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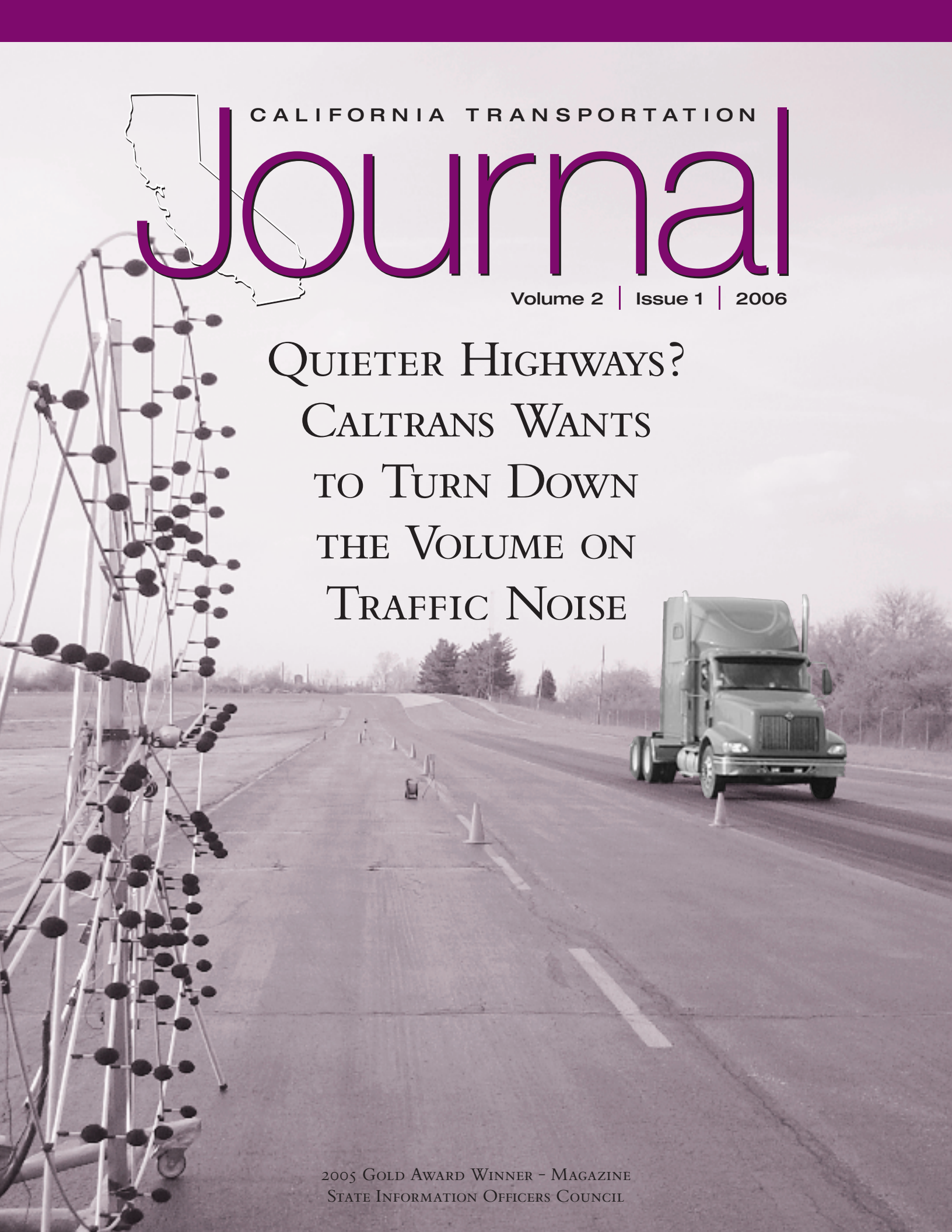

Quieter Highways? Caltrans Wants to Turn Down the Volume on Traffic Noise

2005 Gold Award Winner – Magazine
State Information Officers Council

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Cover Story: A microphone array "maps" truck noise, painting an acoustic picture — part of Caltrans research to find quieter solutions to highway pavement clatter.

Back Cover: *Slow for the Cone Zone.*

California Transportation

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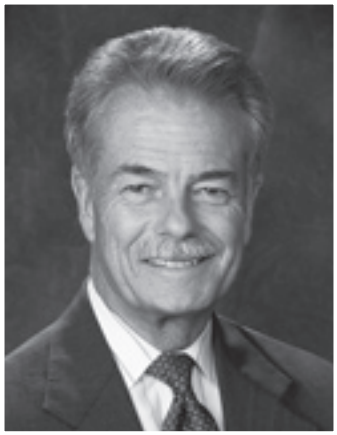
Message from the Caltrans Director

Welcome to another issue of the California Department of Transportation's award-winning *California Transportation Journal*. I'm proud to say that *The Journal* has won yet another honor, this time from an organization representing public affairs officers in California state government. The State Information Officers Council (SiOC) voted *The Journal* its Gold Award for a Magazine published in 2005. We take that as a real honor, and as motivation to maintain the quality of the magazine.

