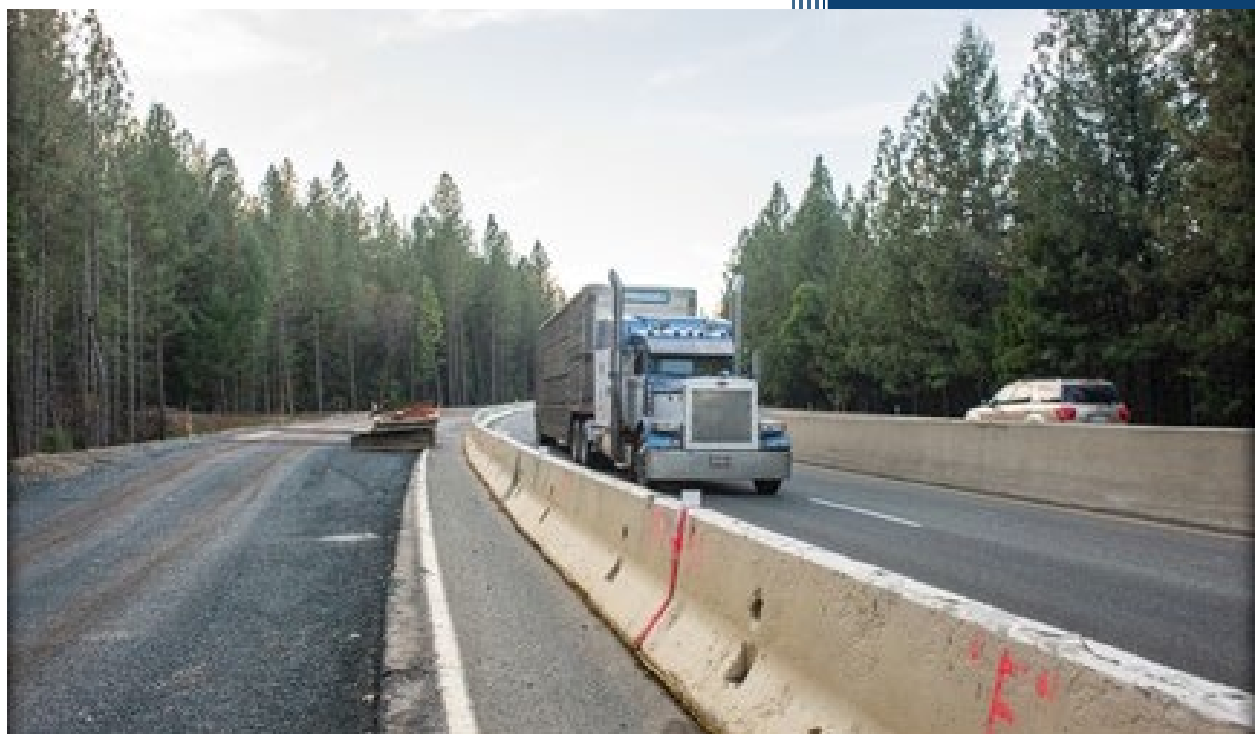


POSITIVE PROTECTION MEASURES



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Report to the Legislature

2024

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Executive Summary

The California Department of Transportation (Caltrans) is committed to providing safe and efficient work zones for the traveling public, as well as Caltrans employees and contractors working on the State Highway System. To this end, Caltrans has multiple safety campaigns to alert drivers and increase public awareness of worker safety: California's Move Over Law, Be Work Zone Alert, and Slow for the Cone Zone. Caltrans also utilizes positive protection measures.

Positive protection measures are used to avoid traffic collisions in work zones. Examples include movable and temporary steel barriers, movable concrete barriers, traditional concrete barriers, crash cushions, and other strategies. The intent is to use approved positive work zone protection devices or mitigation measures in public works projects on the State Highway System.

The purpose of this report is to provide findings and recommendations on the use of positive protection measures as required by **Assembly Bill (AB) 759 (Bigelow, Chapter 617, Statutes of 2019)**.

