



**ANNUAL RAILROAD SAFETY REPORT  
TO THE  
CALIFORNIA STATE LEGISLATURE**



**Pursuant to Public Utilities Code  
Sections 309.7, 765.6, and 7711**

**November 30, 2015  
For  
Fiscal Year 2014 - 15**

**CALIFORNIA PUBLIC UTILITIES COMMISSION  
SAFETY AND ENFORCEMENT DIVISION  
OFFICE OF RAIL SAFETY  
Railroad Operations and Safety Branch**

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This report complies with California Public Utilities Code sections 309.7, 765.6, and 7711.

- Public Utilities Code section 309.7 requires the California Public Utilities Commission (CPUC) to report on activities of the division responsible for consumer protection and safety (currently, the Safety and Enforcement Division) and document expenditures of the funds derived by fees paid by the railroad corporations.
- Public Utilities Code section 765.6 requires the CPUC to report on the actions the CPUC has taken to ensure the safe operations of railroads in this state. In addition, Section 765.6 requires the CPUC to report annually on the impact on competition, if any, of the regulatory fees assessed railroad corporations for the support of the CPUC's activities.
- Public Utilities Code section 7711 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. It also requires the CPUC to include a list of all railroad derailment accident sites in the state on where accidents have occurred within at least the previous five years, describe the nature and probable causes of the accidents, and indicate whether the accidents occurred at or near sites that the Commission<sup>1</sup> has determined to be hazardous.

Note to readers:

Public Utilities Code section 765.6 requires the CPUC to chronicle the operations of the CPUC Railroad Operations and Safety Branch during the previous fiscal year.

Public Utilities Code section 7711 requires the CPUC to report include a list of all railroad derailment accident sites, which are documented by calendar year.

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<sup>1</sup> In this report, "Commission" refers to the five-member commission authorized by the California State Constitution, Article XII, Section 1. "CPUC" refers to the staff of the Commission, under the auspices of the executive director, appointed by the Commission pursuant to Public Utilities Code section 308.

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## Table of Contents

<b>Executive Summary</b> .....	<b>1</b>
<b>I. Introduction</b> .....	<b>4</b>
<b>II. CPUC Safety Culture</b> .....	<b>5</b>
A. Risk Management Status Reports .....	5
B. Crude Oil Reconnaissance Team.....	6
C. Operation Lifesaver Presentations .....	8
D. Railroad Bridge Evaluation Program.....	9
E. Near-Miss Reporting and Analysis.....	11
F. Positive Train Control .....	13
G. California High Speed Rail.....	13
<b>III. The Foundation of the Rail Safety Program</b> .....	<b>15</b>
A. Regular Inspections .....	15
B. Focused Inspections.....	18
C. Accident Investigations .....	18
D. Security Inspections.....	19
E. Safety Investigations.....	21
<b>IV. Challenges for Rail Safety</b> .....	<b>22</b>
A. Reporting of Accidents and Incidents.....	22
B. Recruitment and Retention Problems .....	23
<b>V. Penalties and Citations</b> .....	<b>24</b>
<b>VI. Regulatory Fee Impact on Competition</b> .....	<b>24</b>
<b>VII. Local Safety Hazard Sites</b> .....	<b>26</b>
<b>Appendix A – State Railroad Safety Laws and Regulations</b> .....	<b>30</b>
<b>Appendix B - Examples of Operation Lifesaver Presentations</b> .....	<b>33</b>
<b>Appendix C – Positive Train Control</b> .....	<b>36</b>
<b>Appendix D - Examples of Regular Inspections</b> .....	<b>46</b>
<b>Appendix E - Examples of Focused Inspections</b> .....	<b>50</b>
<b>Appendix F – Accident Investigation Summaries</b> .....	<b>60</b>
<b>Appendix G – Local Safety Hazard Site Maps</b> .....	<b>66</b>
<b>Appendix H - Acronyms</b> .....	<b>70</b>

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# **Annual Railroad Safety Activity Report Fiscal Year 2014-2015**

Pursuant to California Public Utilities Code sections 309.7, 765.6, and 7711

## **Executive Summary**

The California Public Utility Commission (CPUC) railroad safety program's mission is to ensure the safe operation of freight, passenger, and commuter railroads in California. The CPUC performs these railroad safety responsibilities through its Safety and Enforcement Division (SED), Office of Rail Safety, Railroad Operations and Safety Branch (ROSB).

The ROSB mission is to ensure that California communities and railroad employees are protected from unsafe practices on freight and passenger railroads by promoting and enforcing rail safety rules, regulations and inspection efforts; and by carrying out proactive assessments of potential risks before they create dangerous conditions.

Safety culture improvement and proactive risk management are paramount to the CPUC culture and mission. CPUC railroad safety inspectors cite deficiencies of federal, state, and CPUC General Orders (GOs) and Public Utility Codes. (See Appendix A for a list of state railroad safety laws and regulations.) In addition to those specific violations, CPUC railroad safety inspectors, as well as staff, look beyond the regulations toward more comprehensive overall proactive safety oversight. During fiscal year (FY) 2014-15, CPUC railroad safety inspectors created 17 new Risk Management Status Reports (RMSR). These reports are used to identify and record potential risks, about which there are often no regulations, and to assist in remediating those risks by the responsible parties.

The CPUC Crude Oil Reconnaissance Team actively monitors and inspects crude oil rail line rehabilitation projects. This includes new crude oil rail car transfer structures and tracks, facility access track construction or rehabilitations, bridge and grade crossing upgrades and railroad conveyance systems associated with the transportation of crude oil by rail. The focus is to ensure that crude oil facilities and the routes to those facilities comply with federal and state safety laws, in addition to mitigating risks that are not defined in regulations. During FY 2014-15, the team monitored upgrades to 29 miles of antiquated track in the Bakersfield area to ensure compliance by track owners and their contractors. CORT was successful in bringing about improvements to public grade crossings by the responsible parties to more effectively alert motorists and pedestrians of oncoming trains carrying crude oil.

Another proactive risk-mitigation measure includes targeted observations of the state's railroad bridges. The CPUC Railroad Bridge Evaluation Program (RBEP) was established in 2014 and began the training of two new railroad bridge inspectors, as well as incorporating engineering staff from the CPUC Risk Assessment Program. During FY 2014-15, CPUC railroad safety inspectors performed 51 bridge observations, identified 22 general order defects, and created 7 RMSRs to seek remediation to improve the safety of the state's railroad bridges.

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Additional proactive safety activities performed by the CPUC railroad safety program inspectors and staff, described in detail later in this report, included:

- Conducted Operation Lifesaver presentations to prevent injuries and fatalities on railroad tracks.
- Collected and analyzed near-miss incidents.
- Monitored the installation of and evaluated the effectiveness of positive train control.
- Developed monitoring procedures for the safe planning and construction of high-speed rail.

The CPUC employs 45 railroad safety employees (including six current vacancies). 43 employees possess expertise in specific disciplines: hazardous materials, motive power and equipment (locomotives and rail cars), railroad operations, signal and train control, track, and bridges.<sup>2</sup> The inspectors also identify and address additional public safety risks associated with railroad systems.

During FY 2014-15, CPUC railroad safety inspectors conducted the following activities:

- Performed 3,392 inspections and follow-up inspections to monitor the railroads' compliance and remedial actions.
- Cited 9,678 federal regulation non-compliant defects.
- Completed 257 CPUC General Order reports that identified 563 defects.
- Cited 4 violations of state regulations.
- Recommended civil penalties for 233 violations of federal regulations.
- Resolved 26 informal safety complaints.

The CPUC Office of Rail Safety foresees challenges ahead. The most significant challenge, consistent with the 2013 and 2014 Annual Reports, is the slowly improving issue of inconsistent reporting of accidents and incidents by the railroads. Additional challenges continue to be employee retention, mostly due to the pay disparity between the state railroad safety inspectors and their federal counterparts. The much higher pay scales for federal inspectors with the same jobs as state inspectors have caused challenges to recruitment and low retention rates. The resultant vacancies and time spent on training affect productivity and effective actual field

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<sup>2</sup> The FRA certifies the inspectors as an expert in each of the disciplines, except for bridges. The CPUC proactively identified bridges as a risk to public safety and employs one track-certified inspector and one well-experienced bridge inspector to focus on bridges.

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inspection time. The CPUC has identified this issue annually over the past eleven years.

The CPUC can assess civil penalties for serious non-compliant conditions, depending on the egregious nature of the violation. For violations of federal railroad safety regulations, CPUC railroad safety inspectors make recommendations to the Federal Railroad Administration (FRA) for the assessment of penalties. Any penalties collected by FRA are deposited into the U.S. Treasury. For violations of California state laws and CPUC General Orders, CPUC Resolution ROSB-002 provides the SED Director or Deputy Director the authority to issue citations to railroad carriers for violation of certain General Orders and a Public Utilities Code section. A railroad issued such a citation under ROSB-002 may accept the fine imposed or contest it through a process of appeal. During FY 2014-15, the CPUC began processing four pending citations.

Last year, the state Legislature appropriated \$7.6 million for the operations of the CPUC railroad safety program from a dedicated account within the CPUC Public Transportation Reimbursement Account. Public Utilities Code section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by railroad, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations. The fees paid by the railroad corporations are the sole funding source for the CPUC railroad safety program and do not fund any other state programs. Public Utilities Code section 765.6 requires that the Annual Report include a determination of the impact on competition, if any, of these fees. Union Pacific Railroad (UPRR) and BNSF Railway (BNSF) have experienced record profits over the past few years. The railroad user fees assessed in 2014 on UPRR and BNSF represented just over one fourth of one percent of revenues (0.0025), and were unlikely to have had any effect on competition.

Public Utilities Code section 7711 requires the CPUC to report to the Legislature on sites it finds to be hazardous, termed local safety hazard sites, on railroad lines in the state. The sites were identified in 1997 through a formal decision of the Commission.<sup>3</sup> Within the previous five calendar years, California experienced 318 derailments. Of that number, 54 derailments, or 17 percent, occurred at or near local safety hazard sites.



*Derailment, Tehachapi Pass, May 5, 2015. This derailment occurred in Local Safety Hazard Site #16, UPRR Mojave subdivision, specifically, at railroad station Caliente. The cause was a broken coupler (rail car connection device).*

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<sup>3</sup> Commission Decision: D.97-09-045.

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## I. Introduction

The CPUC railroad safety program is one of the most comprehensive railroad safety programs in the nation. The Constitution of California declares that the Public Utilities Code is the highest law in the state, that the Legislature has unlimited authority to regulate public utilities under the Public Utilities Code, and that the Constitution's provisions override any conflicting provision of state law which addresses the regulation of public utilities.

Federal law, Title 49 of the Code of Federal Regulations (CFR), Part 212, establishes the State Safety Participation Program with the FRA. The purpose of the state-federal partnership is to provide an enhanced investigative and surveillance capability by having state agencies assume responsibility for compliance investigations and other surveillance activities as a federal partner.

California state laws complement the federal State Safety Participation Program and provide even greater protection to railroad employees and the public. State laws require the CPUC to perform inspections, surveillance, and investigations of the railroads, and to advise the Commission on all matters relating to rail safety. A summary of applicable California Public Utilities code sections and CPUC General Orders is provided in Appendix A.

The CPUC employs 43 FRA-certified railroad safety inspectors to perform safety inspections and investigations pursuant to the State Participation Program.<sup>4</sup> The federally-certified inspectors enforce rail safety rules and regulations by performing inspections and accident investigations. The CPUC's rail safety responsibilities include:

- Inspecting railroads for compliance with state and federal railroad safety laws.
- Investigating railroad accidents and safety-related complaints.
- Recommending railroad safety improvements to the Commission and federal government.

Public Utilities Code Section 7711 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. It also requires the CPUC to include a list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years, describe the nature and probable causes of the accidents, and indicate whether the accidents occurred at or near sites that the Commission has determined to be hazardous. This statute was promulgated in 1991 following a freight train derailment near Dunsmuir, California, which resulted in a hazardous materials leak consisting of 19,000 gallons of metam sodium, a concentrated herbicide, into the Sacramento River. That same month, another train derailed near Seacliff and released liquid hydrazine. Other rail accidents, including derailments, runaway trains, and other occurrences resulting in injuries and fatalities, increased public and legislative concerns.

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<sup>4</sup> The 2014 Annual Report to the Legislature identifies the requirements for federal certification.



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The CPUC strives to achieve a goal of zero accidents and injuries across all the utilities and businesses it regulates, and within all CPUC facilities.<sup>5</sup> To achieve that goal, the CPUC embraces a comprehensive safety-management approach that integrates public policy, risk management, and compliance with federal and state laws and General Orders. This approach is used as a foundation for continuous improvement of the regulated utilities' safety as well as the CPUC's safety oversight role.

## **II. CPUC Safety Culture**

The CPUC railroad safety inspectors identify public safety risks, “beyond the regulations.” The CPUC works to continuously enhance the safety culture of the railroad industry as well as its own safety culture. To promote a comprehensive safety culture, the CPUC uses proactive tools, cooperative engagement, and presentation methods, such as:

- Risk Management Status Reports
- Crude Oil Reconnaissance Team
- Operation Lifesaver Presentations
- Railroad Bridge Evaluation Program
- Near-miss Reporting and Analysis
- Positive Train Control Team
- High-Speed Rail Oversight

### **A. Risk Management Status Reports**

In the course of field work, CPUC railroad safety inspectors sometimes identify items of concern that are either: (1) out of their area(s) of expertise; (2) outside of formal/official reporting and action protocols; or (3) despite prior formal or informal regulatory action, are still safety risks. When this happens, the inspectors complete a Risk Management Status Report (RMSR). For example, via the RMSR process, CPUC achieved the installation of guard rails on a section of track passing under Interstate 5, to prevent damage to the freeway in the event of a derailment. In addition to serving as an important tool for risk management, an RMSR is a means for CPUC railroad safety inspectors to work across disciplines. CPUC railroad safety inspectors have the ability to address any railroad-related safety risks that they detect, regardless of their discipline or federal certification.

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<sup>5</sup> See the Special Interest section of the CPUC's webpage at <http://www.cpuc.ca.gov> and select “Safety Policy Statement of the CPUC.”

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Once an RMSR is documented, the assigned inspector works with his or her supervisor to mitigate the risk. The inspector and supervisor meet with the responsible railroad, shipper or associated entity's responsible representative and convey the safety risk linked with the issue, and define a time period in which the risk should be addressed. The CPUC railroad safety inspector performs a follow-up inspection to determine whether the risk was mitigated. If the railroad fails to eliminate or sufficiently mitigate the risk, the CPUC Program Manager will pursue resolution with the responsible railroad officials, and if necessary may bring the issue up to the Deputy Director or to the full Commission for further enforcement action,

During FY 2014-15:

- 9 previous fiscal year RMSRs were closed out (i.e., the recommendations were implemented).
- 17 new RMSRs were created. The safety issues were as follows:
  - 2—seeking increased no trespassing signage on railroad property
  - 2—right-of-way protections (fencing)
  - 2—issues related to CPUC General Orders or federal law requirements
  - 2—potential derailment hazards
  - 9—miscellaneous non-regulated safety risks

4 of these new reports were closed; ROSB seeks to resolve the remaining 13 during the next fiscal year.

### **B. Crude Oil Reconnaissance Team**

Increases in railroad shipments of domestic and Canadian crude oil to California refineries have recently become a national concern. Additionally, these tank car shipments may traverse densely populated areas and/or areas posing relatively high risks of derailments or other accidents. CPUC railroad safety inspectors witnessed a significant amount of construction of new crude-oil related railroad transfer facilities in the Bakersfield area in anticipation of increasing volumes of crude oil transported by railroad from Midwest and Canadian shale-oil formations. Upon further investigation, the branch Program Manager formed an interdisciplinary team of federally-certified ROSB railroad safety inspectors, the Crude Oil Reconnaissance Team (CORT). The individual specialties of the inspectors include track and structures (including bridges), signal and train control, hazardous materials shipping and security, operating practices, and railroad equipment (railroad cars and locomotives).

The CORT's purpose is to:

- Assess and mitigate risks and potential risks to public safety associated with crude oil railroad transportation in California.

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- Identify and resolve relevant areas of general safety and regulatory compliance by the railroads.
  - Provide guidance to UPRR, BNSF, their contractors and sub-contractors, and associated maintenance staff to improve the safety of crude oil transportation.

CORT proactively monitors and inspects crude oil transfer facility tracks, unloading installation structures and associated railroad operations. This is to ensure that such tracks, structures and operations comply with federal and state safety regulations, in addition to attempting to mitigate risks that are not defined in regulations. CORT also performs rail and railroad equipment inspections and investigations, and seeks to proactively identify vulnerabilities associated with potential consequences of crude oil releases.

In FY 2014-15, three transfer facilities in the Bakersfield area were of concern:

1. Plains All American transfer facility in Bakersfield (new facility)
2. Alon USA Energy Inc. (in planning stage)
3. Kern Oil and Refining (existing facility)

The Plains All American transfer facility is forecasted to transfer 65,000 barrels per day from railroads, but was designed for 140,000 barrels per day. Completed in 2014, the Plains facility unloaded 23 trains during the period of November 2014 to March 2015, but is not yet running at full capacity. The Plains facility received 13 more trains between August and the end of September.

