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1. REPORT NUMBER	2. GOVERNMENT ASSOCIATION NUMBER	3. RECIPIENT'S CATALOG NUMBER
CA08-0581		

4. TITLE AND SUBTITLE

Development of a Safety Management Protocol

5. REPORT DATE

September 2008

6. PERFORMING ORGANIZATION CODE

7. AUTHOR

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8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS

University of California Traffic Safety Center
UC Berekeley

10. WORK UNIT NUMBER

11. CONTRACT OR GRANT NUMBER

65A0206

12. SPONSORING AGENCY AND ADDRESS

California Department of Transportation
Division of Research and Innovation, MS-83
1227 O Street Sacramento CA 95814

13. TYPE OF REPORT AND PERIOD COVERED

Final June 2005 - June 2008

14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The UC Berkeley Traffic Safety Center (TSC) has produced this report under a contract from the California Department of Transportation (Caltrans). The aim is to address workplace injuries and accidents among Caltrans employees and develop recommendations to reduce their incidence among staff in the field rather than office workers. We examine current Caltrans safety management practices and compare them to those at other states' departments of transportation whose policies or makeup make them relevant. We develop recommendations for Caltrans to improve safety management practices.

17. KEY WORDS	18. DISTRIBUTION STATEMENT	
Caltrans, Safety, Management, Protocol, Report		
19. SECURITY CLASSIFICATION *(of this report)*	**20. NUMBER OF PAGES**	**21. COST OF REPORT CHARGED**
unclassified	48	

Report # CA08-0581

Final Report • September 2008

Development of a Safety Management Protocol

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EXECUTIVE SUMMARY

The UC Berkeley Traffic Safety Center (TSC) has produced this report under a contract from the California Department of Transportation (Caltrans). The aim is to address workplace injuries and accidents among Caltrans employees and develop recommendations to reduce their incidence among staff in the field rather than office workers. We examine current Caltrans safety management practices and compare them to those at other states' departments of transportation whose policies or makeup make them relevant. We develop recommendations for Caltrans to improve safety management practices.

Like California, Caltrans is vast and complex: it employs more than 22,000 full-time permanent staff; they are stationed in 12 districts across a state that encompasses nearly 156,000 square miles. Operations are divided into six divisions—Aeronautics, Highway Transportation, Mass Transportation, Transportation Planning, Administration, and the Equipment Service Center. Caltrans manages more than 45,000 miles of highways and freeways, provides inter-city rail services, and administers permits for more than 400 public-use airports and special-use hospital heliports. For 2007, its operating budget was $13.8 billion.

Employee safety is a high priority at Caltrans. One of goals of the Caltrans Strategic Plan for 2007-2012 is a 25 percent reduction in work-related injuries and illnesses by the end of that period.[1] Currently, approximately 2,000 Caltrans workers are injured annually. Nationally, the transportation industry suffers the second highest share of fatal work-related injuries. The federal Occupational Safety and Health Administration (OSHA) "2003-2008 Strategic Management Plan Goals" called for a 15 percent decrease in workplace fatality rates and a 20 percent decrease in injury and illness rates by 2008.[2]

Central to shaping the planning and implementation of Caltrans' safety management program is the SIMS system, Caltrans' database of accidents and injuries that the agency uses to track and analyze accident information within the organization. One of Caltrans' goals is to expand SIMS' scope beyond mitigating injuries and use it to provide more comprehensive and accessible information in order to standardize and coordinate safety management systems among the 12 districts.

Once Caltrans safety staff members have reviewed and commented on these recommendations, it would be valuable to conduct a comprehensive assessment to determine the practical and fiscal feasibility of implementing them. Further research into specific approaches described in reviews of other DOTs should illuminate program elements that would be most cost-effective and successful in California, given Caltrans' unique needs

[1] California Department of Transportation, *Caltrans Strategic Plan 2007-2012*, p. 45.
[2] OHSA Trade News Release, May 12, 2003. *OSHA's 2003-2008 Strategic Management Plan Goals*. http://www.osha.gov. Accessed 3/11/2004.

The TSC has produced its recommendations based on the following sources.

- Interviews with Caltrans district safety officers.
- Review of Chapter Eight of the Caltrans manual, "Protection of Workers."
- Survey of safety management practices and policies at other state DOTs.
- Interviews with safety personnel at a selection of state DOTs.
- Review of academic and professional literature on workplace safety culture.
- Review of agency resources on industrial safety, e.g., the U.S. Occupational Safety and Health Administration (OSHA) and the State Cal/OSHA.

We have identified three objectives:

- Improve data collection, analysis, and distribution of important findings.
- Enhance and standardize current safety programs, including inspections, and implement low-cost and no-cost initiatives.
- Improve workplace safety culture.

The report follows the following outline:

OBJECTIVE 1:
Improve Data Collection, Analysis, and Distribution of Important Findings

Recommendations:
Improve methods for collecting injury and incident information.

Incorporate State Compensation Insurance Fund (SCIF) claims cost data with injury reports.
Target safety problems, and increase manager accountability based on results of data analysis.

OBJECTIVE 2:
Enhance and Standardize Current Safety Programs, Including Inspections, and Implement Low-Cost and No-Cost Initiatives

Recommendations:

- Restructure safety committees.
- Create partnerships with OSHA and CAL/OSHA.
- Utilize available health and safety/loss control services from California State Compensation Insurance Fund and other sources.
- Standardize training programs.
- Upgrade the inspection and incident investigation program by standardizing training and procedures and increasing the number of job site visits.

OBJECTIVE 3:
Improve Workplace Safety Culture

Recommendations:

- Increase accountability with a new approach to progressive discipline policies.
- Enhance workplace safety culture via organization-wide initiatives.
- Develop an ethic of safety and prevention.
- Make safety a business priority.

OBJECTIVE 1:
IMPROVE DATA COLLECTION METHODS, DATA ANALYSIS, AND INFORMATION DISTRIBUTION

- Improve methods for collecting injury and incident information.
- Incorporate claims costs data with injury reports.
- Target safety problems, and increase manager accountability based on results of data analysis.

RECOMMENDATION 1:
IMPROVE METHODS FOR COLLECTING INJURY AND INCIDENT INFORMATION

More information should be collected for input into SIMS than is currently gathered from the only sources Caltrans uses now, the Data Input for Personal Injury Form (PM-S-0067) and the Vehicle Accident Report (Form STD 270).

The supervisor and employee each complete one part of the Vehicle Accident Report form (respectively PM-S-0067 and STD 270). Information entered into the SIMS database is limited to what originates from parts of these forms completed by supervisors. No data from sources beyond these forms is entered or available in SIMS.

These forms are too restrictive. For example, the required check boxes describing type of injury do not reflect many actual situations.

Supervisors should receive uniform training in investigating accidents and injuries and filling out forms.

A common problem is that forms are missing information or are incomplete. Obtaining the missing information can be a time-consuming task for the district safety officers.

Data entry into SIMS should be restricted to designated personnel (including district safety officers), and they should receive a minimum level of training in the Microsoft Access™ data management program to help them generate more useful reports.

Caltrans has no formal system for training district employees to enter data into SIMS, and no staff members are designated as being responsible for entering the information. Many are not well-trained in the task, leading them to commit errors. Nor is there a uniform deadline for entering data. In some districts, it can be as long as a month before a form's data is entered into SIMS, while in others it happens as soon as forms are submitted.

District safety officers, who do most of the data entry, are not trained in Microsoft Access™. Therefore, few have the skills to take advantage of SIMS to generate detailed statistics and reports. If they need a non-standard report, they request it from the central office in Sacramento.

LESSONS FROM OTHER STATE DOTS

Data collection methods used by the Idaho, Texas, Vermont, and Washington Departments of Transportation offer useful approaches that Caltrans might adopt in whole or in part to improve its own system.

The Idaho Department of Transportation (ITD) collects injury and motor vehicle incident information from a wider array of sources than Caltrans does. They include employee accident forms, tort claim forms, and safety meeting records. Each district has a data entry employee, and all data are entered at least once a week. Only the seven safety staff members, six district business managers, and the employees who enter data in each district may log onto the database. The ITD's chief safety staff members, the Safety Risk Management Manager, generates comprehensive quarterly reports from this database.

At the Texas Department of Transportation (TxDOT), as soon as an incident occurs, district staff e-mail the central safety office, the Division of Occupational Safety, which triggers the creation of an entry in the database. In development since 1989, the database is maintained by trained staff and tracks workplace injuries and workers' compensation claims on a daily basis, compiling data from a wide variety of sources. For example, when an employee is involved in a motor vehicle accident, the finance division provides the employee's hours worked, and fleet equipment operations submits information about the vehicle and its mileage.

At the Washington Department of Transportation (WSDOT), the chief safety officer, the Safety and Health Administrator, has made it a priority to establish a comprehensive database of the rates of injuries and claims and their costs. Before he was hired in 2005, there was no internal injury database in place. Now the regional safety officers input injury, lost time, and medical data into an online system, which copies data to the central server. The system is set up to analyze, synthesize, and produce reports so that safety officers can obtain the information that they need.

RECOMMENDATION TWO: INCORPORATE STATE COMPENSATION INSURANCE FUND (SCIF) CLAIMS COST DATA WITH INJURY REPORTS

Separately from the injuries information that the SIMS system collects, extensive data is gathered on all Caltrans employees' workers' compensation claims by the State Compensation Insurance Fund (SCIF), which serves as the claims administrator for Caltrans. Combining and analyzing these two data sources would generate additional useful knowledge such as the types of injuries that are more likely to result in workers' compensation claims, their costs, and the extent to which claims were disputed successfully. This would provide a context for calculating the return on investment that could be gained through injury prevention activities targeted at specific injuries.

For example, the Washington State Safety and Health Assessment and Research for Prevention (SHARP) program recently studied musculoskeletal disorders to learn how much these injuries contributed to workers' compensation costs.

Currently, extensive information (see footnote below)[3] is available from SCIF, all in electronic format, making integration into SIMS possibly feasible.

Other information available from SCIF under the state master agreement could be used to establish a departmental claims tracking system. For each claim, SCIF can furnish the name of the office administering the claim, the adjuster name and telephone number, the names of any SCIF attorneys involved in the case, the WCAB case number from the Caltrans Return to Work Unit, information on whether the claim has been litigated, the name of the applicant attorney, and whether liability in the case was accepted, delayed, or denied. SCIF can also provide the start and end dates for the claim as well as type of current benefits.

