safety Summit)

Standard	Subject	Description
PROJECT SAFETY		
RSS 5-1.16	"Project Safety Representative"	Assign a representative to: Coordinate and manage project safety work
SSP 5-1.14	Safety Quality Control Manager (SQCM) (April 2021)	A full-time, on-site safety quality control manager (SQCM) dedicated 100% to project safety, for the duration of this contract. The SQCM is to be available after hours as needed.
RSS 5-1.28	"Project Safety Reviews"	Assigned project safety representative must: 1. Participate in a project safety meeting before starting work 2. Perform and document joint safety reviews every other week with the Engineer 3. Participate in a post-project safety meeting
RSS 5-1.23C & RSS 5-1.29	"Job Hazard Analysis (JHA)" (April 2021)	Assigned project safety representative must submit a job hazard analysis as an informational submittal to be discussed as part of project safety reviews

Specification and Plan Updates (since 2018 Safety Summit)

Standard	Subject	Description
SAFETY TRAINING & CERTIFICATION		
RSS 12-4.02C(11)	"Traffic Control Technician"	Includes specifications for training, certification, and responsibilities for traffic control technicians.
SSP 12-4.02C(13)	"Traffic Control Supervision" (April 2021)	Responsible and has full authority to act on behalf of the contractor for administering temporary traffic control.
RSS 12-3.38B	"Materials" of Section 12-3.38, "Automated Flagger Assistance Devices"	The automated flagger assistance device must comply with the *California MUTCD,* Section 6E.04, and Section 6E.06, "Red/Yellow Lens Automated Flagger Assistance Devices."
RSS 12-4.02C(9) SSP 12-4.02C(9)(c)(i) RSS 12-4.02C(9)(c)(ii)(C)	"Flagging" "General" "Additional Flaggers"	Specifications for flaggers, AFAD operators, additional flaggers, advance flaggers and flagger stations.

Guidance Updates since 2018 Safety Summit

Subject	Description
Safety Stand-down Guidance (Construction Manual 2-1)	Defined and delineated requirements for implementing safety stand-downs after a significant safety incident. Severity of the incident determines the level of response, which ranges from project to district or region to all ongoing state projects.
Revised COZEEP Training (Fall 2020)	Training implemented for Caltrans construction staff.
Work Windows (Oct 2019)	Caltrans Chief Deputy memo issued

2018/2020 Safety Initiatives
In Progress

Subject	Description
Positive Protection Design Guidance	Provides guidance to designers on incorporating positive protection devices into their designs. (AB759 & 23CFR630.1106 requirement)
"Safety Ratings Pre-Qualifier"	Require minimum safety "scores to be eligible to bid on Caltrans projects
Vehicle Proximity Sensors	NCHRP206 project in progress.
Work Zone Intrusion Alarms	Tested off-shelf systems (found issues). Secured funding for a new research project. In progress.
Bike/Ped Traffic in Transportation Management Plans	TMP guidelines contain provisions for bike and pedestrian access. Work on additional guidance/specs in progress.
Full Closures	Increase use of full closures.
Speed Safety Cameras in Work Zones	Automated enforcement of speed in work zones.

Thank You!

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Case Study 1

Be Aware, Be Smart – Safety Starts with You

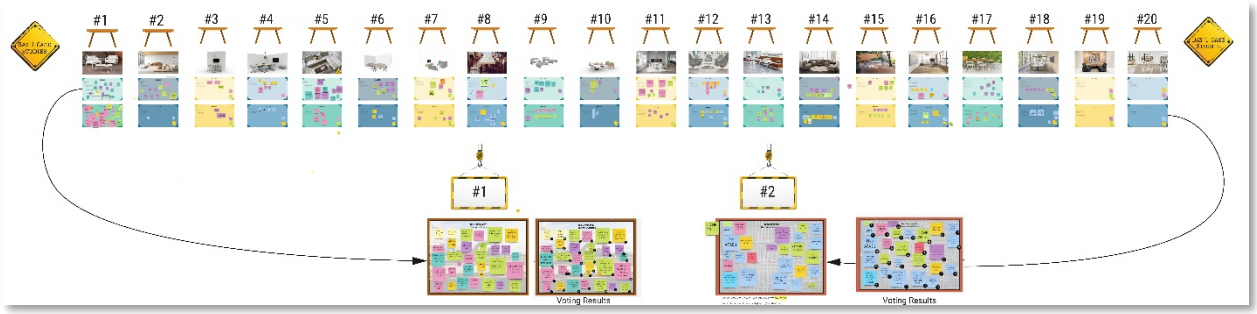
Recommendations	Votes
Add Positive Protection: -Attenuator vehicles -Movable barriers -Mobile barrier	39
1.Training 2. Don't be being complacent 3. Working in pairs 4. Stay near work zone	33
Shadow vehicles or buddy system	30
Work with a spotter	26
HALO LED Hard Hat Light	22
TMA/Shadow following ee on foot	21
More lighting in the lane closures	21
Halo Lights or other personal lighting devices	21
Dedicated entry and exit locations to cone zones	21
training (tail gate) to discuss what needs to be done out there before the shift	20
Must have positive protection	20
Illuminate entire work zone	19
All work being performed behind positive protection	15
Have someone operating his truck to protect him while he moves ahead	15
Culture is key. Protect each other and yourself	13
Worksite Lighting (not head lights)	12
Require all employees on foot to wear a steady light.	11
Speed of vehicle entering the work zone; address in tailgate meeting	11
Additional Traffic Control Device with attenuator for workers on foot.	11
Better planning of work activities, toolbox conversation ahead to determine what needs to be done to protect the workers	10
Can't work isolated - Buddy system work close to vehicles	10
no light, no work; have illumination throughout workzone;	9
visibility of the employee was the biggest factor.	8
Using traffic drums over cones	7
Better communication with fellow employees	7
CalOSHA 10 ft candles of light required; follow the code	7
Employee focusing on task on hand and was not paying attention on the surrounding	5
Have better lighting where he was working	5
repeated messages at daily tailgate meeting re: personal safety reminders	4
Proper PPE?	3
PPE Conditions	2