Alon USA Energy Inc., plans to retool an existing petroleum facility in northwest Bakersfield to facilitate a crude oil transfer facility with the capacity to unload 150,000 barrels per day. This will include construction of a double-track loop rail terminal within its Rosedale Highway plant that would handle an average of two “unit trains” per day or approximately 143,000 barrels per day. A unit train is more than a mile long and so named because it travels as a unit and not switched in-route and not mixed with other types of freight. At such facilities unit trains can be loaded and offloaded without having to separate rail cars from each other. Alon is finalizing their construction plans and is in the process of obtaining their permits.

The Kern Oil and Refining (Kern Oil), located in Bakersfield, has been in operation for many years and is projecting more activity with the shipment of crude oil to their facility. In the first two quarters of 2015 there were little to no shipments of crude oil to the Kern Oil facility. In August 2015, Kern Oil received a one-unit train consisting of 103 tank cars loaded with crude oil. Kern Oil is scheduled to begin receiving five to seven tank cars on a weekly basis.

Similar crude oil by rail facilities are being developed, such as Phillips 66 in Santa Maria, Kinder Morgan in Richmond and by Valero in Benicia. These facilities are still in the planning and/or the permitting stages and will not be online anytime soon.

By being proactive, the CPUC has assisted in getting the railroads to implement several safety

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upgrades to the Bakersfield routes, including:

- Track safety upgrades to approximately 29 miles of track in the Bakersfield area.
- Track upgrades utilizing heavier weight continuous welded rail to more effectively support heavier loads and longer trains.
- Public grade-crossing upgrades with improved signal lights and concrete crossing planks.
- Insertion of in-track guard rails on a main track which passes under US Interstate 5. This reduces derailment risks that could impact the highway support structure.
- Consideration of three additional public grade-crossing upgrades to include passive warning devices, in addition to active warning devices.

CORT continues to perform surveillance activities and site inspections and investigations with the goal to work with the railroads and their associated contractors to improve and maintain competencies and to address potential risks as these facilities continue to receive crude oil products.

### **C. Operation Lifesaver Presentations**

To further the CPUC culture of safety, CPUC rail safety staff present at Operation Lifesaver events. Operation Lifesaver's mission is to end collisions, deaths and injuries at highway-rail grade crossings and on rail property through a nationwide network of volunteers who work to educate people about rail safety. CPUC railroad safety inspectors and support staff volunteer throughout the state, providing presentations to schools, community organizations, drivers' education classes, bus driving workshops and trucking organizations, as well as educating the public at weekend events such as festivals and safety fairs.

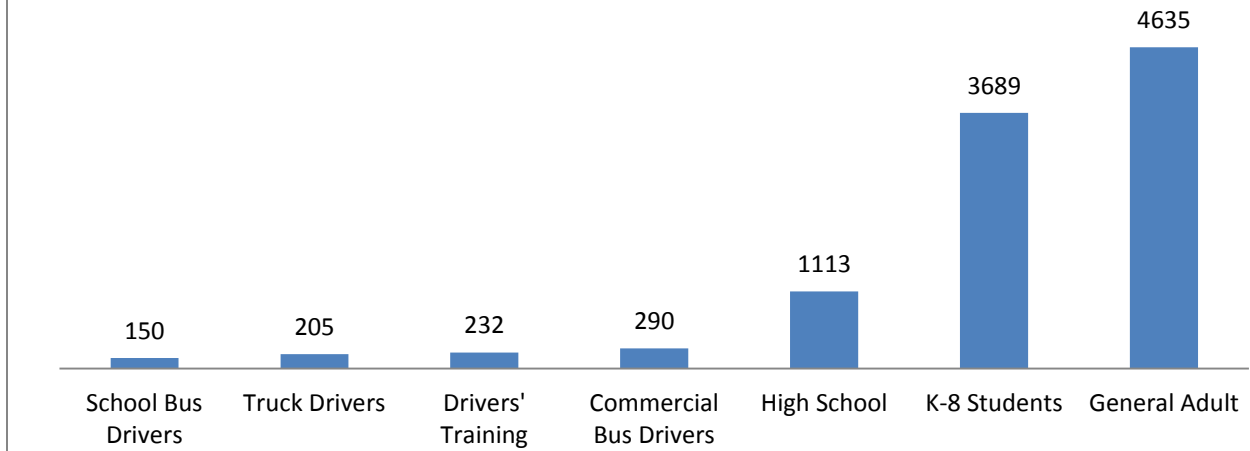
During FY 2014-15, CPUC rail safety staff performed 52 Operation Lifesaver presentations, which reached more than 10,000 people. Some notable presentations include:

- Bilingual presentations to farm workers who work close to railroad tracks in Monterey, Riverside, and Fresno Counties.
- Presentations to San Francisco school children at the annual Halloween Fair.
- Events in Sonoma and Marin counties, preparing residents and businesses for the upcoming operation of Sonoma Marin Area Rail Transit (SMART) commuter rail in that region.

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## Number of Operation Lifesaver Attendees by Group Type (FY 2014-15)



CPUC railroad safety inspectors use Operation Lifesaver to promote a culture of safety. As an example, on September 5, 2014, while inspecting departing trains at the UPRR El Centro yard, a CPUC railroad safety inspector witnessed two boys trying to jump onto a slowly moving train. Later in the day, the same CPUC inspector also spotted a young couple walking between stationary freight cars while looking for space to crawl under the rail cars and cross the tracks. In both cases the CPUC inspector approached the trespassers, explained the potentially fatal consequences of their actions, and directed the boys and the young couple away from the equipment. Additionally, the CPUC railroad safety inspector alerted the UPRR railroad police of the incidents he witnessed.

Realizing that the community could benefit from some Operation Lifesaver rail-safety presentations, the CPUC railroad safety inspector visited a nearby school that is in close proximity to the railroad tracks. The CPUC inspector met with the principal, explained the Operation Lifesaver program, and offered to conduct a rail safety presentation at the school. The principal welcomed the idea and within days made a date available. About 600 students attended the Operation Lifesaver presentation.

Appendix B provides some examples of Operation Lifesaver presentations.

### **D. Railroad Bridge Evaluation Program**

Railroad infrastructure, such as railroad bridges, may pose potentially significant safety risks. These potential risks include the age, structural integrity, and inspection and maintenance practices by railroad owners of California's railroad bridges. Many of these bridges are old steel and timber structures, some over a hundred years old. In addition, many of California's railroad bridges span large bodies of water, major highways, and/or areas of high population density, and are embedded within crude oil train routes.

The FRA only has five railroad bridge inspectors to cover more than 80,000 railroad bridges in

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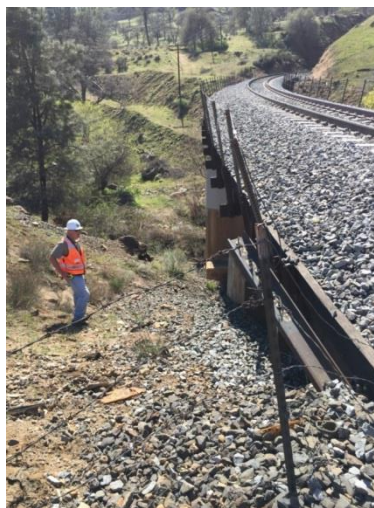
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the United States. One FRA inspector is assigned to California, as well as eleven other states. California has approximately 6,500 railroad bridges. It was because of this less than desirable situation that the CPUC began the Railroad Bridge Evaluation Program (RBEP) in an attempt to better comprehend the condition of railroad bridges in California.

Title 49 CFR, Part 237, requires railroad track owners to create a bridge management program, perform annual bridge inspections, and calculate load capacities. It also requires railroad track owners to make their bridge management program documents and records available for inspection and reproduction by the FRA.

The CPUC railroad bridge safety inspectors work in close cooperation with FRA bridge inspector assigned to California. RBEP initially is focusing inspection efforts on bridges that have been identified as a risk based on the consequence of an accident. The CPUC RBEP inspection staff will perform independent railroad bridge observations and evaluations on a routine basis. In addition, the CPUC and the FRA have agreed to work in concert to ensure that railroad track owners complete their bridge management programs and will conduct joint railroad bridge observations as often as possible.



*A CPUC Railroad Safety Inspector assesses a bridge in Kern County*

During FY 2014-15, the CPUC rail safety staff performed the following:

- Accompanied the FRA bridge inspector on two bridge inspections to initiate a risk inventory.
- Researched other states' approaches to assessing risks associated with railroad bridges.
- Created an initial database of California's railroad bridges.
- Created an interactive map of California's railroad bridges that includes location identifiable by latitude and longitude, as well as by the traditional railroad method of subdivision and milepost.

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- Created a Railroad Bridge Oversight Plan.
  - Created bridge observation forms in order to:
    - Evaluate and confirm railroad track owner bridge inspections.
    - Assess the frequency and quality of railroad track owner bridge inspection programs.
    - Populate the CPUC railroad bridge database with the ages of bridges and the volume of traffic.
    - Identify which railroad bridges will experience increased traffic due to the increase in crude oil transportation by rail.

During FY 2014-15, the CPUC railroad safety inspectors who specialize in bridges performed the following:

- 13 field activities (bridge maintenance procedure observations and demonstrations)
- 51 bridge observations
- 22 General Order Reports identifying defects
- 7 Risk Management Status Reports (inquiries to railroads about bridge safety concerns)
- 2 responses to informal complaints

Moving forward, the CPUC staff will use the results of the initial inspections to prioritize inspections for the remaining railroad bridges. Criteria that may affect a ranking of the risk of a bridge include proximity to high-population areas, use by passenger rail carriers, frequency and use by railroads carrying hazardous materials, and proximity to a seismic fault.

#### **E. Near-Miss Reporting and Analysis**

Public Utilities Code Section 7711.1 requires the CPUC to collect and analyze near-miss data for incidents in California occurring at railroad crossings and along the railroad right-of-way. “Near-miss” is defined as including a runaway train or any other uncontrolled train movement that threatens public health and safety. In support of this requirement, the CPUC has developed a process for managing the risks discovered through the collection and analysis of near-miss data. Using near-miss data to identify locations where there are conditions which may pose a

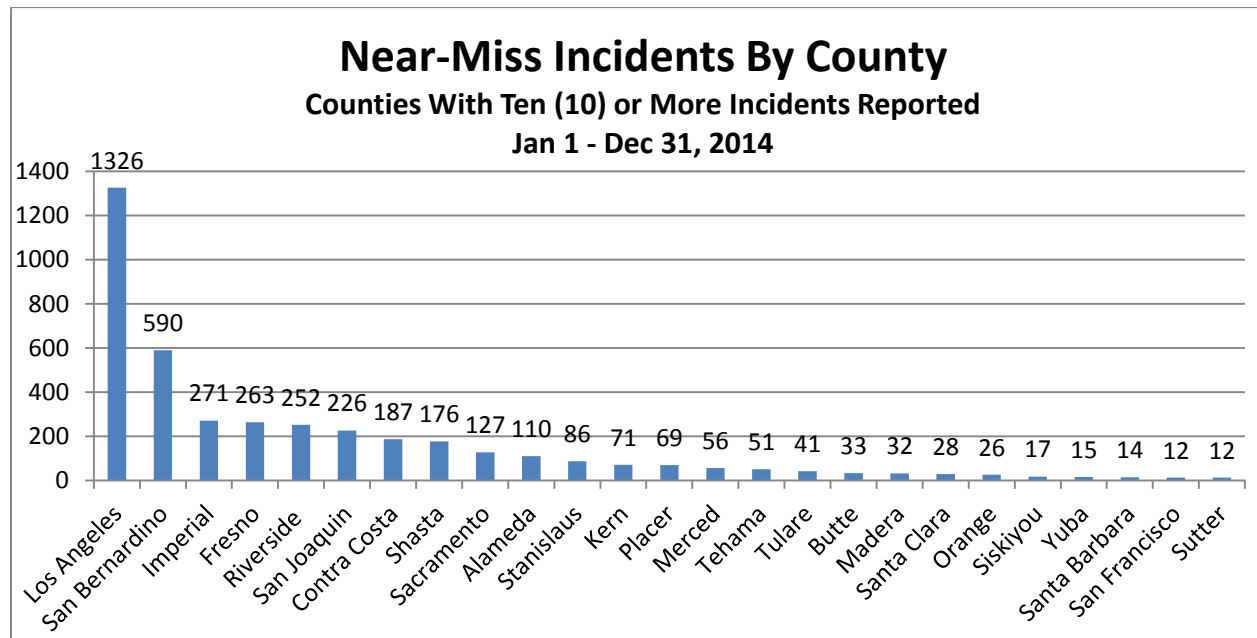
greater likelihood of accidents, and/or have greater consequences in the event of an incident, enables the railroad risk assessment team to improve railroad safety.

To proactively mitigate risks, the CPUC has broadly interpreted the term “near-miss” to include an incident that does not result in the occurrence of an accident, but presents an unintended condition or exposure to a hazard that may have caused an unwanted incident. A negative incident may be preceded by one or more events, making near-miss data useful information for identifying potential threats to public health and safety.

Unfortunately, the data are not systematic or comprehensive. Reporting of most near-miss incidents is voluntary and railroad corporations in California do not equally report near-miss information in a standardized format and do not use a uniform threshold for determining what conditions qualify as near-miss incidents. As such, the reported near-miss data may not be useful for comparisons. Nevertheless, because the data may describe conditions that may be leading indicators of accidents and thus describe characteristics that can be addressed, the near-miss data still has considerable accident prevention usefulness.

In 2013, there were just over 1,000 near-misses reported in the State of California and in 2014 there were over 4,100. There is no evidence to suggest that drivers or pedestrians have become increasingly unsafe around railroad property. It appears that the increase in the near-miss incidents may be associated with the UPRR and the BNSF being more consistent in reporting to the CPUC.

The following graph indicates near-miss incidents by county. It may be expected that Los Angeles County experienced the highest number of near-miss incidents due to the population density, the amount of rail traffic entering and exiting the ports, and the number of railroad crossings. Regardless, it is difficult to draw any real conclusions based on the randomness and inconsistent frequency of reporting near-miss incidents.





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## **F. Positive Train Control**

The Rail Safety Improvement Act of 2008 (P.L.110-432) requires all railroads to install Positive Train Control (PTC) devices in specified areas by December 31, 2015. On October 29, 2015, President Obama signed a bill that included a three-year extension of PTC implementation. Railroads now have until December 31, 2018 to implement PTC, and as late as 2020 under certain circumstances.

PTC is a global positioning system-based technology to provide real-time location and speeds of trains and avoid collisions, such as in the event of an operating rule violation, missing a signal whose indication requires a speed change, route change, or a stoppage. CPUC railroad safety inspectors have been actively engaged in design review, observations, and inspections during the development and construction of PTC systems in California.

PTC systems are designed to avoid human error by providing computerized control of trains to ensure train separation (collision avoidance), line speed enforcement, temporary speed restrictions, and railroad worker wayside safety.

Some California railroads may meet the initial 2015 deadline. As of this writing, Metrolink is likely to be the first passenger railroad to complete implementation by December 31, 2015. Both BNSF and UPRR have provided assistance to Metrolink. BNSF is the freight carrier most likely to complete implementation, followed by UPRR. After these railroads, Caltrain, North County Transit District (NCTD), Sonoma Marin Rail Transit (SMART), Amtrak, and Altamont Corridor Express are likely to follow. Short Line Railroads, if applicable, will most likely be last to complete implementation.<sup>6</sup>

During FY 2014-15, the CPUC railroad safety inspectors who specialize in PTC performed the following:

- Conducted 16 field activities (PTC equipment testing and demonstrations).
- Performed 57 PTC surveillance observations.
- Participated in 29 PTC status meetings.
- Provided ongoing correspondence with the railroads to determine status, challenges, and issues of implementation.

Appendix C includes more information on PTC technology as well as the status of PTC implementation for California railroads.

## **G. California High-Speed Rail**

The California High Speed Rail Authority has made strides in the past year towards realization of its plan to have the first high-speed rail (HSR) operation in the nation, in which trains will be

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<sup>6</sup> For a technical discussion of PTC, see the 2014 Annual Report to the Legislature, Appendix B.

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capable of traveling at speeds greater than 200 miles per hour. On January 6, 2015 a ground-breaking ceremony was held in Fresno with Governor Brown as the keynote speaker.

In June 2015, recognizing the shift from planning to construction, the Authority's Board of Directors approved a construction contract led by Parsons Brinckerhoff Inc. Work has begun on the first section; a 29-mile section of track stretching between Avenue 17 north of Madera and East American Avenue to the south of Fresno. On June 26, 2015 the Authority's design-build contractor Tutor Perini/Zachary/Parsons conducted the first concrete pour at the Fresno River Viaduct in Madera, the first aerial structure that is part of the HSR system.



*Mayor Ashley Swearengen of Fresno addresses the crowd at the January 6, 2015 Ground-breaking Ceremony in downtown Fresno.*

The plan is for passengers to travel between San Francisco and Los Angeles within three hours by the year 2029. Ultimately, San Diego and Sacramento will also be connected to the system.



*Congressman Jim Costa being interviewed at the historic HSR Groundbreaking event.*

CPUC railroad safety inspectors participate in the planning and implementation stages to provide

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information to the HSR Authority on the special California railroad laws and General Orders. In addition, they provide feedback when potential risk factors are identified, take note of any possible conflict with existing regulations, and team with community leaders and stakeholders regarding possible safety concerns.

CPUC railroad safety inspectors participate regularly in HSR Fire and Life Safety Committee consultations in Sacramento and Fresno. These meetings bring a variety of state, federal and local agencies together to share information on the unique needs presented by operation of HSR. Emergency-response can be challenging when faced with structures that are elevated, for example, or parallel electrical transmission lines.