Merit rating policies, which include both "experience rating" and "schedule rating," are worth exploring. Experience rating, for example, is widely used in private sector workers' compensation programs. It compares a firm's ratio of losses to all other employers in the state in similar business classifications and sizes. This can be used to give employees incentives to reduce the cost of claims that might be excessive relative to other firms.

Breaking down Caltrans' department-wide data and showing each region and departmental unit its own experience could allow for more region-specific accountability. While there may be good reasons for regions or departments to achieve different results, the first step is getting the information out and allowing such comparisons to be made. At the very least, managers and supervisors should know the costs associated with injuries within their control.

Caltrans might price regions' workers' compensation coverage differentially or provide other region-specific benefits based on differences in true workers' compensation costs.

In this light, however, it is critical to avoid encouraging the organization to focus on how to reduce claims at the expense of seeking ways to prevent injuries. Some employers turn their attention toward aggressive and often inappropriate claims management behavior, which suppresses claims rather than reducing the underlying problems. Alternatively, hiding a problem through light work assignments or alternate work to simply avoid claims often leads to delays in reporting and addressing serious conditions.

In summary, Caltrans should require facility managers to track data and related costs associated with workplace injury claims. This information should include at a minimum: (1) the number and nature of injuries, (2) temporary disability, Industrial Disability Leave (IDL), and/or continuation of pay (COP) costs by claim, and (3) any overtime costs associated with backfilling for employees out on injury leave.

[3] Currently, the following data is collected by SCIF: (1) Payment date; (2) Payment code; (3) Claim number; (4) Check number; (5) Fiscal year injury occurred; (6) First and last name and middle initial of payee (injured worker); (7) Breakdown of amounts paid for: compensation, medical, miscellaneous, and total costs; (8) Program code.

RECOMMENDATION THREE: TARGET SAFETY PROBLEMS, AND INCREASE MANAGER ACCOUNTABILITY BASED ON RESULTS OF DATA ANALYSIS

Data are an important tool for targeting injury and accident trends and to inform supervisors and to guide planning and development of safety programs. To take advantage of this tool, Caltrans needs to invest in more data analysis and communication of findings to key personnel.

Currently each Caltrans district generates statistics that include year-to-date accident and injury rates, but there is little analysis or comparison, and they are shared only on a casual basis, typically via e-mails from district safety officers. Additionally, Caltrans headquarters generates reports that include district accident summaries, individual incident and claims histories for both personal and motor vehicle injuries, and Cal/OSHA district injury logs and summaries.

To make this data more useful, first, it needs to be more accurate (see Recommendation 2, above). Second, analysis should take place at least twice yearly to determine injury and incident rates and trends. Finally, the data need to be distributed in a systematic manner to all employees, from top-level managers on down.

LESSONS FROM OTHER STATE DOTS

The New York, Idaho, Texas, and Washington DOTs have commendable systems that use data to inform the employee safety program. These DOTs could be used as models for Caltrans to improve its own data management systems.

The New York State Department of Transportation (NYSDOT) created a safety campaign to reduce motor vehicle backing accidents after annual trend reports generated from the accident and injury database revealed that they were increasing. As part of the new safety campaign, NYSDOT created driving maps for the maintenance yards and instituted routine reviews and updates of backing policies listed in the employee manual.

The Idaho Department of Transportation (ITD) safety staff issues quarterly reports listing all industrial accidents and tort claims filed against the ITD. The safety manager first issues these statistics to top management in summary form and then issues a full formal report with complete accident descriptions to all forepersons and section supervisors. The quarterly reports are discussed in detail at all monthly safety committee meetings.

The Texas Department of Transportation (TxDOT) Safety Division publishes an annual report that includes a three-year summary of TxDOT personal injury and motor vehicle rates. In addition, the Safety Division issues a monthly report containing year-to-date injury and incident frequency rates, injury severity rates, and loss time rates for every district and division. The central Safety Division sends the monthly report to safety officers and to district administrative directors. The safety officers in turn distribute it to supervisors and area engineers. Supervisors often report the injury statistics to employees during routine safety meetings.

TxDOT uses this data to decide which safety issues are most urgent and to evaluate solutions. Recently, after analyzing department injury data and concluding that backing was a major source of injuries, it took steps to reduce backing accidents in select "pilot" districts by installing detectors, cameras, and back-up alarms in some vehicles. Because of accurate record-keeping, the safety manager is certain that it has been moderately successful. "The different things we're doing … reduced our backing incidents from an average of 100-130 per year down to 80. So we're making progress."

The Washington Department of Transportation (WSDOT) provides managers with breakdowns of claim costs and open cases within their region on a regular basis. The safety manager commented: "Data is a very strong tool. In my office, we maintain the databases throughout the department. We know what's going on, where it's going on. We have a reporting system so that we know what kinds of accidents are happening, which unit, and it's my responsibility to measure how we are doing. So when I know the measurement, I know the problem. I go back to the top person in the region and say, 'Here's how you're doing, here's the problem, now it's your responsibility to make sure to make the improvement.'"

OBJECTIVE 2:
ENHANCE AND STANDARDIZE CURRENT SAFETY PROGRAMS, INCLUDING INSPECTIONS, AND IMPLEMENT LOW-COST AND NO-COST INITIATIVES

RECOMMENDATION ONE:
RESTRUCTURE SAFETY COMMITTEES

Depending on the district, Caltrans district safety committees meet on a monthly or quarterly basis to address industrial safety. The names of these committees differ; examples include the Accident Review Committee, District Safety Awareness Committee, District Safety Advisory Committee, and District Safety and Health Committee. Agendas and attendance at these meetings vary between districts. Some district safety committees focus on closely examining recent accidents and discussing preventive measures, while others discuss more general topics such as seasonal safety risks. Only in selected districts are employees actively encouraged to attend meetings and voice their safety concerns.

One objective of the *Caltrans Strategic Plan 2007-2012* is to "promote better communication between Project Development Teams and Maintenance forces to assure projects are designed and constructed that contribute to minimizing worker exposure to traffic hazards."[4] Another objective is to "increase the number of Caltrans employees who rate Caltrans management as good or very good at being open and honest in communications with employees".[5]

Exemplary safety programs ensure that management demonstrates visible leadership for every aspect of safety for all employees, at all levels, by creating ongoing improvement systems for district safety programs and maintaining open channels of communication. Safety committees are an important venue for front-line managers and employees to work together on safety initiatives.[6]

Management can demonstrate its commitment to safety by encouraging employees to participate in all aspects of the safety program.

Management can encourage employees to participate by:

- Inviting employees to participate on joint labor-management committees;
- Having employees identify routine hazards
- Developing or revising workplace safety rules;
- Providing meaningful programs and presentations at safety meetings;
- Giving them authority to report and fix hazards under their control;

[4] California Department of Transportation, *Caltrans Strategic Plan 2007-2012*, p. 45.
[5] California Department of Transportation, *Caltrans Strategic Plan 2007-2012*, p. 54.
[6] Industrial Accident Prevention Association (IAPA) website, accessed on May 19, 2008 http://www.iapa.on.ca

- Encouraging them to support co-workers by providing feedback on risks and assisting them in eliminating hazards;
- Having them take part in analyses of new equipment or processes in order to identify hazards before introduction to the workplace.[7]

Management can demonstrate its commitment to workplace safety by communicating clear policies and goals, assigning responsibility for achieving them along visible lines, providing sufficient authority and resources for attaining goals, communicating progress, or lack of it, toward goals, and actively encouraging reports of hazardous conditions before injuries or accidents occur. As part of this management commitment to safety, resources must be provided to allow the interventions to occur. Some purchasing decisions may be delegated to district operations while larger decisions may be centralized.

LESSONS FROM OTHER STATE DOTS

Safety committees are an ideal venue for management and employees to engage in safety activities as described above.

The Idaho and New York Departments of Transportation successfully involve employees in their safety committees. In both of these DOTs, each district is required to a hold monthly safety committee meeting, cover specific safety topics during each meeting, and ensure that at least one field maintenance employee sits on each committee. Caltrans might consider implementing similar standardized requirements to promote more effective district safety committees.

At the Idaho Department of Transportation (ITD), a combination of safety coordinators, foremen, lead workers, and crewmembers attend mandatory monthly maintenance crew safety meetings in each district. Participation in a district Safety Committee is rotating; a member may serve for either 12 or 18 months. The final makeup of the committee must include representatives from all occupations. At these meetings, members review all vehicular incidents and employee injuries that occurred during the previous 30 days, as well as all safety items that arise. For example, seasonal topics such as ice in parking lots might be discussed. Some of the committees also review tort claims filed in their district. The safety manager described the meetings as very effective for keeping safety issues fresh in employees' minds.

The NYSDOT has a similar system; each of its 11 regions has a Safety Committee that includes at least one employee representative from each division (i.e. maintenance, engineering, administration). In larger regions, there can be more than one representative from a division. Committees range in size from eight to 16 members. To encourage participation and open discussion, employees are instructed to "leave their job titles at the door," according to the Safety and Health Director.

[7] Roughton and Mercurio, p. 118.

RECOMMENDATION TWO:
CREATE A PARTNERSHIP WITH OSHA AND CAL/OSHA

Other state DOTs have initiated partnerships with state and national occupational health and safety agencies to enhance their employee safety programs. In the case of Caltrans, Cal/OSHA is a potentially valuable resource.

Cal/OSHA and OSHA have made extensive studies of best practices in occupational health and safety and have posted a great deal of useful information on their Web sites. Cal/OSHA has developed guidelines that are applicable to a range of industries. The agency also offers organizations information about compliance tools, informational workshops, publications, and Internet-based discussion forums for monitoring and improving all aspects of safety management, including workplace safety.

The Cal/OSHA program that would best serve Caltrans' needs is the California Voluntary Protection Program (VPP), which is also a part of OSHA. VPP encourages employers to adopt safety practices that extend beyond Cal/OSHA standards and provide the best feasible protection at jobsites. Employers are invited to apply for participation by reviewing VPP requirements and initiating steps toward meeting its safety commitments. Applicants approved for participation in Cal/VPP receive state and national recognition and are exempt from Cal/OSHA-programmed inspections.[8]

The Vermont Department of Transportation (VTrans) was the first state DOT to sign a VPP alliance with OSHA. The goal is for all VTrans districts to gain VPP Star status, indicating that a district has achieved injury and illness rates at or below the national average for their respective industries. To date, VTrans has implemented the VPP program in only one district and is experimenting with different safety initiatives to meet VPP goals.