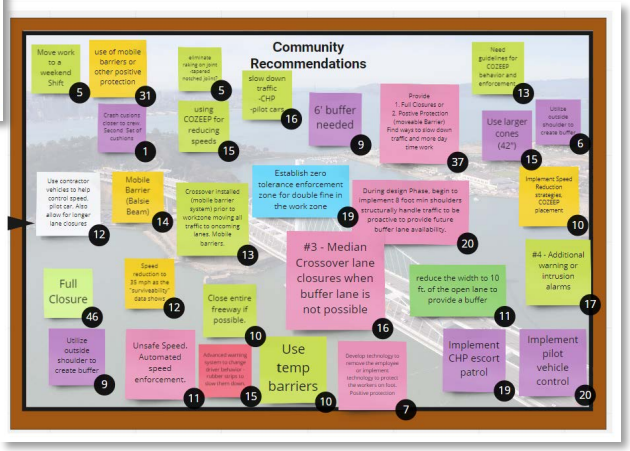
Lack of Lighting?	1
(No votes – Grouped by Training/Processes, Worksite, Lighting, Gear, and Misc.)	
More CHP	
6. Training aspect: The employees need to continually know to have employees have their head on swivel.	
Speed of vehicle entering the work zone; address in tailgate meeting	
'-Work in Pairs, never alone. One worker moves the vehicle to be used as a shield and second worker works protected. - Use additional lighting such as a towable light tower to light the work area.'	
Require a shadow vehicle and a buddy for the worker on foot; TMA truck	
Procedures on how to start the lights during the hours of darkness	
Employee was in buffer lane? Train employees to not be in buffer lane.	
Better coordination with the team on where vehicles should enter and exit the closure	
Have a buddy as lookout	
Culture in the industry: Do we identify potential risks and hazards ahead of time? We need this at the leadership, crew, and individual level	
work in teams	
Look out when people are working on foot and doing layout. Move vehicle along with the employee that needs to be on foot.	
Pre-job safety meeting for all participants - JHA's & SOP's	
Culture is key. Protect each other and yourself	
Ensure people entering the closure need to be there	
speed reduction in the workzone	
Safety Hotline for anonymous info if they are not comfortable speaking up	
Workers have a voice in their own safety. Encourage them to speak up and be accountable for their own safety.	
Speed reduction - should it be lower?	
Train Employees to not advance beyond the beaconed equipment	
Stay close to your shadow vehicle	
Work with a spotter	
Face traffic all the time	
Positive protection vehicle when someone is working on foot.	
Worker could work closer to protection vehicle	
Entering Exiting Closure Training	
Should have identified risks and planned for positive protection	
education to reduce complacency	
Shadow Vehicle / buddy system	
Work on enhancing the culture of company/employee	
Buddy system with workers on foot	
Accepted Norms	
a big factor was that he was alone out there. a buddy system would've helped.	

3. We want to be productive but not in a hurry. He was out by himself and there were others that were there but not at the location yet where the work was being done yet.
communication of location as moving ahead
Better control of movement into and out of the construction zone
Speed of entering the lane closure. More communication.
Lookout/buddy system
human nature to be away from truck and not realize you were unsafe
Need to have better plan for risk identity
the vehicle was not where it should've been
Proactive safety strategies implemented in the bid process. This allows all contractors to be aware of the requirement
Pre-job meeting
was all the proper PPE worn?
Utilization of COZEEP
Better training of employees
7. We get complacent when we have been doing this work awhile.
shadow vehicle closer
No scattered work area(s)
Could have been avoided by 1. Positive protection. He was far away from his positive protection which was his vehicle.
cone spacing
Employee too far away from vehicle
Designated entrances in work zones for construction vehicles. Clearly marked.
All work performed behind positive protection
Attenuator trucks needed for employees on foot
Consider moving work zone entrance to a different location
Limiting distance employee gets from Worksite lighting and shadow vehicle
should these cones have beacons on them to alert drivers?
Positive barriers
Speed Enforcement in Work Zone
Unfortunately, there was room for buffer or protective vehicle
too far from Barrier vehicle
Have extra barrier
Worker should try to use his truck to shield himself from errant drivers.
employee was 1000ft away from his truck unprotected.
rk area where workers are on foot.
4. Rapid set concrete is a face paced operation, so it is better to do it behind k-rail.
Could he have been closer to the shoulder?
would have been better if the vehicle was in front of him while he was working instead of out ahead
More vehicle protection, multiple vehicles?

Add positive movable barriers
Add an impact attenuator vehicle to protect the worker
Add Positive Protection: -Attenuator vehicles -Movable barriers -Mobile barrier
Positive protection for workers on foot
Block the work zone with moveable positive barriers
positive protection k-rail vehicle - limit space between
could have enhanced worker protections been provided? (movable barrier, ...)
Downed Cones. Need to watch for that.
Buffer lane?
Worksite Lighting (not headlights)
poor lighting; needs light tower
Have more lighting for employee
Inadequate lighting
Highway lighting and ensuring that it is around workers on foot
Personal illumination (lighted vest, HALO hardhat, etc.)
Headlamp lighting/PPE (class 3)
Flashing lights on hard hats
lighting
Add portable light towers
Improve Visibility: LED Lights on Employees, Halos, Flashing Beacon on employees
Lighted PPE?
flashing lights on the person
More lighting
Do not work in area with no lighting
this happened early in the evening. hopefully the contractor can do the layout within the lighted area or add more lighting to make employees more visible.
Require all employees on foot to wear a steady light.
Have flashing lights on hard hats
Halo Lights
the employee was struck by another employee. proper reflective or lighted PPE might have helped, or the buddy system
Specific illumination area that the worker remains in
Ensure CalOSHA lighting requirements are being adhered to; not just immediate work area. Headlights are not a substitute
2. PPE - worn out PPE should be replaced. The gear should be reflective.
Condition of cones?
Worker protection should be the number on thought in the construction industry.
Better PPE's
Proper PPE's
Is standard PPE adequate to be visible?
Use of technology to alert the worker of Work Zone intrusion.
better illumination on the PPE might have also helped.

Positive Protection Examples: Attenuator, Shadow vehicles
Best avail PPE being used?
Clean, new PPE
Positive protection
5. A Halo system on the hard hat.
White coveralls
Reflective pants and gaiters
better use of technology
Ask workers in the work zone what they could find more helpful
Risk was not controlled
Comes down to cost. How do we assess risk vs. cost?
was the driver distracted?





