

Date of Hearing: June 28, 2023

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY

Eduardo Garcia, Chair

SB 506 (Laird) – As Amended April 18, 2023

SENATE VOTE: 40-0

SUBJECT: Public Utilities Commission: railroads: colored pavements marking project

SUMMARY: This bill requires the California Public Utilities Commission (CPUC) to develop and implement a pilot project to test the efficacy of colored pavement markings at one or more at-grade highway-railroad crossings, if permissible under federal law or regulation, by January 1, 2026.

EXISTING LAW:

- 1) Provides the CPUC with the exclusive power to determine and prescribe the manner and terms of installation, operation, maintenance, use, and protection of specified railroad grade crossings. Authorizes the CPUC to supervise the operation of pilot projects to evaluate proposed crossing warning devices, new technology, or other additional safety measures at designated crossings, with the consent of the local jurisdiction, the affected railroad, and other interested parties. (Public Utilities Code § 1202)
- 2) Provides that no public road, highway, or street shall be constructed across the track of any railroad corporation at grade, nor shall the track of any railroad corporation be constructed across a public road, highway, or street at grade, nor shall the track of any railroad corporation or street railroad corporation be constructed across the track of any other railroad or street railroad corporation at grade, without having first secured the permission of the CPUC. (Public Utilities Code § 1201)
- 3) Requires the division of the CPUC responsible for railroad safety to be responsible for inspection, surveillance, and investigation of the rights-of-way, facilities, equipment, and operations of railroads and public mass transit guideways, and for enforcing state and federal laws, regulations, orders, and directives relating to transportation of persons or commodities, or both, of any nature or description by rail. (Public Utilities Code § 309.7)
- 4) Establishes the Railroad Highway Grade Crossing Program (RHGCP), also known as the Section 130 Program, which provides federal funds for the elimination of hazards at existing at-grade highway-rail crossings. (Title 23, United States Code, § 130 (23 U.S.C. 130))

FISCAL EFFECT: According to the Senate Committee on Appropriations, costs to implement this bill are unknown but potentially significant due to the pilot development resulting from this bill. The CPUC estimates that any costs to develop and implement a pilot or limited demonstration and research project for colored pavement markings would likely be minor and absorbable.

BACKGROUND:

Crossing Guards – The CPUC has legal regulatory authority over rail safety within California. CPUC rail operations and safety staff are responsible for enforcing both state and federal laws, regulations, CPUC general orders, and directives relating to rail transportation.¹ The CPUC Rail Crossings and Engineering Branch (RCEB) engineers evaluate requests to construct new rail crossings or modify existing crossings. CPUC staff ensure that highway-rail and pathway-rail crossings are safely designed, constructed, and maintained. RCEB staff also evaluate rail crossings configuration after train-related incidents occur at rail crossings, and review complaints regarding rail crossings and rail crossings safety or conditions. However, federal agencies also play a role: the Federal Railroad Administration and the Federal Highway Administration (FHWA) both have authority to regulate safety measures at railroad crossings, which preempts the regulatory authority of the CPUC.^{2,3}

Safety Risks And Study Results – Rail crossings, in particular at-grade crossings⁴, represent a significant safety risk as automobiles, pedestrians, bicyclists, and others can easily collide with a train at a crossing. In fiscal year 2021-22, there were 796 reported railroad-related incidents in California, 464 of which were related to crossing or trespassing, with 155 total incidences of injury and 215 fatalities.⁵ In 2014, the U.S. Department of Transportation conducted a research study to evaluate the effectiveness of roadway pavement markings placed within the dynamic envelope⁶ and new corresponding signage at an at-grade crossing in Fort Lauderdale, Florida. The goal of the added markings and signage was to reduce the number of vehicles that come to a stop within the dynamic envelope, thus reducing the possibility that a vehicle is present on the tracks when a train approaches. Results from study indicate that the addition of the dynamic envelope pavement markings and modified signage reduced the number of vehicles that stopped within the dynamic envelope zone and increased the number of vehicles that stopped properly and safely behind the stop line.⁷ However, the study noted the need for additional field testing before recommendations for wider use of pavement markings could be made.

Federal Express – The Railroad Highway Grade Crossing Program (RHGCP), also known as the Section 130 Program, provides federal funds for the elimination of hazards at existing at-grade highway-rail crossings.⁸ The RHGCP is a cooperative effort between the Federal Highway Administration (FHWA), the California Department of Transportation (Caltrans), the CPUC, railroad companies, and local agencies. In California, the program has historically been funded by a 90% federal contribution and a 10% local matching contribution provided by Caltrans. However, following the passage of the Infrastructure Investment and Jobs Act (IIJA) in 2021,

¹ CPUC; “Annual Railroad Safety Report To The California State Legislature”; November 2022.