Numerous design elements are incorporated into the train sets to be used by HSR that reduce risk in the case of emergency. Security is an integral part of the planning process as well, with risk assessment being a core element. As regulators, CPUC railroad safety inspectors will proactively assess safety risks, as well as monitor compliance with existing regulations.

### **III. The Foundation of the Rail Safety Program**

The CPUC employs 45 railroad safety inspectors, 43 of which are federally-certified in the five FRA railroad disciplines: hazardous materials, motive power and equipment, operations, signal and train control, and track. The remaining two positions are one each for Positive Train Control inspector and railroad bridge inspector. There is no specific federal certification program for Positive Train Control inspectors or railroad bridge inspectors. In addition to the individual inspections, the inspectors also perform overarching risk assessment and risk management to identify and address public safety risks that may not be a violation of a federal or state law.

#### **A. Regular Inspections**

Over the past year, CPUC railroad safety inspectors have engaged in both proactive safety efforts and retroactive accident investigations to mitigate public safety risks. CPUC railroad safety inspectors perform regular inspections, focused inspections, accident investigations, security inspections and complaint investigations. Some examples of inspections and investigations, as well as a comprehensive list of rail safety inspections and investigations, are included in Appendix D.

Total inspection data for each discipline for FY 2014-15 include:

#### **CPUC Hazardous Materials inspectors:**

- Inspected or evaluated 28,977 units in 682 FRA submitted inspection reports
- Identified 602 CFR defects
- Eight FRA civil penalty recommendations (violations)

Hazardous Materials units include each tank car, each record to ensure accurate documentation of the substance contained in a hazardous materials rail car or package, each evaluation of a hazardous materials unintended release mitigation plan, each inspection of the shipper's

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paperwork, and other similar items.

CPUC hazardous materials inspectors conduct a variety of activities, including the investigation of accidents involving the actual or threatened release of hazardous materials as reported by the Governor's Office of Emergency Services (OES) 24-hour Warning Center. Inspectors also conduct unannounced inspections at the facilities of shippers, consignees, freight forwarders, intermodal transportation companies, and railroads.

CPUC hazardous materials inspectors also inspect facilities to ensure compliance with CPUC General Order 161—Rules and Regulations Governing the Transportation of Hazardous Materials by Rail. For example, inspectors look for the appropriate grounding of cars to prevent dangerous static electricity buildup during unloading. GO 161 also has requirements for reporting the release or threatened release of hazardous materials where there is a reasonable belief that the release poses a significant present or potential harm to persons, property, or the environment.

#### **CPUC Motive Power and Equipment inspectors:**

- Inspected or evaluated 78,301 units in 905 submitted FRA inspection reports.
- Identified 3,040 CFR defects.
- 25 FRA civil penalty recommendations (violations).

Motive power and equipment units include each locomotive, each rail car, inspection records or specific components thereof.

PU Code 765.5(d) requires the CPUC to establish, by regulation, a minimum inspection standard to ensure that at the time of inspection, that railroad locomotives, equipment, and facilities located in the Class I railroad yards will be inspected not less frequently than every 120 days.<sup>7</sup>

During FY 2014-15, CPUC railroad safety inspectors did not satisfy the mandate. Of the 52 facilities, 42 sites were inspected three times or more during the fiscal year. Of the remaining 10 facilities, 7 were inspected twice and 3 were inspected once.

The primary reason for not meeting the mandate is employee retention. When a certified CPUC railroad safety inspector leaves, it takes at least one year to hire a new inspector, get the inspector appropriate training for federal certification, and train the inspector in the field using an experienced CPUC railroad safety inspector. During that period of time, CPUC's ability to meet the mandate is reduced. In addition, the experienced inspectors may miss their individually assigned mandate segments because they spend a significant amount of time training the new-hire on California-specific laws and CPUC General Orders.

#### **CPUC Operating Practices inspectors:**

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<sup>7</sup> UPRR and BNSF are the only Class I freight railroads operating in California. The Surface Transportation Board defines a Class I railroad as "having annual carrier operating revenues of \$250 million or more" after adjusting for inflation using the Railroad Freight Price Index developed by the Bureau of Labor Statistics. (49 CFR, Part 1201).

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- Inspected or evaluated 12,379 units in 695 FRA submitted inspection reports.
  - Identified 338 CFR defects.
  - 80 FRA civil penalty recommendations (violations).

Operating practices units include ensuring the accuracy of train consist records, observing crews performing switching operations, reviewing the accuracy and completeness of accident records, ensuring compliance with certifications and licenses, and other similar items.

**CPUC Signal and Train Control inspectors:**

- Inspected or evaluated 8,250 units in 156 FRA submitted inspection reports
- Identified 414 CFR defects
- No FRA civil penalty recommendations (violation) made in FY 2014-2015.

Signal and train control units include each signal system appurtenance, maintenance and testing records, warning devices at crossings, and other electronic or mechanical signaling systems.

**CPUC Track Inspectors:**

- Inspected or evaluated 25,481 units in 881 FRA submitted inspection reports.
- Identified 5,201 CFR defects.
- 120 FRA civil penalty recommendations (violations).

Track units include a mile of track, a switch, a Roadway and Maintenance Machine, a record, and other similar items involving the track structure.

PU Code 765.5(d) requires the CPUC to establish by regulation a minimum inspection standard to ensure that all branch and main line track is inspected not less frequently than every 12 months.

Inspectors use several methods to inspect track. Each method has its benefits and drawbacks depending on the terrain, steepness, and location. The methods include:<sup>8</sup>

- Physically walking the track.
- Riding in a hi-rail vehicle (motor vehicle outfitted with steel rail guide wheels).
- Riding in a FRA “geometry car” (special rail cars equipped to identify, collect, and disseminate geometric track deficiencies and other potential accident causing conditions).

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<sup>8</sup> The Annual Report to the Legislature for the FY 2013-14 provides a detailed explanation about the methods of track inspections: <http://www.cpuc.ca.gov/NR/rdonlyres/79512E3D-2E8D-4CBD-A3E7-5000FA73CCA1/0/2014ROSBAnnualReportLeg.pdf>.

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In FY 2014-15, CPUC railroad safety inspectors surveyed 3,797 miles of track in California aboard the track geometry vehicles. The track geometry vehicles identified 2,523 defective conditions. CPUC railroad safety inspectors conducted numerous follow-up inspections to monitor the railroads' compliance and verify that the defects had been corrected.

### **B. Focused Inspections**

Public Utilities Code section 765.5(e) requires the CPUC to conduct focused inspections of railroad yards and track, and to target the railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density. Focused inspections involve inspectors from a variety of disciplines or multiple inspectors from a single discipline, working together at a specific location or rail facility. Typically, focused inspections are joint efforts between the FRA and CPUC, though Public Utilities Code section 767.5 permits the CPUC to conduct the inspections as the Commission determines to be necessary.

Focused inspections allow CPUC railroad safety inspectors to evaluate all aspects of a railroad or railroad facility's operational and maintenance practices and procedures. They also allow for close evaluation of railroad management and labor abilities, technical expertise and experience, and safety culture. If corrective actions are recommended by CPUC railroad safety inspectors, a follow-up inspection is performed to determine progress by the railroad entity in carrying out the recommended actions.

In FY 2014-15, CPUC railroad safety inspectors performed 45 focused inspections, which consisted of:

- 9 track inspections
- 8 hazardous materials inspections
- 11 operating practices inspections
- 4 motive power and equipment inspections
- 6 signal and train control inspections
- 7 CPUC General Order-related inspections

Appendix E includes a list of focused inspections.

### **C. Accident Investigations**

Public Utilities Code section 315 requires the CPUC to investigate the cause of all accidents occurring within the state upon the property of any public utility directly or indirectly connected with its maintenance or operation, resulting in loss of life or injury to person or property damage. CPUC railroad safety inspectors evaluate each accident when reported to the CPUC (usually, by OES) and determine the appropriate investigative response based on accident severity criteria, including:

- Impact to the public (evacuations, injuries, fatalities)
- Injuries or fatalities to railroad employees or passengers

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- Environmental impact
  - Impact on commercial transportation (highway closures, commuter interruptions)
  - Violations of state or federal railroad safety regulations or operating rules

In FY 2014-15, including all types of accidents and grade crossing incidents, there were 714 reported railroad related incidents. These incidents resulted in a total of 155 fatalities and 93 injuries. Of these totals 97 were train derailments, including one fatality. CPUC rail safety supervisors reviewed all reported incidents, and determined that 55 required further investigation. Appendix F lists examples of accident investigations performed by CPUC railroad safety inspectors.

#### **D. Security Inspections**

Public Utilities Code sections 7665 through 7667 require every owner, operator, or controller of each rail facility to provide a risk assessment to the CPUC for each rail facility, and prescribes the information that must be included. It also requires every rail operator to develop and implement an infrastructure protection program to protect rail infrastructure from acts of sabotage, terrorism, or other crimes. The code requires the CPUC to review the infrastructure protection program submitted by the rail operators, and permits the CPUC railroad safety inspectors to conduct inspections to facilitate the review. To facilitate compliance, the CPUC provided all railroads with a “Security Plan Guidance” document that incorporates concisely the codified specific requirements of the security plans.<sup>9</sup>

During 2014-15 CPUC railroad safety inspectors performed security reviews on 35 railroads.<sup>10</sup> Of the 35, 33 were in compliance with the mandates. The CPUC Rail Safety Security inspectors are working with the two non-compliant railroads to bring them into compliance and will be conducting additional reviews. The two that were not in compliance were:

- Lake Railway, located in Alturas, did not have a risk assessment or infrastructure protection plan. Lake Railway was provided all pertinent codified information and the Security Plan Guidance document.
- Pacific Southwest Railway Museum had a plan; however, there were several areas within their plan that did not comply with the codified requirements.

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<sup>9</sup> Genesee & Wyoming Company, which operates four railroads within California, has adopted the security plan guidance as a blue print to develop a standard format for each railroad.

<sup>10</sup> Amtrak, UPRR and BNSF produce national security plans that are reviewed annually by the FRA. To ensure compliance with state laws, CPUC Rail Safety Security Inspectors reviewed each railroad’s security plan at various locations within the state.

Below is a table identifying the railroad, inspection dates and compliance status:

NAME	DATE OF INSPECT.	COMPLIANT	COMMENTS
Altamont Commuter Express	03/10/2015	Y	
Santa Maria Valley RR	05/18/2015	Y	
Fillmore Western	05/26/2015	Y	
San Joaquin Valley RR	03/09/2015	Y	
Modesto & Empire Traction	03/10/2015	Y	
Central California Traction Company	03/11/2015	Y	
Stockton Terminal & Eastern Railroad	03/11/2015	Y	
Sacramento Valley Railroad	03/11/2015	Y	
Quincy Railroad	03/12/2015	Y	
California Northern Railroad	04/07/2015	Y	
Richmond Pacific Railroad	04/08/2015	Y	
San Francisco Bay Railroad	04/08/2015	Y	
Cal Train	04/09/2015	Y	
Napa Valley Railroad	04/07/2015	Y	
Niles Canyon Railway	04/08/2015	Y	
Santa Cruz Monterey Bay	04/09/2015	Y	
Metrolink	05/11/2015	Y	
Amtrak Los Angeles	05/20/2015	Y	
San Diego & Imperial Valley	06/03/2015	Y	
Ventura County Railroad	06/15/2015	Y	
Trona Railway Company	05/19/2015	Y	
National Switching Service	04/06/2015	Y	
North County Transit District	05/26/2015	Y	
Pacific Sun Railroad	05/26/2015	Y	
Pacific Southwest Railway Museum	06/19/2015	N	7665.2, 7665.4, and 7665.8. PSRM was instructed to correct these deficiencies. They will be re-inspected within 60 days to determine their progress and compliance.
Baja California Railroad	06/03/2015	Y	
West Isle Line	05/05/2015	Y	
Santa Cruz & Big Trees	04/09/2015	Y	
Amtrak Oakland	05/07/2015		
Sierra Northern Railroad	03/10/2015	Y	
Pacific Harbor Lines	05/11/2015	Y	
Los Angeles Junction Railroad	04/10/2015	Y	
BNSF	04/10/2015	Y	
UPRR	06/17/2015	Y	Phone Interview. Security manager is located in Omaha NE.
Lake Railway		N	New railroad. Provided all PU



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codes and Security Plan Guidance and time to develop their plan. Railroad will be inspected in the near future to ensure compliance.

### **E. Safety Investigations**

The CPUC receives safety concerns and complaints from various sources, including railroad employees, railroad unions (e.g., United Transportation Union and the Brotherhood of Locomotive Engineers), the general public, and government personnel. CPUC railroad safety inspectors initially contact the FRA to determine whether the complainant notified that agency as well. The CPUC and FRA determine which agency will perform the investigation to eliminate duplication.

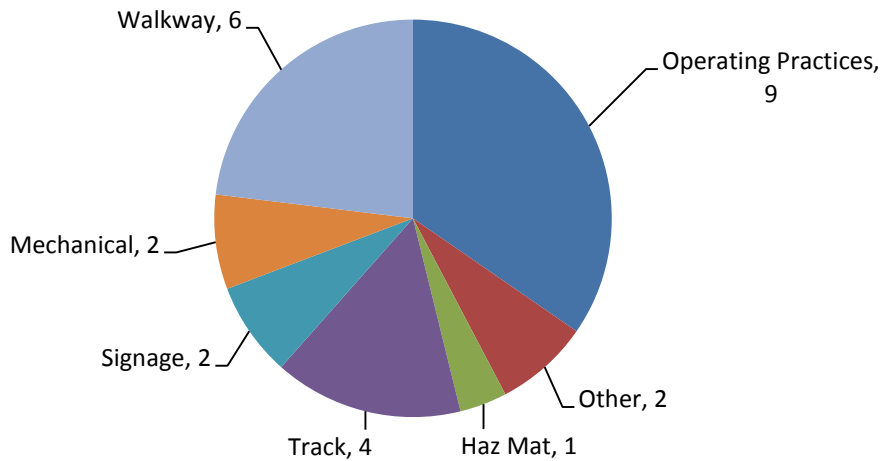
For complaints investigated by the CPUC, an inspector discusses the issue with the complainant or a contact person. The inspector investigates the issue and relevant location and gathers data, including photographs and other pertinent information. The inspector discusses the issue with railroad managers in an effort to gain compliance by pointing out unsafe conditions, practices or risks pertinent to the complaint. A formal or informal action plan is discussed with railroad management, including a timeframe for remediation. The inspector then prepares a written response, with proposals for resolving the complaint, for review by his or her supervisor. A response letter is prepared by one of the CPUC railroad safety supervisors and mailed to the complaining party or his/her representative. A follow-up inspection is performed to ensure compliance and/or remedial action.

In the FY 2014-15, the CPUC investigated and resolved 26 safety complaints.

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## Informal Complaints by Type 2014-15 Fiscal Year 26 Total Closed Complaints



### IV. Challenges for Rail Safety

#### A. Reporting of Accidents and Incidents

In the CPUC's 2013 and 2014 Annual Railroad Safety Activity Reports,<sup>11</sup> the CPUC reported that the most significant challenge facing railroad safety in California is the inconsistency of many railroads with the requirements for reporting incidents and accidents to the OES and/or CPUC. Such inconsistency limits the CPUC's ability to comply with Public Utilities Code section 309.7, which requires CPUC railroad safety inspectors to advise the Commission on rail safety issues, and propose regulatory remedies to address unsafe conditions. As a result, CPUC railroad safety inspectors may be unaware of unsafe conditions, and thus may be unable to address those conditions.

Railroads have been inconsistent in their compliance with federal law, California law, and CPUC General Orders with regard to reporting accident/incidents and hazardous materials releases to the CPUC.

- Public Utilities Code section 315 requires the CPUC to investigate the cause of all accidents that have occurred on the property of any public utility resulting in loss of life or injury to person or property and permits the CPUC to make an order or recommendation.

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<sup>11</sup> <http://www.cpuc.ca.gov/NR/rdonlyres/7945B5AC-B200-431B-A8C4-648AB1BEAB2D/0/2013AnnualReporttotheLegRNCV.pdf>

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- Public Utilities Code section 7661 requires the Safety and Enforcement Division to investigate any incident that results in notification of a runaway train or other uncontrolled train movement that threatens public health and safety, and report its findings concerning the cause or causes to the commission.
  - Public Utilities Code section 7662 requires railroads to provide immediate notification to OES<sup>12</sup> of accidents and incidents.<sup>13</sup>
  - Public Utilities Code section 7672.5 requires railroads to immediately report incidents resulting in a release or threatened release of a hazardous material to relevant agencies, including OES.<sup>14</sup>
  - General Order 161 requires railroads to immediately notify the appropriate emergency-response agency in the event of a hazardous materials incident.
  - General Order 22-B requires that railroads immediately furnish the Commission notification of all train collision and derailments resulting in loss of life or injury, all bridge failures, and all highway crossing accidents resulting in loss of life or injury.

Immediate reporting provides an opportunity to enhance safety. Information regarding an accident's circumstances and cause is often lost as time passes. This information is necessary for the CPUC to deploy inspectors to determine whether the railroad violated regulations or otherwise had unsafe operating or maintenance practices.

CPUC has quarterly meetings with UPRR, BNSF and the California Short Line Railroad Association. In these meetings, CPUC discusses reporting inconsistencies with railroad managers to improve their understanding of reporting requirements. Among other results, these discussions have produced more effective monitoring by railroads of their own reporting procedures, so that the accident/incident information is disseminated back to the CPUC in a timely manner.