This report covers the period from January 2022 through June 2023. During this period, 819 projects were awarded, of which 569 (approximately 70 percent) plan to use positive work zone protection measures. Confirmation of complete deployment and assessment of the effectiveness of these measures will be conducted in 2027. This timeframe accounts for the typical 10-month period between project award and installation of positive work zone protection measures, as well as projects involving multi-season stage construction that may continue for several years.

AB 752 (Rubio, Blanca, Chapter 813, Statute of 2023) directs Caltrans to prescribe standards and specifications requiring the appropriate use of positive work zone protection on all covered activities on the State Highway System.

Caltrans developed and published Design Information Bulletin 91, "Guidelines on the Use of Positive Work Zone Protection and Mitigation Measures," on June 28, 2021. Design Information Bulletin 91 requires an evaluation of the need for positive protection measures on all projects on the State Highway System delivered on or after January 1, 2022.

Caltrans continues to make improvements to positive protection measure guidelines by partnering with our stakeholders and ensuring that positive protection measure policy and standards are continuously implemented and applied uniformly.

Background

Statutory Reference and Purpose

In AB 759, the Legislature found and declared the following:

- 1) People who construct and maintain California's roads and transportation infrastructure deserve a safe working environment and to be protected from preventable injury and death. Therefore, protecting construction and maintenance workers is a high priority.
- 2) Requiring the Department of Transportation to specify the appropriate use of positive protection measures, as described in subdivision (a) of Section 92.1 of the Streets and Highways Code, and to provide compensation for optional safety devices when requested by a contractor on a public works project will greatly reduce preventable injuries and deaths to construction and maintenance workers and drivers.

AB 759 requires Caltrans to update guidance by July 1, 2021, to specify the appropriate use of positive protection measures with the goal of isolating workers or work zones from traffic. AB 759 also requires Caltrans to provide compensation for the use of a safety device when requested by a contractor on a public works project.

AB 759 is the State analog of Subpart K of Title 23 Code of Federal Regulations (CFR) 630.1106, which requires consideration of road user and worker safety on Federal-aid projects on all agency's policies and procedures. It states:

- (a) Each agency's policy and processes, procedures, and/or guidance for the systematic consideration and management of work zone impacts, to be established in accordance with 23 CFR 630.1006, shall include the consideration and management of road user and worker safety on Federal-aid highway projects. These processes, procedures, and/or guidance, to be developed in partnership with the [Federal Highway Administration (FHWA)], shall address the use of Positive Protection Devices to prevent the intrusion of motorized traffic into the work space and other potentially hazardous areas in the work zone; exposure Control Measures to avoid or minimize worker exposure to motorized traffic and road user exposure to work activities; Other Traffic Control Measures including uniformed law enforcement officers to minimize work zone crashes; and the safe entry/exit of work vehicles onto/from the travel lanes. Each of these strategies should be used to the extent that they are possible, practical, and adequate to manage

work zone exposure and reduce the risks of crashes resulting in fatalities or injuries to workers and road users.

Caltrans began implementing AB 759 (see Implementation Status section) in 2020. The legislation requires compensation for the use of optional safety devices when requested by a contractor on a public works project.

AB 752 directs Caltrans to prescribe standards and specifications to require the appropriate use of positive work zone protection on all covered activities on the State Highway System as a permanent solution. (See Implementation Status section.)

Program Background

Caltrans continues to make safety its top priority by continually striving for enhancements to highway worker safety, and Work Zone Safety has been identified as one of the challenge areas in the 2020-2024 Strategic Highway Safety Plan.

The following are the safety enhancements pertaining to positive protection measures that are currently being implemented:

- Improvements to the buffer lane specifications, which provide for more space between the workers and traffic by requiring adjacent lanes in certain conditions to be closed to traffic.
- Specifying the use of impact attenuator vehicles when conditions and contractor operations do not allow for a buffer lane.
- Specifying, whenever possible, the use of temporary barrier systems between traffic and construction workers, including requirements for clear width on the work zone side of the temporary barrier.
- Improving guidance on when to use temporary movable barriers during construction.
- Expanding the duration of the allowable work window and length of lane closures to allow workers more production time each shift. This helps complete projects faster, thereby lessening the exposure to workers.