This month, we have a story about a transportation issue that is often "heard," but rarely talked about: the noise on modern highway pavements. (See "Turn Down the Volume," page 2.) Caltrans has been at the forefront of researching "quiet pavement" in recent years, and it has worked in cooperation with entities as diverse as the General Motors Corporation (in the United States and Germany) and the Federal Highway Administration.



Researchers studied highway sounds with a sophisticated array of microphones and computers to analyze what they "heard," formed a task force of experts, and listened to noise that resulted from different finishes on concrete. As a result of their work, we hope, you'll hear less about highway pavement noise down the road.

There are times when such issues as road noise seem insignificant — during natural disasters, for example. Hurricane Katrina, earthquakes in California and disasters such as mudslides and firestorms can test the limits of government to respond effectively. However, the Governor's Office of Emergency Services (OES) has included Caltrans in plans to respond to natural disasters through the California Emergency Act and California Emergency Plan. The Director of the OES discusses how state and local governments can respond effectively to emergency situations. (See "Emergency Response System Stands Ready in Post-Katrina Environment," page 8.)

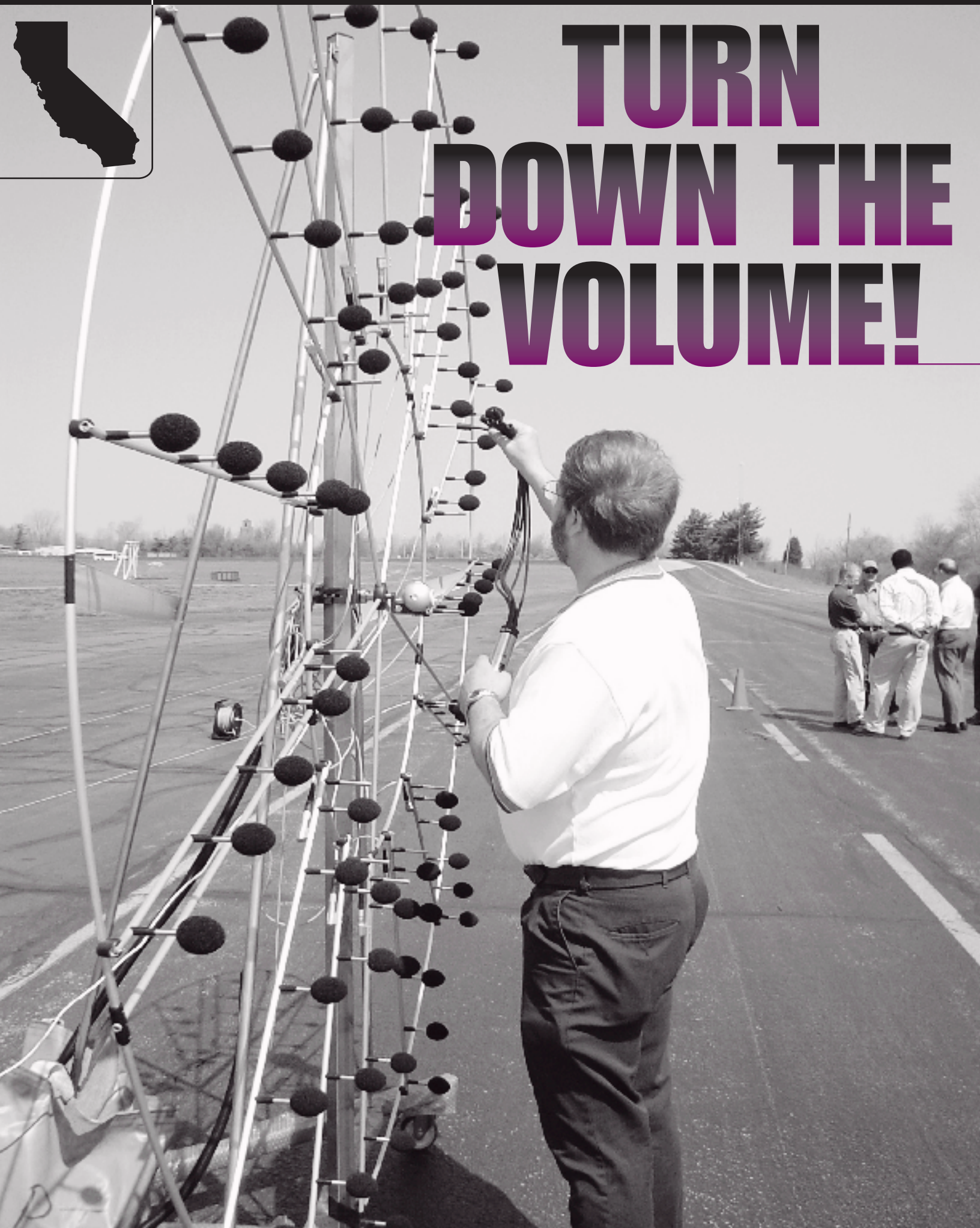
In other stories in this issue, we learn how Caltrans uses technology to help keep traffic moving when thick "pea soup" tule fog envelopes large parts of California's San Joaquin Valley each winter. We haven't learned how to make the fog go away, but we are getting better at working around it. (See "Technology Lends a Hand When Nature Ladles Up 'Pea Soup' Fog," page 12.)

