



# CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

No 9

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Richard Land

## Interview with Richard Land, Caltrans Chief Engineer

**R**ick Land is currently the Chief Engineer and Deputy Director for Project Delivery for the California State Department of Transportation (Caltrans). He is a graduate of California State University, Sacramento, and has been with the Department for over 30 years. Rick has spent most of his career working in various project delivery functions. Prior to his current assignment Rick was Chief of the Department's Structure Design operations.

As the Chief Engineer and Deputy Director, Rick oversees the statewide development and construction of transportation improvement projects on California's State Highway System. The Department's project delivery divisions under his direction include project management, environmental analysis, right-of-way and land surveys, design, engineering services, and construction. The Department currently has over 2500 projects in some stage of development, of which approximately 550 projects worth more than \$9.5 billion are under construction.

### How will Caltrans deal with the impact of limited funding for pavement preservation projects?

Caltrans will continue to focus its limited funding on those areas around the state where further deterioration will cost us significantly more in the future. The areas where the cost to completely rehabilitate failed pavements and impact on traffic are high should receive more attention than areas where such work is not as costly or disruptive. The prioritization of such work will be done through collaboration between the recently created Division of Pavement Management and each individual district. In the not too distant future, we plan to incorporate a more robust pavement management system into the prioritization and decision making process. By using an enhanced pavement management system, making decisions based on observed surface conditions, known subsurface conditions and performance curves developed through our research efforts, we can improve the effectiveness of our future pavement preservation expenditures.

### What are the major differences in delivery for preservation vs. rehabilitation projects?

Rehabilitation projects, including roadway rehabilitation and pavement rehabilitation projects, are projects that focus on pavement conditions which

are in need of major repair or replacement. Rehabilitation projects also address drainage facility rehabilitation as well as the need to bring the existing roadway up to the current safety design standards. Other work can include increasing shoulder widths, improving sight distance, increasing vertical clearances and adding roadside safety features to reduce the potential for roadway runoff accidents. These projects follow the full project development process and must be scoped, estimated and programmed into the State Highway Operation Protection Program (SHOPP). Projects are then developed, designed and delivered, generally over a three to four year period after initial project evaluation. These projects typically occur on roadways that have deteriorated beyond the scope of a preventive maintenance effort.

Preventative maintenance and pavement preservation projects focus on keeping the roadways in good condition and postpone the need for major rehabilitation. These projects are generally scoped for the next year's plan, and then developed, designed and delivered in a much shorter time frame than needed for rehabilitation projects. The work of these projects is typically confined to the existing roadway and, therefore, these projects have few environmental and utility or right of way issues that need to be addressed during design and construction. Modifications to the existing roadway are not usually part of preservation projects and require significantly less time to complete the construction phase.

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### What will be Caltrans' emphasis in the next three to five years on preservation vs. rehabilitation projects?

Highway rehabilitation projects for both highways and bridges will continue to be a major focus in the SHOPP over the next few years. But without a significant increase in available funding, rehabilitation needs will continue to outpace projects to address those needs. The 2010 SHOPP programming cycle suggests that approximately \$6.2 billion will be needed annually to meet SHOPP needs, but only \$1.5 billion will be available.

Pavement that is still in good condition will be evaluated for preventative maintenance needs and Caltrans will continue to advance preservation activities as much as current funding permits. Currently, we have about \$206 million per year allocated for preservation projects.

### The federal government has passed a significant stimulus package to help rebuild the infrastructure. Is California ready for this, and if so, what will be the priorities addressed?

Caltrans has been working with the Federal Highway Administration and our local partners to prepare for the economic stimulus package. Our focus is on projects that can move quickly to the construction phase to create or sustain jobs. The California Business Roundtable has reported that

18,000 jobs are created for every \$1 billion in construction projects and this is significant to California's economy and financial recovery. The portion for highways coming to California is estimated to be about \$2.6 billion.

### Controlling project costs has been difficult in recent years with the volatile changes in fuel and materials costs. How will Caltrans deal with the cost volatility in the future?

Keeping up with changes in fuel and material costs has been challenging. In addition to constantly monitoring bid prices received for our advertised construction contracts, we continue to monitor economic forecasts for various construction material commodities typically used in transportation improvement projects and adjust our estimates accordingly. The Caltrans Division of Construction also meets regularly with our industry partners to discuss the cost volatility for paving asphalt, fuel and steel products. In response to industry concerns, Caltrans has facilitated joint task teams with the Associated General Contractors of California (AGC), the Engineering and Utilities Contractors Association (EUCA) and the Southern California Contractors Association (SCCA) to discuss price indexing for fuel and steel products. The teams are also developing recommendations for possibly adjusting price indexes currently being used on Caltrans construction projects for asphalt products.



An example of some of the other challenges that take time away from pavement surface treatments.

## Surface preservation warfare

By: C Bryan Graves, P.E.

As the person in charge of maintaining the roadways in Butte County located in Northern California, I have to get into the trenches in order to preserve what we have. Many different foes raise their ugly heads to challenge the time, money and resources available to combat pavement preservation issues. Time is always whittling away at the strength and beauty of the roadway surface, turning from black to grey, and

sometimes to white or even dirty brown. There are several different innovations in the surfacing and preservation world, the trick is to pick the right treatment, apply it correctly and keep within bud-

get. Most importantly, we have to focus on the budget, as the amount that is made available is just a fraction of what it really costs to keep the roads in the condition the politicians expect and the traveling public demands. So where does that leave the status of surface preservation warfare?