## **B. Recruitment and Retention Problems**

Recruitment and retention were identified in the 2013 and 2014 CPUC Annual Railroad Safety Activity Reports as major obstacles to fulfillment of CPUC's mandated railroad safety duties. These continued to be challenges in FY 2014-15.

The 2013 Annual Report discussed the issue in detail.<sup>15</sup> In brief, the CPUC rail safety program has difficulty in attracting and retaining qualified personnel, in large part due to salary

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<sup>12</sup> The California Office of Emergency Services was formerly called the California Emergency Management Agency (CEMA).

<sup>13</sup> OES immediately notifies the CPUC.

<sup>14</sup> OES immediately notifies the CPUC.

<sup>15</sup> <http://www.cpuc.ca.gov/NR/rdonlyres/7945B5AC-B200-431B-A8C4-648AB1BEAB2D/0/2013AnnualReporttotheLegRNCV.pdf>

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differentials between state service on the one hand, and both federal and private sector employers on the other. As discussed earlier, when a certified railroad safety inspector leaves CPUC, inspection requirements are difficult or impossible to meet. Last year, the CPUC railroad safety inspectors failed to meet the statutory mandate to inspect all railroad facilities located in class I railroad yards every 120 days due to lower remuneration than their peers at other rail facilities and the FRA. The CPUC railroad safety inspectors who are certified in motive power and equipment performed just 143 inspections, when they could have performed about 156.<sup>16</sup> During those 143 actual inspections, they identified 3,040 defects and cited 25 defect violations. Using averages, if the CPUC had been able to retain well-trained inspectors, they could have likely identified 3,315 defects and 27 violations. That results in the possibility of 275 missed defects, some of which could cause derailments of railroad cars carrying hazardous materials in heavily populated areas of California, or worse, cars carrying passengers. The CPUC supports compensation parity and stands ready to assist in any appropriate venue to achieve this parity.

## **V. Penalties and Citations**

The CPUC Office of Rail Safety can assess penalties depending on the non-compliance. For noncompliance with federal railroad safety regulations, railroad safety inspectors make recommendations to the FRA for the assessment of penalties. For noncompliance with certain General Orders and a Public Utilities Code section<sup>17</sup>, CPUC Resolution ROSB-002 delegates Commission authority to the Director or Deputy Director of the Safety and Enforcement Division to issue citations to railroad carriers. The General Orders contain requirements for trackside walkways and clearances, and the Public Utilities Code provides requirements for wayside signage and certain railroad operating rules. A railroad issued such a citation may accept the fine or contest it through a process of appeal.

During FY 2014-15, CPUC railroad safety inspectors noted:

- 233 civil penalty recommendations for violations of federal laws.<sup>18</sup>
- 4 citations for violations of state laws.

## **VI. Regulatory Fee Impact on Competition**

Public Utilities Code section 309.7 requires the activities of the CPUC that relate to safe operation of common carriers by railroad, other than those relating to grade crossing protection, to be supported by the fees paid by railroad corporations. In 2014-15 the Legislature appropriated \$7.6 million from the CPUC Transportation Reimbursement Account. The fees paid by the railroad corporations are deposited into a dedicated subaccount within the CPUC

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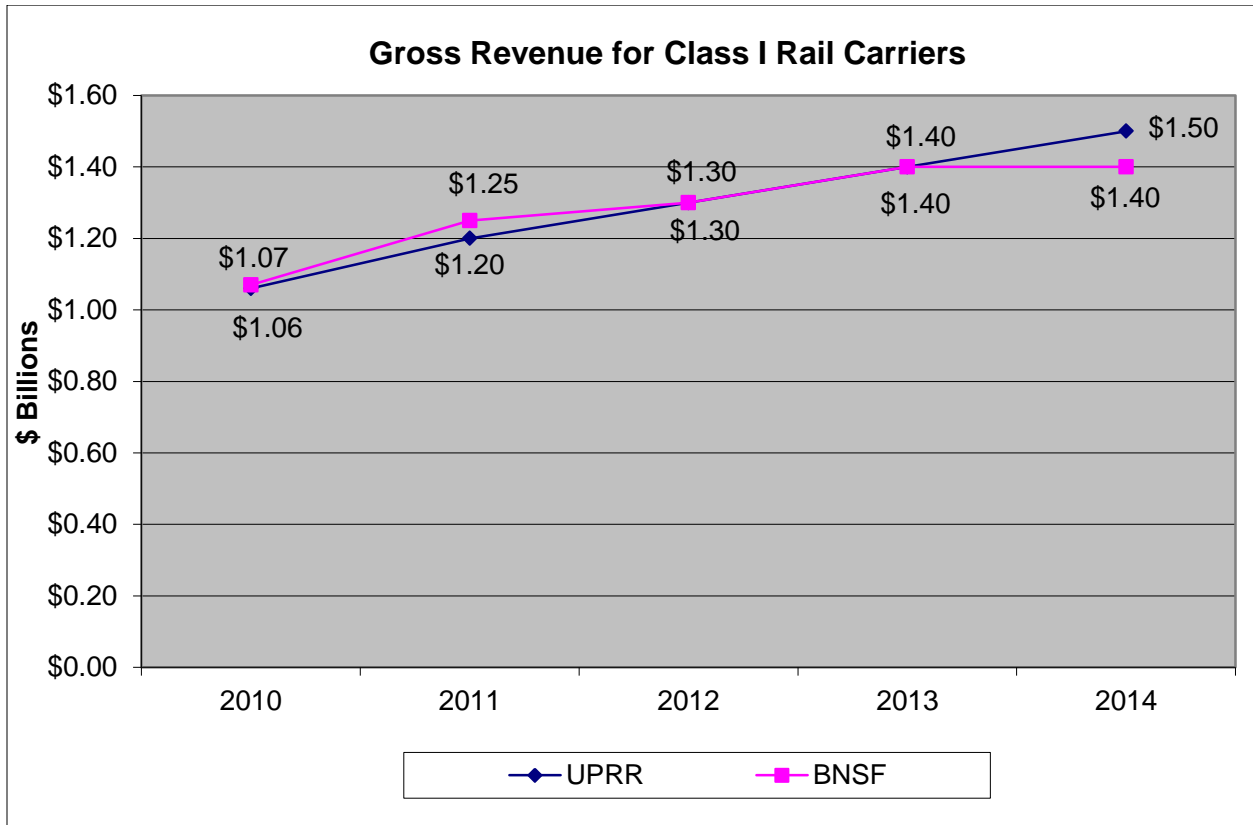
<sup>16</sup> 52 facilities 3 times per year.

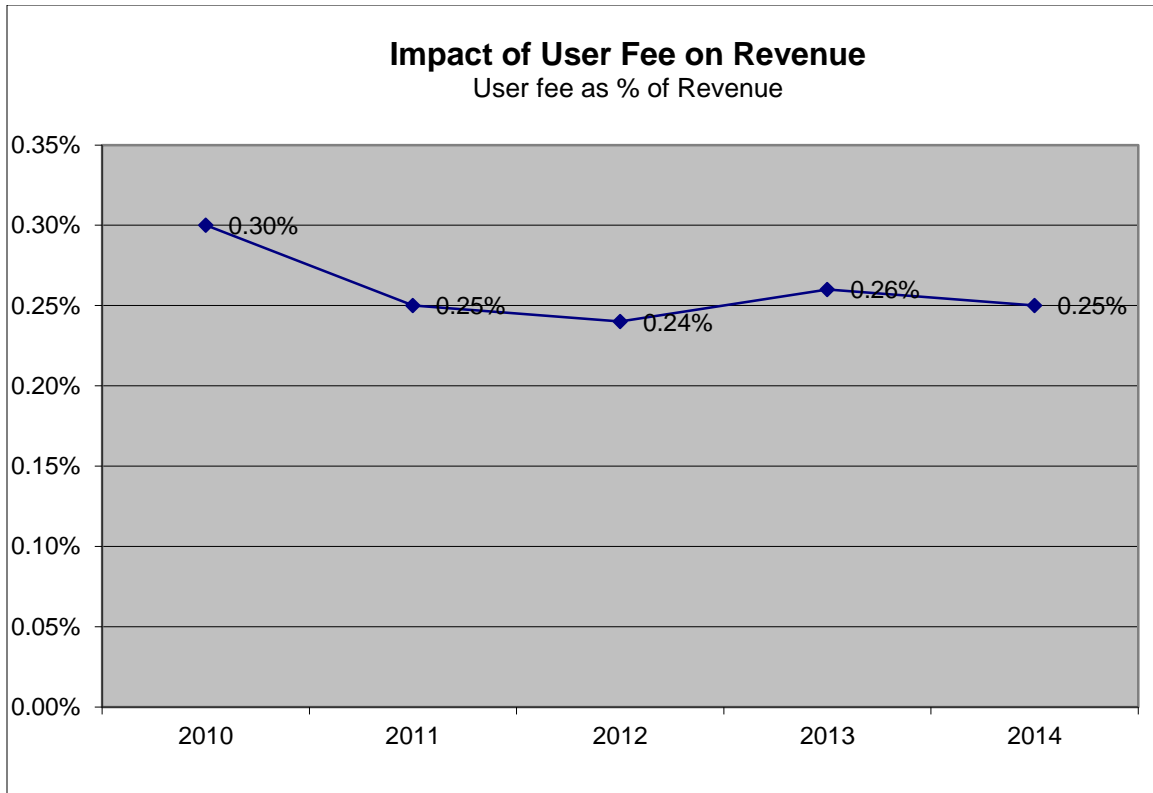
<sup>17</sup> GO 26-D, GO 118-A, and Public Utilities code section 7662.

<sup>18</sup> Fines under federal regulations range from about \$1,000 to \$5,000 each, per day. The final penalty amount depends on the resolution of a claims conference between the railroad and the FRA.

Transportation Reimbursement Account and are the sole funding source for the CPUC Railroad Operations and Safety Program. The fees do not fund any other CPUC programs.

Public Utilities Code section 765.6 requires that the Annual Report include a determination of the impact on competition, if any, of these fees. The railroad user fees assessed in FY 2014-15 on UPRR and BNSF represented just one fourth of one percent (0.0025) of revenues, and were unlikely to have had any effect on competition.





UPRR and BNSF have experienced record profits over the past few years. UPRR Board of Directors approved a two-for-one stock split in 2014 that was paid out as a dividend to its shareholders.<sup>19</sup> The first quarter of 2015, UPRR stock produced a 10-percent dividend increase. According to UPRR, “Union Pacific has paid dividends on its common stock for 116 consecutive years.”<sup>20</sup> For BNSF, its 2014 profit rose 2 percent over the prior year to \$3.8 billion,<sup>21</sup> despite reduced volume on the railroad’s network as a result of congestion-related service delays. In 2013, financial analysts estimated that BNSF Railway accounted for approximately twenty-percent of Berkshire Hathaway’s net income.<sup>22</sup>

## VII. Local Safety Hazard Sites

Public Utilities Code section 7711 requires the CPUC to report to the Legislature on sites on railroad lines in the state it finds to be hazardous. The sites were formally identified in 1997 in

<sup>19</sup> [http://www.uprr.com/newsinfo/releases/financial/2014/0515\\_stocksplitt.shtml](http://www.uprr.com/newsinfo/releases/financial/2014/0515_stocksplitt.shtml)

<sup>20</sup> [http://www.uprr.com/newsinfo/releases/financial/2015/0205\\_dividend.shtml](http://www.uprr.com/newsinfo/releases/financial/2015/0205_dividend.shtml)

<sup>21</sup> [http://www.omaha.com/money/despote-service-bottlenecks-bnsf-profits-chug-along/article\\_447069dd-d85c-56bc-a06e-65dc3219fd22.html](http://www.omaha.com/money/despote-service-bottlenecks-bnsf-profits-chug-along/article_447069dd-d85c-56bc-a06e-65dc3219fd22.html)

<sup>22</sup> [http://journalstar.com/ap/business/bnsf-s-earnings-a-big-part-of-berkshire-s-profit/article\\_0091af0d-2133-5460-90af-b23ba1b563fa.html](http://journalstar.com/ap/business/bnsf-s-earnings-a-big-part-of-berkshire-s-profit/article_0091af0d-2133-5460-90af-b23ba1b563fa.html)

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Commission Decision, D.97-09-045, and were termed Local Safety Hazard Sites (LSHS).<sup>23</sup> Two methods to determine sites were used: 1) sites determined by a statistically significant higher derailment rate than elsewhere on the line, and 2) sites determined by the operating railroad to require stricter operating practices than elsewhere on the line. For example, railroads place a limit on how much tractive effort (locomotive power) can be concentrated at any one point in a train in relation to the tonnage the locomotives are pulling on steep grade and tight curves. Too much tractive effort concentrated at any one point, such as the front or rear of a train, can cause cars to derail in tight curves.

Section 7711 also requires the CPUC to include a list of all railroad derailment accident sites in the state on which accidents have occurred within at least the previous five years, describe the nature and probable causes of the accidents, and indicate whether the accidents occurred at or near sites that the Commission has determined to be hazardous. This report, in addition to the electronically available list of all railroad derailment accidents over the past five years and the causes, fulfills those requirements.<sup>24</sup>

Table 1 lists the accidents that have occurred “at or near” an identified local safety hazard site within the previous five years pursuant to Public Utilities Code subsection 7711(a). The original analysis identifying these sites was based on the higher risk main line and siding accidents.

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<sup>23</sup> The CPUC is currently using the term “high hazard areas” to distinguish from the legal term “local safety or security hazard”, as used in the preemption exemption language of the Federal Railroad Administration (49 U.S.C. § 20106).

<sup>24</sup> A derailment list is located at <http://www.cpuc.ca.gov/safety/Rail/Railroad/>

Table 1—List of Local Safety Hazard Sites

*LSHS #	Current LSHS Track Line	Previous LSHS Track line at time of D.97-09-045 <sup>25</sup>	RR Milepost	Number of Derailments 2010-14	Overlap with Site #**
16	UPRR Mojave Subdivision	SP Bakersfield Line	335.0 to 359.9	12	
9	UPRR Black Butte Subdivision	SP Shasta Line	322.1 to 332.6	2	#10
10	UPRR Black Butte Subdivision	SP Shasta Line	322.1 to 338.5	3	#9
19	UPRR Mojave Subdivision	SP Bakersfield Line	463.0 to 486	2	
12	UPRR Roseville Subdivision	SP Roseville District	150.0 to 160.0	3	
6	UPRR Yuma Subdivision	SP Yuma Line	542.6 to 589.0	2	#3, #4
22	UPRR Canyon Subdivision	UP Feather River Division	234.0 to 240.0	1	#25
25	UPRR Canyon Subdivision	UP Feather River Division	232.1 to 319.2	3	#22, #23
3	UPRR Yuma Subdivision	SP Yuma Line	535.0 to 545.0	0	#6
23	UPRR Canyon Subdivision	UP Feather River Division	253.0 to 282.0	1	#25
4	UPRR Yuma Subdivision	SP Yuma Line	586.0 to 592.0	0	#6
26	BNSF Gateway Subdivision	UP Bieber Line,	15.0 to 25.0	1	
31	BNSF San Diego Subdivision	ATSF San Diego	249.0 to 253.0	1	
1	UPRR Coast Subdivision	SP Coast Line	235.0 to 249.0	0	
7	Central Oregon and Pacific Railroad Siskiyou Subdivision	SP Siskiyou Line	393.1 to 403.2	0	
27	UPRR L.A. Subdivision, Cima Grade		236.5 to 254.6	0	
28	BNSF Cajon Subdivision	ATSF Cajon	53.0 to 68.0	0	

<sup>25</sup> In 1996, UPRR purchased Southern Pacific Railroad.

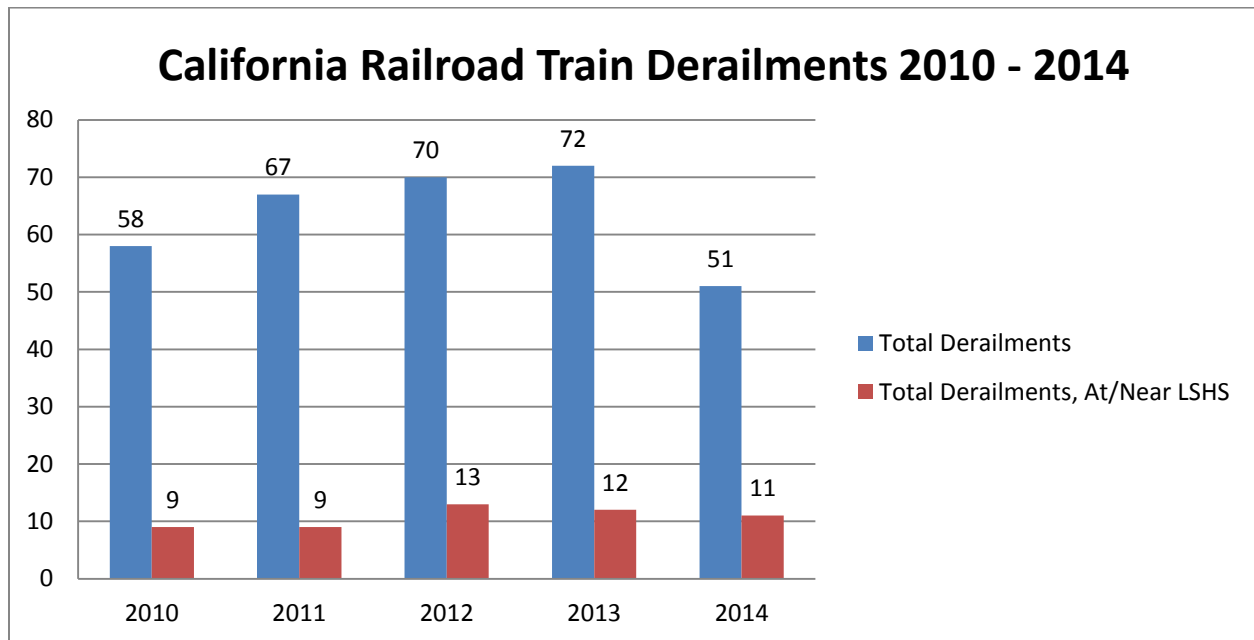


29	BNSF Cajon Subdivision	ATSF Cajon	81.0 to 81.5	0	
30	BNSF Cajon Subdivision	ATSF Cajon	55.9 to 81.5	0	

\*The LSHS number (LSHS #) is for identification purposes only, and does not indicate any ranking.