² Federal Railroad Administration; “Office of Railroad Safety”; October 2020; <https://railroads.dot.gov/about-fra/program-offices/office-railroad-safety>

³ Federal Highway Administration; “Railway Highway Crossing Program Overview”; July 2022; <https://highways.dot.gov/safety/hsp/xings/railway-highway-crossing-program-overview>

⁴ Any place where a road crosses railroad tracks on the same vertical level, rather than as an underpass or overpass.

⁵ CPUC; “Annual Railroad Safety Report To The California State Legislature”; November 2022.

⁶ The region between and immediately adjacent to the tracks at an at-grade highway-rail crossing.

⁷ U.S. Department of Transportation; “Effect of Dynamic Envelope Pavement Markings on Vehicle Driver Behavior at a Highway-Rail Grade Crossing”; April 2014.

⁸ CPUC; “Railroad Crossing Section 130 Funding Program”; June 2018.

Section 130 projects are typically funded 100% by federal funds, with California's federal apportionment totaling approximately \$17 million per year.^{9,10}

In addition to funding the implementation of safety measures, federal agencies set national standards to guarantee a degree of marking and signage consistency nationwide. Protocols in the Manual on Uniform Traffic Control Devices (MUTCD), created by the FHWA, specify certain colors for a variety of safety-related markings and signs.¹¹ Though the CPUC contends the FHWA has the ability to grant an exemption, the FHWA requires strict adherence to national standards for traffic signage. As noted in the MUTCD, "Design, application, and placement of traffic control devices other than those adopted in this Manual shall be prohibited"¹² unless specified provisions are adhered to. Any test of traffic control devices which substantively deviate from those outlined in the MUTCD must be submitted to FHWA as "requests for any interpretation, permission to experiment, interim approval, or change"¹³

Grounded Pilots – According to the CPUC, in 2018 and 2020, the CPUC sought approval from the FHWA, in coordination with Caltrans, for an FHWA permit for the State of California to conduct an at-grade rail crossing safety pilot experiment. This proposed pilot aimed to test the effectiveness of additional visual guidance to enhance motorists' and pedestrians' awareness when approaching an at-grade rail crossing. In addition, the pilot sought to determine whether changes in color pavement markings and signage can result in an increase in driver safe-stopping behavior and assess the effects pavement markings might have on the number of accidents, injuries, and fatalities at those crossings.

The selected proposed pilot project location was State Route 120 in Escalon, California in San Joaquin County, based on anticipated future risks of incidents (e.g., crude oil unit trains and increasing tourism traffic to Yosemite National Park). The estimated pilot project cost was \$100,000 - \$250,000, which included the cost of the paint to cover the selected crossing, contracting with UC Berkeley to record behavior at the crossing (pre- and post-paint), and a compilation of results into a study to be published and peer reviewed. The costs for the painting projects were extremely low compared to other upgrades at rail crossings that enhance safety. However, the FHWA did not grant approval to the CPUC and Caltrans to proceed with the pilot based on the color selection (red and/or yellow), given the existing federal MUTCD protocols specifying red/yellow colors for other safety markings.¹⁴

Costs – According to the CPUC, the painted color marking applications were estimated to cost about \$3 per square foot, while other crossing upgrades run from the hundreds of thousands to millions of dollars, depending on the type of project. The CPUC notes that while these cost

⁹ Federal Highway Administration; "Railway Highway Crossing Program Overview"; July 2022; <https://highways.dot.gov/safety/hsip/xings/railway-highway-crossing-program-overview>

¹⁰ Caltrans; "Caltrans Railway-Highway Crossings Program (RHCP) Section 130 – Project Funding"; <https://dot.ca.gov/programs/local-assistance/fed-and-state-programs/sec130/project-funding>

¹¹ U.S. Department of Transportation – Federal Highway Administration; Manual on Uniform Traffic Control Devices; Updated July 2022.

¹² Pg. 4; U.S. Department of Transportation – Federal Highway Administration; Manual on Uniform Traffic Control Devices; Updated July 2022.

¹³ Pg. 4; U.S. Department of Transportation – Federal Highway Administration; Manual on Uniform Traffic Control Devices; Updated July 2022.

¹⁴ U.S. Department of Transportation – Federal Highway Administration; Manual on Uniform Traffic Control Devices; Updated July 2022.

estimates date to 2018, the cost of implementing pavement markings in high traffic areas is still a relatively low-cost solution for potentially increasing public safety. The CPUC acknowledges that specific funding for these projects could be realized by a combination of federal funding, if authorized, along with state, local, and railroad funding.