In 2006, the Idaho Department of Transportation (ITD) and Idaho OSHA entered into a three-year alliance to improve workplace conditions and reduce the number of industrial injuries at the ITD. This alliance includes a 10-hour employee course, Occupational Safety & Health in Roadway Construction, taught by Idaho OSHA employees, as well as meetings where OSHA representatives speak to a selection of maintenance employees and construction foremen about nationwide injury and fatality rates with an emphasis on the importance of reducing exposure to hazardous occupational activities.

In terms of resources available in-state to Caltrans, Cal/OSHA offers formal workplace trainings and safety initiative programs of varying lengths on topics as diverse as accident investigations, ergonomics, falls, and hazardous chemicals. All topics correspond to requirements in the Cal/OSHA Regulations for Construction Safety and General Industry Safety. Cal/OSHA also offers free topic-specific safety guides and informational posters.

[8] "California Voluntary Protection Program", Cal/OSHA website, http://www.dir.ca.gov/dosh/cal_vpp/cal_vpp_index.html, Accessed May 20, 2008.

Similar resources can be accessed online with the purchase of a membership to the privately-owned California Employer Advisor website. The site offers advice to human resource professionals, business owners, and managers aimed at ensuring compliance with state and federal laws that govern employer-employee relationships.[9]

Federal OSHA operates the national OSHA Training Institute (OTI) Education Center, which offers training seminars and workshops in southern California. OTI targets federal and state compliance officers and state consultation program staff, but also provides training for private sector personnel and federal personnel from agencies other than OSHA. The training topics are similar to those offered by Cal/OSHA and include 10-hour and 30-hour courses in construction safety and general industry safety and health hazards.[10]

RECOMMENDATION THREE: UTILIZE EXISTING HEALTH AND SAFETY AND LOSS CONTROL SERVICES FROM THE STATE COMPENSATION INSURANCE FUND (SCIF) AND OTHER SOURCES

As part of its Master Contract with Caltrans, the State Compensation Insurance Fund is required, on request, to carry out the following:

- SCIF shall designate a safety services contact person at each dedicated office to be a resource for safety services and referrals at no additional charge.
- Direct safety services and industrial hygiene services from SCIF shall be available on an hourly rate basis, arranged through the safety services contact person at the nearest dedicated office.

Once it has identified problem areas, Caltrans should utilize these services, which are available around the state.

In addition, Caltrans should consider encouraging line workers and supervisors to become trained through university-based health and safety programs such as the Workers Occupational Safety and Health Training and Education Program (WOSHTEP).[11] The curriculum includes core modules addressing topics relevant to workers in a variety of California workplaces, as well as a series of supplemental modules covering specific industries and hazards. Priority is given to training workers who have significant health and safety responsibilities, such as those serving on a committee or as a designated safety representative, and those who are able to train other workers.

To be certified as a WOSH specialist, a participant needs 20-24 hours of training: six core modules (14-16 hours) and a minimum of three supplemental modules (6-8 hours). A WOSH specialist who successfully completes this training will be able to:

[9] California Employer website, http://www.employeradvice.com/. Accessed May 22, 2008.
[10] OSHA Training Institute, OSHA website, http://www.osha.gov/dcsp/ote/oti.html, Accessed May 20, 2008.
[11] "Worker's occupational safety and health training and education program (WOSHTEP)," California Department of Industrial Relations website, http://www.dir.ca.gov/CHSWC/WOSHTEP_factsheet.htm, Accessed May 19, 2008.

- Understand the importance and key elements of a successful injury and illness prevention program in the workplace.
- Identify a full range of potential hazards on the job and uncover root causes of injury and illness.
- Evaluate possible control measures for common hazards.
- Explain the legal requirements for maintaining a safe and healthy workplace and support an employer's compliance efforts.
- Participate actively in injury and illness prevention efforts and problem-solving in the workplace.
- Serve as a health and safety resource for others, including co-workers, joint labor-management committees, unions, and employers.
- Contribute to reduction of workers' compensation costs through promotion of prevention and early return to work.

RECOMMENDATION FOUR: STANDARDIZE TRAINING PROGRAMS

Currently, there are no routinely available district-level training sessions for maintenance and construction crews.

Generally, employee safety training varies widely between districts, and there is no standard curriculum or central office responsible for carrying out training and seeing that it is effective. The following is a roundup of some of the current practices.

New hires for maintenance crews receive training from their supervisors based on Chapter Eight of the Caltrans Employee manual, "Protection of Workers." This training can last from a few hours to an entire week and is occasionally supplemented by materials or safety videos, but their value may be suspect: one Caltrans District Safety Officer described them as "outdated."

Regarding general safety training, employees are expected to attend brief "tailgate meetings," typically in the morning before the crews leave for job sites, at least once every two weeks. These provide supervisors with the opportunity to discuss general safety issues and those specific to the job site.

LESSONS FROM OTHER STATE DOTS

The Texas Department of Transportation (TxDOT) has the most comprehensive training program of all the DOTs surveyed. Because TxDOT employees are not unionized, management may encounter fewer hurdles to implementing training programs than the management of Caltrans, whose employees work under union contracts. Nonetheless, there are enough institutional similarities that the TxDOT program is worth considering as a model.

TxDOT district safety officers dedicate approximately 30 percent of their time to training. The average TxDOT maintenance employee spends the equivalent of one work week (approximately five days) a year attending training sessions. TxDOT training uses routine, general sessions conducted by and for agency personnel, as well as periodic,

topic-driven programs conducted by outside contractors, usually extension program staff from different branches of the Texas university system.

A key element is a daily, 10-minute meeting that supervisors are required to hold with their crews—and document that they have held—every morning. District safety officers routinely attend these meetings to ensure that the required safety topics are covered. Because they are documented, starting in 2004, TxDOT officials can audit the records to ensure compliance. In addition, district safety officers, supervisors, and crewmembers attend monthly safety meetings. They tend to be related to work zone safety, but might also address broader issues such as coping with hot summertime outdoor working conditions.

The topic-driven programs are designed in response to a yearly survey of district safety officers, who are asked what types of training are most needed in their districts. TxDOT contracts for district-level training sessions on the subjects identified in the surveys. Work zone traffic control, flagger training, and equipment safety are some of the recent topics. The Texas Engineering Extension Service at Texas A & M University and the Continuing Education Department of the University of Texas at Arlington are two of the contractors hat have conducted trainings.

For training to be effective there must be a major commitment of time and effort. The purpose must be communicated clearly to employees, and needs must be thoroughly analyzed, so that employees find the programs relevant and useful. Training must be tailored to a variety of learning styles and must be incorporated into the agency's work culture: from newly hired employees and part-time contractors through the most senior and experienced staffers (who are likely to be a valuable resource in the initial planning and setting of goals). Training must also be evaluated regularly so that ineffective programs can be adjusted, and overlooked topics can be added. Finally, records must be kept that document training programs, their effectiveness, and their changes over time in order to keep them responsive to workplace needs and employee attitudes.[12]

At the very least, providing a centrally administered, standard training program would help Caltrans achieve one of the objectives of the *Caltrans Strategic Plan 2007-2012*, to "increase by 5% the number of Caltrans employees who agree or strongly agree that the training they have received at Caltrans has adequately prepared them for the work they do."[13]

[12] Roughton and Mercurio, pp. 290-293
[13] California Department of Transportation, *Caltrans Strategic Plan 2007-2012*, p. 54.

RECOMMENDATION FIVE: UPGRADE THE INSPECTION AND INVESTIGATION PROGRAM BY STANDARDIZING TRAINING AND PROCEDURES AND INCREASING THE NUMBER OF JOB SITE VISITS

District-level safety officers are the only Caltrans personnel with responsibility for carrying out safety inspections, but they are not required to undergo training that specifically addresses safety inspection methods. Additionally, district safety officers typically communicate with supervisors via the phone or e-mail, with the result that safety officers have very few opportunities to even be in the field, much less carry out safety inspections on site. As a result of these and other factors, safety inspections appear to be under-utilized in many Caltrans districts.

Effective safety programs analyze the workplace to identify risks on an ongoing basis in order to capture all the existing hazards and revise policies to reflect changing conditions and job sites.[14] There are a number of approaches to this task, including comprehensive safety and industrial hygiene surveys, specifically targeted proactive "change analysis," before the addition of new facilities, employees, equipment, materials, and processes, and routine hazard analysis.[15,16]

Inspections should cover the entire workplace, be carried out at regular intervals, and be documented on standardized forms that are kept on file and used in follow-up inspections. There must be a procedure for tracking the presence of hazards that are identified and tracking when they are mitigated or eliminated. Inspection data should also be incorporated into the larger safety prevention program.[17]

Currently, Caltrans does not have a standardized incident investigation system or protocol. A routine form is completed after an incident or injury, but each district handles investigations independently. By creating a uniform process throughout the agency, Caltrans will ensure that the investigation will be conducted in a non-judgmental, constructive manner, and that the results produced will be replicable across the agency.

Information gathered from an effective investigation is essential to develop the knowledge to prevent future accidents. There are a number of techniques and processes that contribute to an objective, productive investigation. They can include root cause analysis, tracking the audit trail, interviewing injured employees, recreating the incident, and understanding interactions between elements of the existing safety system (equipment, environment, people—employees, contractors, temporary employees, visitors etc.—and management).[18,19]

[14] Roughton and Mercurio, p. 186.
[15] Roughton and Mercurio, pp. 185-187
[16] Roughton and Mercurio, pp. 185-187
[17] Roughton and Mercurio, p. 207.
[18] Roughton and Mercurio, pp. 227.
[19] Roughton and Mercurio, pp. 255-256

LESSONS FROM OTHER STATE DOTS

The Oregon Department of Transportation (ODOT) has an exemplary job site inspection system. Safety managers inspect each site in their region at least once a month. In addition to work performed by ODOT employees, they inspect work done by contractors performing alongside ODOT. There are additional regularly scheduled workplace safety inspections. Employees are encouraged to call the central safety office to report any issues or violations. The regional manager conducts an on-site investigation into each reported problem.