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Case Study 2

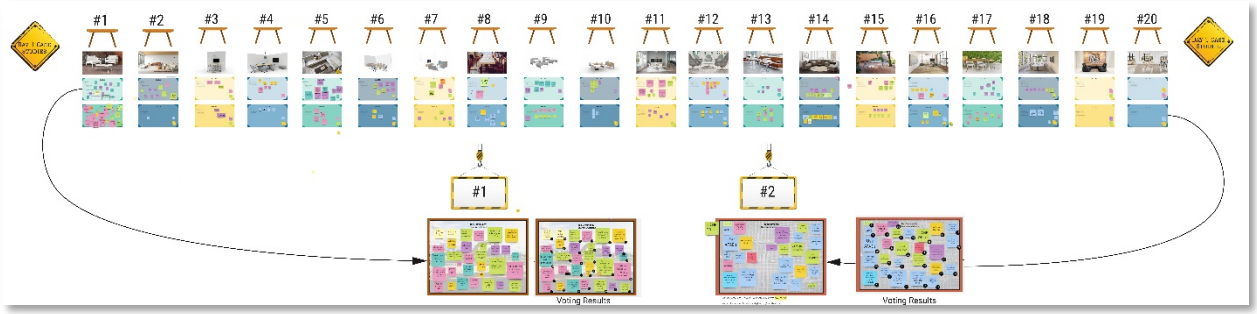
Be Aware, Be Smart – Safety Starts with You

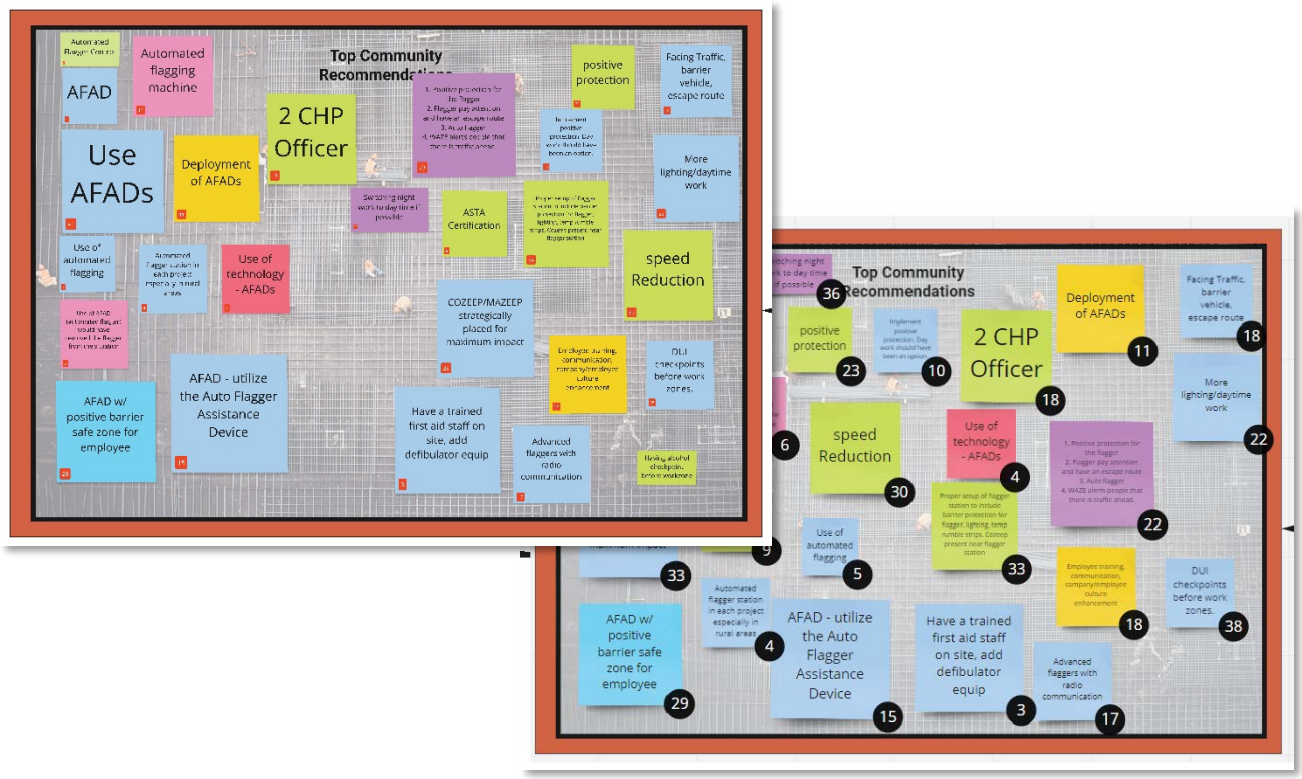
Recommendations	Votes
Use AFADS	41
DUI checkpoints before work zones.	38
Switching night work to day time if possible	36
Proper setup of flagger station to include barrier protection for flagger, lighting, temp rumble strips. Cozeep present near flagger station	34
COZEEP/MAZEEP strategically placed for maximum impact	33
Speed Reduction	30
AFAD w/ positive barrier safe zone for employee	29
Positive protection	23
1. Positive protection for the flagger 2. Flagger pay attention and have an escape route 3. Auto flagger 4. WAZE alerts people that there is traffic ahead.	23
More lighting/daytime work	22
2 chp officer	18
Facing Traffic, barrier vehicle, escape route	18
Employee training, communication, company/employee culture enhancement	18
Advanced flaggers with radio communication	17
AFAD - utilize the Auto Flagger Assistance Device	15
Automated flagging machine	13
Deployment of AFADS	11
Implement positive protection. Day work should have been an option.	10
AFAD	9
ASTA certification	9
Use of AFAD (automated flagger) would have removed the flagger from the situation	6
Automated flagger control	5
Use of automated flagging	5
Use of technology - AFADS	4
Automated flagger station in each project especially in rural areas	4
Have a trained first aid staff on site, add defibrillator equip	3
(No votes – Grouped by AFADS, Flagger Behavior / Location, Worksite, and Training/Processes)	
Use AFADS	
Auto flagger	
Only real tech that could have helped is AFADS.	
AFAD - utilize the Auto Flagger Assistance Device	