Technology is playing an increasingly important part in transportation, and Caltrans played a major role in last fall's Intelligent Technology Congress in San Francisco. ("Caltrans Hosts 12th ITS World Congress in San Francisco," page 14.)

And, finally, *The Journal* takes a look at the most recent Caltrans Workers Memorial, an annual event that pays homage to highway workers and others who have died while trying to keep the state's transportation system safe. While deaths continue to occur, lives are being saved through a Caltrans public outreach campaign that urges motorists to "Slow for the Cone Zone." (See page 18.)

Will Kempton, Director

TURN DOWN THE VOLUME!



Quiet Pavement and Traffic Noise Research in California

By Bruce Rymer, Senior Transportation Engineer, California Department of Transportation

Traffic noise is a perennial hot button issue on any roadway construction project. The big question is how to reduce highway noise. In attempting to provide an answer, the California Department of Transportation (Caltrans), along with its partners, has attracted national attention as one of the premier researchers in the highway acoustics field.

In a multifaceted research effort that goes back seven years, Caltrans has made a number of advances in noise control. For example, Europe, which has been studying highway noise since the late 1980s, was considered ahead of the United States in quiet-pavement policy and technology. However, following a May 2004 information gathering tour of Europe, Caltrans Chief Deputy Director Randell H. Iwasaki ordered a study of European quiet pavement.

The resulting Noise Intensity Testing in Europe (NITE) Study showed that off-the-shelf quiet pavements in California and Arizona compared favorably with those in Europe. The NITE Study, which examined 66 different pavements in four countries, was a cooperative effort between General Motors of North America, General Motors Opel Division in Germany, Caltrans and the Federal Highway Administration (FHWA).

As a side note, Caltrans research has also validated a decision it made in the 1970s regarding the acoustic benefits of "longitudinal tining" Portland cement concrete (PCC) pavement (imprinting in the direction of travel). Many other departments of transportation at the time decided to "tine" grooves transversely (across the pavement). As it turns out, current noise studies prove that longitudinally tined PCC pavement is

continued on page 4

generally quieter than the transverse alternative.

The Arizona Department of Transportation (ADOT), a research partner, has now adopted the California model, and state departments of transportation across the country are either changing or examining a change to the longitudinal tining that Caltrans pioneered more than three decades ago.

Seeking a Quieter Solution

It is clear that reducing roadway noise is a complex subject.

The FHWA has long listed a number of ways to tame traffic noise, but as roadways aged and nearby land was developed, practical options usually dwindled to one: sound walls. Unfortunately, sound walls merely block roadway noise. A more effective way to control noise is to turn down the volume at the source — lower vehicle noise levels.

Years ago, Caltrans began a series of systematic noise studies aimed to better understand various "noise generators" on the roadway, which today places Caltrans at the cutting edge of traffic noise research.

The four primary noise generators on any vehicle can be classified as aerodynamic, mechanical, exhaust, or tire/pavement noise. Of these, Caltrans has control over only one component: pavement.

Caltrans' initial research objective was to determine whether pavement could be used to lower overall traffic noise. Anecdotal evidence seemed to suggest that it could. Consequently, Caltrans environmental engineers set out to determine its scientific validity.

Pavement Studies

The first and longest pavement acoustic study was on Interstate 80, a six-lane freeway west of Davis, California, that carries about 140,000 vehicles a day, 10 percent of which are trucks. In late summer of 1998, Caltrans placed a new porous, open-graded asphalt concrete (OGAC) pavement on top of an old, dense-graded asphalt concrete (DGAC). Subsequently, microphones in fields next to the freeway measured that noise levels had decreased by 6.0 decibels — more than 33 percent.

For seven years, Caltrans engineers used groups of microphones to measure roadside noise at the location. Then they matched the results with supplemental meteorological and operational data. The result was that OGAC pavement overlay reduced noise by about 6.0 decibels during the first four years and 4.5 to 5.0 decibels over the last three years. After seven years, the pavement still provides a 4.3-decibel reduction (measured 65 feet from the freeway).

Contrary to the earlier consensus about the durability of pavement acoustic levels, the Davis/I-80 research indicates that, under those conditions, OGAC pavement provides a long-term improvement, although it is not clear why noise increased in the last three years of the study. The Partnered Pavement Research Center at the University of California at Davis is attempting to verify the findings.

Laboratory-grade microphones, above and right, record traffic noise levels along test highways. Examples of various pavement grading options are illustrated on page 5, top. Far right, a measuring stick shows a detailed view of a diamond-headed pavement micro-grinder.