Let us first look at time and how it affects the roadways. We have roads today that are made up of a mixed bag of components. Some began as market, agriculture and logging gravel roadways that were surfaced with oil and rock. Limited and inadequate structural sections usually prove to make the roads a burden, as we see increased traffic and

**Bryan Graves is a graduate of CSU, Chico, and is currently the Maintenance Superintendent for Butte County. A north state leader in the use of pavement preservation treatments, including pavement recycling, he shares some of the issues facing local agencies in California.**





Pavement surfaces can vary just from age and required maintenance.

a greater percent of truck traffic. Then there is the engineered and designed roadways using aggregate base and asphalt pavement. History is showing that these roadways were not designed to carry the demanding loads of today and in several cases, what was designed and what is constructed are two different things.

Then the twist comes when the concrete slab 'Old State Highway' was gifted to the County. We didn't know much about something that had a white surface, so we made it wider and placed pavement over it to make it black, but now time is letting us know that what was underneath affects the performance of the surface. Furthermore, all these above-mentioned road types already have had some type of repair done on them, making them a patchwork of non-homogeneous asphalt, streaked with crack seal webs, and not so desirable to drive upon.

Since there are so many different road make-ups, designs and demands, I have attempted to arm the County with several options in order to best preserve our road network assets. Butte County has always been aggressive with its 'chip seal' program ranging from thirty to ninety miles of roads constructed annually by contract force account, in-house labor, or a combination of both. The effort made through the years shows success when we start incorporating our Pavement Management System to survey and catalog surface conditions, in order to aid in the selection of a future treatment options. We have used 'single' chip seals, 'double' or 'armor' chip seals, 'scrub seals' using single layer methods, 'cape seals', as well as asphalt pavement overlays using leveling courses or pavement over fabric. We are always looking for the best treatment for the condition, which considers both old and new methods, cost-benefit and reliability.

If the pavement age, conditions and methods did not present enough of a challenge, the County also has to constantly juggle fluctuating budgets and constraints. If one looked at the 1,000 miles of surfaced roads throughout Butte County, divided by 20 years of service life allowed for each surface

treatment, we would have to average 50 miles of surface treatment a year to maintain the current condition. The money available to complete pavement preservation in the past has come from the 'Road Fund', which is solely made up of 'Gas Tax' dollars. The gas tax has remained about the same for over 15 years. The cost of materials in many cases has tripled, along with increases in equipment and labor rates. This equates to the same amount of money in the pot divided by higher cost, equals less work done on the roadways. So we are challenged at the County to do more for less. We must take advantage of additional funding sources when they come our way and get more productive with the pavement surfacing that is completed. With the recent financial turmoil facing our nation, the amount of money available for infrastructure is going to be threatened. We have to continue the battle, make progress and arm ourselves to maintain what we have.



Surface preservation can have many different forms. This is a 'scrub seal' being placed by county crews.



A good roadway for the future with the proper preparation, application and finishing touches.

## European experiences with use of noise reducing pavements

By Hans Bendtsen, Senior Researcher, Danish Road Institute/Road Directorate and visiting researcher at the University of California Pavement Research Center, Davis

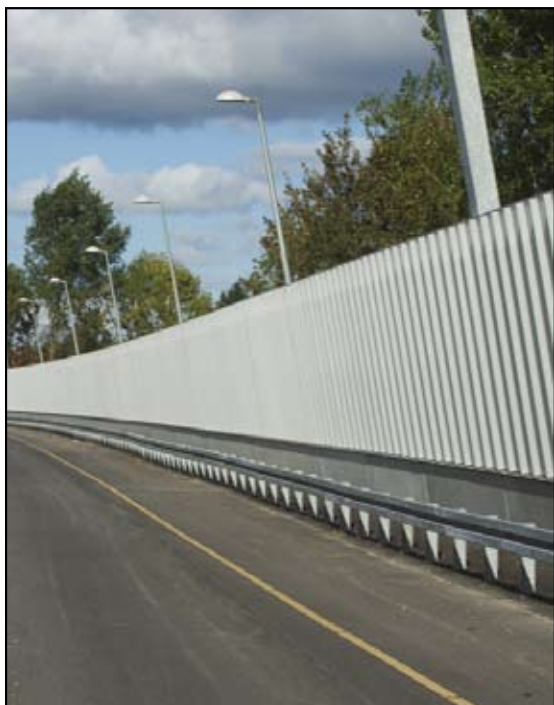
Linus Motumah, Senior Transportation Engineer, Caltrans, Office of Pavement Engineering

Bruce Rymer, Senior Transportation Engineer, Caltrans, Division of Environmental Analysis

*There is increasing focus in Europe on applying noise reducing pavements on the road networks. Caltrans contracted with the Danish Road Institute to prepare an overview of the current state of the art. Caltrans plans on using these technologies to reduce road noise.*

Quieter pavement is a new concept for the construction or rehabilitation of roadway surfaces intended to reduce the impacts that tire/pavement noise has on the highway environment. To facilitate better understanding of the acoustic and structural performance of quieter pavements, in 2006, Caltrans implemented its Quieter Pavement Research (QPR) program. The program is designed to develop surface treatment strategies, materials, design specifications, and construction methods that will result in quieter pavements that are also safe, durable, and cost-effective. Caltrans QPR effort involves research on tire/pavement noise characteristics of flexible and rigid pavement surface treatments and textures, including the effects of pavement aging and subsequent surface distresses on tire/pavement noise levels. As a part of this effort, in June, 2008, the Danish Road Institute/Road Directorate (DRI-DK) delivered the report "Use of Noise Reducing Pavements – European Experience" It can be found at [www.dot.ca.gov/hq/esc/Translab/ope/DRI-DK-TechNote-69-Report.pdf](http://www.dot.ca.gov/hq/esc/Translab/ope/DRI-DK-TechNote-69-Report.pdf). The main findings from this report are presented in this article.

