Caltrans Stands Down for Safety

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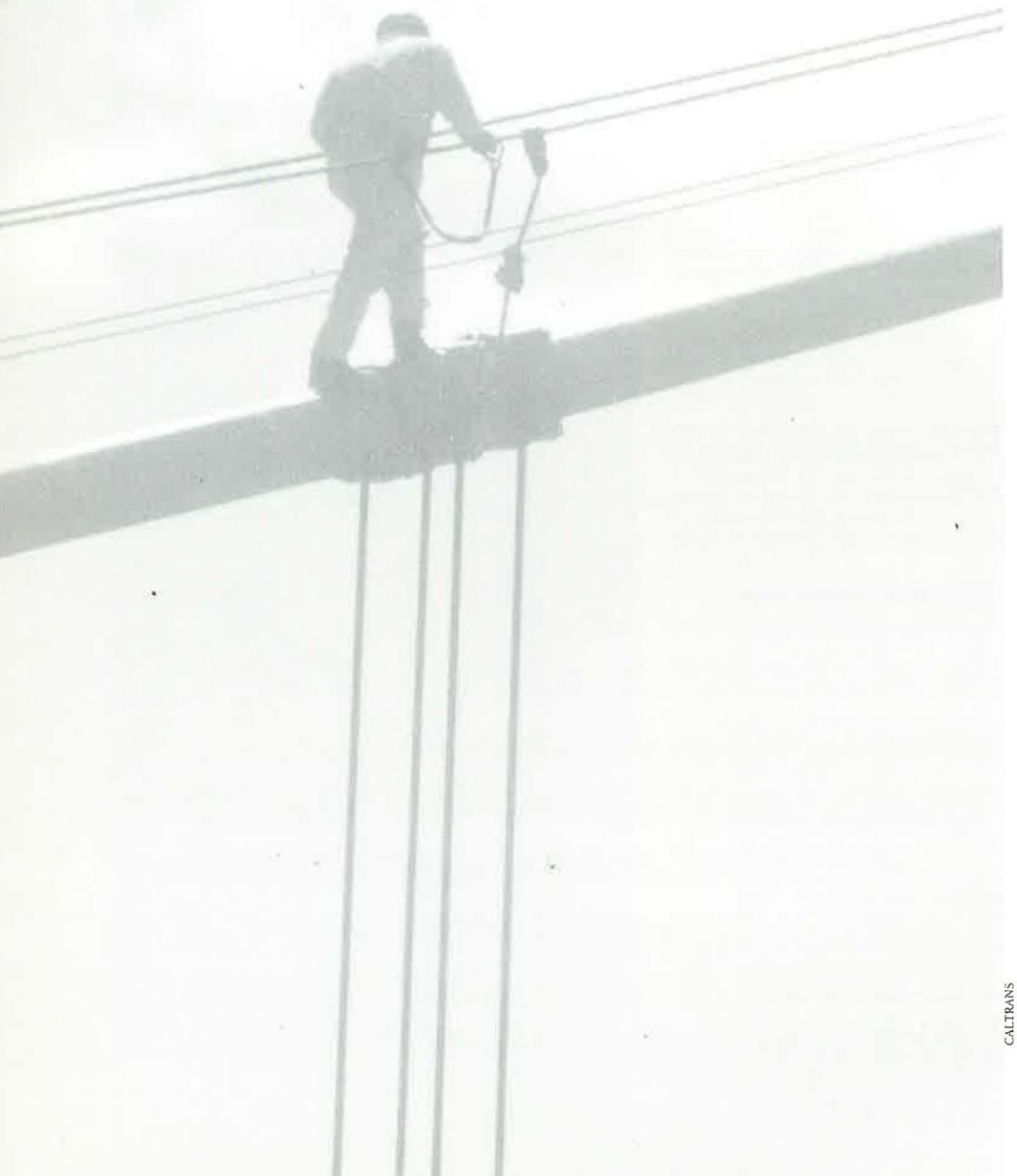

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On April 28, 1993, California Department of Transportation (Caltrans) landscape worker Juan (John) Thome had reason to be concerned for his safety as he joined his crew along the Pomona Freeway east of Los Angeles. He was wearing a black safety arm band to honor California's Worker Memorial Day and to remind himself, his crew, and the public to be careful. Despite his precaution, he became the victim of an 18-wheel truck that went out of control, hit a parked Caltrans truck, and fatally struck him. He was the third Caltrans worker to die on the job in 12 months. Indeed, 58 Caltrans workers have died on duty since 1972, and 143 have been killed since the department's first fatality in 1924.

The deaths of workers like John Thome have played a strong role in prompting Caltrans Director James W. van Loben Sels to place safety among his highest priorities. Van Loben Sels has committed the full resources of his 20,000-person department to ending deaths and injuries.