Use of AFAD (automated flagger) would have removed the flagger from the situation
Use of AFAD
Auto flagger run by a flagger outside the roadway (AFAD)
5. Autoflagger
Use of automated flagging
Automated flagger device
Use of automated flagger system
Flagger needs to stay alert.
Set up a better flagger station.
Where sight distance is limited, place warning devices/flaggers where they would be most visible
Flaggers should have the vehicle as shield
Plan an escape route for the flagger before the operation
COZEEP/MAZEEP need to be more visible upstream of flaggers
Potential for tightening up the closure in an area w/multiple lanes
Flagger training/ certification
Additional COZEEP; each flagger station
1. Look for an out, a place to run from an oncoming traffic
Reduced speed into work zone
Position of worker
COZEEP at each end of closure
Flaggers must be protected. It comes down to that.
Placement of flagging station - allow for maximum visibility
Utilization of a temporary traffic signal in lieu of flaggers
Flagger ahead sign
Proper setup of flagger station to include barrier protection for flagger, lighting, temp rumble strips. Cozeep present near flagger station
Lighted flagger station
Flaggers must be protected
Possible longitudinal barrier for flagger to "Escape"?
Have a trained first aid staff on site, add defibrillator equip
Cone spacing
More COZEEP needed (2 min)
Advanced driver alert system
Placement of an attenuator
Rumble strips/stripes
Lighting vehicle protection
Place COZEEP unit prior to (upstream) of the flagging station
3. Possible horizontal rumble strips
Additional high-visibility signage

Rumble strips - placement far ahead of job site could have alerted the motorist. Ways needed to alert the driver.
Temporary barricade or vehicle
Barrier/illumination to enhance visual; COZEEP placement
Physical barrier - positive protection; K-rail could be placed
Identify enhanced positive protection for flaggers
2. Positive protection for the flagger.
Where the worker stands (in the light)
Utilization of moveable barriers to protect flagger
Attenuator
Lights may attract intoxicated drivers.
Added lighting in workzone
Lighting
Have a sign turning vehicle yield to ped
Rumble strips
Request Local PD to increase DUI check points on surface streets near projects
Having alcohol checkpoint before workzone
ASTA certification
Add pilot vehicle to reverse traffic control
Plan exit/evacuation strategy
Certified Flagger training
Proper training for flaggers highlighting appropriate escape routes and adequate PPE.
Speed reduction
Invest to get more CHP officers dedicated to COZEEP. They don't have enough officers.
ATSA certification - national
Vehicle closure positive protection buddy system lighting up the worker
Employee training, communication, company/employee culture enhancement
Was day work a viable option? Did anyone ask?
Body position facing traffic
Implement positive protection. Day work should have been an option.
Communication is also critical. Making people aware that this happened to put people on guard for this particular type of incident
Training
Use speed reduction
Should day work be considered when you have too many decision points, i.e., Intersection
Pilot car to slow down traffic?
Situation awareness for flagger such as have an escape route
Person working must have training/experience/important role
DUI checkpoints

Certification needs to be a requirement
Positive protection for flagger
More consideration for full closures
Training required - must be certified as flagger - must know about escape route
Revisit full facility closures
Run COZEEP speed break round robins
4. WAZE warn people that traffic ahead. Advanced warning
Positive protection is the only effective measure to prevent uncontrolled entry in work zones.
Stiffer penalties for work zone intrusion/collisions
CHP check points near construction zones
Two CHP. One in each Direction
2 CHP officers
2 CHP officer
Placement of CHP with flashing lights; increase COZEEP
CHP needs to be visible
2 CHP officers





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Case Study 3 & 4

Be Aware, Be Smart – Safety Starts with You

Recommendations	Votes
Full Closure	46
Provide 1. Full Closures or 2. Positive Protection (moveable Barrier) Find ways to slow down traffic and more daytime work	37
use of mobile barriers or other positive protection	31
During design Phase, begin to implement 8 foot min shoulders structurally handle traffic to be proactive to provide future buffer lane availability.	20
Implement pilot vehicle control	20
Establish zero tolerance enforcement zone for double fine in the work zone	19
Implement CHP escort patrol	19
#4 - Additional warning or intrusion alarms	17
slow down traffic -CHP -pilot cars	16
#3 - Median Crossover lane closures when buffer lane is not possible	16
using COZEEP for reducing speeds	15
Use larger cones (42")	15
Advanced warning system to change driver behavior - rubber strips to slow them down.	15
Mobile Barrier (Balsie Beam)	14
Need guidelines for COZEEP behavior and enforcement.	13
Crossover installed (mobile barrier system) prior to workzone moving all traffic to oncoming lanes. Mobile barriers.	13
Use contractor vehicles to help control speed, pilot car. Also allow for longer lane closures	12
Speed reduction to 35 mph as the "survivability" data shows	12
reduce the width to 10 ft. of the open lane to provide a buffer	11
Unsafe Speed. Automated speed enforcement.	11
Implement Speed Reduction strategies, COZEEP placement	10
Close entire freeway if possible.	10
Use temp barriers	10
6' buffer needed	9
Utilize outside shoulder to create buffer	9
Develop technology to remove the employee or implement technology to protect the workers on foot. Positive protection	7
Utilize outside shoulder to create buffer	6
Move work to a weekend Shift	5
eliminate raking on joint -tapered notched joint?	5
Crash cushions closer to crew. Second Set of cushions	1

(No votes – Grouped by Speed Reduction Recommendations, Worksite, and Training/Processes)
Speed Reduction
reduce speed limit
Speed reduction
Speed Reductions more than 10 mph
Slow down traffic in closure
Speed Reduction
Reduce Speed
Speed reduction to 35 mph as the "survivability" data shows
Proactive speed enforcement by CHP
Better speed reduction measures
Longer lane closures can create longer que which will slow down traffic
Ask Cozeep to slow traffic down through work zone main line traffic and offramps
Change behavior and awareness of work zones. Decrease speed further.
Slow down the speed in work zone (e.g. rumble strips)
COZEEP to do rolling side to side to slow traffic. COZZEP not to be stationary
Pilot car to meter speed
Further reduction of speed limit in the work zone
Implement Speed Reduction strategies, COZEEP placement
use of pace car to manage traffic & speed
#3 speed is issue buffer use shoulder if available.
Pace Cars slowing Traffic
positive barrier
Increase Buffer Space use Shoulder if no lane available
full freeway closure
detection system
Use more positive protection (e.g., barrier vehicles) to provide more worker protection
Positive protection - k rail even if it is difficult. Put workers behind a barrier, cones do not provide enough
Mobile Barrier (Balsie Beam)
Beef up the shoulder (wider and stronger) to create the buffer for two-lane freeway during construction
Movable crash Cushions
Utilize outside shoulder to create buffer
Use Shoulder
Closer cone spacing
Shift traffic toward the median shoulder to create buffer
It seems like we can decrease the spaces between cones
Create the zone from interchange to interchange with full closure
Use temp barriers