An express ring-road around Copenhagen in Denmark combines noise reducing pavement, four meters (13 ft.) high noise barriers and façade insulation.



### Use of noise reducing pavements is a trend in Europe

There is increasing trend in Europe on using noise reducing pavements as a cost-effective measure to reduce the impacts of traffic noise on the highway environment. In most European countries, noise reducing surface treatments and textures are often used on a case-by-case basis in new construction and pavement rehabilitation projects. Although noise reducing pavements are more often becoming part of the "toolbox," only a few countries have an explicit policy for use of them.

The Netherlands applies noise reducing porous



The open CPX noise trailer "deciBella" from the Danish Road Institute.

asphalt on all major highways; while in Denmark, where noise-reducing surface courses are frequently used on both new and rehabilitation projects, a policy is still under development by the Danish Road Directorate. As in California and other states in the US, it is the owner/operator who pays for the quieter pavement surface treatments.

Quieter pavements can be used in conjunction with other traffic noise abatement measures like sound walls and building façade insulation, etc. A quieter pavement strategy is an option that addresses the problem at the source (tire-pavement noise) and it is often the most cost-effective measure for noise abatement. The noise reduction obtained by applying quieter pavements depends very much on the type, age and condition of pavement used for comparison or reference. The reference pavements used around Europe are typically chosen from what would have been the most likely pavement type used for major highways.

### Danish noise reduction classification system

The introduction of the Danish "so-called" SRS noise reduction classification system for quieter pavements has been an important development towards the use of quieter pavements in Denmark. SRS is the acronym for the Danish wording of Noise Reducing Surfacing. The system is based on the Close Proximity Method (CPX) for noise measurements, which is similar to the California On Board

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Sound Intensity method (OBSI) used in California and other states. In order to ensure reliability and uniformity, the SRS system allows various independent providers of CPX measurements to offer their service as long as they participate in an annual field calibration of the equipment. The SRS system classifies quieter pavements in three classes: A, B and C, where class A surface treatments exhibit the highest noise reducing effect and class C the lowest.

The Danish SRS system provides a process for marketing and contracting quieter pavement surface treatments. When a pavement project is advertised, the bid documents can specify if a quieter pavement surface treatment is required to achieve noise reduction levels specified in one of the three classes:

- A: Very good noise reduction: Noise Reduction >7.0 dBA
- B: Good noise reduction: 5.0 <Noise Reduction <7.0 dBA
- C: Noise reduction: 3.0 <Noise Reduction <5.0 dBA

This classification system enables the contractor to produce documentation of the noise reduction of a specific pavement by comparing measured values with a national reference value, such as dense graded hot mix asphalt (HMA). The intent is to certify the noise reduction benefits of pavement surface treatments and textures including new products. The system also enables local agencies — not skilled in noise considerations — to make prudent decisions on the use of proven noise reduction solutions that fit their needs and funding constraints.



Typical On Board Sound Intensity (OBSI) dual probe installation.

Due to more than a decade of research and development carried out in cooperation between the Public Road Research Institute (DRI-DK), transportation agencies and pavement industry, it has been possible to introduce quieter pavements in Denmark. The warranty periods for noise reducing pavements in Denmark are the same as for standard pavements (legally five years) but there is no established practice yet as to how the warranty covers the acoustical performance. This may be changed when more experience is gained.



Basem Muallem

## Pavement preservation in District 8

By Basem Muallem, P.E., California Department of Transportation

**T**he California Department of Transportation (Caltrans) is committed to pavement preservation and preventive maintenance as a logical substitute for pavement rehabilitation and/or reconstruction. In order to achieve this mission, a serious effort has to be in place to move from a “worst first” and reactive mode to preservation and maintenance. To keep the investment in our highway assets in good condition, we need first to identify our investment, and then keep a log of the history of our pavement with emphasis on preventive treatments that have already been applied. Caltrans District 8 has the right attitude in endorsing pavement preservation with a plan to account for its current inventory and future treatments.

### Background

Caltrans District 8, which is located in San Bernardino, is responsible for about 6850 lane-miles of flexible and rigid pavement and their current condition is:

- 26% of pavement lane miles need rehabilitation
- 1700 lane miles of highways require immediate attention
- 90% of damaged pavement is in outer lane

About 75% of the freeway system was built between 1959-1974. The Maintenance Division in District 8 has had a mission to manage our staff and watch for cost overruns. In addition, we need to emphasize ongoing communication with field staff, and inform the field of status/issues so they can optimize the use of their resources.