Broom finish

Burlap finish

Tining

Grinding

Reducing/Eliminating Joints in the Concrete

The Next Steps

By 2000, Caltrans was involved in two separate studies on sound — one involving multiple pavements and a second measuring the acoustics of tires on pavements.

The site of the first, an expanded pavement acoustic study, was on the remote, two-lane Highway 138 in the high desert 80 miles northwest of Los Angeles. Five different asphalt concrete (AC) pavements, each approximately one-half mile to a mile long, were placed next to each other — all exposed to similar environmental and operational conditions.

Caltrans chose the U.S. Department of Transportation's Volpe Acoustic Research Center to measure the site's pavement acoustics. Based on the accepted approach of measuring next to roadways, it soon became clear that determining small acoustic differences between the five pavements would be challenging and expensive at best.

At the same time, Caltrans research was traveling down a different path. Rather than measure all vehicle noise next to the roadway, the new process measured just tire/pavement noise from a single test vehicle, a technique that General Motors (GM) had pioneered for measuring tire/pavement noise in passenger car tires.

The GM approach evaluated different tires on one test pavement. Caltrans inverted the process, and determined that one tire could equitably measure and compare different pavements. Measurements could be taken from a test vehicle driving at freeway speed and provide a quicker, less expensive method for comparing pavement acoustics.

This new On Board Sound Intensity (OBSI) process essentially captures an acoustic "fingerprint" of a pavement and allows engineers to evaluate and compare pavement acoustics quickly — without the old "wayside" method's complications of weather, wind, ambient noise, buildings and water. It is fast, accurate, repeatable, and inexpensive — a significant improvement over previous measuring methods.

By 2005, an Expert Task Group led jointly by the FHWA and the American Association of State Highway and Transportation Officials (AASHTO) adopted the GM/Caltrans measurement approach and began drafting a specification for the process.

Although much of the early research focused on AC pavement, some research done on the Highway 58 Bypass near Mojave, Highway 85 in Santa Clara, and on various bridges throughout California has identified potential improvements to PCC, which can also reduce noise levels on roads and bridges.

Other areas identified for further study include using a broom or burlap finish on the road rather than tining, grinding, and reducing or eliminating joints in the concrete.

... ALONG WITH OTHER PAVEMENT-ENGINEERING CONSIDERATIONS — ACOUSTICS IS BECOMING AN IMPORTANT DESIGN PARAMETER.

Other Partners/Studies

In 2002, Caltrans also began coordinating quiet pavement research with ADOT and the National Center for Asphalt Technology (NCAT) at Auburn University.

The partnership proved to be fruitful and mutually beneficial. The NCAT provided a test track where additional AC pavements could be examined in a controlled environment and made several heavy trucks available for testing.

The OBSI testing method worked on flexible and rigid pavements, as well as bridge decks. As a result, the Caltrans quiet pavement database was expanding, and the technique was beginning to replace wayside measurement as the preferred method of evaluation.

Meanwhile, UC Davis and Caltrans consultants Illingworth and Rodkin, Inc., are continuing research on refining acoustic technology and asphalt pavement performance (including rubberized AC). Caltrans is also developing a research project to further investigate PCC pavement options, and it is partnering in another study with FHWA, the American Concrete Pavers Association and the Concrete Pavement Research Center in Iowa. In addition, Tom Pyle, Chief of the Office of Rigid Pavement and Structural Materials, is also a panel member on a research project on PCC pavement texturing by the National Cooperative Highway Research Program (NCHRP).

What Have We Learned?

Acoustic data can now be used to rank pavements from the quietest to the loudest. This Pavement Noise Index has proven to be an important tool in examining different pavement design and rehabilitation strategies. Safety will continue to trump all pavement-engineering decisions. However, along with other pavement-engineering considerations — like maintenance and longevity — acoustics is becoming an important design parameter.

As a result of research by Caltrans and its partners, we now know:

- Pavement can reduce tire/pavement noise by 8.0 to 10.0 decibels.
- There is a significant range in performance in each major pavement category.
- As a group, open-graded ACs show the best noise performance in California and Arizona, but improvements can be made in noise levels of all types.
- Surface roughness/texture control the lower frequencies.
- Grinding can significantly lower noise in transversely tined PCC.
- Construction variations to the same pavement specification can account for 2.0 decibels. Therefore, enforcing contract specifications is key to reducing noise.

A test vehicle with an innovative On Board Sound Intensity (OBSI) tester on its rear wheel, left, takes a direct measurement of tire/pavement noise. At right, the OBSI tester can be seen more clearly. It gathers tire/pavement noise, but blocks out the sounds of weather, wind, ambient noise and water.

LIKE MAINTENANCE AND LONGEVITY —

Where Are We Headed?

However, there is more work to be done. Before receiving FHWA approval to use quieter pavement as a noise abatement strategy, two unknowns must be resolved: How long do the benefits last? How does quiet pavement affect heavy truck noise levels?