\*\* Where a site’s boundaries overlap with another site identified by the different method, the other site is listed in this column.

Within the previous five calendar years, California experienced 318 derailments. Of that total, 31 derailments, or 10 percent, occurred at or near local safety hazard sites. For this report, “at or near” includes any location of railroad track along the railroad right-of-way that is contained in the segment of railroad designated to be a local safety hazard site, including the distance of track one mile on each side of the local safety hazard site. Maps of local safety hazard sites are included in Appendix G.



Data source: Federal Railroad Administration, Office of Safety Analysis

## Appendix A – State Railroad Safety Laws and Regulations

State Constitution, Article XII, Sec. 4	The commission may fix rates and establish rules for the transportation of passengers and property by transportation companies ....
PU Code Sec. 309.7 (a)	(a) The division of the commission responsible for consumer protection and safety shall 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. The Safety and Enforcement Division shall advise the commission on all matters relating to rail safety, and shall propose to the commission rules, regulations, orders, and other measures necessary to reduce the dangers caused by unsafe conditions on the railroads of the state.
PU Code Sec. 309.7 (b)	(b) In performing its duties, the Safety and Enforcement Division shall exercise all powers of investigation granted to the commission, including rights to enter upon land or facilities, inspect books and records, and compel testimony. The commission shall employ sufficient federally certified inspectors to ensure at the time of inspection that railroad locomotives and equipment and facilities located in class I railroad yards in California are inspected not less frequently than every 180 days, and all main and branch line tracks are inspected not less frequently than every 12 months.
PU Code Sec. 309.7 (c)	(c) The general counsel shall assign to the Safety and Enforcement Division the personnel and attorneys necessary ...to enforce safety laws, rules, regulations, and orders, and to collect fines and penalties resulting from the violation of any safety rule or regulation.
PU Code Sec. 309.7 (d)	(d) The activities of the Safety and Enforcement Division that relate to safe operation of common carriers by rail, other than those relating to grade crossing protection, shall also be supported by the fees paid by railroad corporations.
PU Code Sec. 315	315. The commission shall investigate the cause of all accidents occurring within this State upon the property of any public utility or directly or indirectly arising from or connected with its maintenance or operation, resulting in loss of life or injury to person or property and requiring, in the judgment of the commission, investigation by it, and may make such order or recommendation with respect thereto as in its judgment seems just and reasonable.
PU Code Sec. 765.5	(a) The purpose of this section is to provide that the commission takes all appropriate action necessary to ensure the safe operation of railroads in this state. (b) The commission shall dedicate sufficient resources necessary to adequately carry out the State Participation Program for the regulation of rail transportation of hazardous materials as authorized by the Hazardous Material Transportation Uniform Safety Act of 1990 (P.L. 101-615). (c) On or before July 1, 1992, the commission shall hire a minimum of six additional rail inspectors who are or shall become federally certified, consisting of three additional motive power and equipment inspectors, two signal inspectors, and one operating practices inspector, for the purpose of enforcing compliance by railroads operating in this state with state and federal safety regulations. (d) On or before July 1, 1992, the commission shall establish, by regulation, a minimum inspection standard to ensure, at the time of inspection, that railroad locomotives, equipment, and facilities located in class I railroad yards in California will be inspected not less frequently than every 120 days, and

	<p>inspection of all branch and main line track not less frequently than every 12 months.</p> <p>(e) Commencing July 1, 2008, in addition to the minimum inspections undertaken pursuant to subdivision (d), the commission shall conduct focused inspections of railroad yards and track, either in coordination with the Federal Railroad Administration, or as the commission determines to be necessary. The focused inspection program shall target railroad yards and track that pose the greatest safety risk, based on inspection data, accident history, and rail traffic density.</p>
PU Code Sec. 768	768. The commission may, after a hearing, require every public utility to construct, maintain, and operate its line, plant, system, equipment, apparatus, tracks, and premises in a manner so as to promote and safeguard the health and safety of its employees, passengers, customers, and the public. The commission may prescribe, among other things, the installation, use, maintenance, and operation of appropriate safety or other devices or appliances, including interlocking and other protective devices at grade crossings or junctions and block or other systems of signaling. The commission may establish uniform or other standards of construction and equipment, and require the performance of any other act which the health or safety of its employees, passengers, customers, or the public may demand.
PU Code Sec. 7661	The Safety and Enforcement Division shall investigate any incident that results in a notification...and shall report its findings concerning the cause or causes to the commission.
PU Code Sec. 7662	Requires a railroad to place appropriate signage to notify an engineer of an approaching grade crossing and establishes standards for the posting of signage and flags, milepost markers, and permanent speed signs.
PU Code Sec. 7665.2	By July 1, 2007, requires every operator of rail facilities to provide a risk assessment to the commission and the agency for each rail facility in the state that is under its ownership, operation, or control, and prescribes the elements of the risk assessment.
PU Code Sec 7665.4	<p>(f) Requires the rail operators to develop an infrastructure protection program, and requires the CPUC to review the infrastructure protection program submitted by a rail operator. Permits the CPUC to conduct inspections to facilitate the review, and permits the CPUC to order a rail operator to improve, modify, or change its program to comply with the requirements of this article.</p> <p>(g) Permits the CPUC to fine a rail operator for failure to comply with the requirements of this section or an order of the commission pursuant to this section.</p>
PU Code Sec. 7667	
General Order 22-B	Requires that railroads immediately furnish the Commission notification of all train collision and derailments resulting in loss of life or injury, all bridge failures, and all highway crossing accidents resulting in loss of life or injury.
General Order 26-D	Establishes minimum clearances between railroad tracks, parallel tracks, side clearances, overhead clearances, freight car clearances, and clearances for obstructions, motor vehicles, and warning devices to prevent injuries and fatalities to rail employees by providing a minimum standards for overhead and side clearance on the railroad tracks. (Pursuant to PU Code Sec. 768.)
General Order 72-B	Formulates uniform standards for grade crossing construction to increase public safety. (Pursuant to PU Code Sec. 768.)
General Order 75-D	Establishes uniform standards for warning devices for at-grade crossings to reduce hazards associated with persons traversing at-grade crossings. (Pursuant to PU Code Sec. 768.)
General Order 118-A	Provides standards for the construction, reconstruction, and maintenance of walkways adjacent to railroad tracks to provide a safe area for train crews to work. (Pursuant to PU Code Sec. 768.)

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General Order 126	Establishes requirements for the contents of First-Aid kits provided by common carrier railroads. (Pursuant to PU Code Sec. 768.)
General Order 161	Establishes safety standards for the rail transportation of hazardous materials. (Pursuant to PU Code Sec. 768.)

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## Appendix B - Examples of Operation Lifesaver Presentations

### September 5, 2014:

Based off of prior trespassing concerns observed by a CPUC Motive Power and Equipment (MP&E) inspector, staff felt that the community of El Centro could benefit from Operation Lifesaver rail-safety presentations. Staff contacted the Principal of a nearby elementary school in close proximity to the railroad tracks. Once staff explained the Operation Lifesaver program to him and offered to conduct a rail safety presentation at the school, the Principal welcomed the idea and scheduled a series of assembly meetings for the presentations. Subsequently, Staff was able to reach out to approximately 600 students with the rail safety message. With such good cooperation from school officials, CPUC staff feels they have made significant progress in presenting railroad safety awareness to this small community.



*Multiple railroad tracks run near Kennedy Middle School in El Centro, making it a particularly relevant site for providing Operation Lifesaver Rail Safety presentations*



*A CPUC Railroad Safety Inspector (Motive Power & Equipment) making one of several Operation Lifesaver presentations at Kennedy Middle School in El Centro*

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**September 9, 2014:** CPUC Rail Safety personnel joined forces to share information about rail safety with the public at a Department of Motor Vehicles (DMV) sponsored Health and Safety Fair held in Sacramento at the DMV’s state headquarters. The Operation Lifesaver booth featured a variety of information geared towards the general populace, including safe driving tips, and the Operation Lifesaver message of “Look, Listen and Live” reminding motorists and pedestrians to stay focused and abide by the law to refrain from becoming a statistic.



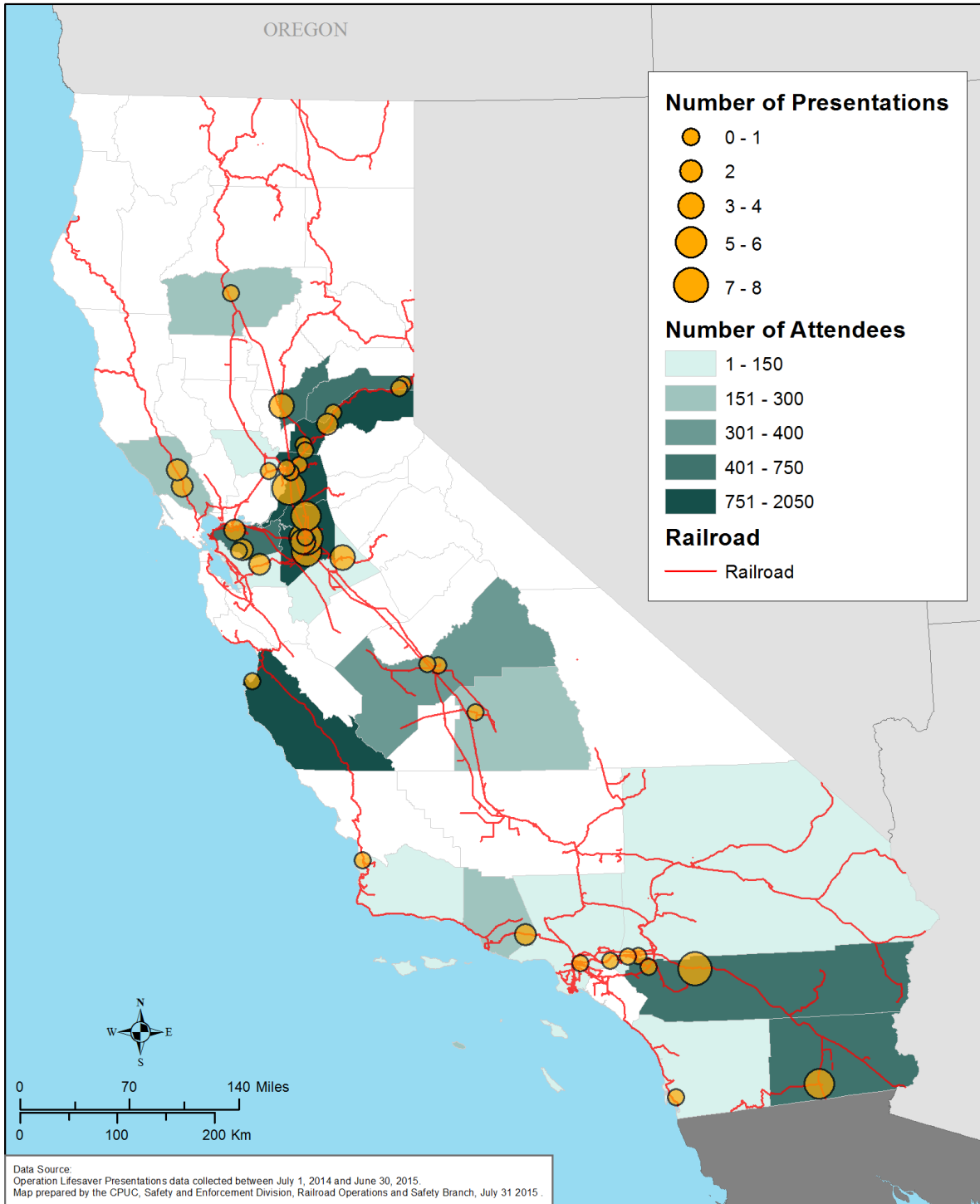
*CPUC representatives at the DMV sponsored Health and Safety Fair held in Sacramento September 9, 2014*

**February 5, 2015:** A CPUC railroad safety inspector and rail crossing engineer staffed an Operation Lifesaver booth at the Zenith Ag Safety and Compliance Summit in Fresno. This event was particularly valuable in that truck drivers for agricultural companies were provided information on driving safely in the vicinity of railroad tracks. Farm fields and packing sheds are often located close to railroad tracks, making it a high priority for drivers to be aware of possible hazards associated with railroad tracks, and to stay focused when approaching and crossing the tracks. CPUC railroad safety inspectors also took part in Ag Safety and Compliance Summits in Visalia on April 8, 2015 and Monterey County on January 22, 2015.



*CPUC Railroad Safety Staff providing information at the Operation Lifesaver booth at the Ag Safety & Compliance Summit in Fresno*

# Operation Lifesaver Presentations FY 2014-2015





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## Appendix C – Positive Train Control

The Rail Safety Improvement Act of 2008 requires Positive Train Control (PTC) implementation nationally by December 31, 2015. This deadline was recently pushed back until December 31, 2018.



*Investigators re-enact the 2008 Metrolink crash as part of the investigation*

PTC systems are integrated command, control, communications, and information systems for controlling train movements. PTC systems are comprised of digital data link communications networks, continuous and accurate positioning systems, on-board computers with digitized maps on locomotives and maintenance-of-way equipment, in-cab displays, throttle-brake interfaces on locomotives, wayside interface units at switches and wayside detectors, and control center computers and displays. PTC systems issue movement authorities to train and maintenance-of-way crews, track the location of the trains and maintenance-of-way vehicles, have the ability to automatically enforce movement authorities, and continually update operating data systems with information on the location of trains, locomotives, cars, and crews. The remote intervention capability of PTC will permit the control center to stop a train should the locomotive crew be incapacitated.

PTC is an intricate national web of technologies integrated to work between railroad entities. Although the specific PTC systems used by each railroad may differ, dissimilar systems must be interoperable with each other in order to function properly and to prevent accidents. This coordination is achieved through the railroads' Interoperable Train Control (ITC) Committee.

PTC systems vary by railroad, with the same expected functionality regardless of varying equipment and must be interoperable so that any railroad's equipment can utilize another railroad's PTC system.

Federal and State funding has been provided to various railroads operating in California for PTC implementation.

PTC is most commonly associated with the railroad discipline of signal and train control. CPUC Rail Safety has identified further areas of focus and has two inspectors overseeing these aspects as well, including train operations (OPS) and technology and communications (IT). CPUC has one inspector focusing on operations and one inspector focusing on the technology aspects of

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PTC in order to enhance safety oversight of the complex methodology of PTC. These two inspectors must cover the entire State of California; more inspectors are needed to effectively oversee this complex safety technology.

There are safety risks for scenarios not addressed with current PTC system design. They include a lack of individual respective train to train proximity awareness; between signals rear-end collision; vehicle/pedestrian collision; and federal regulatory exemptions for specific criteria which do not require PTC operation beyond unforeseen system failure underway.

Another risk associated with PTC is revealed by examining the different requirements for PTC between the largest freight railroads and short-lines. All short-line locomotives which can access California PTC track are not required to have PTC-interoperable locomotives. Remote-control stopping would not be available on the non-PTC locomotive, severely compromising the PTC system in California.

The complexity of the technology increases risk of PTC system safety, particularly with software changes which require extensive testing across multiple railroads to reduce safety issues related to the changes.

Although Pacific Sun Lines (a short line railroad) is not required to equip their trains with PTC equipment in order to interchange with North Coast Transit District (NCTD - Coaster) tracks by federal regulation, NCTD is requiring Pacific Sun Lines to equip their trains with PTC equipment in order to operate on their tracks, which host not only other passenger trains, but freight as well.

There are over 22,000 locomotives capable of entering California operating in the U.S. which would benefit by increased inspections to ensure PTC interoperability and operating status when entering California.

Although PTC installation is a federal law, the FRA has not been able to witness a large portion of PTC testing and validation procedures, and instead relies on self-reporting by rail operators such as Metrolink. The CPUC does not have enough inspectors to effectively and proactively monitor PTC implementation to ensure that safety regulations and protocols are formulated and enforced.



*Overhead view of May 12, 2015 Philadelphia Amtrak accident*

To highlight the consequences of delayed implementation, the May 12, 2015 Amtrak accident in Philadelphia's preliminary investigation indicated that perhaps PTC would have stopped the train which was violating a particular speed, resulting in an automated brake application that slowed or stopped the train thus avoiding the deadly derailment that resulted from the over speed condition through a curve.