### Definition of preventive maintenance

From AASHTO’s Standing Committee on Highways, Preventive Maintenance is defined as the planned strategy of cost effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of

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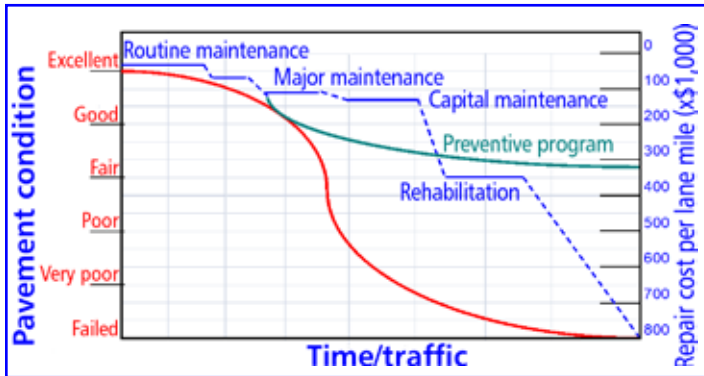


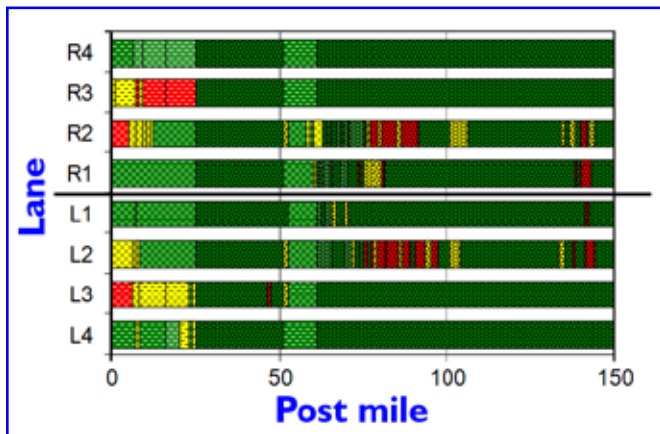
Figure 1. Pavement condition vs. cost to repair

system (without increasing structural capacity). We need to employ the "4R" strategy: right time, right strategy, right location, and the right material. In the United States, the cost to maintain the system at its existing condition level is about \$53.6 billion annually. The current spending level is \$38.3 billion per year and the cost estimate to bring the entire system up from its current level of "fair to poor" to a "good" level would exceed \$200 billion (Figure 1).

### Pavement condition survey (PCS) bar chart development

Based on the pavement condition survey, every lane-mile in Caltrans District 8 was color-coded, which reflects the actual level of distress as shown in Figure 2. We used post mile as the x-axis and individual lane as y-axis. Green means the pavement is in good condition and is a preventive maintenance candidate, yellow indicates the pavement has minor structural problems and red indicates a major structural problem. Pavement type was also considered. The dark color reflects flexible pavement, and the light color represents rigid pavement. By reviewing the bar chart in Figure 2, we are able to precisely identify the condition of our freeways.

Figure 2. Pavement condition bar chart



By reviewing the bar chart in Figure 2, we are able to precisely identify the condition of our freeways.

### Pavement management chart development

After the pavement condition bar chart is constructed, the next step is to develop the pavement management chart as shown in Figure 4. We use the pavement condition as the x-axis and the 10-year projection as y-axis. According to their construction acceptance dates, existing projects are added to the chart. The projects are color-coded in this figure: highway maintenance (HM) projects in orange, capital rehabilitation projects in violet, and capital preventive maintenance (CAPM) projects in blue.

A decision tree (Figure 3) for the pavement had to be utilized in order to plot the 10-year plan for rigid and flexible pavements. It consisted of the following treatments, including Major Maintenance (HM), Preventive Capital Preservation (PCAP), Corrective Capital Preservation (CCAP), and Rehabilitation (Rehab).

### Pavement management

With the decision tree in place, and the existing projects identified, the pavement strategy for the forecasted 10-year plan was plotted for both flexible as well as rigid pavements. The total cost/needs are clearly plotted for the 10-year projection (figure 4) with emphasis on the highway maintenance, capital preventive maintenance and rehabilitation programs.

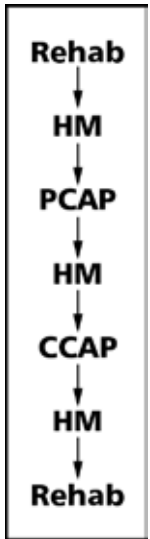


Figure 3. Decision tree for maintenance and rehabilitation

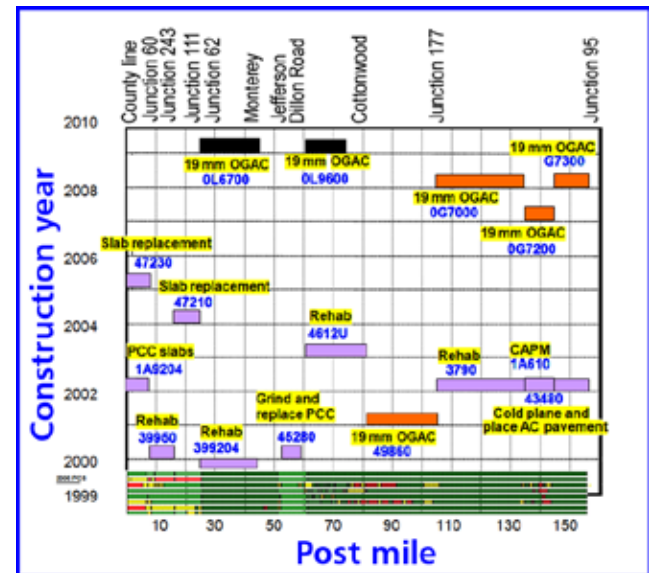


Figure 4. Pavement management chart.