Caltrans' current and future acoustic work will focus on answering these and other questions. In the interim, Caltrans has issued a "Guide on Designing Quieter Pavement," which includes much of the latest research information. Caltrans has also launched a "Quieter Pavement" Web site to provide the latest information on what California is doing for quieter pavements, as well as data from other states, countries and agencies:

http://www.dot.ca.gov/hq/oppd/pavement/qpavement.html

Caltrans will continue looking into the relationships between pavement and noise levels, with the presumption that such research will be important in the traffic noise modeling, pavement design and roadway noise abatement designs for the future. CTJ

CALIFORNIA:

Emergency Response System Stands Ready in Post-Katrina Environment

By Henry Renteria

Director, Governor's Office of Emergency Services

In the aftermath of hurricanes Katrina and Rita, many Americans, including residents of the Golden State, are asking whether their respective cities and states are ready for a catastrophic emergency.

California has a long history of significant emergencies, including the great San Francisco earthquake 100 years ago; the 1989 Loma Prieta earthquake, witnessed by millions of Americans as they watched the World Series; the 1994 Northridge earthquake, which until Hurricane Katrina was the nation's most costly disaster; as well as several major emergencies involving wildfires and flooding.

A major objective commonly shared by city, county and state agencies in California is the protection of lives, property and the environment.

Local and state agencies can rely on at least two key resources to help them achieve that objective after every emergency — California's Emergency Services Act and the California Emergency Plan.

The California Emergency Services Act spells out the legal authorities and responsibilities of government agencies from the city serving the affected area to the state. It also describes the conditions under which the mayors of affected cities, boards of supervisors for the affected counties and the Governor can exercise emergency powers.

By law, local government is primarily responsible for meeting the emergency needs of its residents during an emergency.

San Francisco, California; Earthquake April 18, 1906. Hibernia Bank Building. Photo courtesy of the U.S. Geological Survey Library

The reliance on local resources — fire fighters, search and rescue teams, law enforcement and public works personnel — as primary first responders makes sense for practical reasons. They are already located in the affected community and are more familiar with both the affected area and public served than colleagues from other parts of the state and country.

Although the primary role of state and federal agencies is to support local response efforts, there

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Floods, fires, excessive snow storms and earthquakes have all put their imprints on California. Fortunately, the California Emergency Plan, in which Caltrans plays a important part, can help minimize loss of life, injuries and damage to property.

may be times when agencies such as the California Department of Transportation (Caltrans), the California Highway Patrol (CHP) and the California Department of Forestry and Fire Protection (CDF) take immediate action.

Checking on the integrity and approving the use of state roads, bridges and overpasses after earthquakes and other emergencies are prime examples of post-emergency work, which one state agency, Caltrans, conducts automatically and routinely under its own authority.

If the impacts of an earthquake, flood, fire or other emergency surpass a city's ability to meet the needs of its residents, the city can also use California's statewide mutual aid system to obtain help, first, from unaffected cities and county agencies within its own county and, then, from cities and counties outside the impacted area.

One significant lesson learned from California's experiences in previous emergencies is that sound, flexible planning concepts and systems that can be used to ensure consistency in any emergency are more practical and effective than dozens of separate and disparate plans for every conceivable scenario a city, county or state might encounter.

The California Emergency Plan spells out the state's concept for operating in an emergency, including the use of the state's Standardized Emergency Management System (SEMS) to coordinate information flow and resources. It also describes the process for obtaining and providing mutual aid, illustrates the state and federal notification and warning systems, and identifies lead and support roles of state and federal agencies.

As part of the effort to ensure consistency in emergency operations, each city and county in California has developed an emergency operations plan. By law, local plans must be consistent with the California Emergency Plan and comply with SEMS.

Each year local, state and federal agencies test their plans during drills and exercises involving hundreds of fire fighters, law enforcement personnel and other first responders. These events also offer management organizations the chance to test their ability to support field operations in real time through emergency operations centers.

Lessons learned from these exercises as well as from emergencies in other states, including hurricanes Katrina and Rita, provide emergency planners with the chance to see which elements of their

BE USED TO ENSURE CONSISTENCY IN ANY EMERGENCY ARE MORE
ND DISPARATE PLANS FOR EVERY CONCEIVABLE SCENARIO...

emergency plans work well and — more importantly — which elements don't work as well as expected. The exercises allow officials to identify and correct shortcomings before another event occurs.

Hurricanes Katrina and Rita have reinforced the recognition that a catastrophic event could tax local and state resources. It's also a reminder that emergency planners at all levels need to plan in advance for mass evacuation and sheltering even if an event capable of requiring such action is improbable.

To date, the largest evacuation in state history occurred during the 1997 floods. During that event, local law enforcement officials ordered the evacuation of 120,000 residents of Sutter and Yuba counties.

In the aftermath of hurricane Katrina and after the exodus from Houston as hurricane Rita approached, OES is now working closely with Caltrans, the CHP and other state partners to develop mass evacuation guidance for use by local governments.