The Vermont Department of Transportation takes the process beyond traditional investigations. Either a safety manager or a designated Human Resources staff member reviews every single First Report of Injury form filed by Department of Transportation employees. They then send a "Safer Form" back to the district to be completed by the injured employee and supervisor. The Safer Form requests additional information about the incident and injury, identifies a policy that may have been violated based on the injury description in the First Report, and solicits suggestions for safety program improvements. Reviewing each claim form is a useful practice that ensures accountability between the central and district safety officers, as well as the district safety officers and crewmembers.

OBJECTIVE 3:
IMPROVE WORKPLACE SAFETY CULTURE

RECOMMENDATION ONE:
INCREASE ACCOUNTABILITY WITH A NEW APPROACH TO PROGRESSIVE DISCIPLINE POLICIES

Several District Safety Officers mentioned that accountability and attitudes surrounding safety in Caltrans could be improved. This could be due to its size and de-centralized structure. Whatever the cause, it should be addressed. Safety managers from other state DOTs stressed the importance of creating a workplace culture that emphasizes safe practices.

Safety must become a priority at every level of the organization—from upper management to field employees. A significant problem is ensuring that supervisors adhere to the safety regulations outlined in the Employee Manual and investigate industrial accidents. Several District Safety Officers suggested that the current management system does not include realistic methods for enforcing safety policies.

For safety to become a workplace priority, individuals at all levels of the organization must expect to be held accountable for their actions. This can be achieved by developing a clearly defined accountability management system.

Oregon OSHA has defined essential characteristics of an effective accountability system. They include:

- Formal standards of behavior and performance, e.g., clear policies, procedures, or rules;
- Resources to meet those standards, e.g., a safe workplace, effective training, and adequate oversight of work operations;
- An effective measurement system of safety performance at all levels of the organization;
- Appropriate application of consequences, both positive and negative; and
- Consistent application throughout the organization[20]

A successful accountability system aims to methodically help employees and supervisors take responsibility for their actions and the actions of others on the team by:

- Clearly defining expectations of performance in written performance objectives;
- Periodically evaluating this performance jointly with employees;
- Allowing employees the freedom to learn and develop in a positive and non-threatening manner; and
- Imposing negative consequences only when training and mentoring have not been effective.[21]

[20] Roughton and Mercurio, p. 153
[21] Roughton and Mercurio, pp. 170-172

This kind of accountability system is known as progressive discipline. It employs communication and collaboration, which also helps employees improve their workplace performance, the ultimate goal of any successful disciplinary system. Caltrans should consider implementing these accountability and progressive discipline solutions, and devise its own progressive discipline protocol that targets employee safety violations.

RECOMMENDATION TWO: ENHANCE WORKPLACE SAFETY CULTURE VIA ORGANIZATION-WIDE INITIATIVES

Caltrans should engage in organization-wide safety initiatives that motivate employees to participate in the safety process. Individual Caltrans districts have held events such as equipment rodeos, but they have never been initiated on a statewide level. Caltrans has also begun external statewide public safety awareness campaigns including 1999's "Slow for the Cone Zone" that educated drivers about highway work zones.[22] Similar statewide campaigns should be developed and aimed at employee safety issues.

RECOMMENDATION THREE: DEVELOP AN ETHIC OF SAFETY AND PREVENTION.

A fundamental tenet of a successful safety program is that management, starting with employees with the most authority, down through front line management including supervisors and foremen, all actively participate in efforts to increase workplace safety.[23]

LESSONS FROM OTHER STATE DOTS

At the Oregon Department of Transportation (ODOT), support from the director has helped legitimize their industrial safety program throughout the organization. ODOT aims to ensure that managers respect the role of safety and also pass this attitude down through to employees in regional offices.

The Washington Department of Transportation (WSDOT) made a similar commitment to establishing safety as a top priority. In May 2007, the Washington State Governor's Management Accountability and Performance Group issued a mandate to improve performance within WSDOT in several areas, including employee risk management. In 2005, WSDOT Secretary Doug McDonald introduced the "Pre-activity Safety Plan" via an executive mandate, and currently each of the regional safety managers are required to spend at least 75% of his or her time working on activities outlined in the plan.

An important component of the Pre-activity Safety Plan is that every employee, from new hires in the maintenance division to the Secretary of WSDOT, has an electronic "individual performance management profile." Every WSDOT employee also agrees to abide by specific expectations for safe behavior, and his or her safety performance is regularly evaluated. Supervisors are expected to ensure that every major duty that an employee performs is rated in terms of adherence to safety requirements. Eighty or 90

[22] California Department of Transportation, *Caltrans Strategic Plan 2007-2012*, p. 22.
[23] Roughton and Mercurio, p. xxiii.

percent of employees and supervisors receive positive marks when their safety behavior is rated in an annual evaluation. The Safety and Health Director noted: "The PSP (Pre-activity Safety Plan) was a never-heard-of acronym before. Now everybody that you talk to knows what it is."

Caltrans should consider implementing similar programs and issuing a safety mandate or, at a minimum, generating a safety memorandum from top-level staff in the central office.

RECOMMENDATION FOUR: MAKE SAFETY A BUSINESS PRIORITY

One of the tensions at Caltrans is that while supervisors continually remind employees to engage in safe work practices, productivity is the main priority. This attitude is reflected in the small number of safety officers within the organization and the pressure for employees to meet output goals rather than safety goals. There is no easy way to resolve the tension between safety and productivity, particularly when the Caltrans budget dictates staffing and equipment decisions. This is a problem common to almost all the DOTs surveyed: the only DOT representative interviewed that did not list safety program funding as a limitation was the Safety and Risk Manager at the Oregon Department of Transportation (ODOT).

In the past few years, the ODOT Safety Department has diligently worked to make employee safety one of the organization's leading values by convincing decision makers that safety has an impact on productivity. The Safety and Risk Manager is one of the top managers participating in the executive level Highway Management Team, and each of the regional safety officers is a member of the Region Management Team. As the safety manager explained: "Being part of the management team we [the Safety Department staff] are always there. It's a topic on the Management Team agenda. Safety is there and participating in the conversation. Even conversations around budget, so we're equal to those other things, and it has made a tremendous difference in how we look at safety."

Management support from the ODOT Director has also helped the safety department receive the funds necessary to sustain a full staff in the main office. In comparison with the other states that we examined, Oregon has the largest safety staff in a DOT headquarters office: eight full-time employees. By establishing the connection between safety and productivity, ODOT has legitimized the safety program and obtained increased funding for safety initiatives.

There are already-developed programs that Caltrans might consider investing in as the first step toward changing organizational values around safety. (See appendix C).

CONCLUDING THOUGHTS

Many of the program elements described above would require changes in Caltrans policies and would incur costs for research, start-up, implementation, and evaluation. The purpose of this report has been to provide Caltrans with a menu of options that might meet some of the most pressing needs and safety program shortcomings at Caltrans. The State Case Study Appendix includes many additional background details about the size and structure of the DOTs in the states referenced in this chapter.

Additional appendix materials provide some suggestions in greater detail.

Once Caltrans safety staff members have reviewed and commented on these recommendations, it would be valuable to look closely at the feasibility of implementing them in terms of the needs and costs unique to Caltrans. A comprehensive safety assessment or, at least, further research into specific issues, will clarify those program elements which would be most cost-effective and successful in California.

STATE CASE STUDY APPENDIX

INTRODUCTION

This section contains a qualitative examination of exemplary safety programs at six Departments of Transportation (DOTs), those in Idaho, New York, Oregon, Texas, Vermont, and Washington. They were chosen after a preliminary examination of DOT safety programs in all 50 states and interviews with representatives from a selection of DOTs.

Key points from these detailed examinations are included in the main body of the report, along with recommendations about how these practices might inform new policies at Caltrans.

For each state, there is a brief discussion of demographics, population, and geography, a description of the size and structure of the DOT, with an emphasis on the division of districts and employee roles.

We supplemented the qualitative analysis with interviews of each state's safety official(s) and materials they submitted in response to questions. The analysis also describes criteria used to determine what state had notable employee safety practices and discrepancies between initial program goals and post-implementation results. Several states have not yet submitted requested information and materials.

IDAHO: STRONG SAFETY LEADERSHIP AND ACCOUNTABILITY TOOLS

IDAHO FACTS

STATE DEMOGRAPHICS AND GEOGRAPHY

According to the 2006 U.S. Census, Idaho's population is 1,466,465, and its three largest cities are Boise, 190,122 residents, Nampa, 68,156, and Pocatello, 52,910. The median household income in Idaho is $40,509, and per capita is $17,841. Each is approximately $4,000 below the national average.[24]

Geographically, Idaho is the 13th largest state in the U.S., measuring 82,747 square miles. A landlocked state, its 3,100 river miles are the most of all 48 states in the continental U.S. Counting lakes as well, it contains 823 square miles of water mass.

Idaho has over 60,000 miles of roads, approximately 4,000 bridges, 1,887 miles of rail lines, and 125 public airports. Of these, the Idaho Transportation Department (ITD) has jurisdictional responsibility for almost 5,000 highway miles, over 1,700 bridges, and 30 airports. The ITD also oversees federal grants to 15 rural and urban public transportation systems, provides state rail planning and rail-project development, and supports bicycle and pedestrian projects.[25]

ITD: ORGANIZATIONAL STRUCTURE

The ITD is divided into six divisions: Aeronautics, Highways, Motor Vehicles, Transportation Planning, Administrative Services, and Public Transportation. It employs over 1,800 full-time workers and uses temporary hires to drive snowplows in the winter and perform inspections in the summer.

According to the ITD's head of safety, about 500 employees are employed as maintenance transportation techs, about 300 are engineers, and the remaining 1,000 primarily do administrative work. ITD is headquartered in Boise, the state capital, and divides its statewide operations among six districts. The workforce is not unionized.

ITD: SAFETY DEPARTMENT ORGANIZATIONAL STRUCTURE

The head of safety at ITD is the Safety Risk Management Manager. This person reports to the Administrative Division Administrator and works at ITD headquarters. The position, which is the only safety position at headquarters, "oversees the statewide program for developing the safety policies and regulations for reviewing all tort claims against the department and facilitating who will be responding to those tort claims."

[24] Idaho State website, "Facts About Idaho", http://www.state.id.us/aboutidaho/facts.html. Accessed on March 13, 2007.
[25] Idaho Department of Transportation website, http://www.itd.idaho.gov/newsandinfo/faqs.htm. Accessed March 13, 2008.