### Summary

Pavements are our most expensive investment, and using preventive maintenance is a significant departure from the historical way of doing business and accordingly is definitely the most cost-effective alternative. The adoption of a preventive maintenance program is a shift in philosophy from "worst first" to earlier intervention with emphasis on preventive maintenance. To effectively safeguard our huge investment, a ten-year plan should be available with existing as well as projected projects identified. With our goal identified and management support secured with dedicated funding, pavements can be maintained in good condition for a prolonged period. This is no longer a myth, but a proven reality.

## PPTG activities

### All Members meeting held in December 2008



Dragos Andrei



Shadi Saadeh



Cathrina Barros

The All Members meeting was held in the offices of Los Angeles County on December 9, 2008. Shakir Shatnawi welcomed over 60 people in attendance at this meeting. He introduced Professors Dragos Andrei of Cal Poly, Pomona, and Shadi Saadeh of CSU, Long Beach, as new additions to the Center in Southern California. These universities are part of the Center's growth plan.

Shakir went on to describe the new Division of Pavement Management. The three offices within the new division include Engineering, Preservation, Systems Management and Programming. Currently there is a search for a new state pavements engineer. Major projects of the new division include the development of a new Pavement Management System, Integrating Pavement Preservation into all Caltrans activities, and the development of a new Pavement Design system.

Cathrina Barros discussed Caltrans work on warm mix HMA focusing on the project in District 5, near Morro Bay. She indicated that Caltrans would be doing more warm mixes next year, including the use of warm mixes on an asphalt rubber project in District 11.

Work activities from the 22 sub-groups of the PPTG were discussed. Each co-chair described the activities the groups had been working on as well as future plans.

Mary Stroup-Gardiner summarized the activities of the Center and reported that she became Technical Director of the Center replacing Gary Hicks effective December 1, 2008. Gary will continue to serve the Center and will work on other projects for the CIWMB, NCHRP, and FHWA. Professor Ding Cheng of the Center described the California Innovative Database which is available on-line at [www.cp2info.org/center](http://www.cp2info.org/center).

Mary Stroup-Gardiner also discussed the upcoming conferences including the Annual Pavement Preservation conference to be held in Oakland on April 8-9, 2009, and the First International Conference on Pavement Preservation to be held in Southern California in 2010.

During the wrap-up, discussions indicated current travel restrictions and the economy will be factors in attendance at upcoming meetings. Therefore, the PPTG will combine the Co-Chairs and All Members meetings so that there are only two All Members meetings a year where the Task Group Co-Chairs provide an update to the other PPTG members. These meetings will provide a mechanism for sharing ongoing Task Group work with all of the PPTG members in a more time-efficient process.

## MTAG training and revisions

Due to the state budget crisis, there will be no MTAG training seminars scheduled for this calendar year. Hopefully, we will be able to provide training next year. Also, we will not be working on revisions to the MTAG during this time, except where needed to support revised specifications, such as Crack Treatment and Bonded Wearing Course.

### Caltrans pavement preservation specification status

PPTG sub-task groups are busy trying to meet the May 19, 2009 deadline that the Office Engineer (OE) has established for the moratorium on the publication of new and revised specifications. The moratorium has been set to allow work to be concentrated on publication of the 2010 edition of the Standard Specifications.

Current NSSP's that are being upgraded to SSP's are Bonded Wearing Course (39-640, 660 and 680) and Micro-surfacing (37-600). Current SSP's being revised include Crack Treatment (37-400), Modified Binder Chip Seal (37-020) and Asphalt Rubber Chip Seal (37-030). All of these need to go through the Rock Products Committee approval process.

The Bonded Wearing Course specifications will be sent for review very soon. The Micro-surfacing specification was sent for review January 8 and the sub-task group is now working to incorporate the comments that were received. The Crack Treat-



Hans Ho, Casey Holloway, Shakir Shatnawi, Erik Updydke, and Greg Kelley at the PPTG All Members meeting.

ment specification was sent out for review on February 11, with comments due by March 2. Asphalt Rubber Chip Seal was sent for review on January 18, with comments due February 10. The Modified Binder Chip Seal specification is almost ready for review.

For the 2010 edition of the Standard Specifications, the Crack Treatment and Asphalt Rubber Chip Seal SSP's will be incorporated into the Standard Specifications. The Bonded Wearing Course, Micro-

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surfacing, and Modified Binder Chip seal specifications will remain as SSP's. The Recycling sub-task group now has NSSP's available for CIR and HIR. These will be used for projects as part of the Recycling Initiative.

### PPTG meeting plans for 2009

**T**entative dates for PPTG meetings in 2009 are as follows:

- All members meeting will be held in November, 2009, in Southern California. The location has yet to be determined.
- The various committees need to meet or teleconference as needed to deal with the issues in their work plans

### New PPTG co-chairs

Several changes to the PPTG leadership have occurred since our last newsletter.

- Craig Hennings replaced Casey Holloway as the concrete industry co-chair. Casey will remain as his backup co-chair
- Dr Ding Cheng of the CP2 Center replaced Rita Leahy as the flexible pavement industry co-chair for the Strategy selection
- Vijay Singha replaced George Bradley as the local agency co-chair in Northern California. We still need a replacement for Phil Demery the other Northern California co-chair. Please contact Shakir Shatnawi if you are interested ([Shakir.shatnawi@dot.ca.gov](mailto:Shakir.shatnawi@dot.ca.gov))



## Meetings and conferences

### TRB meeting held in Washington, D.C.

**C**enter Staff attended the Transportation Research Board (TRB) 88th Annual Meeting held in Washington, D.C., on January 11-15, 2009. The



Attending the TRB meeting in January were (left to right) Shadi Saadeh (CSU LB), Wen Huang (Maryland State Highway Administration), Mary Stroup-Gardiner (CP2C), Anne Stonex (MACTEC)

TRB meeting covered all the areas in transportation and attracted more than 10,000 transportation professionals from all over the world. It was an excellent opportunity to promote pavement preservation knowledge. Many of the Center-related documents were exhibited at the TRB meeting, including the CP2 Center brochure, Western

Pavement Preservation Partnership (WPPP) brochure, the latest Center Newsletter, and the second announcement for the First International Conference on Pavement Preservation in 2010 and the California Pavement Preservation Conference in Oakland, California, on April 8-9, 2009.