Need buffer
use off ramp as detour (incident #4)
Shadow vehicle/mobile barrier
Positive Protection / Moveable Barrier
Increase buffer space where possible
positive protection
Positive barriers always
use of Movable Barrier
Use mobile barriers to protect workers on foot. (Balsey Beam)
Rumble Strips
closer cone spacing
traffic drums in lieu of cones
advance traffic with pilot vehicle
Enhanced Driver training and enforcement of traffic laws - more stringent laws, lose license. Stronger penalties.
Cozeep was present but did not seem effective. Is it possible for them to have the radar gun out or some deterrent
Having cozeep drive in the lane at a slow speed might help
Both incidents were due to public parties - poor driving.
More frequent inspection of traffic control devices and roadway conditions and/or debris
Use CHP to round robin traffic through the work zone
Need guidelines for COZEEP behavior and enforcement.
Proper enforcement
Implement more full closures for high-risk jobs. Remove the public factor.
Close road when no buffer lane, or use COZEEP as pace cars if closure not possible
Possible multiple COZEEP units at random construction zones for periodic/ random heavy enforcement.
Use CHP in better positions
Stopping traffic -- metering through-put
CHP traffic breaks
Use pilot car
Safety Experts review projects under closure
While specs were followed, still had an intrusion. Problem is vehicles continue to travel at high speeds.
Joint training to educate on speed zone reduction
Force congestion by use of COZEEP round robin
Implement CHP escort patrol
Implement pilot vehicle control
Buffer Full Closure
More COZEEP
Additional COZEEP

CHP round robins to reduce speeds or "roving strategy"
More full closures
2 Cozeep available, 1 for the blue lights as vehicles approach, 1 for enforcement
Technology to disconnect cell phones? - limit usage in work zones
More frequent debris removal and sweeping
More enforcement by CHP
Education campaign on Distracted driving
Work "backward" so crews face traffic. Equipment in f
Designated a look-out and use a horn or method of communication for staff to jump to an escape route
Have crews coordinate
Increase fines in work zones
better driver educations of traffic zones
Monitor open lanes for debris
Full Closure
Address resources of partners
Driver Behavior/Distraction
Daytime work
Develop technology to remove the employee or implement technology to protect the workers on foot. Positive protection
Work zone intrusion alarms
Higher fines for work zone infractions
Daytime Closures
Evaluate traffic control plans to evaluate working signs and barrels at sections were highways and freeways split.
Full Closure
Technology to warn - social media/Waze. Enhance partnership with alerts - accuracy is important. Might have to penalize a contractor for last minute changes.
enhanced TTC at ramp locations to avoid driver confusion
allow for longer lane closures


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Voting Results


Community Recommendations
Use of mobile barriers or other positive protection
slow down traffic -CHP -pilot cars
6' buffer needed
Use larger cones (42")
Mobile Barrier (Balsie Beam)
establish zero tolerance enforcement zone for double fine in the work zone
#3 - Median Crossover lane closures when buffer lane is not possible
#4 - Additional warning or intrusion alarms
reduce the width to 10 ft. of the oper lane to provide a buffer
Full Closure
Close entire freeway if possible.
Utilize outside shoulder to create buffer
Unsafe Speed. Automated speed enforcement.
Use temp barriers
Implement CHP escort patrol
Implement pilot vehicle control
Community Recommendations
slow down traffic -CHP -pilot cars
6' buffer needed
Use larger cones (42")
Mobile Barrier (Balsie Beam)
Establish zero tolerance enforcement zone for double fine in the work zone
#3 - Median Crossover lane closures when buffer lane is not possible
#4 - Additional warning or intrusion alarms
reduce the width to 10 ft. of the open lane to provide a buffer
Full Closure
Close entire freeway if possible.
Utilize outside shoulder to create buffer
Unsafe Speed. Automated speed enforcement.
Use temp barriers
Implement CHP escort patrol
Implement pilot vehicle control

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Case Study 5

Be Aware, Be Smart – Safety Starts with You

Recommendations	Votes
Automated equipment for removal of debris	37
use CHP for traffic break	33
1. Training on position of employee 2. attenuator closer to barrier 3. on wide medians have two attenuators 4. use separate crew to do work rather than the attenuator driver (use radio communication)	27
Another vehicle next to attenuator to close opening (required for area being protected is greater than 20')	23
Additional shadow vehicle	21
Use two attenuator trucks. 1st one within 3 feet of concrete barrier, 2nd one slightly back of the 1st and between 1st attenuator truck and live traffic	20
Collaborate with the auto industry to implement technology for safety culture. Example geofence of workzone and/or kill switch for errant vehicles	19
1-new technology to set up or clean up with robotic arms 2- minimize exposure for set up or cleanup process 3-more CHP presence even with short period work 4-cultural shift in public awareness of work zones	18
CHP rolling closure	18
MAZEEP on shoulder	17
Add another Attenuator & Arrow Board in advance	16
Vehicle placement	15
CMS sign on the (TMT) truck in advance of closure	14
Audible warning device on the attenuator truck, could be automated or manual. Work zone app alert.	14
Portable barrier	13
'-education -driver awareness'	13
mobile barrier	13
Equip Auto arm to Attenuation Truck so that there's one vehicle	12
Advanced warning - rumble strips far in advance to "wake up" the drivers. To make them aware - social media/apps to give warnings of construction zones. Beeping sound or alarm to notify of speed as approaching work zone. Those with repeated speeding tickets have device in vehicle to monitor speed.	11
Use more positive barriers	11
Employee use radio to communicate, train staff to not stand and talk in the work zone	10
Use buffer lane	10
Complete protection of median. No space for vehicle passing. K-rail or multiple TMA's	10
Ticketing for illegal dumping, littering. Use cameras for enforcement	8
speed reduction -enforcement -traffic calming	8