The planning guidance developed by OES will not replace or override the evacuation and sheltering plans developed by local governments. Instead, the work of OES and Caltrans will be to provide the guidance and templates local governments can use to bolster existing evacuation plans and procedures.

Through the mass evacuation planning process, OES will rely on the expertise of Caltrans, the CHP and others to examine a number of complex issues. Among the issues for consideration are the practicality of "contra flow;" dealing with cars that run out of gas or break down during the evacuation; the transportation and sheltering needs of the elderly, physically challenged and others with "special needs," as well as the impact of evacuees on neighboring communities.

As OES, key state agencies and local governments review and amend their plans to address challenges learned from hurricanes Katrina and Rita, as well as integration of the state's Standardized Emergency Management System (SEMS) with the Federal Government's National Incident Management System (NIMS), their journey will continue down a road toward their mutual goal of eliminating loss of life, minimizing injuries and reducing the damage to property in future disasters.

Could California experience a disaster like New Orleans felt last year? Could the 1906 San Francisco earthquake be repeated, or could fire sweep through the Oakland/Berkeley Hills? Planning can help communities prepare for the problems that could arise.

Henry Renteria was appointed by Governor Arnold Schwarzenegger as Director of OES in May 2004. Prior to his appointment, Renteria served the City of Oakland for 19 years as the Director for the city's Office of Emergency Services. During that time he coordinated the city's response to the 1989 Loma Prieta earthquake, and the 1991 East Bay Hills firestorm. CTJ

Technology Lends a Hand When Nature Ladles Up 'Pea Soup' Fog

By John Robin Witt

Editor, California Transportation Journal

Between November and February, California's San Joaquin Valley can resemble a giant cauldron of pea soup, its dense fog roiling in a vast natural basin that stretches from the foothills of the Sierra Nevada to the Coast Range that rims the Pacific Ocean.

For some 250 miles from Bakersfield north to Sacramento, a thick layer of suspended water particles can form so tightly in the late evening and early morning hours that motorists sometimes compare the experience to driving while wearing a blindfold.

The Valley is one of the few places in the world with such extreme fog conditions. Natives know that the tule fog can leave communities "socked in" and, during the worst of it, airplanes are grounded and children are occasionally excused from school. Motorists are advised to proceed at their caution, because the conditions drastically reduce stopping distances and reaction times.

The problem is that fog, which hangs in low-lying valley bottoms, can creep up silently on unsuspecting drivers. One moment the roadway is clear. The next moment, visibility can drop to 200 feet or less. The dramatic change in visibility, coupled with high traffic speeds, can result in multiple-car pile-ups, severe injuries and deaths.

However, instead of just talking about the weather, the California Department of Transportation (Caltrans) and California Highway Patrol (CHP) have chosen to do something about it. Rather than risk deadly chain-reaction accidents along Highway 99 or Interstate 5, the two agencies have significantly cut the accident rate due to fog over the last 15 years.

California's Operation Fogbound has operated since 1991, but in recent years has employed a stronger public warning and information program to help drive down the number of fog-related accidents.

Operations vary somewhat in different parts of the Valley. For example, the Caltrans Automated Warning System (CAWS) around the Stockton area uses high-tech equipment such as roadside weather stations and visibility meters, electronic message signs and low-powered AM radio stations to give drivers advance warning about conditions ahead.

In other instances, field patrols will call information into Traffic Management Centers for

evaluation. Among the factors to be considered are highway visibility, wind speed and direction, air humidity, precipitation and pavement moisture, and traffic speeds.

This information is ultimately fed to changeable message signs (CMS) on the highways, which warn that dense fog is ahead and that motorists should drive with care.

Signs also let motorists know there is "Slow Traffic Ahead" when average speeds are down to 35 mph, and "Stopped Traffic Ahead" at 11 mph.

In addition, when visibility is lowered to less than 500 feet, the CHP implements its "Pace Car" program. Officers, their car lights flashing, escort traffic safely through the fog at a reduced and consistent speed.

Caltrans also distributes "Fog: What You Can't See Can Kill You," a pamphlet with fog facts and a list of specific, common sense tips about driving in fog: Reduce speed, listen for other traffic, be patient, and drive to the right, for example.

In partnership, Caltrans and the CHP provide a life-saving service to motorists driving through the San Joaquin Valley in the winter. And that really comes in handy when travelers find themselves "in the soup" and looking for a little help. CTJ

One moment the roadway is clear. The next moment, visibility can drop to 200 feet or less.

Caltrans Hosts 12th ITS World Congress in San Francisco

A glimpse into our Intelligent Transportation

By Srikanth Balasubramanian

Program Manager for the 12th ITS World Congress
California Department of Transportation

Systems future

The eyes of the world were on San Francisco last November for the 2005 Intelligent Transport Systems World Congress, held at the Moscone Center and nearby SBC Park.

The Intelligent Transportation Society of America (ITS America) sponsored the event. However, representing the host state, the California Department of Transportation (Caltrans) was very active and had been planning for the worldwide gathering since July 2003 when it agreed to work with ITS America.