Although the most serious accidents occur in the field, van Loben Sels directed all employees to participate in the first annual departmentwide Safety Stand Down, held in August 1992, a forum focusing on heightened safety awareness. Office workers were to participate for a minimum of four hours and field workers for at least eight. The third annual Stand Down was in October 1994.

The objective was to focus employee attention on Caltrans's commitment to safety, with the expectation of making the department a safer and more productive place to work. Safety was acknowledged as the responsibility of all employees throughout the department and at every job level; not only their participation but also their ideas were sought. Van Loben Sels believed it was crucial for Caltrans and contract employees to know that their safety and that of the traveling public were equally important to the department.

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Initially, many employees were skeptical about the benefits of participating in the day-long program. But once they saw an opportunity for making real changes in the department's perspective on safety, most employees came forward. Most then perceived the program as positive and employee oriented, a forum in which their comments and suggestions were taken seriously. Participation was nearly 100 percent, and media coverage was extensive.

Safety Stand Downs were held at headquarters and in all 12 of Caltrans's administrative districts, in offices and in the field. Each office was in charge of determining the shape and agenda of its own program. The results took a variety of forms, ranging from competition between units to generate innovative ideas to partnerships with the California Highway Patrol and contractors who also participated.

Demonstrating solidarity with field crews, office workers made suggestions about safer field operations. For example, some noted that they conspicuously slow down in highway maintenance and construction zones as an example to other drivers. Others suggested stiffer legal penalties for speed violations in work zones. At the same time, many were impressed that their own work environments were seriously considered. Safety activities for office workers included discussions and training about their safety risks, such as fire, violence in the workplace, and chemical hazards.

The department's primary focus, however, was on limiting field workers' exposure to hazards along the roadside. Throughout the process Caltrans safety officers collected myriad ideas and comments for safety improvement, forwarding all to the Office of Safety and Health in Sacramento.

After the first all-day forum, the department initiated a new philosophy: Design for Safety. In September 1992 Director van Loben Sels brought Caltrans's top managers to a meeting in Sacramento to discuss ideas, methods, and procedures for building safety into all aspects of the department's work.

The result was the formation of the Design for Safety Action Group, which continues to meet to discuss ways of reducing employee exposure to hazards at every phase of transportation work—beginning with land purchase and carrying on through construction, maintenance, and rehabilitation.

Over time, the action group identified approximately 90 issues to be addressed. Forty Design for Safety concepts were sent to the responsible program areas for further development, along with consideration of feasibility and costs. Finding the funds to evaluate and implement these activities was a challenge. The action group allowed the department's divisions to establish the costs of the programs, and in some cases funds were used from existing allocations within the division; in other cases the money was redirected to the safety concepts from additional transportation funds and from partnerships with other organizations, such as that with the University of California, to test the use of robotics for maintenance tasks.

Although cost-effectiveness was never the main issue, many of the Design for Safety concepts may also result in cost savings. For example, efforts to design more low-maintenance highway landscaping should result in lower labor costs; the development and implementation of longer-lasting pavements and guardrails, although they may cost more initially, are likely to be offset by long-term cost savings in materials and labor.

This investment in safety has produced other encouraging dividends. Since

Eliminating roadside hazards to workers is primary focus of Caltrans Safety Stand Down program.

the first Safety Stand Down, the department's injuries have dropped from 2,385 to 2,130 per year. Lost days have dipped from 7,945 to 6,389—or a total of 1,556 days per year. Because the program is new, the department has not yet fully evaluated the relationship between safety awareness policies and these reductions or the safety program's long-term effectiveness. Over time Caltrans expects to show a significant improvement in its safety record.

Key Concepts

To date 11 Design for Safety concepts have been completed and 3 are near completion. Some of the most significant concepts are described in this section.

Glare Screen

Caltrans's Traffic Operations division is designing concrete headlight-glare screens for medians. Current screen types use metal mesh and plastic paddles, which require considerable maintenance. When a portion of the screen is hit or damaged, employees must repair or replace it, thereby exposing themselves to traffic. The longer-lived and lower-maintenance concrete screens should result in lower long-term costs and reduced worker exposure to traffic.

Concrete glare screens can be installed at less than $20 a linear foot and require little maintenance. Their use provides protection from the glare of approaching headlights while reducing worker exposure to traffic.

The Caltrans Office of Structural Materials successfully tested a retrofitted concrete glare screen and showed it to withstand repeated vehicle contact with little or no damage.