The Safety Risk Management Manager oversees six Safety and Training Coordinators, one in each district. They conduct monthly safety meetings in their districts and ensure that safety program training is in place and that materials and information are distributed to their district's employees. Each district coordinator is responsible for the safety of approximately 200 employees, who are mostly maintenance workers. The district coordinators spend the majority of their workday in the district headquarters office, with some trips to the field to perform inspections and training.

CRITERIA FOR SELECTION

ITD was selected because of its strong commitment to safety programs as demonstrated by its large number of safety employees relative to its payroll, mandatory meetings for ongoing and new procedures, broad participation inside the organization, including headquarters personnel, regular analysis and dissemination of safety performance data, a high level of communication and accountability, and its decision to form a partnership to tap the expertise of the Idaho State OSHA.

Despite its relatively small size, ITD has a comparatively low ratio of1 to 200 safety personnel to employees. Safety Risk Management Manager Cheryl Rost has held her position for 30 years and carries out continuous program evaluations and improvements.

SAFETY PROGRAM HIGHLIGHTS

REGULAR SAFETY MEETINGS

IDT holds mandatory monthly safety committee meetings attended by select members of maintenance crews in each district. The membership consists of a combination of safety coordinators, foremen, lead workers, and crewmembers. Participation is rotating; a member may serve for either 12 or 18 months. To be eligible to serve, an employee must be recommended by a supervisor. The final makeup of the committee must include representatives from all occupations.

At these meetings, members review all vehicular incidents and employee injuries that occurred during the previous 30 days, as well as all safety items that arise. For example, seasonal topics such as ice in parking lots might be discussed. Some of the committees also review tort claims filed in their district. Safety and Risk Manager Rost described the meetings as very effective for keeping safety issues fresh in employees' minds. "The Safety Committees enable different employees at different times to look at what we do and how we do it, our procedures. The development of job safety analyses causes them to do the same thing, to look at their procedures to identify hazards," she said.

When new jobs begin, or projects on hiatus are resumed, safety personnel develop and go over a safety analysis document relevant to the specific assignment with the crews involved in the project.

In addition to the district safety committees, there is a safety committee at headquarters, with at least one representative from each of the six ITD divisions, Aeronautics,

Highways, Motor Vehicles, Transportation Planning, Administrative Services, and Public Transportation.

DATA MANAGEMENT AND QUARTERLY REPORTS

ITD gathers personal injury and motor vehicle incident information from several sources, including employee accident forms, tort claim forms, and safety meeting records, and stores it in a commercial database that facilitates analysis and sharing of findings. Each district enters its information at least once a week. An administrative data entry employee in each district is assigned the task. Only the seven safety staff members, six district business managers and the employees who enter data in each district may log onto the database. The Safety Risk Management Manager then generates comprehensive quarterly reports from this database. She first issues these statistics to top management in summary form and then issues a full formal report with complete accident descriptions to all foremen and forewomen and section supervisors. The quarterly reports are discussed in detail at monthly Safety Committee meetings.

ALLIANCE WITH IDAHO OSHA

Although it is not required to comply with federal OSHA rules, ITD entered into an alliance with the Idaho OSHA to improve its workplace conditions and reduce the number of workplace injuries. Slated to last three years, it was initiated in 2006.

Under the agreement, ITD employees can attend a 10-hour course, Occupational Safety & Health in Roadway Construction, taught by Idaho OSHA employees, as well as meetings where OSHA representatives discuss nationwide injury and fatality rates with an emphasis on the importance of reducing exposure.

In addition, ITD and Idaho OSHA have agreed on a number of specific, clear objectives that extend beyond ITD by encouraging its contractors and other employers in the state to work more closely with Idaho OSHA.

The alliance is developing information about how to recognize and prevent workplace hazards, as well as ways to communicate that information to ITD workers and supervisors. They are doing outreach by means of printed materials, training programs and other events. In terms of outside contractors, they are encouraging them to use the free services of the Idaho Occupational Safety and Health consultation program at Boise State University and build long-term relationships with staff there.[26]

HOW DO THESE FINDINGS COMPARE TO OUR EXPECTATIONS?

The main reasons for interviewing Rost were her length of service in a small DOT and her involvement with an OSHA initiative. Rost would therefore be able to comment on the techniques that have worked best during her tenure, focusing specifically on engaging

[26] Idaho Department of Transportation website, ITD, OSHA Form Safety Training Alliance, http://itd.idaho.gov/Transporter/2005/070805_Trans/070805_OSHA.html. Accessed March 13, 2008.

employees in the process of creating safety policy and using injury data to motivate increased attention to safety. Rost felt strongly that IDT has developed a successful safety program. She was unable to think of any needed improvements short of increasing the safety program budget.

Rost commented on the ITD-OSHA alliance, explaining that the two main results were the 10-hour employee course and the fact that recently OSHA representatives have spoken at special ITD safety meetings, where at least 100 maintenance employees and construction foremen were present. Rost did not mention if any of the other ITD-OSHA alliance goals were met.

NEW YORK: EMPLOYEE AWARENESS AND MOTOR VEHICLE SAFETY

NEW YORK FACTS

STATE DEMOGRAPHICS AND GEOGRAPHY

According to the 2006 U.S., New York's population was 19,306,183, and its three largest cities were New York City, with 8,143,197 residents, Buffalo with 279,745, and Rochester with 211,091. New York City is the most populous city in the U.S. New York State's median household income was $45,343, and median per capita was $23,389.[27]

Geographically New York measures 53,989 square miles.[28] On the east, it is bordered by the Atlantic Ocean and by three of the Great Lakes to the west. New York has a varied landscape including ports along the eastern seaboard, the Adirondack and Catskill mountains, and lowlands extending from Lake Ontario to the northeast along the Canadian border.

The New York State Department of Transportation (NYSDOT) was formed in 1967. In 2008, NYSDOT published the following list of transportation network elements that exist in New York State:

- A state and local highway system that annually handles over 100 billion vehicle miles. The total system encompasses more than 113,000 highway miles and more than 16,000 bridges.
- An extensive 4,600-mile rail network over which 42 million tons of equipment, raw materials, manufactured goods and produce are shipped each year.
- 513 public and private aviation facilities through which more than 31 million people travel each year.
- Five major ports which annually handle 50 million tons of freight.
- Over 130 public transit operators, serving over 5.2 million passengers each day.
- 12 major public and private ports, which handle more than 110 million tons of freight annually.
- A separate branch of the NYSDOT specific to New York City.[29]

NYSDOT: ORGANIZATIONAL INFORMATION

NYSDOT operates across 11 regions and employs approximately 12,000 full-time workers. This includes the New York City Department of Transportation, which handles all transportation matters in the five boroughs that make up the greater New York City metropolitan area. The NYSDOT main office is located in state capital of Albany. Most NYSDOT employees are unionized.

[27] US Census Bureau Web site, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/36000.html. Accessed on March 25, 2008.
[28] Online Atlas Web site, "New York", http://www.onlineatlas.us/ny.htm. Accessed on March 25, 2008.
[29] New York Department of Transportation website, "NYDOT History: Past and Present", https://www.nysdot.gov/portal/page/portal/about-nysdot/history/past-present. Accessed March 26, 2007.

At least one-third of NYSDOT employees work in the maintenance division. The remainder work in construction, design, planning and program management, information technology, traffic systems, and administrative divisions.

NYSDOT: SAFETY DEPARTMENT ORGANIZATIONAL STRUCTURE

The head of safety at NYSDOT is the Safety and Health Director II, who is stationed at headquarters in Albany. The position is assisted by the Safety and Health Director I (Charles Gaynor, whom we interviewed), an industrial hygienist, and an administrative assistant. Gaynor explained that the primary responsibility of the main office safety staff is to create regulations and respond to compliance issues.

A Safety and Health Representative II and a Safety and Health Representative I are stationed in each of the 11 NYSDOT regions and report to both a general regional director and to the Safety and Health Director II at the main office. These Safety and Health Representatives are responsible for ensuring that all employees in their region attend trainings. They also develop safety programs tailored to the needs of individual regions. Gaynor estimated that Safety and Health Representatives spend 75 percent of their workday in the office processing paperwork and 25 percent at job sites. Safety and Health Representatives attend meetings with the Safety and Health Directors twice a year, in the spring and fall.

CRITERIA FOR SELECTION

New York was chosen because NYSDOT touts a "Safety Review" program, whereby the safety officers examine safety practices several times per year in each district. NYSDOT has also made demonstrated efforts to involve employees—labor and management—in the safety process through safety committees and information distribution. For example, NYSDOT posts regular quarterly employee health and safety updates online and also issues these reports to all employees in paper form.

SAFETY PROGRAM HIGHLIGHTS

The most impressive elements of the NYSDOT Safety and Health program are the efforts to create an engaging safety culture through safety committee meetings, organization-wide initiatives, and literature distribution. NYSDOT has also adhered to its 2006 Safety Review Program goal of routinely assessing safety program initiatives. These reviews resulted in NYSDOT focusing on increasing safety related to industrial motor vehicle incidents.

SUCCESSFUL SAFETY COMMITTEES

Each of the 11 NYSDOT regions has a regional Safety Committee that includes at least one employee representative from each of the divisions in the region (i.e., maintenance, engineering, administration) and the Safety and Health Representatives. The sizes of these committees reflect the regional employee populations and consist of between eight and 16 members. The employees range in job title from crewmember to foreman to supervisor. To encourage participation and open discussion, employees are instructed to "leave their job titles at the door," according to.

Every year safety officers from each region attend an annual day-long Safety Committee conference in a central location. During this event, officers brainstorm about best practices and new initiatives for the upcoming year.

SAFETY INFORMATION DISTRIBUTION: POSTERS, NEWSLETTERS, ONLINE POSTS

NYSDOT has recently revived a safety awareness posters campaign, Gaynor explained. "A number of months ago, we went back to producing our own posters that are department-specific… professionally done." He estimated that NYSDOT had issued six over the past 18 months. "And they seem to have had a pretty good effect," he added. They issued reminders about work zone safety clothing and seasonal hazards.

They are hung up in district offices and are included in the thrice-yearly Safety and Health Division newsletters, which stand out from those of other states because of their higher design quality and color printing. The newsletters are posted on the NYSDOT Web site, along with all safety manuals.