Temporary scrambling devices for work zones; go back to radios	2
(No votes – Grouped by Technology, Worksite, and Training/Processes)	
Link portable radar feedback devices with vehicle GPS or cell phone app.	
Dual operator controls in attenuator truck so operator has option of controls	
Automated ways to perform work	
Use more machinery instead of personnel (e.g., cone picking devices)	
Kill switch for errant vehicles into the workzone	
Automated debris pickup!	
Lane detection on all vehicles	
Add 'waldo arms' to the front of the sweepers to pick up and stow large debris	
Automated equipment for removal of debris	
Sole Source challenges to purchasing innovative equipment	
Automated arm/bucket to grab debris.	
use hands free headsets between shadow vehicle and workers	
Automated work zone intrusion devices	
Equip Auto arm to Attenuation Truck so that there's one vehicle	
Navigation app alert of work zone (iCone, smart arrow board, PCMS)	
Technology to slow down vehicles in the workzone (geofence)	
different equipment to collect debris	
using tech/new equipment	
Temporary scrambling devices for work zones; go back to radios	
Employee use radio to communicate, train staff to not stand and talk in the work zone	
Positive barrier protection.	
Attenuator plus rolling barricade.	
Mobile barricades that render the vehicle inoperable	
Use more positive barriers	
Attenuator last line of defense out far enough behind the work	
Use of multiple TMA's side by side to protect entire intrusion area (CO #1 if additional to plans)	
Second attenuator truck to block entire median	
Increase signage	
Increase use of buffer lanes	
Use Balsi beam or other positive protection	
More CMS signs	
Use buffer lane	
Do a #1 lane moving lane closure to increase buffer in work area	
Rumble strips along median shoulder. If not present, take additional precautions when working in the median	
Maybe add shoulder closures ahead of work	
PCMS in advance Lane closed Ahead message	
Angle shadow vehicle while on a curve	
Double up on attenuator vehicles	

Mobile Barriers
advanced mobile CMS in addition to shadow vehicle
Crash cushion Operator Certification/Training
COZEEP/MAZEEP ticketing
MAZEEP support
Mazeep/Cozeep even for mobile short duration operations
COZEEP/MAZEEP even for maintenance functions regardless of time frame
Stagger MAZEEP and attenuator truck to minimize intrusion
Increase training for crews for specific conditions
Ensure there is always a designated lookout
Minimize exposure for set up or clean up process
multiple shadow vehicles
Close the number 1 lane increase buffer
Full closure
CMS Truck prior to attenuator, warning traffic of work in the median
Awareness of location of Attenuator. Gap too large
Face traffic, plan escape routes
utilize CHP traffic breaks
Separate driver for attenuator stays in vehicle
enhanced information/education to the public re: distracted driving
enhance the Move Over message /campaign and increase enforcement
Rolling closure by CHP
Close ramp for short period of time.
Ticketing for illegal dumping, littering. Use cameras for enforcement
Better guidelines /training for crews
More protection, even with mobile operations and short term jobs.
CT pay under CO #1 for additional measures to protect work zone if not accounted for in the plans (additional TMA's in this instance)
Reduced speed zone
CHP provide traffic break
Training/incident discussion/close call
Too little reaction time to make a spotter effective
Full Closure
safety tailgate meeting to reinforce safe practices
Additional shadow vehicle
Seemed to be a blind-spot of drive. No rear view mirror or an open bed. Get rid of side boards


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#5
Voting Results


use CHP for traffic break
Use buffer lane
Additional shadow vehicle
Vehicle placement
Portable barrier
MAZEEP on shoulder
Equip Auto arm to Attenuation Truck so that there's one vehicle
Automated equipment for removal of debris
Use more positive barriers
-education -driver awareness
mobile barrier
speed reduction -enforcement traffic calming
CHP rolling closure
Add another Attenuator & Arrow Board in advance


Use buffer lane
Vehicle placement
MAZEEP on shoulder
Portable barrier
Automated equipment for removal of debris
Use more positive barriers
-education -driver awareness
mobile barrier
CHP rolling closure
Add another Attenuator & Arrow Board in advance

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Safety Award Recommendations

Be Aware, Be Smart – Safety Starts with You

Top Three Selected from Each Group
Above and beyond award recognize contractor (and maybe CT/Contr team) examples: - crane safety in which decisions were made by someone other than super to determine if work should proceed e.g., due to weather - dedicated safety manager when not required by specs - additional flaggers/traffic control - partnering charter with extra emphasis on safety which changes project culture related to safety
new uses for existing technology
incentives for safety above and beyond specs
Osha recordable rate less than a threshold
Awards should have a tiered structure similar as Partnering Awards.
Mid-day event similar or concurrent with the Workers Memorial Ceremony
survey from project team members, inclusive of all subcontractors re: safety of work area; Positive score if timely resolved issues
Develop a project Safety score.
Lessons learned if incidents or near misses happen and how those changes were implemented into the project
innovative Technology, work methods, materials
Metric to track training program that is project specific, including the utilization of JHA
Innovation safety award, contractors who pilot new products
Overall Safety Project Award All factors of safety to be considered that are tied to: - All project safety and public convenience specs - Safety Regulations e.g., CalOSHA - Compliance with Safety Std plans - Innovative contribution to enhance work zone safety -risk assessment and mitigation All these would be weighted/ measurement. Example CEM 0606- Safety checklist.
Have an award based on risk categories for example Traffic Control, Lane Closures, Fall Protection...etc.
Contractor initiated innovation to enhance safety
Have tiers that award contracts at smaller contract budgets
Identify scoring criteria for level of Risk of the project use a weighted criterion (travel volumes, complex operations, limited traffic windows)
Set tiers for safety-related company recognition, e.g., Premier, Gold, etc. Decal on helmet, truck.
Ensure that the job has a specific COSP for each item of work.
Post on jobsite Safety-related information
Innovation safety award (employee -grass roots contractor and CT) implemented ideas by CT statewide are awarded
Award Tiers: Project Development Safety Awards for each Internal Division (Planning, Environmental, Design, Traffic Operations, Construction and Maintenance)
Award Tiers: Gold, Silver, Bronze based on score/points received w/ Best in Class Gold Winner
Award/portion of application focused on safety focused specification changes implemented or developed