Guidance Rollout

Caltrans, in consultation with FHWA, developed Design Information Bulletin 91: "Guidelines on the Use of Positive Work Zone Protection and Mitigation Measures" which was published on June 28, 2021, with an implementation date of January 1, 2022. It is to be used by all projects within the State Highway System.

The bulletin provides guidance on applying positive work zone protection and mitigation measures in projects on the State Highway System. Federal regulations define positive protection measures as devices that contain and/or redirect vehicles and meet the crashworthiness evaluation criteria contained in the National Cooperative Highway Research Program Report 350 and the Manual for Assessing Safety Hardware (MASH).

The guidance requires that an engineering analysis be performed by a licensed civil engineer during design development for each applicable project to determine if the use of positive protection measures is required. Mitigation measures may also be used in lieu of positive work zone protection devices when it is determined that placing a positive work zone protection device may cause more exposure than not placing a positive work zone protection device. The guideline allows modifications to positive protection measures during construction with required documentation.

Caltrans employees were trained on using positive protection measures guidelines, and new employees will receive recurring training.

On March 15, 2021, Caltrans issued the Construction Procedure Directive 21-4, Work Zone Positive Protection which provides suggestions on various types of positive protective measures that can be utilized in construction projects, such as temporary concrete barriers and steel barriers, mobile and moveable barrier systems, and impact attenuator vehicles. Caltrans evaluates each ongoing project, and if the department deems positive protection measures are beneficial, Caltrans allows the contractor to submit a change order to implement positive protection on the project.

Implementation Status

Caltrans analyzed all awarded projects between January 1, 2022, and June 30, 2023, to identify projects that included positive work zone protection devices. Based on the bid items related to positive protection measures, all State highway projects that were advertised and included positive protection measures in the bidding package were identified. In addition, maintenance activities and encroachment permit projects that deployed positive protection measures were recognized. Projects where positive protection measures were added and deployed during construction with a change order were also identified. Available data and information yielded the following:

- Of 819 awarded projects, 569 projects included positive protection measures in the bidding package.
 - 30 of the awarded projects added positive protection measures and deployed them during construction at an additional total cost of \$2 million across all 30 projects.
- 13 maintenance projects performed by Caltrans employees deployed positive protection measures.
- 48 encroachment permit projects deployed positive protection measures.

Although assessment of the full effectiveness of positive protection measures will require more time, Caltrans employees and contractors acknowledge the importance of having more access to innovative positive protection measures after the implementation of Design Information Bulletin 91. Figure 1 below shows a mobile barrier system, which can be deployed and removed quickly while protecting workers.

Figure 2 shows a movable barrier system that provides the benefit of continuous work protection while accommodating directional traffic volume demand during rush hours.



Figure 1: Mobile Barrier System



Figure 2: Movable Barrier System

Implementation of AB 752

Following the passage of AB 752, Caltrans will update policies to expand the use of positive protection measures. Caltrans is currently finalizing its AB 752 Implementation Plan, developing additional oversight guidance, and considering changes to the California Manual on Uniform Traffic Control Devices.

Caltrans is currently aligning staff resources to implement AB 752 and has started to identify policies and procedures that need to be drafted or updated. A plan for engagement with communities, industry, and other stakeholders is being developed. These efforts are expected to be completed by 2027. Following the release of these updated policies, Caltrans will incorporate these changes into operating manuals and begin using updated positive protection measures in the encroachment permit process for projects on the State Highway System.

As policies are updated, Caltrans will continue to review and research new temporary safety devices, including temporary barriers and work zone intrusion warning systems. Caltrans will use its existing processes to review new safety devices for approval and will continue to develop new guidance, including bid item codes for the implementation of these products.

Findings

When the implementation of Design Information Bulletin 91 began, some projects already under development required revisions to their design plans to include positive protection measures. The change orders to add positive protection measures on the 30 projects resulted in an additional total cost of \$2 million. New projects now consider positive protection measures in the early project development phase, and thus, associated costs are incorporated into the project programmed budget.

Data shows that 70 percent of the projects awarded between January 1, 2022, and June 30, 2023, implemented positive work zone protection measures.