While attending the conference, Technical Director Mary Stroup-Gardiner gave a presentation about the economics of flexible pavement preservation based on MTAG. Professor Ding Cheng also gave a presentation about the curri-



TRB meeting attendees Patte Hahn (NCP) and Ding Cheng (CP2C)

cula development on waste tire applications in civil engineering.

The Center appreciates the supports of the FHWA, Foundation of Pavement Preservation (FP2), and AASTHO TSP2 for allowing us to display our materials in their exhibit booths and/or hospitality suites. Information on the International conference on Pavement Preservation was presented at various information booths in the major hotels, and at committee meetings including AHD18 Pavement Preservation, AHD20 Pavement Maintenance Committee, and AFD10 Pavement Management Systems Committees.

### CCSA holds its annual conference in Ontario

The California Chip Seal Association held its 2009 conference on January 21-22, 2009, at the Doubletree Hotel in Ontario, California.

The conference was highlighted by the keynote talk by Will Kempton, Director of Caltrans. He gave a stimulating and honest, but not encouraging, speech on the economic health of the State of California and what the stimulus package might do for the paving industry. "California needs a budget now" was his message, and it needs to find a new way to finance future projects. Without a budget, it is difficult to sell bonds for the infrastructure bond projects which means Caltrans may have to stop work on the projects. The \$25.7 billion in the stimulus package would result in a net gain of \$2.57 billion for California. This money might be used to back fill the bond issues, which would result in no new paving projects. About 250 people attended the conference and they gave Director

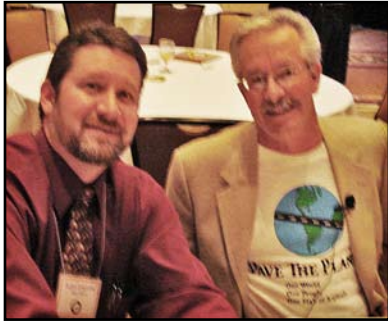


Will Kempton

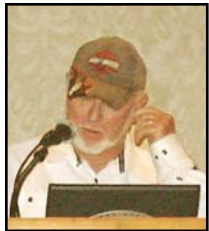
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Kempton a rousing hand for his honesty and enthusiasm and for his support of pavement preservation. As he mentioned, the rehabilitation program has shrunk so much that the preservation program now exceeds the rehab program in total dollars.



Scott Dmytrow and Skip Brown discuss the award winning project in Williams.



Don Milner received the Lifetime Achievement Award from the CCSA board of directors.

The rest of the conference consisted of excellent presentations from agencies and industry on the importance of pavement management in supporting preservation programs, the basics for a variety of pavement preservation treatments including chip seals, scrub seals, chip seals over fabrics, and cape seals using a variety of binders. All of the presentations will be posted at the CCSA website [www.chipseal.org](http://www.chipseal.org).

Other presentations were given on the importance of quality control and quality assurance and trouble shooting ideas to ensure successful projects. The consistent message was for agencies and contractors to work together to minimize any chance of early problems. The CP2 Center at Chico State also discussed its resources and its help desk which deals with problems on all types of preservation issues. The website for the Center is located at [www.cp2infor.org/center](http://www.cp2infor.org/center).

Other highlights included the recognition of Don Milner of Graham Contractors who received the association's life time achievement award in 2009. Prior winners of this prestigious award include Jim Towns of Western Emulsions and Murl Butler of ISS. The Yearly Projects of Excellence awards were given honoring the Contracted Companies/Agencies that had exceptional pavement preservation applications.

### Winners of the Yearly Projects of Excellence awards

Company	Agency	Award category
Intermountain Slurry Seal	Caltrans District #5	Slurry-Micro Surface
International Surfacing Systems	City of San Jose	Innovation-Chip Seal
Delta Construction	City of Williams	Innovation-Chip seal
Western Emulsions	Los Angeles County	Chip Seal
Graham Contractors	County of Santa Barbara	Cape Seal

### California Pavement Preservation Conference

The 4th Annual California Pavement Preservation conference will be held in Oakland CA on April 8-9-2009. The Keynote speaker will be Director Will Kempton of Caltrans. The conference is presented by the Pavement Preservation Task Group (PPTG) in cooperation with the Center, the California LTAP program and Caltrans. On April 7, pre-conference training sessions will be held on the following topics:

- Pavement management fundamentals
- Asphalt fundamentals
- Concrete pavements

- Pavement preservation concepts
- Asphalt pavement maintenance

For more information on the conference, exhibiting opportunities, and sponsorship, please call 510-665-3628 or email [conferences@techtransfer.berkeley.edu](mailto:conferences@techtransfer.berkeley.edu).