BACKING AND MAINTENANCE YARD CRASHES

After years of routinely assessing safety program initiatives and their effects, the Safety and Health Department decided to focus on two key problem areas: backing accidents and maintenance yard crashes.

Backing accidents were chosen because they resulted in a high rate of severe injuries. As a result of this new focus, the main safety office routinely reviews and updates the employee manual and adds new information based on knowledge gained by safety officers in the regional and main offices. Most recently, a September 2007 memorandum described the proper methods for backing up trucks in the winter when snow and ice reduce visibility.

NYSDOT decided to address the problems of crashes within its own maintenance yards by creating traffic maps for them, based on staff reviews of every industrial injury resulting from a vehicle collision. As Gaynor explained: "So many collisions were between our own vehicles on our own property. That was because everybody was just driving around any place that they wanted to." With the traffic patterns mapped and maps shared among drivers, crashes have decreased.

HOW DO THESE FINDINGS COMPARE TO OUR EXPECTATIONS?

According to the Safety and Health Director II, NYSDOT has earned its good reputation for involving employees in the safety program and distributing ample information about industrial safety. NYSDOT particularly stands out in its commitment to reducing industrial accidents resulting from motor vehicle incidents.

OREGON: SAFETY AS A BUSINESS PRIORITY

OREGON FACTS

STATE DEMOGRAPHICS AND GEOGRAPHY

According to the 2006 U.S. Census, Oregon's population was 3,700,758, and the three largest cities were Portland, with 533,427 residents, Salem with 148,751, and Eugene with 144,515. The median household income was $42,568, and the median per capita income was $20,940 respectively.[30]

Geographically, Oregon measures 95,997 square miles. Its landscape is diverse. It has mountain ranges with peaks that rise over 10,000 feet, as well as Hells Canyon, North America's deepest canyon, and Crater Lake, North America's deepest lake. The Pacific Ocean marks Oregon's entire western boundary, which consists of 295 miles of coastline.[31] It is the country's number one exporter of forest products; agricultural products, notably nursery stock, are its number two export.

The Oregon Department of Transportation (ODOT) oversees Oregon's system of highways and bridges, public transportation services, rail passenger and freight systems, and bicycle and pedestrian paths. It employees approximately 4,700 people and is responsible for 33,558 lane miles of paved roads; ODOT also manages driver licensing and vehicle registration programs, motor carrier operations, and transportation safety programs.[32]

ODOT: ORGANIZATIONAL INFORMATION

The Highway Division of ODOT employs approximately 2,500 people; this number does not include administrative employees that work in the Department of Motor Vehicles, which also falls under the jurisdiction of ODOT.

All ODOT maintenance and construction employees work in the Highway Division, as do most ODOT engineers. They work out of a central office located in the state capital, Salem, and in five regions. Between 300 and 500 employees work in each region. ODOT employees are eligible to join the Clerical Support Union or the Associated Engineering Employees Union; approximately 60 to 70 percent of ODOT employees belong to one of these two unions.

ODOT: SAFETY DEPARTMENT INFORMATION

The head of safety at ODOT is the Safety and Risk Manager, who works in the central ODOT office, which also has an Executive Assistant; the Risk Management Coordinator; the Central Services, Rail, and Transit Manager; the Workers' Compensation Manager;

[30] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/41000.html. Accessed on March 26, 2008.
[31] Oregon state website, "Oregon Economic and Community Development Department", http://www.oregon.gov/ECDD/KIDS/kidrpt_clim.shtml. Accessed March 26, 2008.
[32] Oregon Department of Transportation website, http://www.oregon.gov/ODOT/about_us.shtml. Accessed March 26, 2008.

Industrial Health Services and Safety Tracker Tech Services; the Transportation Services Specialist; and the Safety Technician. In addition, each of the five regional highway offices has a local safety manager. ODOT's central safety office had the largest staff of any safety department in this study.

We interviewed the Safety and Risk Manager, who described her office as being responsible for statewide policy for safety and risk, including a team-based approach to decision-making in this area. The focus is on prevention and education, including safety training and awareness. Much of the prevention and training work is developed at the regional level. "Each of the regional safety managers manages the prevention program in their highway regions… focusing on incident analysis, identifying where potential injuries occur, where are the risks involved, where are the exposures." Her office is also responsible for administering claims for workers' compensation, property, and liability insurance.

CRITERIA FOR SELECTION

Oregon was selected on the basis of the qualities of the ODOT Web site, including a comprehensive volume of safety information posted online that includes links to employee safety information relevant to each specific ODOT department. Also, Oregon has recently publicized several workplace safety initiatives directed at state employees. The Department of Administrative Services is currently actively involved with a statewide employee safety initiative. In 2006, the Director of ODOT issued a policy mandate containing guidelines intended to increase safety for ODOT employees, and in 2007 the Highway Motor Carrier Division initiated a Workplace Safety Action Plan. One objective was to investigate the effects of these ODOT industrial safety initiatives.

SAFETY PROGRAM HIGHLIGHTS

ODOT's approach is an example of "safety as a business priority." While other ODOT departments have faced budget cuts, in the past five years the Safety Department has seen its funding rise, enabling it to hire additional staff members. Commendable safety program elements include workplace safety inspections and employee incentive programs. Of the states in this study, Oregon had the largest safety staff in a DOT headquarters: eight full-time employees.

INTEGRATION OF SAFETY AND BUSINESS

In the past few years, the ODOT Safety Department has convinced decision-makers that safety affects productivity, creating a consensus that the safety of employees, contractors, and the public are one organization's leading values. The Safety and Risk Manager is one of the selected top managers who participates in the executive level Highway Management Team. Each of the regional safety officers is a member of the Region Management Team. The Safety and Risk Manager explained: "We [the Safety Department staff] are always there. It's a topic on the Management Team agenda. Safety is there and participating in the conversation… So we're equal to those other things and it has made a tremendous difference in how we look at safety."

Many of the safety officers interviewed from other states cited lack of funds as one of the main obstacles limiting safety program development. By establishing the connection between safety and productivity, ODOT legitimized the safety program and was able to justify increased funding. Support from the ODOT Director has helped legitimize the industrial safety programs and ensure that managers both respect the role of safety and pass on their attitudes to employees in regional offices.

WORKPLACE SAFETY INSPECTIONS

Oregon is one of the few state DOTs that appears to actively enforce its policy of monthly safety inspections. Regional safety managers and transportation maintenance coordinators conduct regularly scheduled workplace safety inspections. Regional safety managers conduct "workplace review" inspections at each site in their region at least once a month. In addition to work performed by ODOT employees, they check on outside contractors working alongside ODOT. The Industrial Health Manager from the central office also visits sites around the state, conducting respiratory testing to determine indoor air quality conditions. Employees are encouraged to call the central safety office to report any safety issues or violations, which the regional manager responds to with an on-site investigation.

EMPLOYEE INCENTIVES: "RAISE THE BAR"

The Safety and Risk Manager described a simple initiative, called "Raise the Bar," to increase employee attention to workplace safety. Beginning in early 2007, "I presented our executive staff and our highway management team with five Hershey bars [with a] wrapper around [them] that says we value safety, 'raising the bar.' They were charged with taking those five candy bars and recognizing someone for safe behavior and then coming back to their management team and saying who they gave their bar to and why. It generated a lot of conversation around safety. And they started doing it on their own and it was just phenomenal. It was just a simple way of regenerating the conversation."

HOW DO THESE FINDINGS COMPARE TO OUR EXPECTATIONS?

Oregon met expectations of engaging in new initiatives aimed at increasing workplace safety. Management support for the safety program has resulted in notably positive initiatives, ranging from ODOT issued agency-wide safety memoranda to increased funding for agency safety staff. The research provided no information about ODOT's specific response to the 2006 statewide initiative to increase industrial safety or the 2007 Highway Motor Carrier Division Workplace Safety Action Plan.

TEXAS: COMPREHENSIVE SAFETY TRAINING AND DATA COLLECTION

TEXAS FACTS

STATE DEMOGRAPHICS AND GEOGRAPHY

According to the 2006 U.S. Census, Texas' population was 23,507,783, the three largest cities being Houston with 2,016,582 residents, San Antonio with 1,256,509, and Dallas with 1,213,825.[33] Texas has the second largest population, after California. Houston, San Antonio, and Dallas are the fourth, seventh and ninth largest cities in the U.S. respectively. The median household income was $41,645, and the median per capita income was $19,617.[34]

Geographically, Texas is the largest of the 48 continental states, occupying approximately seven percent of the total water and land area of the United States, and measuring 268,581 square miles. By comparison, Alaska measures 663,267 square miles and the third largest state, California, 163,696 square miles. The southern border of Texas abuts Mexico. The Texas landscape includes coastline along the Gulf of Mexico, arid plains, and mountain ranges with peaks more than 8,500 feet high. The longest river in Texas is the Rio Grand, which is 1,254 miles long.[35]

Texas has one of the oldest departments of transportation in the U.S. The Texas Legislature founded the agency in 1917 when the state began to construct its road system. Today the Texas Department of Transportation (TxDOT) oversees the entire state transportation system and is comprised of 25 divisions dedicated to different functions such as aviation, construction, maintenance, motor vehicles, public transportation, railways, and safety. The largest divisions are those involved in maintaining the extensive highway system.[36]

In 2007, TxDOT published Pocket Facts that included the following information about the Texas transportation network:

- TxDOT maintains 79,696 centerline miles of highway in Texas (centerline miles are traveled in a one-way direction regardless of the number of lanes in a roadway).
- Texas has 49,829 bridges, about 40% more than any other state. TxDot conducts routine inspections of each bridge at least once every two years.
- 300 airports in Texas are eligible for TxDOT funding.

[33] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/48000.html. Accessed on April 8, 2008.
[34] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/48000.html. Accessed on April 8, 2008.
[35] Texas Almanac, "Texas' Natural Environment", http://www.texasalmanac.com/environment/ Accessed April 8, 2008.
[36] Texas Department of Transportation Web site, http://www.dot.state.tx.us/default.htm. Accessed April 8, 2008.

- 6,445 transit vehicles including buses and vans operated in Texas. TxDOT provided 271.1 million rides on public transportation vehicles in 2006.[37]

TXDOT: ORGANIZATIONAL INFORMATION

TxDOT has approximately 14,000 permanent employees, most of them full-time. According to Safety and Industrial Hygiene Section Director Jerral Wyer, the maintenance division with approximately 4,800 employees, is the largest. The next largest is construction, with 2,500, and all other employees are spread throughout the remaining 23 divisions, many of which serve administrative functions. TxDOT employees are not unionized. Administratively, TxDOT is divided among 25 geographic regions.