Railroads operating in California are in varying stages of PTC implementation. It is important to note that many railroads are receiving assistance with state and federal funding as highlighted by the Amtrak – California report. The complexity of PTC makes it challenging to predict progress. A best assessment based on the dynamic nature of implementation, the following is a list in order of most likely to be complete with implementation in California first:

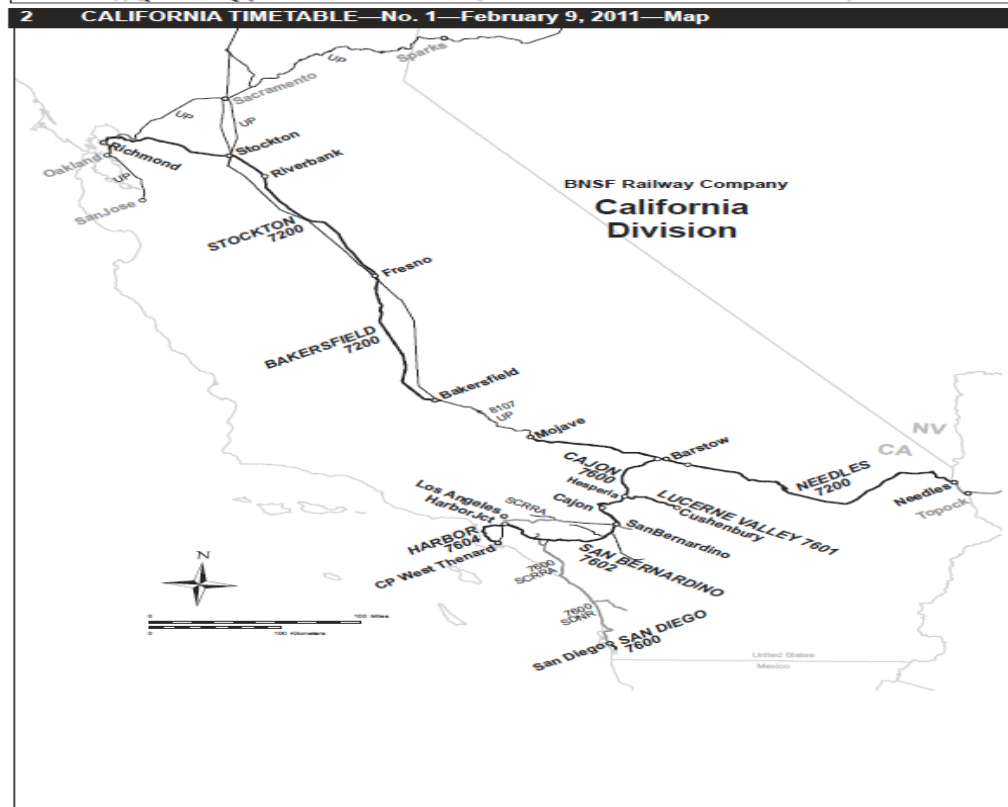
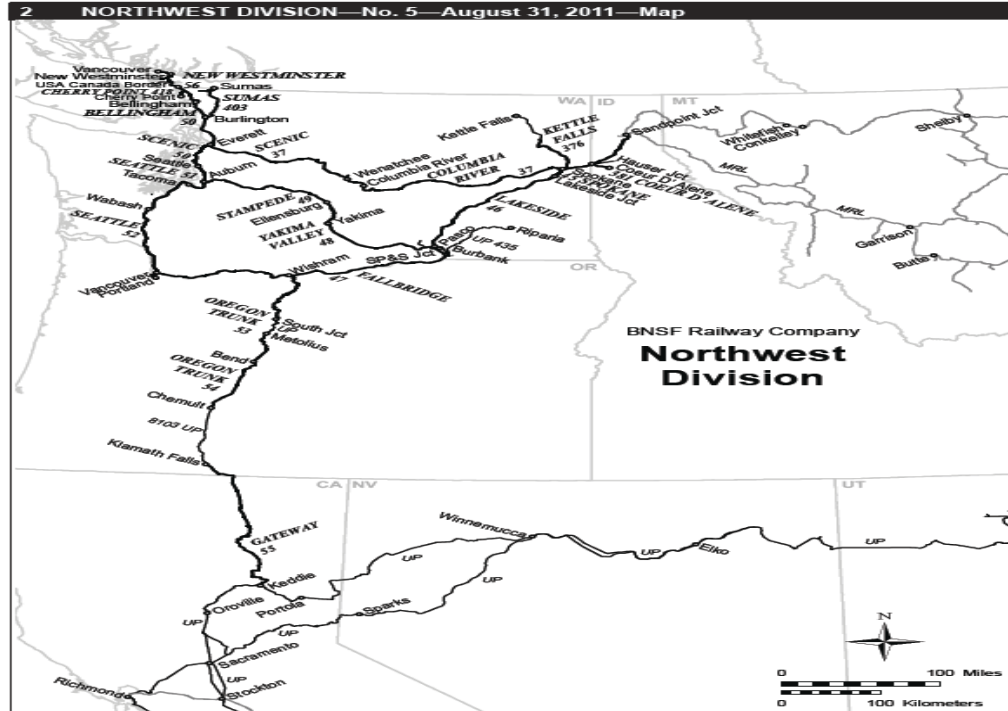
**1. Metrolink (SCAX)**

a. (All subdivisions in Revenue Service Demonstration (RSD))



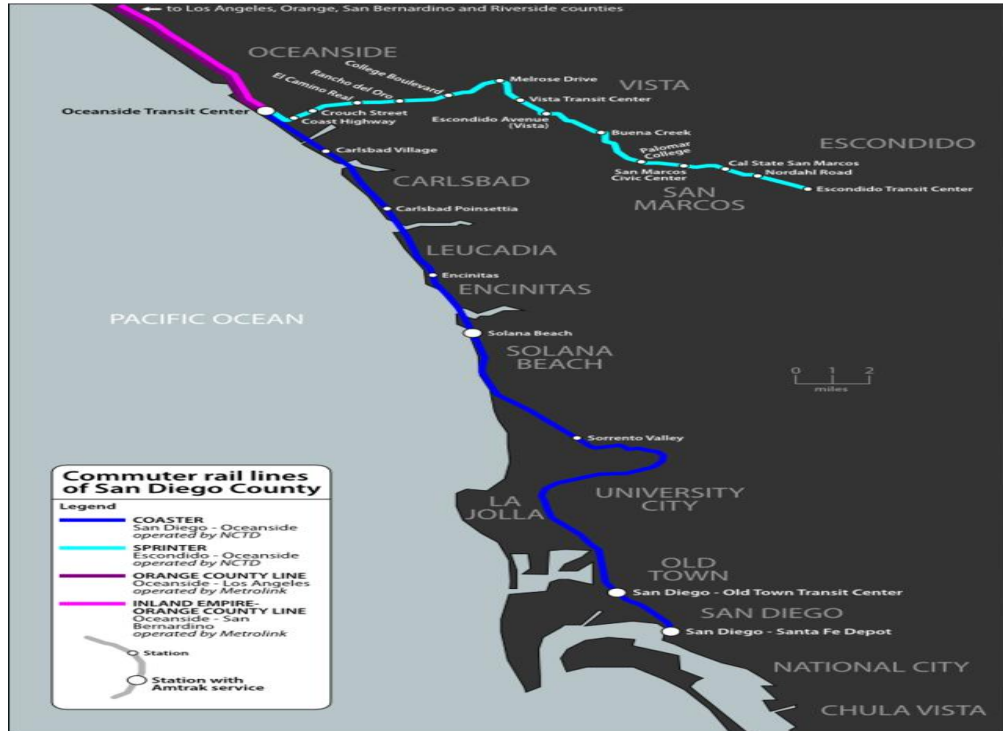
## 2. BNSF Railway (BNSF)

- a. (All subdivisions in Revenue Service (RS) and conditional certification as non-vital overlay (the protection relies mainly on the base system with an additional layer of protection from the PTC overlaying the current signal system))

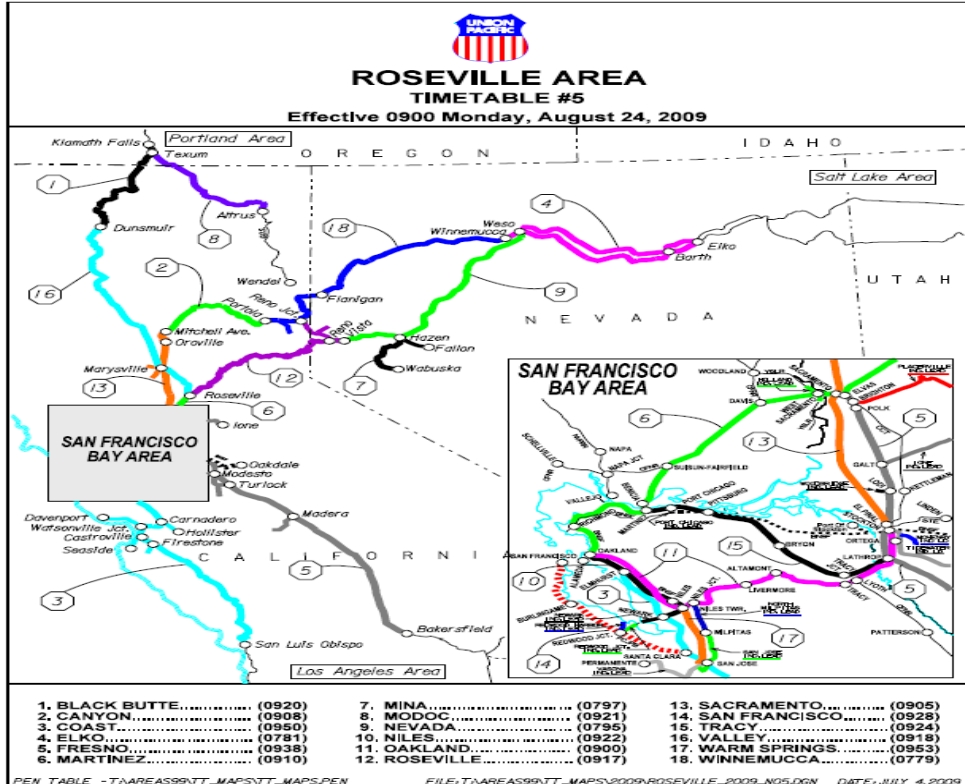




3. North Coast Transit District (NCTD) "Coaster"  
 a. (infrastructure/train installation in progress)



4. UPRR  
 a. (Southern California subdivisions are in testing; rest of state still installing)





5. Caltrain (JPBX)

- a. (infrastructure/train installation in progress, testing targeted for Fall of 2015)



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6. **Amtrak – National Fleet** (e.g. California Zephyr, Coast Starlight, Southwest Chief)
    - a. (Dependent on host railroad, trains mostly ready for testing, selecting dispatch system).



7. **Amtrak – California** (information provided by Caltrans Division of Rail)
    - a. The California Department of Transportation’s (Caltrans), Division of Rail and Mass Transportation manage and coordinate State-wide intercity passenger rail service known as Amtrak California. Caltrans contracts with Amtrak, to provide daily operation and maintenance of Amtrak California service. Amtrak California is comprised of two rail routes, the Pacific Surfliner which operates between San Luis Obispo and San Diego, and the San Joaquin which operates between Oakland/Sacramento and Bakersfield.

In addition to these two routes, the Capitol Corridor, a State-funded, but separately operated service, extends from Auburn to San Jose. The Capitol Corridor and the San Joaquin Corridor share Caltrans-owned rail equipment. The Pacific Surfliner Corridor utilizes some Caltrans-owned rail equipment, but predominately uses Amtrak owned equipment. The intercity passenger rail network is shared with the BNSF Railway Company (BNSF) and the UPRR freight services, and Caltrain, Altamont Commuter Express, Metrolink and Coaster commuter rail services. California’s intercity passenger rail system carries approximately five and a half million passengers annually. Amtrak California Positive Train Control Implementation in California: In California the base infrastructure and track work required to implement Positive Train Control (PTC) is complete. Each of the host railroads, UPRR, BNSF, Metrolink, North County Transit District and Caltrain are now in different stages of PTC system verification and testing. To date, Amtrak has installed and tested many of the on-board components required for PTC operations on the State-owned locomotives and cab-cars, as well as on Amtrak-owned equipment used in California. Amtrak is projecting to have the remaining components installed and move to the system verification and testing phase by October 2015. With Caltrans support, Amtrak is working diligently to have PTC fully deployed by the December 31, 2015, deadline. Funding: To date, Caltrans has allocated approximately \$350 million in State funds, towards the implementation of PTC on the intercity passenger rail, freight and commuter corridors. In addition, Caltrans administers close
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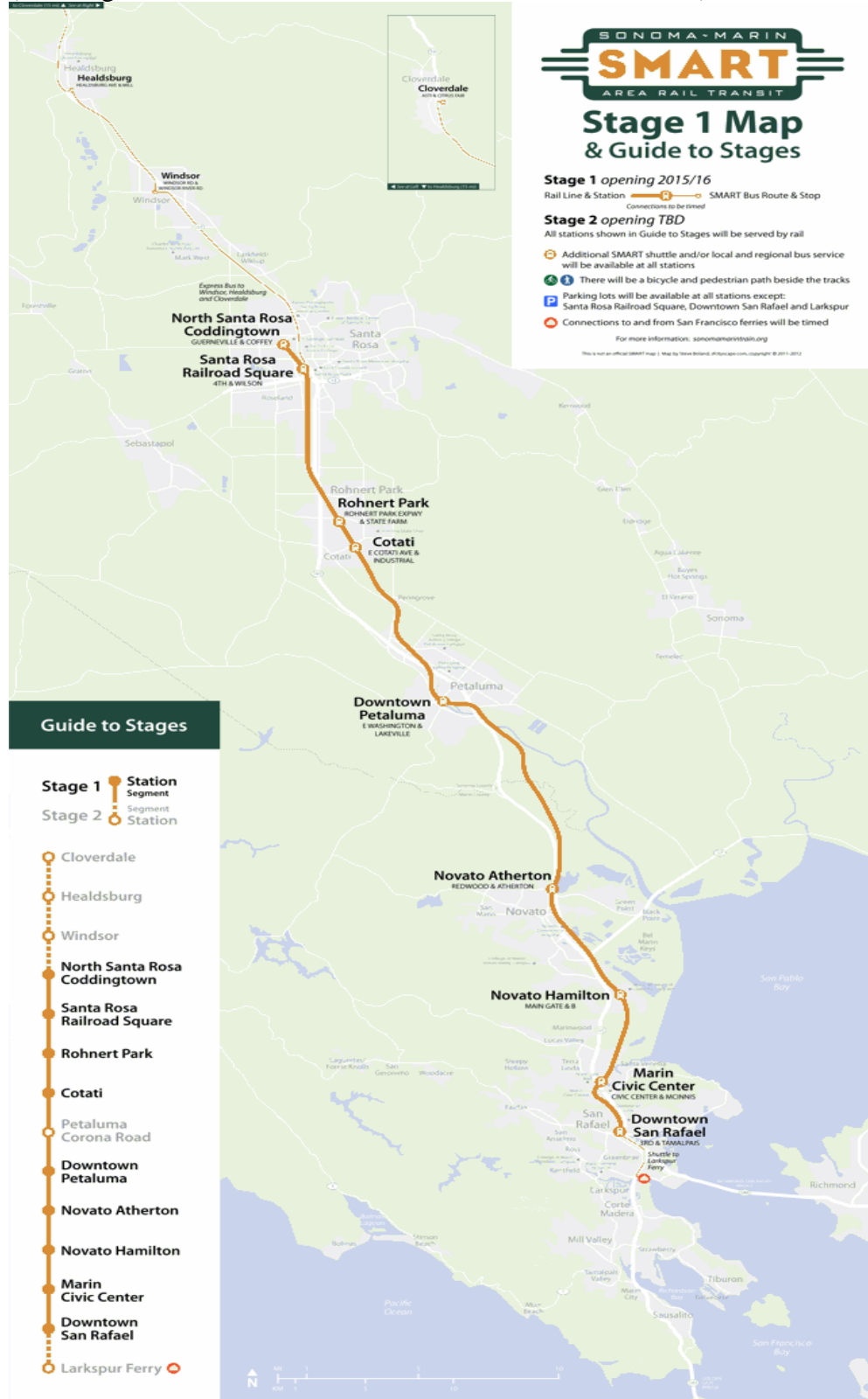
to \$40 million in federal grants for completion of communications backhaul along the Pacific Surfliner Corridor.