Project development staff provided positive feedback on the Design Information Bulletin 91 training. Caltrans recognizes that recurring training would benefit the staff and ensure continued implementation of the positive protection measures.

Recommendations

While 70 percent of projects awarded between January 2022 and June 2023 plan to use positive protection measures, a small subset of the awarded projects have deployed positive work zone protection measures since January 1, 2022. It is expected that the number of deployed projects will increase significantly over time, especially with the passage of AB 752. Caltrans has started working on the necessary steps to support the implementation of AB 752 and expects to complete the implementation by 2027.

Caltrans will continue to evaluate new products and incorporate them into departmental policies and design standards. The following are the measures that Caltrans will continue to provide to enhance the effectiveness of the implementation:

1. Collect lessons learned from Caltrans staff on the guidance document and update the guidance to improve the process.
2. Conduct surveys with construction and maintenance workers as well as the industry to collect feedback on the deployment of the positive protection measures.
3. Develop performance metrics to measure the effectiveness and benefits of implementing positive protection measures.

Caltrans recommends continuing the implementation and monitoring of positive protection measures. The Highway Safety Features New Products Committee will continue to provide updates that will be publicly available.

Conclusion

Caltrans successfully delivered *Design Information Bulletin 91: Guidelines on the Use of Positive Work Zone Protection & Mitigation Measures* on time and continuously trains Caltrans staff to use positive protection measures appropriately to isolate workers and work zones from traffic. Caltrans continues to improve positive protection measure guidelines by partnering with stakeholders and ensuring that the policy and standards are implemented and applied uniformly.

Appendix A. Statutory Reporting Reference

STREETS AND HIGHWAYS CODE – SHC

DIVISION 1. STATE HIGHWAYS [50 - 897] (enacted by Stats. 1935, Ch. 29.)

CHAPTER 1. Administration [50 - 227.1] (enacted by Stats. 1935, Ch. 29.)

ARTICLE 3. The Department of Transportation [90 - 155.7] (amended by Stats. 1977, Ch. 579.)

92.1.

(a) The department shall update guidance by July 1, 2021, to specify the appropriate use of positive protection measures, including, but not limited to, automated flagger assistance devices, buffer lanes, impact attenuator vehicles, and temporary barriers, with the goal of isolating workers or work zones from traffic.

(b) Where the department's updated guidance allows, but does not require, use of a safety device, the department shall provide compensation for the optional safety device when requested by a contractor on a public works project of the department.

(c) (1) The department shall submit a report to the Legislature by January 1, 2024, in compliance with Section 9795 of the Government Code that includes findings and recommendations on the use of positive protection measures used pursuant to this section.

(2) The requirement for submitting a report imposed under this subdivision is inoperative on January 1, 2028, pursuant to Section 10231.5 of the Government Code.

(d) After the report required by subdivision (c) is submitted to the Legislature, the department shall prescribe standards and specifications that are consistent with the updated guidance developed pursuant to subdivision (a) to require the appropriate use of positive protection on all covered activities on the state highway system. In developing these standards and specifications, the department shall solicit input from relevant stakeholders, including, but not limited to, construction labor groups, contractors, utilities, local agencies, and community organizations.

(e) The department may adopt regulations as necessary or appropriate to carry out the purposes of this section. Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code shall not apply to any standard, criterion, procedure, determination, rule, notice, or guideline established or issued by the department pursuant to this section.

(f) (1) A contractor that has requested and received compensation for an optional safety device pursuant to subdivision (b) shall use the optional safety device in conformance with the department's guidance.

(2) The Division of Occupational Safety and Health, in consultation with the department, may adopt regulations as necessary or appropriate to administer and enforce paragraph (1).

(g) For purposes of this section, the following definitions apply:

(1) "Covered activity" means all construction and maintenance activities performed on a state highway right-of-way, including, but not limited to, utility work and repair activities.

(2) "Positive protection" means barriers or other devices placed between workers and motorized traffic that contain or redirect vehicles and meet applicable crashworthy criteria, as contained in Section 1A.13 of the California Manual on Uniform Traffic Control Devices.

(Amended by Stats. 2023, Ch. 813, Sec. 1. (AB 752) Effective January 1, 2024.)