TXDOT: SAFETY DEPARTMENT INFORMATION

The head of safety at TxDOT is Wyer, the Safety and Industrial Hygiene Section Director, who works in the Division of Occupational Safety at headquarters in the state capital of Austin. Three other headquarters employees work specifically on the safety program: an industrial hygienist and two safety specialists. Approximately 35 employees in the Division of Occupational Safety handle workers' compensation claims, tort liability, and safety and hazardous material-related functions.

All four central office safety staff perform similar functions, with the primary difference being that the Director's role includes a supervisory component. All four spend a significant portion of their time performing field work in the 25 geographic TxDOT districts. They support all employee safety programs, namely crew safety, vehicle safety. and industrial hygiene.

TxDOT has a minimum of one safety officer in each of its 25 districts, and they report to the district manager. Larger districts such as Dallas have multiple safety officers and administrative support staff for them. Responsibilities of safety officers include program evaluation, safety inspections at job sites and the yard, coordinating and conducting training sessions, distributing safety information to district employees, and reporting all injury, incident, and claims information to the central office via a database system.

CRITERIA FOR SELECTION

We selected TxDOT because the Safety Division provides a range of safety training opportunities aimed at both new and long-term TxDOT employees. Additionally, its safety materials are available on the public TxDOT Web site.

Texas is the state most similar to California in terms of population and geographic size, variety of physical environments and demographics, and the size and layout of its major metropolitan areas. The Texas highway system is similar to California's in terms of its history and expansive size. Because of these similarities, we anticipated that TxDOT would have staffing characteristics and safety issues similar to Caltrans.

[37] Texas Department of Transportation 2007 Pocket Facts, ftp://ftp.dot.state.tx.us/pub/txdot-info/pio/pfacts/pf_2007.pdf. Accessed on September 24, 2008.

SAFETY PROGRAM HIGHLIGHTS

Safety and Industrial Hygiene Section Director Jerral Wyer believes that TxDOT's safety program success results from the strong safety culture that he has helped develop and strengthen during his 19-year career at TxDOT. By focusing on ongoing training, encouraging employee participation on all levels and utilizing comprehensive data collection techniques, Texas has witnessed a significant reduction in the number of workers' compensation claims filed by TxDOT employees over the past 20 years.

SAFETY TRAINING

The TxDOT safety program stands out in terms of the amount of training it provides and the approach used.

District safety officers, who develop the majority of the training, spend an estimated 30 percent of their time on it. The average TXDOT maintenance employee spends the equivalent of one work week (approximately five days) a year attending training sessions.

Because TXDOT employees are not unionized, management may encounter fewer hurdles to implementing training programs than the management of Caltrans, whose employees work under union contracts. Nonetheless, there are enough similarities that the TXDOT program is worth considering as a model. For example, although the central office sets guidelines, TXDOT districts have a large degree of autonomy in formulating their safety programs, an approach that might work well in Caltrans.

There are training program has two components: (1) routine daily crew and monthly district meetings and (2) special topic training sessions conducted by organizations contracted by the TxDOT.

TXDOT training uses routine, general sessions conducted by and for agency personnel, as well as periodic, topic-driven programs conducted by outside contractors, usually extension program staff from different branches of the Texas university system.

A key element is a daily, 10-minute meeting that supervisors are required to hold with their crews—and document that they have held—every morning. District safety officers routinely attend these meetings to ensure that the required safety topics are covered. Because they are documented, starting in 2004, TXDOT officials can audit the records to ensure compliance. The meetings might also address a change in a project. "If they're going to have a lane closure on a highway, they go through the safety considerations that they need for that operation," Wyer explained.

In addition, district safety officers, supervisors, and crewmembers attend monthly safety meetings. They tend to be related to work zone safety, but might also address broader issues such as coping with hot summertime outdoor working conditions.

The topic-driven programs are designed in response to a yearly survey of district safety officers, who are asked what types of training are most needed in their districts. The sessions are offered to both recently hired employees and long-term workers. TXDOT

contracts for district-level training sessions on the subjects identified in the surveys. Wyer commented, "We are constantly looking, evaluating and proposing new training. One of the more recent ones was an in-house course that we call Focus on Safety, and it targets our maintenance and construction operations, areas and operations where we've has serious injuries and fatalities over time. Work zone traffic control is a segment of it. It's a one-day course." The Texas Engineering Extension Service at Texas A & M University and the Continuing Education Department of the University of Texas at Arlington are two of the contractors who've conducted trainings.

In the event that there is not enough interest to necessitate a training session in a particular, district, employees are welcome to attend a session in a neighboring district.

EMPLOYEE PARTICIPATION IN THE SAFETY PROGRAM

TxDOT ensures that employees at all levels participate in safety programs through what it calls "Safety Points of Contact." Supervisors in each payroll unit, which are sub-groups within districts, choose from a pool of volunteers employees to receive training in safety practices and principles beyond what is required for average employees. (The district safety officers also must attend the trainings.) Those who complete the training are then identified as a "Safety Point of Contact" and dedicate approximately 10 percent of their time to safety issues. They also meet with their district safety officers every quarter or twice a year.

Each district has an average of 20 such "Contacts." Wyer described them as communication links between employees and supervisors, which have "added a lot of value to our safety process. This is a field employee that is hopefully interested in safety that we've trained on safety practices and processes, and we ask for their day-to-day involvement. If they see something, they need to get it addressed. If they don't know the answer, then they make phone calls or emails to get the answers. They start with their supervisor and then the safety officer."

DATA COLLECTION

Since 1989, TxDOT has been developing a comprehensive database system that tracks workplace injuries and workers' compensation claims. When a district staff sends initial information to the central office via email, a new injury or incident entry is created in the database. A trained administrator in the central Division of Occupational Safety updates the database on a daily basis. This staff member may consult several sources to obtain all of the required data. For example, if an employee is involved in a motor vehicle accident, the Finance Division provides the employee's hours worked and Fleet Equipment Operations submits vehicle and mileage information.

The Safety Division publishes an annual report that includes a three-year summary of TxDOT personal injury and motor vehicle rates. In addition, each month, the Safety Division issues a brief report containing year-to-date injury and incident frequency rates, injury severity rates, and loss time rates for every district and division. The TxDOT Central Office sends the monthly report to safety officers and to district directors. The

safety officers in turn distribute this monthly report to supervisors and area engineers. Supervisors often report the injury statistics to employees during routine safety meetings.

TxDOT uses this data to decide which safety issues are most urgent. Wyer said that because of accurate record-keeping, he is certain that a recently initiated motor vehicle backing program has been moderately successful, "…the different things we're doing, the cameras, the back-up alarms, the detection devices, and just the awareness, has reduced our backing incidents from an average of 100-130 per year down to 80. So we're making progress. We're not at zero. But that is improvement." The backing initiative includes installing detection devices, cameras, and back-up alarms in TXDOT vehicles in select "pilot" districts.

Perhaps because of this comprehensive data collection system, and fact that TxDOT publishes this data internally over 13 times per year, Wyer was the only safety officer interviewed who was able to provide quantitative injury rate information.

In 1991, one out of every 10 employees was injured on the job, amounting to approximately 1,500 injuries per 15,000 approximately employees. In contrast, in 2007, the number of reported injuries was 474 out of approximately 14,000 employees, a reduction in the ratio of employees' filing claims from 10% to 3.5%.

HOW DO THESE FINDINGS COMPARE TO OUR EXPECTATIONS?

Contrary to expectations that the TxDOT interview would reveal a focus on new employee training, it appears that the cornerstones of the TxDOT safety training are continuing education sessions on topic-specific safety issues and high-frequency crew meetings that always include a brief discussion of job site or work zone safety.

VERMONT: STRONG OVERSIGHT AND THE VOLUNTARY PROTECTION PROGRAM (VPP)

VERMONT FACTS

STATE DEMOGRAPHICS AND GEOGRAPHY

According to the 2006 U.S. Census, Vermont was the second least populous state in the country, with 623,908 residents.[38] The three largest cities were Burlington with 38,531 residents, Rutland with 17,046, and South Burlington with 16,993. The median household income was $44,548, and the median per capita income was $20,625.[39]

Geographically, Vermont is the eighth smallest state in the United States, measuring 9,614 square miles. It is bordered by Canada to the north and has many rivers and lakes, including a western border formed by Lake Champlain. The Green Mountains, which give Vermont its nickname, run through the middle of the state and are believed to be among the oldest mountain ranges in the world.[40]

The Vermont Department of Transportation (VTrans) oversees Vermont's airports, railways, highway, public transit systems, bicycle systems, and the state motor vehicles division.[41]

VTRANS: ORGANIZATIONAL INFORMATION

As of March 2008, VTrans employed approximately 1,335 people, 563 of whom work as maintenance technicians and maintenance support. VTrans employees work out of a central office located in the state capital of Montpelier, and out of nine districts determined by geographic divisions. Most VTrans employees are unionized.

VTRANS: SAFETY DEPARTMENT INFORMATION

The head of safety at VTrans is the Safety and Hazardous Materials Manager, who works in the central office and is the only full-time safety employee. Staff members in the central office provide administrative support. Each of the nine regional highway offices employs two District Technicians who each spend 15 to 20 percent of their time supporting the safety program. District Technicians report to the District Transportation Administrator. Each District Technician has different ways of managing safety in his or her district. For example, the Safety and Hazardous Materials Manager described how District Technicians create their own priorities: "In one district a technician spends 50 plus percent of their time in the office. Or you could go to another district and say that they spend 75 percent or 25 percent. Their primary focus is not safety. It's basically the engineering part of the districts as well as they're the go-to people for the municipalities."

[38] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/50000.html. Accessed on March 27, 2008.
[39] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/50000.html. Accessed on March 27, 2008.
[40] Vermont Secretary of State website, "Geography", http://www.sec.state.vt.us/kids/geography.html. Accessed March 27, 2008.
[41] Vermont Department of Transportation website, www.aot.state.vt.us/. Accessed March 26, 2008.

CRITERIA FOR SELECTION

Vermont was chosen after reviewing the VTrans Web site, which included a comprehensive volume of safety information posted online, including workplace safety zone information for VTrans employees. Also, we selected VTrans because it conducts a range of training programs for new employees.