COMMENTS:

- 1) *Author's Statement.* According to the author, “As the regulatory authority overseeing rail safety within California, the CPUC strives to achieve a goal of zero accidents and injuries. Despite the various safety efforts and risk management activities, incidents resulting in injury and even death still occur. Items such as inattentiveness and misjudgment at railroad crossings contribute to these safety incidents. To enhance safety at railroad crossings, Senate Bill 506 requires the CPUC to develop and implement a pilot program that will add colored markings at railroad crossings. The CPUC will then report to the Legislature on the effectiveness of the colored markings and if they were effective in reducing safety incidents.”
- 2) *Proceeding Forward.* The bill gives CPUC broad discretion in implementing the project. It is likely, given the range of approaches permissible under this bill, that the CPUC would open a regulatory proceeding to inform the development and implementation of the pilot project. This would solicit input, comment, and deliberation over the various aspects of the pilot, including which colors and marking layouts would be applied, which crossing(s) would be selected for study, and where funding would be sourced from. Perhaps the most important outcome of allowing the CPUC broad discretion is that this would enable the CPUC to carefully and deliberately craft an application for federal approval. However, should this project be implemented for multiple years or expand from a pilot study to widespread implementation, maintenance of the markings would be an important consideration. These markings would be subjected to weathering, as well as driven over regularly, and would require regular upkeep to maintain a recognizable color. Whether the CPUC, local public agencies, railroad operators, or a combination of multiple parties would bear the responsibility for maintaining additional markings would be important to gauge the long-term financial impact of implementation.
- 3) *An Iron Horse of A Different Color.* Certain colors, particularly yellow and red – which most frequently suggest caution or indicate danger – already have uses under federal railway and highway regulations. If such markings are precluded from use under federal guidelines, whether the remaining colors would effectively signal caution without confusing motorists and pedestrians is unclear. Currently, 11 of the 13 colors listed in the MUTCD have been assigned specific meanings by the FHWA, with coral and light blue representing the only two colors yet unassigned. Even these two unassigned colors, however, are being “reserved for future applications that will be determined only by FHWA after consultation with the States, the engineering community, and the general public.”¹⁵

Alternative methods of increasing awareness of railroad crossings may be worth considering, including the written messages “do not block” and “keep clear” applied in

¹⁵ Pg. 10; U.S. Department of Transportation – Federal Highway Administration; Manual on Uniform Traffic Control Devices; Updated July 2022.

white on the road surface, or signage indicating “do not block the intersection” and “do not stop on the tracks.” Both methods are currently optional under the MUTCD,¹⁶ and wider implementation, particularly at high-risk intersections, may improve crossing safety. However, these methods are likely to cost more than the proposed color blocks on the roadway.

- 4) *Sign, Sign, Everywhere A Sign.* The effectiveness of any signage or signaling rests on recognition and comprehension, which is most often cemented by consistency: red, octagonal signs indicate for drivers to stop, and certain warning symbols (radiation hazard, biohazard, and skull-and-crossbones to indicate poison) are widely recognized internationally. These signs are so widely, and so quickly, recognized because they are widely, consistently, and unambiguously applied. Even if updated signage more effectively communicates the presence of a hazard (e.g., a mushroom cloud instead of the conventional, but largely arbitrary, trefoil radiation symbol), the novelty of the sign may cause confusion and make a risky situation even more dangerous. For this reason, any changes to signage associated with hazards like railroad crossings should, similarly to the tracks themselves, be approached with caution.

- 5) *Prior Legislation.*

SB 385 (Hueso) was a code clean-up bill that removed the provisions related to specific pilot projects for the use of audible warning devices. Status: Chapter 425, Statutes of 2017.

SB 62 (Morrow) clarified the requirements and exceptions for a pilot project that relates to audible warning devices and extended to additional locations the proposed pilot project. Status: Chapter 601, Statutes of 2001.

AB 1249 (Daucher) authorized a pilot project to test supplementary safety measures at railroad crossings. Status: Chapter 393, Statutes of 2001.

SB 1491 (Leslie) authorized a test of the wayside horn at railroad crossings. Status: Chapter 263, Statutes of 2000.

AB 923 (Hertzberg) required the CPUC, in consultation with Caltrans, to adopt rules and regulations prescribing uniform standards defining when enforcement begins after the warning signal sounds at a railroad crossing. Status: Chapter 841, Statutes of 1999.

REGISTERED SUPPORT / OPPOSITION:

Support

California State Legislative Board, Sheet Metal, Air, Rail and Transportation Workers –
Transportation Division (SMART-TD)
California Teamsters Public Affairs Council
California State Legislative Board, Brotherhood of Locomotive Engineers and Trainmen, and
Teamsters Rail

¹⁶ Pg. 383; U.S. Department of Transportation – Federal Highway Administration; Manual on Uniform Traffic Control Devices; Updated July 2022.

Opposition

None on file.

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