### International Conference on Pavement Preservation (ICPP)

The First International Conference on Pavement Preservation is to be held April 12-16, 2010, in Newport Beach, California, with the purpose of bringing together researchers and experts working in the field of pavement preservation to exchange ideas and discuss critical issues and concerns. The conference will be co-organized by the California Department of Transportation (Caltrans), the Federal Highway Administration (FHWA) and the Foundation for Pavement Preservation (FP2). Others participating in the planning of the conference include the California Pavement Preservation Center, the National Center for Pavement Preservation (NCP), and the University of California, Berkeley.

The conference venue will be in sunny Southern California close to the John Wayne Airport. Hotel information will be provided on the website soon. The conference will replace the successful California Pavement Preservation Conference for 2010. We will be inviting bids for a location for the second conference, to be held in 2014. If anyone is interested in submitting a bid, please contact Shakir Shatnawi at [shakir.shatnawi@dot.ca.gov](mailto:shakir.shatnawi@dot.ca.gov).

### Main topics

The main theme of the conference will be pavement preservation and sustainability. The conference will address an array of issues that are relevant to the pavement preservation community. Presentations were invited on the following topics:

- Benefits of pavement preservation (economic and environmental)
- Integrating pavement preservation into pavement management
- Pavement preservation treatments for flexible pavements (design, materials, constructability, and performance)
- Pavement preservation treatments for rigid pavements (design, materials, constructability, and performance)
- Strategy selection
- Funding pavement preservation
- Promoting pavement preservation to the public and our elected leaders

### Preliminary program

The conference program will consist of peer reviewed papers and selected invited presentations. Highlights of the conference are expected to

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include case studies of preservation from US Highway agencies, industry, and international organizations. The presentations are expected to take place on April 13-15, with workshops and/or demonstrations to take place on April 12 and 16, 2010.

### Call for abstracts and papers

Over 90 abstracts were received by the extended deadline of February 1, 2009. Authors should hear back from the technical committee by April 15, 2009. Authors of the abstracts selected will be invited to submit full papers to be included in

the conference proceedings. Final papers should be submitted electronically using the conference website at [www.pavementpreservation.org/icpp/](http://www.pavementpreservation.org/icpp/). The submission of full papers and camera-ready copies of papers should be completed by the dates listed below. Full papers will be reviewed by the Technical Committee for selection to be included in the conference proceedings or the Pavement Preservation Journal:

- Submission of full papers:  
July 1, 2009
- Submission of camera-ready copies of full papers:  
November 1, 2009



## Center news

### Update on the CIWMB Continuing Education and University Curricula Project for RAC and CE applications of waste tires

Each year there are about 40 million waste tires generated in California. The California Integrated Waste Management Board (CIWMB) is tasked with diverting these tires from the waste stream to being recycled into useful products. Civil engineering applications are the fastest growing market for

Two training workshops have been given to professors who are teaching classes related to the waste tire application. One professor training workshop was conducted in Sacramento on December 19, 2008, for the universities in the Northern California. Another was held in Pomona on January 5, 2009, for universities in Southern California. About 14 professors from 11 different universities attended these workshops. The workshops were very successful and the professors who attended gave very high rankings for the workshops. They indicated the teaching materials are very useful and can be incorporated into their teaching tasks.

Another workshop is scheduled on April 17, 2009, in San Luis Obispo. For more information on the workshop, please contact Professor Ding Cheng at [dxcheng@csuchico.edu](mailto:dxcheng@csuchico.edu). Registration information can be found on the Center website at [www.ecst.csuchico.edu/cp2c/ciwmb/SLOProfessorTrainingWorkshop.htm](http://www.ecst.csuchico.edu/cp2c/ciwmb/SLOProfessorTrainingWorkshop.htm).

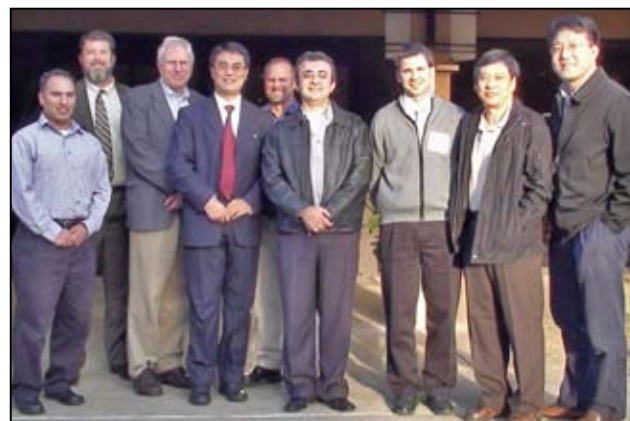
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Professor training workshop participants in Sacramento are, left to right, front row: Darlene Mathias, Hector Estrada, Luke Lee, Albert Johnson, J. Larralde; back row: Ming Xiao, Akthem Al-Manaseer, Kaven Shafizadeh, Justin Reginato, Michael Lepech, Joel Arthur, Gary Hicks, Ali Porbaha, Ding Cheng.

waste tire products. These products possess some desirable engineering properties. To promote sustainable and successful waste tire applications in civil engineering, a curriculum development and dissemination project was funded by CIWMB. The primary purpose of this project was to produce and disseminate teaching materials which could be used in undergraduate civil engineering courses.

A series of course modules have been developed for a variety of undergraduate Civil Engineering courses including Introduction to Civil Engineering Design, Mechanics of Materials and Materials Testing Lab, Soil Mechanics and Foundations, Contract and Specifications, Environmental Engineering, Solid Waste Management, and Transportation and Pavement Materials. These course materials are available to be integrated into various undergraduate courses in the Civil Engineering curriculum and serve to introduce students to sustainable building practices and "green" construction.