The 12th annual ITS World Congress brought researchers, industry professionals and government officials together with public and private counterparts from Europe, Asia and elsewhere around the world to showcase the latest advancements of ITS technology and policy.

It included five days of serious transportation science, technology and policy discussions. However, many of the 7,100 participants from 57 countries could hardly be blamed for thinking of George Jetson or even Buck Rodgers as they sampled some whiz-bang ITS technology demonstrations. They ranged from "smart" roads to automated buses and warning systems that help prevent intersection collisions and/or unintended departures from highway lanes.

What is ITS World Congress?

The ITS World Congress meets each year on a different continent, rotating between Europe, Asia and America. In 2004 it met in Nagoya, Japan, and next year's Congress is scheduled for London, England.

In consideration of this year's theme, "Enabling Choices in Transportation," the World Congress featured various ITS choices to improve future mobility. In fact, many participants believe that ITS will play a key role in improving mobility in the transportation network of tomorrow.

The event began with the Welcome and Opening Plenary Session, in which Business, Transportation and Housing Secretary Sunne Wright McPeak gave an address, along with other distinguished guests from China, Japan and the United Kingdom.

This event consisted of five key components: Educational Program Sessions, Exhibitions, Technical Tours, an Innovative Mobility Showcase that demonstrated the latest ITS technologies at work and a live, real world demonstration of some ITS technologies on the State Highway

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System. The event also featured allied activities such as the American Association of State Highway and Transportation Officials (AASHTO) Day and a celebration of women in transportation.

The educational programs included plenary, executive, scientific and technological sessions that provided forums for ITS professionals to learn and exchange new ideas.

The exhibitions were resources for transportation products, services and solutions. Leading ITS technology companies showcased their latest products and services.

The nine technical tours provided the chance for participants to experience many ITS technologies currently being used to improve mobility in the Bay Area.

The Innovative Mobility Showcase (IMS) was new this year, and it allowed attendees to experience a variety of ITS technologies in a controlled environment (the parking lot of SBC Park). It showed examples of how government and private industry can form powerful partnerships to research, develop, test, evaluate and deploy transportation innovations.

As the steward of California's transportation system, Caltrans was particularly active in the IMS, which offered more than 30 demonstrations of how advanced technology can make the state's future transportation system more efficient and effective in the face of a rapid population growth. Such live demonstrations of ITS technologies had never been done before at a World Congress.

The real world ITS demonstrations on the State Highway System had never been done before either. They allowed private companies to use Caltrans and other public infrastructure to demonstrate ITS technologies before, during and after the World Congress. Data collected from the field were transmitted to World Congress venues so attendees could see the ITS technologies at work.

Caltrans Involvement

Caltrans was actively involved in all aspects of the World Congress. Employees presented papers and participated in technical discussions on ITS-related subjects. Director Will Kempton and Chief Deputy Director Randell H. Iwasaki gave major addresses. Iwasaki also testified before an informational hearing on Intelligent Transportation Systems held by the Senate Transportation and Housing Committee, which Senator Tom Torlakson chaired.

Caltrans also sponsored booths at the Moscone Center where representatives met with private companies and explored opportunities to develop public-private partnerships for deploying ITS technology.

Caltrans hosted a technical tour of its District Traffic Management Center. Caltrans also worked with the University of California, Berkeley, to conduct technical tours of university facilities where ITS research is being conducted on behalf of Caltrans. In collaboration with UC Berkeley, Caltrans also conducted demonstrations of ITS technologies at the Innovative Mobility Showcase.

The ITS World Conference brought together researchers, along with industry and government officials, to learn about Intelligent Technology Systems. ITS has already led to "smarter" buses, cars and improved information for travelers.

They included:

- Vehicle-Infrastructure Integration (VII) Technology. This communicates 5-1-1 (TravInfo) travel information between vehicles and the roadside infrastructure. It provides drivers with information about travel times and warnings about work zones and travel incidents ahead. Caltrans partners include the Metropolitan Transportation Commission (MTC), DaimlerChrysler, and Volkswagen.
- The Smart Intersection was developed through a partnership between Caltrans, UC Berkeley, and Econolite. It warns drivers when it is unsafe to make a left turn due to oncoming traffic. Radar and Geo Positioning System (GPS) sensors can track vehicles nearing an intersection. A "no left turn" tells a driver when it is unsafe to proceed.
- Automated Bus Rapid Transit Technology. This guidance system steered a bus through a designated route in the park. A signal controller gave the bus a signal light priority and allowed the vehicle to pass safely through a "smart" intersection. Partners were Caltrans, UC Berkeley, Mark IV and Econolite.
- The Integrated Collision Warning System. Attendees could travel from the Moscone Center to SBC Park on a bus fitted with front and side collision warning systems, which could be used both on highways and in cities.

Concurrently with the World Conference, Caltrans, UC Berkeley and the MTC also expanded travel time notification on the Bay Area's freeway system. The pilot program, which has been running since May on Interstate 80 in Berkeley, uses two changeable message signs to provide drivers with an estimate of how long it would take to reach common destinations, such as the Carquinez Bridge, downtown San Francisco or the Richmond/San Rafael Bridge.