Statewide Contractor Summit with safety awards, partnering awards, safety summit and presentations on other related/innovative construction ideas/practices/topics. Other states have similar events.
Criteria (AGC uses): 1. company mgmt commitment 2. active ee participation and buy in 3. safety training 4. hazard ID and control (JHA) 5. safety program innovation
Safety Helmet Sti
Pilot projects and adopted enhancements
Award for recognizing excellence in safety.
Award for identifying a leading indicator and their solutions
Tracking of near misses and the trend throughout progress of the project.
Award tiers: bronze, silver, gold, platinum based on # of criteria met
Contractor award for introduction of new safety innovations such as implementation of safety technologies to enhance safety, most innovative safety training.
Incentive for positive behavior. Make it a team effort. Collaborative vote by all project members - make it a competition. Most Valuable Safety Partner (MVSP) Safety Innovation VECP
Recognizing companies or individuals that are going above and beyond normal expected safety protocols, such as utilizing media outlets to inform public on our purpose.
Best Contractor proposed improvement
Best overall team - Prime & Subcontractors
1. Pre-Planning with focus on safety 2. Pre activity mtg with JHAs 3 Submittal of preplanning/ work plan and JHAs
Rewards based on pro-active safety measures/programs that identify risks and corrective measures.
Measurement of contractor's management commitment to strong safety culture. Develop score card
Award Contractors and not Project
Insurance company ex-mod rating.
safety vecps
Reward Attitude and Culture
Conversation needs to be around what is the safest number of crews to do a job rather than what is the fewest number of crews to get the job done. Change the mindset - Safety First then Efficiency
Measure of number of recordables / incidents and lost time compared to duration of project or worker hours. Goal of zero incidents and zero lost time (possibly use TRIR Total Recordable Injury Rate as the KPI)
Create checklist to verify safety activities quarterly? Checklists may include: Equipment Ladders Cranes Excavations Boom equipment, etc
joint & independent safety teams
Quantitative Proof of a culture of safety
Percentage of Weekly Safety Inspections Submitted/Completed with Caltrans and Contractor
Separate award for PIO campaign, expand funding for public awareness
Partnering Innovation specifically related to safety through the use of minimize exposure (i.e. Engineering Controls or Changes in Procedures). Ability for Caltrans and Contractor share credit
Category based on no lost times and would vary depending on the number of manhours
Cost, duration, complexity adds to the exposure
Safety partnering meeting between contractor & Caltrans. Scorecard to measure that event.
Number of Safety VECPs Approved and Implemented
Zero Fatalities Lost Time Recordable Injuries

Individual / Agency/ Project Awards
zero Lost Time based on Workhours

Categorized Safety Award Recommendations

Methodology
survey from project team members, inclusive of all subcontractors re: safety of work area; Positive score if timely resolved issues
Develop a project Safety score.
Lessons learned if incidents or near misses happen and how those changes were implemented into the project
Osha recordable rate less than a threshold
Metric to track training program that is project specific, including the utilization of JHA
Have an award based on risk categories for example Traffic Control, Lane Closures, Fall Protection...etc.
OSHA safety metrics, incident rate, lost day rate, etc.
recognition by public or other agencies of project safety social media polls (most positive project rating is awarded)
Safety Award a broken into types and # of locations of work
daily safety meetings
Tracking of JHA on project and utilization of it on the project.
Demerit if specifications are not followed (i.e., lane closures not picked up on time, working outside the windows)
Quarterly basis - meet and assess project. give MVP safety award. individual or team. Give some form of recognition - team vote
Look at things from a positive perspective instead of punitive.
Safety innovation already in place - give it a 60/40 VECP. should be ongoing, no time limit or quantum limit
Bring Back R-OCIP (CT Spec from 2012 in NR
Gather 3-year incident rate history; TRIR, LTIR, and DART rate
Tracking of near misses and the trend throughout progress of the project.
Conversation needs to be around what is the safest number of crews to do a job rather than what is the fewest number of crews to get the job done. Change the mindset - Safety First then Efficiency
reporting of safe/good work habits
Are SSP being implement and enforced?
incentives for safety above and beyond specs
Structure
Awards should have a tiered structure similar as Partnering Awards.
Have tiers that award contracts at smaller contract budgets
Identify scoring criteria for level of Risk of the project use a weighted criterion (travel volumes, complex operations, limited traffic windows)
Example: Project Value Based
Set tiers for safety-related company recognition, e.g., Premier, Gold, etc. Decal on helmet, truck.
Award Tiers: Project Development Safety Awards for each Internal Division (Planning, Environmental, Design, Traffic Operations, Construction and Maintenance)

Award Tiers: Gold, Silver, Bronze based on score/points received w/ Best in Class Gold Winner
Award tiers: bronze, silver, gold, platinum based on # of criteria met
Measurement of contractor's management commitment to strong safety culture. Develop score card
Insurance company ex-mod rating.
Measure of number of recordables / incidents and lost time compared to duration of project or worker hours. Goal of zero incidents and zero lost time (possibly use TRIR Total Recordable Injury Rate as the KPI)
Create checklist to verify safety activities quarterly? Checklists may include: Equipment Ladders Cranes Excavations Boom equipment, etc.
Categories of Projects (such as Size, Cost, working days, risks,
Application is scored like Partnering Awards - Gold, Silver, Bronze. Contractor and CT fill out together
Consider size of project, percent of traffic in live traffic
Consider good public notification strategies as a category
Partnering-based categories on how the project team made the work site safer
Systematic awards like Partnering awards
Partnering awards ceremony in Sacramento modelled after the Partnering; look at proactive steps, number of incidents, joint meetings, etc.
If contractor uses subs, then need to document that all subs were involved in the safety planning of that job 1. Reviewed scope of work 2. provided a safety plan
Daily safety meetings, are they recordable, Safety in the planning process, we focus on efficiency Sub contractor if CT not involved can be difficult, going over hazards on new procedure job hazard analysis
Checklist for all criteria: who has most qualified for award (JHA, reviews/safety meetings/innovations/enhancements
Annual partnering awards - make safety award part of it. Make it as the number 1 recognition, before project partnering award. Give it priority over other awards.
Contractor has specific safety rating at bid time; give advantage points for higher safety rating in bid like small business; rating has to be a certain level to be considered for the process. Establish a threshold for safety before being eligible to bid. Not just all prices driven.
Tier by Project Size $$$
Innovation Category
Tier by Project Duration
Tier by Construction zone duration - Long term closure (# of days), long duration (55 hours)
Align goals and criteria with CT Strategic plans
Have an award with multiple criteria
Categorize contractors by industry trade group specialty.
Categorize contractors by No. of work hours logged each year
OSHA citation history
Contract Type of Award: Exposure (i.e. Paving vs Structure)
Contract Required Document Submittal Percentage
Caltrans and Contractor Partnering Quarterly Meetings
Joint Daily Safety Meetings with Caltrans
Major Project Award
Project Category