Landscaping and Vegetation

Several of the department's most recent maintenance fatalities have occurred during vegetation control or removal. As a result, highway landscaping is being designed for low maintenance and less employee exposure to traffic. Future projects will provide for the following:

- Access gates for maintenance operations from local streets and frontage roads. This includes adding paved maintenance parking areas away from traffic on high volume highways and in other areas where access is unavailable from local streets and roads.
- Removal, relocation, and upgrading of irrigation systems next to shoulders and other traffic areas.
- Increased use of centrally controlled irrigation systems for managing, programming, and monitoring daily maintenance watering operations from a central location. In perennially drought-conscious California, this strategy makes good conservation sense, too.
- Reduction, elimination, and replacement of vegetation and other features that require frequent lane closures along urban freeways.
- Plant removal to maintain sight distance and readability of roadside signs next to shoulders, ramps, and curves that require frequent lane closure. This also helps reduce mowing and fire hazards.
- Mulching between plants to minimize vegetation control spraying.
- Use of plants that require less maintenance along highways, thereby limiting the time workers are exposed to danger. In addition, early eradication of vegetation also saves time and worker exposure.

Concrete Guardrail

Although the initial cost for concrete guardrail ($20 a foot) is higher than metal

Design for Safety program addresses every phase of transportation work, including construction, maintenance, and rehabilitation.

beam guardrail ($15 per foot), concrete lasts longer and is damaged less often. Therefore it reduces worker exposure and overall maintenance costs. An additional benefit to the traveler will be fewer lane closures for repair.

Maintenance and Construction Zone Safety

Caltrans is using the California Highway Patrol to provide increased enforcement in work zones in a concept known as the Maintenance/Construction Zone Enhanced Enforcement Programs (MAZEEP and COZEEP). To make MAZEEP and COZEEP more effective, Caltrans plans to combine them with other speed-reduction strategies to reduce traffic intrusion into work zones. These strategies include

- Establishing policies to reduce speed limits in construction zones.
- Using radar for speed enforcement in construction zones on conventional highways.
- Using radar that shows drivers their speed and the speed limit.
- Providing pull-out areas for driver checkpoints on conventional highways.
- Asking contractors to be more aggressive in identifying COZEEP needs.

A recent memo from the Caltrans construction program notes, "The severity of accidents within construction zones has decreased dramatically over the past few years .... The accident severity—and also fatalities—has declined to such a degree that construction zones are actually becoming safer for the public to drive through than non-construction zones." Department statistics show that the presence of changeable message signs, law enforcement officers, and temporary barriers has made a difference.

Maintenance Access on Urban Freeways

Off-pavement access to freeways in urban areas is an important way to ensure the safety of highway workers. Gates or openings to service areas will be from outside the right-of-way. The California Highway Patrol can also use them for enforcement stops. Beginning in 1994 the department has allocated $4 million a year for a decade to provide the needed access. In addition, Caltrans hopes to provide off-deck access along state bridges.

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State Route 330 was closed for pavement restoration and erosion control, unprecedented action by the Caltrans San Bernadino District office.

Marketing Safety

Marketing safety is one Design for Safety concept being included in all of the department's written procedures and manuals and in various training academies and programs. Employees are also informed about safety through newsletters, electronic bulletin boards, and safety tailgate meetings.

Integrating New Safety Practices

Many of the safety concepts are being incorporated into early project assessment at Caltrans. For example, the Design for Safety concepts are currently being included in the Department's Project Development Procedures Manual and Project Study Guidelines. In addition the Design for Safety concept is being incorporated

Maintenance and construction zones are of special interest to Caltrans in developing worker safety procedures.

and discussed in the Project Engineers Academy, a periodic workshop for Caltrans managers charged with delivering transportation projects.

Most Design for Safety concepts either have been implemented or are in the process of moving toward implementation. Another offshoot has been to accelerate the implementation of several Design for Safety concepts in the urban freeway setting. The department has defined the urban freeway for this purpose as one with average daily traffic of 175,000 vehicles or more.

The Urban Freeway Safety Practices Workshop held in August and September of 1993 developed 46 safety items from suggestions developed from the August 1992 statewide Safety Stand Down, the Design for Safety concepts, the Work Site Safety Procedures Review Recommendations, and the Urban Freeway Safety Task Force Recommendations. Of these safety items, 16 have been accomplished and implemented since the last Safety Stand Down, 8 have been recommended, and 22 are being evaluated.

Caltrans continues to see a positive impact from its safety activities. Hundreds of good ideas have been exchanged, many of them already affecting traffic operations in the state. Perhaps most important, Caltrans has come to see safety as a way of life that, once established, will guide employees through their careers, making the state's transportation system safer for highway workers and the traveling public in the process.

Safety awareness is not just a one-day event. Any organization that wants to make a difference must commit itself to a continuing discussion and solution of daily safety issues in the workplace—through regular staff meetings, quarterly interdepartmental safety meetings, or weekly tailgate safety meetings.

Results of the Safety Stand Down were at least as much psychological as statistical. In a sometimes too impersonal bureaucracy, workers gained a sense that they can influence their own work environment. Employees perceived that management was taking safety seriously and was listening to and addressing their concerns.