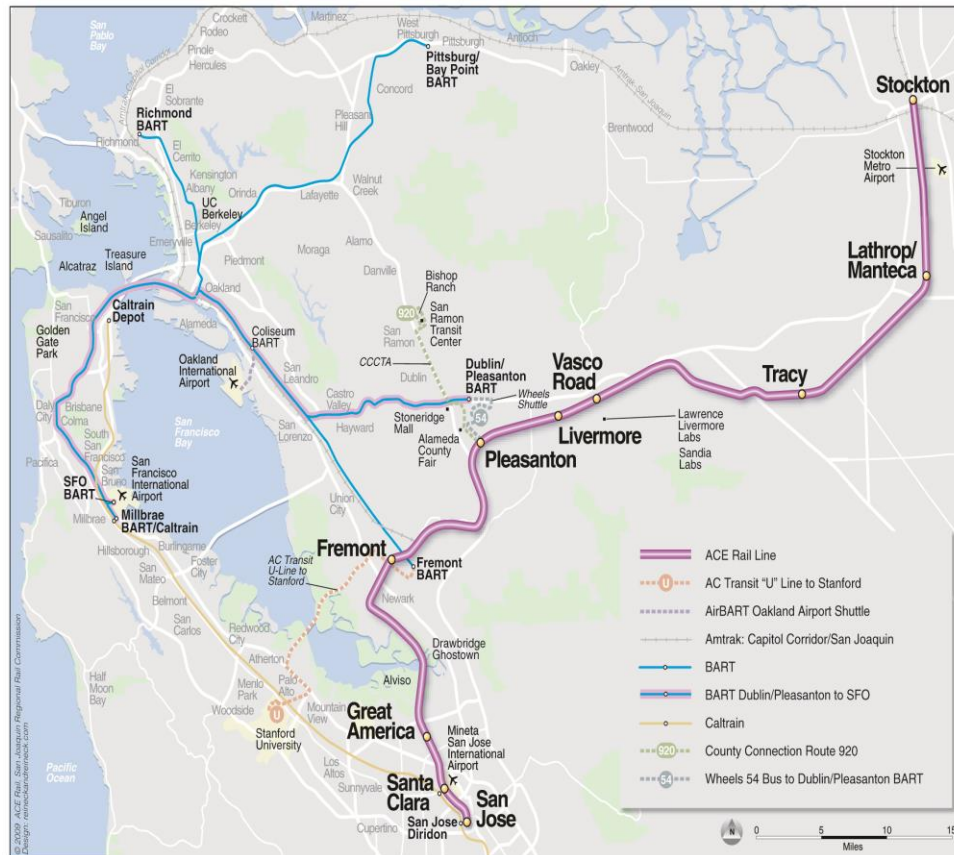
## 8. Sonoma Marin Area Rapid Transit (SMART)

a. (Building a brand new commuter rail line, all new installation)



## 9. Altamont Corridor Express (ACE)

- a. (Dependent on UPRR – ready to sign agreement for equipping trains as tenant when available)



## Appendix D - Examples of Regular Inspections

Below are examples of regular inspections carried out during the 2014-15 fiscal year:

**December 2, 2014:** A CPUC railroad safety inspector performed a General Order inspection near the UPRR Stockton Yard located in Stockton, CA. Observations were made for compliance with CPUC General Order (GO) 26-D. GO 26-D has specific parameters on how far construction materials, fence posts and other items must be kept away from the track to avoid endangering railroad employees performing routine trackside duties. The defective conditions found pertained to newly installed signal appurtenances (green upright boxes) impeding side clearance requirements, as well as creating unsafe walkways (GO 118A).

CPUC staff photographed the area and provided UPRR management with a General Order inspection report regarding these non-compliant conditions, along with the photos. UPRR management acknowledged the concern and initiated remedial action for non-compliant

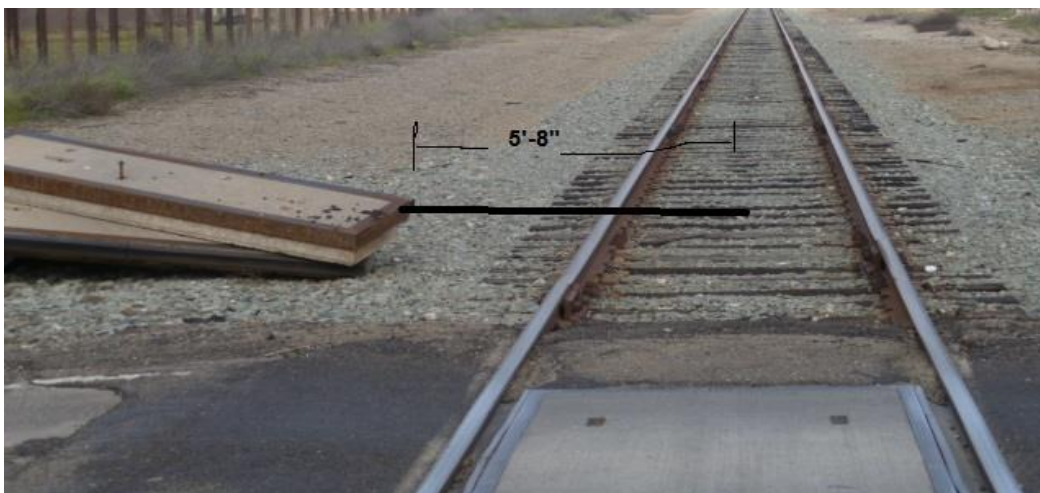
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condition. UPRR personnel relocated the equipment utilizing below ground box installations, thus eliminating the condition.



*View looking South of Industrial Road, stationary green equipment boxes in walkway within 8' 6" of track center could strike an employee riding the side of equipment (Freight cars can extend 3 ft. beyond the rail)*

**January 14, 2015:** A CPUC railroad safety inspector conducted a regular highway road crossing inspection at Harney Lane in Lodi on the Central California Traction (CCT) Railroad. During the inspection, items were noted that were placed less than 8 feet 6 inches from the track center line. This is not in compliance with GO-26-D or GO 118-A as the condition impedes side clearance and walkway requirements for railroad employee to perform routine trackside duties. These items appeared to be placed at the entrance to railroad right of way to deter the general public from trespassing. However, railroad employees working on and around moving equipment could be seriously injured by tripping on such an obstacle in the walkway. As a result of the inspection the non-compliant issues found were remediated by railroad personnel in a timely manner.



*According to California State General Order 26-D Clearances, objects may not be placed closer than 8' 6" from the centerline of tangent track. The items in the photo were placed at 5' 8" from centerline of track.*



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**January 21, 2015:** A CPUC railroad safety inspector conducted a routine inspection of UPRR main track between Portola, California and the California/Nevada Stateline. During the inspection, a broken rail was discovered in a passing track near the Sierra Army depot. There was an eight inch piece missing from the length of the top of the rail. This condition, if not detected before the next train would pass over this location, could cause a serious train derailment, especially considering the maximum authorized train speed at this location is 60 MPH. As a result of this inspection, the accompanying UPRR representative removed the main track from service until repairs were completed.



*View of discovered breakout in rail as a result of a bolt-hole crack at a miter cut insulated joint*

**February 6, 2015:** As part of a regular inspection, CPUC railroad safety inspectors visited North County Transit District (NCTD) PTC lab for a demonstration of their PTC equipment. The PTC lab is used to test and program all the necessary information for PTC. This equipment is used to simulate actual train movement and signal aspects for any section of track or subdivision.

In the safety of a controlled environment all phases of PTC operation can be simulated here. In the lab environment you can insure the PTC system prevents train to train collisions, enforce speed restrictions, protect Roadway Worker within their limits of authority, enforce highway-rail grade crossing malfunction directives, etc. This lab is also used to train locomotive engineers before they operate an actual PTC equipped train.

The photo below shows the equipment necessary to simulate actual signals from the field as well as the view of the PTC monitor that the locomotive engineer would see when operated in PTC territory. Included in the racks below are three different types of field equipment used for control of signals. As a result of the inspection, CPUC railroad safety inspectors were able to gain a greater knowledge of PTC, as well as witness and participate in realistic simulations that will enhance their ability to enforce safety regulations as PTC is implemented in California.



*The top screen below would be the monitor that would be used to display the PTC information to the train engineer.*



*NCTD continues to make slow progress in their implementation of PTC. The new goal is to have PTC operational by the end of the year.*

**February 24, 2015:** As part of training for the regular inspection process, CPUC railroad safety inspectors attended a “Hazardous Materials Emergency Response Briefing and Equipment Demonstration” at the California State Railroad Museum, sponsored jointly by the BNSF and UPRR. Presentations were conducted by members of management and rank and file from BNSF, UPRR, the California Short Line Railroad Association and Central California Traction Railroad, Valero Refinery of Benicia, Dow Chemical of Pittsburg, CA. and Roseville Fire Department. The presentations gave a brief overview of current Federal, State, OSHA, EPA and American Association of Railroads regulations governing hazmat shipments by rail. Discussed were new



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regulations for tank car construction, available media and electronic apps for hazardous material identification, and the company's *Chemtrec* and *TransCaer* systems, which provide emergency training for hazardous commodity handling. Chemtrec also provides detailed commodity information, available 24 hours for responders of hazardous spills.



*PTC Training Trailer*



*Rail Tank Car for Hazardous Response Training*

After the presentations, a tour and explanation of hazardous “Training and Response Equipment” was conducted. The following equipment was displayed and toured; PTC training trailer, 1 hi-rail geometry truck, 1 hazmat response truck, 5 hazmat response trailers, 1 training rail tank car with interior access, 1 rail flat car equipped with manway covers for training, 1 recently (2014) constructed “111a” rail tank car equipped with bulkhead shields and a UPRR locomotive. CPUC staff felt that this was an exceptional training opportunity.

## **Appendix E - Examples of Focused Inspections**

Below are examples of CPUC focused inspections as well as joint CPUC-FRA focused inspections during the FY 2014-15:

**July 15-16, 2014:** CPUC railroad safety inspectors performed a focused inspection of rail operations at a BNSF crude oil offload site in Richmond, CA, and UPRR facilities in Benicia and Martinez (Ozol). This inspection was part of a joint CPUC-FRA focused inspection. This inspection was organized by CPUC staff due to an increase in human-factor caused incidents in the East Bay area. And since crude oil shipments into California increased dramatically this past year, the concern to investigate these human factor issues was of paramount concern. CPUC staff inspected the BNSF and UPRR receiving and classification yards, including the unloading facility in Richmond where crude oil loads and empties are handled. UPRR’s Ozol Yard in Martinez and Benicia facility also handle empty crude oil tank cars.



*BNSF Richmond Secured Crude Oil Offload site - Loaded cars are protected, secured inside a gated facility and monitored in a locked area with spill protection surrounding equipment*

According to BNSF officials, at the time of this inspection, a single 100-car loaded crude oil train is transported into the Richmond yard approximately every two weeks. Loaded tank cars are delivered to a secure site in two 25 car sets (50 total loads) at a time. These loads enter the state in Northern California, traveling on both BNSF and UPRR track to reach Richmond, the final destination. The unloading sites at Richmond was inspected for potential safety risks, such as checking securement of standing rail car equipment and ensure the site restricts public access.

In addition to auditing the BNSF, UPRR and Amtrak facilities in Richmond, Benicia, Martinez and Ozol, CPUC staff visited and inspected Receiver/Shipper facilities in Collier and Benicia. Such audits include observations to ensure a safe working environment for railroad workers. At one rail facility in Benicia, CPUC inspectors performed a follow-up investigation regarding a boxcar which had recently been involved in an incident where the box car had a door fall off striking a passing passenger train on a main track. CPUC railroad safety inspectors found two State General Order defects, which were addressed and corrected by the facility personnel at this industry.



*Inspection of facility in Benicia revealed two State General Order defects, both unsafe for railroad workers: One is a clearance issue, the other a tripping hazard due to obstacles left on the dock and in the walkway*

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**November 14, 2014:** The scheduled arrival of the first crude oil unit train at the newly constructed Plains American, LLC, crude oil unloading facility near Bakersfield, CA, motivated the CPUC’s Crude Oil Reconnaissance Team (CORT) to conduct a focused inspection of the San Joaquin Valley Railroad (SJVR). The SJVR serves the new facility and is the lessee of the track that is jointly owned by the BNSF and the UPRR. The inspection focus was to ensure the entire 29 track miles to be traversed by the expected crude oil unit trains had been proficiently inspected after many months of rehabilitation work. In the previous ten months these tracks were upgraded to allow for higher train speeds. The track was originally sufficiently adequate for 10 MPH. The rehabilitation work was intended to upgrade it to 25 MPH. The CORT staff utilized a high rail vehicle and walking inspections to cover the entire length of main, siding and yard tracks. CORT staff inspected switches, curves, signals and grade crossing devices along 29 miles of track. The CORT team identified and recorded defects, but did not find any conditions that warranted civil penalty recommendations. The defects noted were corrected by SJVR personnel or their contractors in a timely manner. Conducting joint inspections with the SJVR provided them a better understanding of the proactive mission of the CORT team.



*CPUC Railroad safety inspector-CORT member inspecting a switch*

**December 10, 2014:** As part of a focused inspection, CPUC railroad safety inspectors performed an audit of North County Transit District (Coaster) emergency preparedness plan, as required by Code of Federal Regulations (CFR) part 239. The audit/observation focused on section 103, subsection A, of the regulation. Subsection A states “Each railroad operating passenger train service shall conduct full-scale emergency simulations in order to determine its capability to execute the emergency preparedness plan under the variety of scenarios that could reasonably be expected to occur on its operation, and ensure coordination with all emergency responders who voluntarily agree to participate in the emergency simulations.” This simulation was held just outside the Marine Corps Base, Camp Pendleton, at Fallbrook Junction which is near locate Oceanside, San Diego County, CA. Participating agencies at this event included: Oceanside Fire Department, San Diego County Sheriffs Department, Transit Security Administration (TSA), Office of Emergency Services (OES), North County Transit District (NCTD), Amtrak Police, BNSF Police, FRA, CPUC Office of Rail Safety (both heavy rail and transit sections), Carlsbad Fire Department, and Transit America Services.



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The simulated scenario fictionalized an “active shooter” on board a Coaster train. The simulation premise was that train had been proceeding normally when suddenly a shooting broke out on board the train. The simulated train only had 16 passengers on board at the time of the event. The passengers were employee volunteers and regular Coaster riders. The train crew simulated stopping the train while concurrently contacting the train dispatcher to report the occurrence. The dispatcher simulated contacting first responders and emergency personnel setting in motion the emergency training. San Diego Sherriff Department armed officers responded to the location and began by searching the train for the shooter. The deputy sheriffs found no shooter, but identified two injured riders who required immediate medical attention and one special needs rider who required assistance exiting the train. Once the train was cleared of danger, the emergency medical responders were able to board the train and remove the injured passenger and place him in medical transport.

During the course of the inspection CPUC railroad safety inspectors no defects or exceptions were noted. The next two photos were taken during the exercise.



*Law enforcement and first responders at simulated shooting incident onboard a train*



**March 2 – 5, 2015:** CPUC railroad safety inspectors teamed up for a multi-discipline focused inspection in the Bakersfield area on the UPRR, BNSF Railway, Amtrak and SJVR. Reactive

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data regarding railroad incidents and injuries points to Kern County as an area needing improvement. The team focused particularly on crude oil routes, as these routes pose significant risk. Disciplines included in this focused inspection were Operating Practices, Track, Signal & Train Control, Motive Power & Equipment, and Hazardous Materials. The focused inspection also included staff from the CPUC's new Railroad Bridge Evaluation Program.



*Both curves and grade territory are factors taken into consideration when choosing which bridges to examine. Bridge in the Tehachapi Pass area was chosen for observation as it features both.*

In addition to performing 30 compliance inspections regarding federal and state regulations, valuable time was spent observing operations and maintenance practices at the Plains All-American LLC crude oil unloading facility near Bakersfield. Significant improvement was noted on SJVR track leading to the Plains facility, due to major track rehabilitation work performed in preparation for receiving crude oil unit trains. An inspection of other UPRR and SJVR yard tracks in the vicinity revealed a moderate number of track-related defects that needed immediate remedial actions to prevent possible derailments. These defects included several center cracked rail joint bars. Such non-compliant conditions, if not repaired in a timely manner, could easily be causal in a derailment.

Railroad operating practices were observed on all three railroads, with inspectors observing a UPRR crew performing egregiously unsafe actions on moving railroad equipment during routine switching operations near an industry on the outskirts of Bakersfield. These observations included a railroad employee crossing from one side of a moving train to the other on the end platforms between rail cars. Another example was a railroad employee standing on a rail car coupler – doing so could cause the employee to fall between cars while the train is moving; and yet another railroad employee straddling cars (one foot on one rail car platform and the other foot on the following rail car platform) while moving. The CPUC railroad safety inspectors discussed



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the identified defects with the railroad employees at the scene, and afterwards with a UP manager for follow up. Of particular concern was that there were experienced or “seasoned” employees in this instance that were teaching their unsafe habits to a new student employee assigned to train with this crew. Discussions regarding the lack of an effective safety culture were held with local railroad managers and these subject employees; and applicable regulatory enforcement was taken by CPUC staff.

CPUC railroad safety inspectors examining hazardous material tank cars on the UPRR and BNSF Bakersfield yards identified defective conditions on several cars, including missing placards and defective tank car sample valves. A thermal crack was found on the wheel set of a railroad tank car at the BNSF yard. This crack in the wheel could grow and cause portions of the wheel to fragment or separate, possibly causing a derailment. The responsible local railroad managers were notified of these non-compliant conditions and, accordingly, the cars set out onto a repair track until remediated.

A number of unsafe walkway and side clearance issues were found that were not in compliance California State General Orders 118-A and 26-D. The unsafe, non-compliant conditions were documented and reported to the responsible railroad representatives. Prompt remedial actions were taken by railroad representatives.



*Uneven walkway surface can lead to serious injury of crew members working alongside moving equipment, Such conditions do not comply with State General Order 118-A*

The multi-discipline focused inspection was successful in finding unsafe conditions on the railroad properties inspected, as well as providing training for railroad employees unfamiliar with our state regulations. The event also allowed for valuable field training for new CPUC employees, and additional familiarization with what will be their future assigned territory. By focusing on crude oil routes, identification and correction of noncomplying conditions could make a difference in preventing accidents and injuries affecting the public as well as railroad employees.