Incentivizing Safety? How?
Based on $$$ Value
Smaller Project Award
Carrot and stick award criteria
Cost, duration, complexity adds to the exposure
Individual / Agency/ Project Awards
Collaboration
amount of active involvement for all subcontractors; scoring for collaboration
Partnering Safety Award
Best Team Collaboration
Safety commitment and partnering activities with Caltrans
Partnering Innovation specifically related to safety through the use of minimize exposure (i.e. Engineering Controls or Changes in Procedures). Ability for Caltrans and Contractor share credit
Safety Partnering Award
Communication
Separate award for PIO campaign, expand funding for public awareness
Safety Communication, acknowledgement of safety concerns on the project and elevation of the risks
Compliance
Overall Safety Project Award All factors of safety to be considered that are tied to: - All project safety and public convenience specs - Safety Regulations e.g. CalOSHA - Compliance with Safety Std plans - Innovative contribution to enhance work zone safety -risk assessment and mitigation All these would be weighted/ measurement. Example CEM 0606- Safety checklist.
Ensure that the job has a specific COSP for each item of work.
Percentage of Weekly Safety Inspections Submitted/Completed with Caltrans and Contractor
Award for conducting continuous and effective safety tailgate meetings.
Weekly Project Safety Meetings
JHA's (pre-activity mtgs.)
Safety reviews prior to activities
Consistent 100% compliance safety meetings
100% compliance with Operational/Safety Reviews
Meeting or exceeding goals established in Partnering Charter
Safety Training up to date
Percentage of Weekly Safety Inspections Submitted/Completed with Caltrans and Contractor
Weekly Safety Meetings Submitted
Culture / Equity
Reward Attitude and Culture
Quantitative Proof of a culture of safety
Equity criteria and/or EEO surveys
Excellence
Award for recognizing excellence in safety.
Award for identifying a leading indicator and their solutions
safety vecps

Number of Safety VECPs Approved and Implemented
Individual Award for new / innovative / above & beyond Idea Consideration for each trade
job tidiness
and $ of CCO issued to implement safety enhancement and/ or innovation.
Identification of established procedure requirements which exceed the minimum Specifications
Joint award between Caltrans and the Contractor for exceeding the minimum Specifications regarding safety
Enhanced PPE use
Training above and beyond minimum
Above and beyond award recognize contractor (and maybe CT/Contr team) examples: - crane safety in which decisions were made by someone other than super to determine if work should proceed e.g. due to weather - dedicated safety manager when not required by specs - additional flaggers/traffic control - partnering charter with extra emphasis on safety which changes project culture related to safety
Recognizing companies or individuals that are going above and beyond normal expected safety protocols, such as utilizing media outlets to inform public on our purpose.
Accident reduction
Recognize teams that are going above and beyond
Traffic Control Award
Safety Documentation and speed in addressing safety issues
Safety of the Traveling Public in the Construction Zone
Implementation
Award for Organization or implementation of new technologies to enhance safety.
Innovative safety ideas implemented within the construction work zone
Innovation
innovative Technology, work methods, materials
new uses for existing technology
Innovation safety award, contractors who pilot new products
Contractor initiated innovation to enhance safety
Innovation safety award (employee -grass roots contractor and CT) implemented ideas by CT statewide are awarded
Contractor award for introduction of new safety innovations such as implementation of safety technologies to enhance safety, most innovative safety training.
Incentive for positive behavior. Make it a team effort. Collaborative vote by all project members - make it a competition. Most Valuable Safety Partner (MVSP) Safety Innovation VECP
Partnering Innovation specifically related to safety through the use of minimize exposure (i.e. Engineering Controls or Changes in Procedures). Ability for Caltrans and Contractor share credit
Innovation safety award (project related) judged by panel based on write up of how safety was improved
# of innovative ideas implemented by team
Steps taken to address recognized safety hazards
Award for use of new technology in safety.
Award for the most innovative employee safety training
Award for excellence in creating a better Code of Safe Practices that is project specific.

Award for extraordinary effort for a safety related issue
Safety coordinator award
Contractor Safety Innovation Award
Innovative training
Innovation used in project
Best Idea to Reduced Exposure
Creative accommodation of Bikes and Pedestrians
Innovation Award
Minimize baseline exposure (i.e., implementation of elimination or engineering controls, using k-rail, or changing from 10 day operation into a 7 day operation)
Project with the best innovation implementation
Use of innovative technology, find ways to overcome challenges to getting timely approvals
Successful with No Incidents
Category based on no lost times and would vary depending on the amount of manhours
Zero Fatalities Lost Time Recordable Injuries
zero Lost Time based on Workhours
effective traffic control/detours placed and maintained safely
Safety record - normalize by hours of operations for the project
include Equipment loss/damage as part of criteria
shut down time due to safety issues or incidents
# of accidents. # of crashes did project meet project safety requirements
zero injuries/accidents during construction period
Recognition for safety on projects
Time without a safety related incident. Reward/recognition for safer practices.
Manhour Dependent/ Manhours without a Lost Time Incident/ Lost Time Incident Rate
Incident Rates/Quantity
Category based on no lost times and would vary depending on the amount of manhours
Number Manhours
Few to none incidents, injuries
Leading indicators, near miss reporting
Tracking close calls or near misses and recognize/reward what kept it from being an injury. Recognize prevention.
Miscellaneous
Criteria (AGC uses): 1. company mgmt commitment 2. active ee participation and buy in 3. safety training 4. hazard ID and control (JHA) 5. safety program innovation
Best overall team - Prime & Subcontractors
1. Pre Planning with focus on safety 2. Pre activity mtg with JHAs 3 Submittal of pre planning/ work plan and JHAs
Rewards based on pro-active safety measures/programs that identify risks and corrective measures.
Award Contractors and not Project
joint & independent safety teams
Safety partnering meeting between contractor & CalTrans. Scorecard to measure that event.

How to Award
Mid-day event similar or concurrent with the Workers Memorial Ceremony
Post on jobsite Safety-related information
Statewide Contractor Summit with safety awards, partnering awards, safety summit and presentations on other related/innovative construction ideas/practices/topics. Other states have similar events.
Personalized billboards so traveling public sees the workers as human beings
Publicize safety of project
Helmet stickers for safety
Certificate or other award, e.g. mug
Annual Safety Award Dinner where companies/teams submit safety-related information
Team recognition
Public Outreach to communicate award winners
Recognition with $$$$
Monthly Safety Board - Recognize/provide public praise to projects or members of a project team.