SAFETY PROGRAM HIGHLIGHT

VOLUNTARY PROTECTION PROGRAM AND VTRANS DISTRICT SEVEN

The Safety and Hazardous Materials Program Manager attributes progress on safety issues to describe VTrans' involvement with the federal OSHA-sponsored Voluntary Protection Program (VPP). VTrans was the first state DOT to sign a VPP alliance with OSHA. The goal is that one by one, all VTrans districts will gain VPP "Star" status. Those that have done so, according to the OSHA Web site, "have achieved injury and illness rates at or below the national average of their respective industries. These sites are self-sufficient in their ability to control workplace hazards. Star participants are reevaluated every three to five years, although incident rates are reviewed annually."[42]

As of spring 2008, VTrans chose to test the VPP program in District Seven, located in northern Vermont, and subject to a high annual industrial injury rate compared to the other eight districts. The idea is to see if VPP would be a fit for the agency overall. The Safety and Hazardous Materials Manager commented: "Our thing has always been to do more of what works and less of what doesn't. So what we've done is we've really put a lot of effort and time into working with one of our districts to see if the VPP program is going to work, and we can roll it out to other districts. What we didn't want to do is roll it out to all of them and then spread ourselves thin or find out that it doesn't work."

CENTRAL OVERSIGHT

VTrans is the only state DOT in this portion of the study in which a manager, either the top safety officer or a designated human resources staff member, reviews every injury form filed by an employee. In response, they send back what is known as a "Safer Form" to be completed by the injured employee and the supervisor. This form requests more details about the incident and injury, identifies a policy that may have violated based on the injury description in the initial report, and solicits suggestions for safety program improvements.

Such close scrutiny of each incident at a central level may only be possible when there are a small number of claims, but it appears to be a useful practice, ensuring accountability between the central and district safety officers, as well as between district safety officers and crew members.

[42] US Department of Labor Occupational Safety and Health Administration, "OSHA Trade News Release", September 19, 2006, http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=NEWS_RELEASES&p_id=12498. Accessed on March 27, 2008.

STATE SAFETY COMMITTEE

Representatives from several state agencies in Vermont including VTrans, Buildings and General Services, the Health Department, and the Governor's Office, as well as a select Union representatives, participate in a State Safety Committee that meets four times a year. It has a rotating chairmanship, changing every two years between a representative of management and the union. These meetings offer an opportunity for both sides to talk about serious safety concerns and learn from the experiences of other agencies. During the last year, the group has focused on safety issues relate to air quality.

HOW DO THESE FINDINGS COMPARE TO OUR EXPECTATIONS?

The decision to interview a representative from VTrans was based on the understanding that Vermont had unique training programs. However, the Safety and Hazardous Materials Manager did not indicate that employee training was a noteworthy aspect of the VTrans safety program. Instead, the interview concentrated on the VTrans-OSHA VPP alliance because the Safety and Hazardous Materials Manager believed initiatives associated with the VPP program are promising means of reducing employee injury rates.

WASHINGTON: THE PRE-ACTIVITY SAFETY PLAN

WASHINGTON FACTS

STATE DEMOGRAPHICS AND GEOGRAPHY

According to the 2006 U.S. Census, Washington's population was 6,395,798.[43] In 2000, approximately 3,043,878 people (approximately half of Washington's population) lived in the Seattle-Tacoma area. The median household income was $48,438, and the median per capita income was $22,973.[44]

Geographically Washington is the 18th largest state and covers 71,303 square miles, with 4,721 square miles of lakes and rivers. To the west is the Pacific Ocean, and Canada is on the north. Washington is a mountainous state that is divided into six geographic land areas: the Olympic Mountains, the Coast Range, the Puget Sound Lowlands, the Cascade Mountains, the Columbia Plateau, and the Rocky Mountains. The western coast of Washington typically receives up to 160 inches of precipitation annually, making it the wettest region in the 48 continental United States.[45]

The Washington Department of Transportation (WSDOT) oversees the transportation infrastructure in Washington, including highways and bridges, public transportation services, rail and freight systems, airports, and the fourth largest ferry system in the world.[46]

WSDOT: ORGANIZATIONAL INFORMATION

WSDOT employs approximately 7,600 people. It is divided into seven administrative regions. According to a top administrator, WSDOT employs more engineers than maintenance crew members, which would make it unique among DOTs in this survey. Most employees are unionized.

WSDOT: SAFETY DEPARTMENT INFORMATION

The WSDOT Industrial Safety program is headquartered at the state capital of Olympia. Its chief is the Safety and Health Administrator. Each of the seven regions has at least one safety officer, but they report to their regional managers, not the headquarters safety office. "We are working on some arrangement in which the corporate office will have better direct control organizationally… Now, they [regional safety officers] do not report to me. I have to use other means of influencing them, so that we can have some consistency within the program," the administrator said.

[43] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/53000.html. Accessed on March 27, 2008.
[44] US Census Bureau website, "State and County Quick Facts", http://quickfacts.census.gov/qfd/states/53000.html. Accessed on March 27, 2008.
[45] Washington State website, http://www.netstate.com/states/geography/wa_geography.htm. Accessed March 27, 2008.
[46] Washington Department of Transportation website, http://www.wsdot.wa.gov/. Accessed March 27, 2008.

CRITERIA FOR SELECTION

Three years ago, in 2005, WSDOT hired a new Safety and Health Administrator, Joel Amos. In May 2007, the Washington State Governor's Management Accountability and Performance Group issued a mandate to improve performance within WSDOT in several areas, including employee risk management. It is monitoring results. Under Amos, the agency has made significant progress in reducing the number of industrial injuries and workers' compensation claims filed by WSDOT employees.

SAFETY PROGRAM HIGHLIGHTS

The year he arrived, Amos and DOT Secretary Doug McDonald established the Pre-activity Safety Plan. Its purpose is to communicate to employees that safety can always be increased and that the number of workplace injuries can be reduced. McDonald used an executive mandate, a tool that is respected by management and taken seriously, to introduce the plan.

Currently each of the regional safety managers is expected to spend at least 75% of his or her time on duties outlined in the plan, which are similar to job hazard analysis. Amos described the plan as "a tool by which both the lead person, their supervisor, and the employees involved in a job have to prepare a Pre-activity Safety Plan, which entails recognizing the hazards associated with a job. They're going to have to consider all the potential hazards that they can face while doing the job, and they will have to write those things down and recognize all the hazards associated with those tasks. They will then have to come up with control measures to ensure sure that they do not get hurt if they are exposed to those kinds of hazards."

Amos noted that because the new initiatives have only been in place for the past two years, he could only use numbers informally to quantify the program's success. Based on events defined as OSHA Recordable Accidents, the number of workers' compensation claims filed by WSDOT dropped by 30 percent between 2006 and 2007. From a baseline established in fiscal year 2006, the WSDOT goal is to reduce the number of claims by an additional 20 percent in fiscal year 2008.

STREAMLINED REPORTING, DATA COLLECTION, AND INFORMATION DISTRIBUTION

One of the Safety and Health Administrator's priorities was to establish a robust database of injury and claims rates and costs. The regional safety officers input data into an online system, which is then uploaded to a central server that the Safety and Health Administrator oversees. The system is set up to analyze, synthesize and produce reports so that safety officers can obtain the information that they need. All levels of management now receive breakdowns of claim costs and open cases within their regions in an attempt to increase risk awareness.

"Data is a very strong tool. We know what's going on, where it's going on. We have a reporting system so that we know what kinds of accidents are happening, which unit, and it's my responsibility to measure how we are doing. So when I know the measurement, I

know the problem. I go back to the top person in the region and say, 'Here's how you're doing, here's the problem. Now it's your responsibility to make sure to make the improvement.'"

As claims have dropped, the rate of accident reporting has increased since 2006. Higher reporting rates might be attributed to a new WSDOT campaign encouraging employees to report all workplace incidents and safety violations. Employees can report directly to managers or anonymously via a phone hotline, which encourages employees fearful of repercussions, including union or disciplinary actions.

MANAGEMENT SUPPORT FROM THE TOP DOWN

WSDOT embarked on a data-driven campaign to improve workplace safety as a result of support from then-WSDOT Secretary Douglas MacDonald. The campaign began after McDonald reviewed claim costs and rates between 1995 and 2005 and determined that there had been little reduction in claims. McDonald helped establish a practice of routinely and carefully examining the costs of all existing and new workers' compensation claims, not simply focusing on the numbers associated with new industrial injury claims. Although McDonald no longer works at WSDOT, the focus on reducing workers' compensation costs has remained, providing momentum to continue improving the database and management accountability systems.

According to the Safety and Health Administrator, during the first year of the Pre-activity Safety Plan, employees and supervisors were skeptical because previous WSDOT programs had lasted only a few months. It has been essential that executives at every level have communicated that the Pre-activity Safety Plan is a permanent program tool aimed at improving WSDOT employee experiences. When asked about the most notable results of the plan, the Safety and Health Administrator said: "It's just that communication of culture change and so once you have that, the culture, it's just a matter of the organization having the systems in place like the enabling system and the sustaining system that need to be put to work."

EMPLOYEE ACCOUNTABILITY

An important component of the Pre-activity Safety Plan is that every employee, from a new hire in the maintenance division to the Secretary of WSDOT, has an individual performance management profile available electronically. Every individual who works for WSDOT agrees to abide by several safety behavioral expectations, and every year during general annual employee evaluations, his or her safety performance is evaluated. Supervisors are expected to ensure that every primary job duty an employee performs is rated in terms of adherence to safety requirements. These evaluations have reached a been successful, with eighty or ninety percent of employees and supervisors receiving positive marks when their safety behavior is rated in this annual evaluation. The Safety and Health Administrator commented, "The PSP (Pre-activity Safety Plan) was a never-heard-of acronym before. Now everybody that you talk to knows what it is."

HOW DO THESE FINDINGS COMPARE TO OUR EXPECTATIONS?

The Safety and Health Administrator provided useful information about WSDOT safety program specifics, particularly in the area of data collection. The data collection methods and amount of searchable criteria in the WSDOT injury and claims database add up to an exemplary information collection system. Because the Pre-activity Safety Plan is in its beginning stages, and data have only been collected for only the past two years, it was not possible to obtain a great deal of statistical information from WSDOT.