**March 4, 2015:** As part of a focused inspection on the crude oil line running through in Kern

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County, a group of CPUC railroad safety inspectors participated in an inspection of the new radio controlled switches that have been installed as part of the safety upgrades on the crude oil route on the SJVR Buttonwillow and Sunset subdivisions. These radio controlled switches allow train crews to operate main line switches remotely from the cab of a locomotive



*Radio controlled switch on the Buttonwillow subdivision, Kern County*

The photo above of a switch shows the switch set for straight movement westward on the Buttonwillow Subdivision. If the switch was reversed, or the switch rails lined for the other side, a train would precede towards the Sunset Subdivision. The new hydraulic switches are controlled by the radios in the locomotives. The system used is much like the push button system used on phones. The engineer that is operating the train enters the proper code for the route that the train is to take.



*Picture of inside of control case.*

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Other safety features provided by this new technology are radio announcements made when the switches are manipulated. The switches also have an electronic detection circuit that prevents the switch from being used when a train is in close proximity. This prevents derailments. The control cases for these new switches also have electronic event recorders. The data from these recorders can be downloaded to a laptop when analyzing failures or malfunctions. The result of this focused inspection determined that the new radio controlled switches were working properly and in compliance with applicable safety regulations.

**May 5, 2015:** CPUC railroad safety inspectors performed a focused inspection of the BNSF facility in Stockton, CA, San Joaquin County, also known as Morman Yard. The purpose of the inspection activity was monitoring compliance GO 118-A walkways.

CPUC staff had identified issues with air hoses and other materials being left in walkways by railroad mechanical employees when finished performing train air brake tests in the yard. Ironically, an issue occurred at the time of this inspection. A train conductor on an outbound train stopped his set of locomotives near our inspection team to descend to the ground from the locomotive step to perform a routine duty. Before anyone could react to warn him, the conductor actually put his foot on an air hose that was left in the walkway and stumbled a bit. He did not injure himself, fortunately, but our point was made very profoundly by this minor incident. Local managers participating with the team agreed to remedy the situation immediately.

Another issue that arose was the movement of defective freight cars for repair. In the photo below, the rail car coupler and part of the draft system are missing. When the BNSF mechanical manager was questioned about the car and how it arrived in that condition, he replied that moving cars with this deficiency was a routine matter and he had no problem with it. The CPUC railroad safety inspector advised him that all freight cars and locomotives are required to have couplers capable of working, as required by federal regulation. The BNSF mechanical manager told the CPUC railroad safety inspector that he did not believe that such a regulation exists requiring working couplers. He went on to say that absent “proof” the car would soon be moved to Barstow as is. The CPUC railroad safety inspector sent the BNSF mechanical manager and another BNSF railroad employee an electronic copy of the federal law requirement. The second BNSF railroad employee acknowledged the federal law and also concluded that the equipment could not legally be moved to Barstow. BNSF has since taken the car from service and will scrap the car without further intent to move it to another facility. One of the main purposes for this regulation is, for example, say such a car had been placed at the rear of a train, which is where a defective or bad ordered rail car traditionally goes, if allowed. And say further still that a derailment occurred on that same train, especially one that involved hazardous materials. Railroad emergency response personnel would not be able to attach a locomotive to the rear of this train to move cars away from any potential danger.

As a result of this focused inspection it was determined that there was lack of full compliance with General Order 118-A, and that train air brake testing paperwork was not properly completed. A follow-up inspection was conducted a few weeks later with successful results.





*Defective car with missing coupler*

**May 12-13, 2015:** Six CPUC railroad safety inspectors carried out a focused inspection on the SJVR in Fresno, with an emphasis on compliance with State General Orders. The event provided new CPUC inspectors an opportunity to learn more about the state regulations. Non-complying walkway and clearance issues were found including tripping hazards, vegetation creating side clearance impairment, and grade crossing safety concerns. SJVR management was notified of the identified defects for corrective action and the defects were repaired.



*This pile of debris in the walkway of an industrial lead track on the Clovis Branch is a GO 118-A defect. The debris poses a hazard to trainmen either tripping, or fouling the track and possibly being struck by moving equipment while trying to get around the pile of dirt, asphalt and concrete.*



*Long ties extend into the walkway, posing a tripping hazard, remnants of a track that was removed. This condition does not comply with GO 118-A.*



*Remnants of an old concrete structure to the left of the locomotive are a tripping hazard and could lead to injury of crew members getting on or off the locomotive.*

**June 16, 2015:** CPUC railroad safety inspectors joined CPUC staff from the Rail Crossing Engineering Branch (RCEB), Kern County managers, Caltrans, and representatives from UPRR, BNSF Railway and SJVR to conduct grade crossing upgrade project reviews for three crossings located in Kern County. These three Kern County grade crossings currently have passive warning devices including crossbucks and are located on a crude oil unit train route.

The meeting was conducted at each crossing location to determine the configuration and type of active crossing equipment that was needed to upgrade each crossing. Two of the crossings, Shafter Road and Houghton Road are located in a rural area and subject to foggy conditions



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during the winter. Adams Street is located in a residential area. Both Shafter and Adams have elementary schools in close proximity.

The meeting allowed all legally responsible agencies to understand what each agency was actually responsible for during the installation and subsequent maintenance once completed. CPUC railroad safety inspectors pointed out that the risk of a train/vehicle collision is greater during inclement weather, especially the foggy conditions prevalent in the San Joaquin Valley during the winter. Active warning devices with flashing lights, as well as flashing lights in advance of the crossing would greatly help during times when heavy fog is present.



*Crossing located at Adams Street in Bakersfield CA, with passive warning device (crossbucks)*

## **Appendix F – Accident Investigation Summaries**

CPUC rail safety supervisors reviewed all reported rail incidents. Of that amount, 55 required investigations. The following reports provide an example of CPUC rail safety investigations.

**November 25, 2014:** At approximately 2:05 AM (PST), a westbound UPRR freight train derailed 12 cars in an unincorporated area of Plumas County. The train originated at North Platte, Nebraska and was destined for Stockton, California. This train had two locomotives on the head end and one locomotive (Distributed Power Unmanned or DPU) at the rear of the train. The derailment did not result in any injuries or fatalities.

The derailment was located within CPUC’s local safety hazard site No. 23 on the Feather River Canyon route. The North Fork of the Feather River traverses through the canyon just below the derailment site. Highway 70 is located across the canyon on the opposite side of the river from the railroad tracks. The derailment occurred on a curve with the train operating at a recorded speed of 23 mph. Maximum authorized speed is 25 mph. The train crew indicated that the trip was uneventful prior to an emergency train air brake system application. Of the 12 cars that derailed onto the ground, nine of those rail cars rolled down the canyon towards the Feather River. One rail car remained upright, while two other rail cars leaning on their side. At least one car released feed corn into the river. The CPUC investigation determined the cause of the derailment was attributed to a broken rail. No other contributing causes were found regarding



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railroad equipment, signal and train control or human factors related to train handling or train dispatching. Equipment damage was estimated at \$640,049 and track damage at \$85,768. There was no signal damage.

As a result of the CPUC investigation, the railroad has implemented the following remedial actions:

1. UP will test the rail on the portion of the subdivision for defects 6 times per year versus 1 time as required by FRA.
2. When the rail wear (head loss) reaches ½ inch, that segment of rail will be entered in a program for replacement
3. UP will be working on a rail project that will eliminate rail installed prior to the year 2000; this would take out all the older 133 pound per yard rail in the canyon to be replaced by new and heavier 141 pound per yard rail.
4. Districts with curved territories would hire additional track inspectors and add new management positions for more effective oversight. Locations would include the Canyon, Donner Pass and Tehachapi territories on the UPRR. These locations are also crude oil unit train routes. This plan is to add 70 inspectors and management staff over the next five years.

Since this incident the UPRR has made significant improvements in the Feather River Canyon, including putting in 40 miles of new rail to replace the older, lighter rail. They have also stepped up their hiring program to include more managers and track maintenance employees in grade territories. UP track inspection frequency has also been increased.

**January 6, 2015:** CPUC railroad safety inspectors investigated a seven car derailment at the UPRR Davis Yard in Roseville, CA. The incident occurred on January 5, 2015, at approximately 6:02 pm (PST). A westbound freight train departing track #308, with a total of 68 cars, derailed before it was able to get out of the yard. Of the seven cars that derailed, three were upright, two were leaning and two were on their side. The two rail cars that were on their sides included a tank car containing hazardous materials. The tank car sustained substantial damage to its outer shell, but the inner shell was not breached and consequently there was no release of Hazmat material. Due to damage to the hazmat car and initial uncertainty about a possible release, the UP initially set up a half mile evacuation zone. The UPRR initial report stated the cause was a broken rail on the lead track of the departure yard. This was substantiated by CPUC staff. Train derailments involving hazardous materials where track defects are primary cause are of particular concern. In locations where such statistics highlight this concern, CPUC staff will often monitor and mentor the railroad maintenance personnel, focusing on each employee's competency and ability to perform effective regular inspections. Mentorship and observations in the field allow CPUC inspectors to discuss training needs and other remedies with local railroad managers.



*CPUC Railroad Safety Inspector examining damage to a tank car as a result of the derailment*



*Derailement site with UP's track gang working to restore track*

**January 9, 2015:** At approximately 1:03 PM (PST), A UPRR maintenance of way (MOW) on-track machine, which was traveling southbound on the main track, collided with an occupied pickup truck at Masten Avenue grade crossing in Gilroy, Santa Clara County, resulting in a motor vehicle driver fatality. No hazardous materials were released as a result of this collision. A CPUC railroad safety inspector responded to the scene to investigate, along with the California Highway Patrol, local fire and emergency responders, and UPRR management.

CPUC railroad safety inspectors in discussions with FRA inspection staff and UP management concurred that the collision was caused by the failure of the maintenance machine operator to comply with UPRR safety policy regarding safe operational procedures for railroad maintenance machines. As a result of this investigation, CPUC railroad safety inspectors made the following recommendations to attempt to mitigate the risk of future similar collisions occurring:

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1. Utilize a turn-table to place machines in the forward direction for improved visibility when traveling.
  2. Place a co-pilot in the other available seat (if equipped) to identify when grade crossings are clear and protected.
  3. Utilize flagmen at grade crossings.
  4. Utilize signal and train control personnel at grade crossings.
  5. Limit travel distance for MOW equipment.
  6. Travel in small groups in order to alleviate traffic congestion at grade crossings.

During a follow up inspection, CPUC staff observed this same crew traverse their MOW equipment on the Hollister Branch northward over several at grade crossings. The maintenance crew followed the recommendations made by CPUC staff, including posting flagmen at grade crossings all the way through Gilroy and to their destination.

**April 7, 2015:** A BNSF freight train derailed in Esperanza, east of Los Angeles at approximately 6:00 PM (PDT). The freight train consisted entirely of cars loaded with shipping containers capable of being stacked two-high. The derailed train was traveling eastward adjacent to Esperanza Road near where the tracks reduce from three main lines to two. Six cars derailed, causing extensive damage. The derailed cars were not in consecutive order in the train. All six cars derailed upright. There were no injuries or hazardous materials releases involved. The investigation by CPUC railroad safety inspectors determined the cause of the derailment to be a broken wheel.



*Derailed site illustrating track damage at Esperanza.*





*Track damage at Esperanza derailment site*

**April 16, 2015:** At approximately 2:05 PM (PDT), five empty rail cars at JD Heiskell and Company, a grain company in Pixley, Tulare County, collided with a passing southbound UPRR freight train. Pixley is located 17 miles south of the city of Tulare. The derailed rail cars remained upright after colliding with the side of the passing train. The UP train contained some hazardous materials cars. However, none of the hazardous materials rail cars were damaged during the collision. This incident would not have been prevented by PTC. There were no fatalities, injuries or hazardous materials releases due to the collision and subsequent derailment.

CPUC railroad safety inspectors determined the cause of the accident was due to JD Heiskell personnel engaging in an inappropriate rail car switching practices. This resulted from loss of situational awareness and/or inappropriate protection of train movements by JD Heiskell personnel. CPUC staff suggested that the crew involved receive additional training and that a safety action plan be put together to ensure such actions do not happen in the future. The Production Foreman related that they were having a plant safety meeting the week of April 20th and that this derailment issue was reason for it. CPUC railroad safety inspectors left business cards with the on duty managers and will follow up with the appropriate officers regarding the implementation of the training and safety action plan by JD Heiskell.

An RMSR was filled out on this incident and discussed with UPRR upper management. The discussion involved track derailing appurtenance improvements that could mitigate a reoccurrence of this scenario. UPRR managers were receptive to the ideas discussed with the CPUC and are currently reviewing and evaluating their own standard plans. UPRR is planning to make a permanent change in their standard plans regarding improved types of derailing appurtenances and tracks that should be in place in this and other similar facilities.



*View of sideswipe location at Pixley, CA.*

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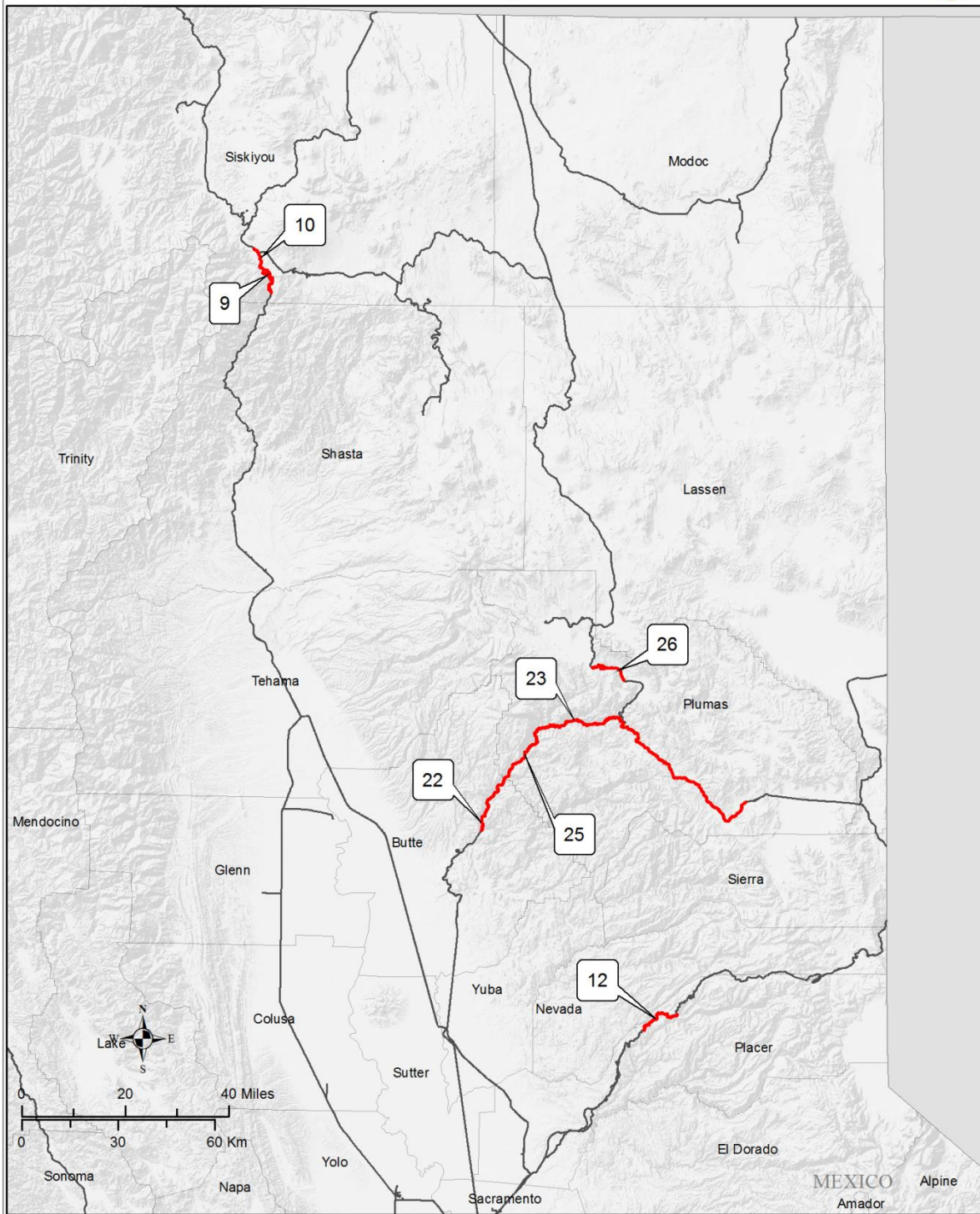
## **Appendix G – Local Safety Hazard Site Maps**

Notes:

Maps are broken down into three areas: 1) Northern California, 2) California Central Coast/Desert Valley, and 3) Southern California and are listed on pages 70-72 in that order.

These maps are being updated, and soon should be available as interactive maps on the CalOES website. For information on accessing those maps, legislators should contact the CPUC's Office of Government Affairs.

# STATE OF CALIFORNIA Local Safety Hazard Sites





# STATE OF CALIFORNIA Local Safety Hazard Sites





# STATE OF CALIFORNIA Local Safety Hazard Sites



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## Appendix H - Acronyms

CFR	Code of Federal Regulations
CORT	Crude Oil Reconnaissance Team
CPUC	California Public Utilities Commission
FRA	Federal Railroad Administration
GO	General Order
HSR	High-Speed Rail
LSHS	Local Safety Hazard Site
MP&E	Motive Power & Equipment
OES	Office of Emergency Services
OL	Operation Lifesaver
PTC	Positive Train Control
RMSR	Risk Management Status Report
ROSB	Railroad Operations and Safety Branch
SED	Safety and Enforcement Division
SMART	Sonoma-Marín Area Rail Transit
UPRR	Union Pacific Railroad