In early November, the system was expanded to 16 signs in areas around the Bay Area. They displayed travel times obtained from the Bay Area's 5-1-1 TravInfo system.

What Did Caltrans Gain?

Caltrans hoped to achieve three goals with its participation in the World Congress.

First, it wanted to expedite the implementation of the latest ITS technologies in California. Second, Caltrans wanted to develop policies to promote public-private partnership. And, finally, Caltrans wanted to continue to be the leader in implementing Vehicle-Infrastructure Integration (VII) Technology.

By those three criteria alone, Caltrans would certainly call the World Congress a success. It was a tremendously exciting event for ITS professionals and transportation personnel in general, and Caltrans was proud to be a part of it. CTJ

Caltrans Remembers

Its Fallen Workers

California Department of Transportation (Caltrans) employees, friends and family gathered in April at the State Capitol for a Workers Memorial honoring highway maintenance and other employees who have died in the line of duty. Since 1924, a total of 166 Caltrans workers have died in the line of duty, including three employees this year.

By John Robin Witt
Editor, California Transportation Journal

Caltrans organized the event to focus not only on the workers who have been killed, but also to call attention to the need for motorists to slow down in work zones. Research shows that drivers will drive more carefully when they understand that they are just as much at risk in a work zone as a Department of Transportation worker.

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THE CALTRANS HONOR GUARD SYMBOLICALLY INDUCTED DANIEL BROESKE, SEAN MERRIMAN AND JACKIE RAY ALDRIDGE, WHO LOST THEIR LIVES IN THE PAST YEAR... ADDING THREE NEW CONES TO THE CAUTION SIGN...

The Workers Memorial ceremony gave grieving Caltrans employees and families an opportunity for closure. Caltrans placed 163 cones in the shape of a 60-foot wide caution sign in the center of the memorial — each cone with a black band bearing the name of a fallen worker. The Caltrans Honor Guard symbolically inducted Daniel Broeske, Sean Merriman and Jackie Ray Aldridge, who lost their lives in the past year, to the brotherhood of Caltrans fallen workers, adding three new cones to the caution sign, bringing the total to 166 representative cones.

"You have the gratitude of every member of our state," said Edie Lambert, a popular Sacramento TV news anchor who served as emcee for the event.

Speakers included directors of the following: Caltrans; the California Highway Patrol; Office of Traffic Safety (OTS); Business, Transportation and Housing Agency (which oversees all three departments); Associated General Contractors of California; and the Federal Highway Administration. They sat near a podium, framed by an impressive 23-foot long National Work Zone Memorial Wall, which had been provided by the American Traffic Safety Services Association.

The audience of several hundred stood in a large semi-circle, facing members of the fallen workers' families — all waiting quietly as speakers made their way to the podium.

"Today we honor the great sacrifices of all these Caltrans workers and recognize the tremendous loss that their family and friends have suffered," said Caltrans Director Will Kempton. "The greatest honor we can bestow is to keep their memory alive."

"Taps" was performed by a National Guard Chief as a ceremonial wreath was laid. Caltrans employee Deidre Wright sang "Amazing Grace." Changeable message signs were placed on the steps of the State Capitol and read: "In Memory."

Contributions from four companies covered the event's out-of-pocket costs, totaling $6,397. Orange ribbon-shaped lapel stickers were donated and given to event participants. Grants from OTS and the California Transportation Foundation provided additional financial support.

You have the gratitude

Media coverage included 48 separate TV and radio broadcast stories over three days on 14 different stations statewide, plus two newspaper stories. The stories ran in English and Spanish in Los Angeles, San Diego, San Francisco, San Jose, Sacramento and Fresno broadcast markets. Total media value based on published rates was $340,066. While it was a solemn ceremony full of recollection, there was also a message of hope.

It was noted that since 1999, California has seen a 35 percent drop in fatalities in work zones and 28 percent decrease in motorist injuries. If California had experienced the same yearly increases as the rest of the nation, more than 157 additional Californians — motorists and workers — might have lost their lives since 1999.

Caltrans officials believe that California's improving highway work zone death rate is connected to the "Slow for the Cone Zone" campaign, an innovative advertising and public outreach effort that began in 1999 to reduce crashes, injuries and deaths of motorists and employees in work zones. Using radio, television and billboard advertising, the campaign cautions motorists to be alert, slow down and use caution when they see orange safety cones that identify a work zone — known simply as "cone zones."

The message seems to be getting through to the public. "Next year," said Director Kempton at the end of his Workers Memorial address, "let us work together so that we add no more cones to the caution sign." CTJ

"Next year," said Director Kempton... "let us work together so that we add no more cones to the caution sign."

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C A L T R A N S

This publication is dedicated to all highway workers, including those who have lost their lives while improving California's highway system.

SAVE LIVES AND SLOW FOR THE CONE ZONE

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