Professor training workshop participants in Pomona, Calif., are, left to right: Julian Ibarra, Joaquin Wright, Gary Hicks, Ding Cheng, Joel Arthur, Shadi Saadeh, Dragos Andrei, Xudong Jia, Uksun Kim.

## Update on CIWMB project on terminal blends and warm mixes

Center staff have been working on a project supported by the California Integrated Waste Management Board to accomplish the following goals:

- Investigate the feasibility of including terminal blend asphalt rubber into the grant program of the CIWMB
- Determine the feasibility of using the warm mix technology with asphalt rubber hot mix and with asphalt rubber spray applications

Terminal blends are a form of asphalt rubber binder that is manufactured at the refinery by blending the crumb rubber with asphalt at elevated temperatures. This is a different process than the conventional field blended asphalt rubber that has been used for many years in California. Terminal blends can contain 15-20% or more of crumb rubber so they meet the definition of ASTM for asphalt rubber (min of 15% CRM). We are currently surveying suppliers and users of terminal blends for use in hot mixes and chip seals in California and throughout the United States. If you have experience with the use of terminal blend asphalt rubber binders for the applications, please contact Dr Gary Hicks at [rg Hicks@csuchico.edu](mailto:rg Hicks@csuchico.edu). We are interested in the following:

- Types of uses of terminal blends
- Performance compared to asphalt rubber or polymer modified products
- Potential problems with terminal blends such as the ability to document the amount of rubber in the binder

We are also meeting with suppliers of warm mix technologies to determine the feasibility of using these technologies with field or terminal blended asphalt rubber hot mix or spray applications. The primary benefit of doing this is to reduce energy costs and to reduce emission. We have determined that the AR products can be used with warm mix technology in hot mixes, but have not yet found that they have been used in chip seals. Caltrans will be constructing their first RAC-O project using warm mix technologies this construction season. This project will provide useful information in support of this effort. If you have information regarding warm mix technologies that can help with this endeavor, please contact Dr. Mary Stroup-Gardiner at [mstroup-gardiner@csuchico.edu](mailto:mstroup-gardiner@csuchico.edu). We are very interested in the following:

- Agencies that have used warm mixes with asphalt rubber in hot mixes and or any pavement preservation treatment

- Potential problems with using warm mix with asphalt rubber application

Dr. Stroup-Gardiner met with Caltrans and a Chinese Delegation on Feb 17, 2009 to discuss the Center's work with warm mixes. Her presentation can be found on the Center's website.

## NCHRP Synthesis 40-13: In-place recycling of asphalt pavements

This project deals with the development of a synthesis of information on in-place recycling methods used for asphalt pavements. It will cover the following techniques:

- Surface recycling using both cold and hot in-place recycling techniques
- Full depth reclamation using a variety of additives

The project will consist of a literature search and survey of agencies' practices. The final product will include an update on project selection, design, construction, specifications and more. Best practices and case histories will also be included.

If you have information to share on any of these items, please contact Dr. Stroup-Gardiner at [mstroup-gardiner@csuchico.edu](mailto:mstroup-gardiner@csuchico.edu). Dr. Stroup-Gardiner made a presentation on this project at the ARRA annual meeting in Palm Springs on Feb. 19, 2009. Her presentation can be found on the Center's website.

## NCHRP 40-01: Recycled materials and by-products in highway applications

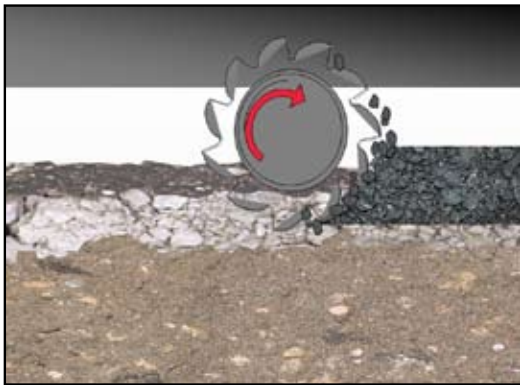
Recycled materials and industrial byproducts are being used in transportation applications with increasing frequency. While there is a growing body of experience showing that these materials work well in highway applications, the related information and experience are not synthesized in a coherent body. This study will gather the experiences of transportation agencies, both foreign and domestic in determining the relevant properties of recycled materials and industrial by-products and the beneficial use for highway applications. The study will include strengths and weaknesses of material applications.

The synthesis should serve as a guide to states revising the provisions of their materials specifications to incorporate the use of recycled materials and industrial by-products, and should, thereby, assist producers and users in 'leveling the playing field' for a wide range of dissimilar materials.

Information to be gathered for the synthesis will include:

- A comprehensive list of current candidate materials that are readily available or stockpiled for common usage, and their uses, in a matrix format

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Schematic of a milling machine processing an asphalt pavement.

- Identify and review available test procedures for assessing physical and chemical characterization, compaction, geomechanical properties, long-term durability, and environmental performance, including suitability and risks
- Summarize best material preparation and quality control techniques (including stockpiling). For more information on this study, please visit our website at [www.cp2info.org/center](http://www.cp2info.org/center).

### Center growth plan

Dr. Mike Ward, Dean of the College of Engineering, Computer Science and Construction Management, attended a Memorandum of Understanding signing on February 18, 2009, in Long Beach to formally establish the growth plan as a partnership between the three universities. Such a partnership will result in a virtual Pavement Preservation Center for the State of California. The other partners of the growth plan include Long Beach State and Cal Poly, Pomona. The faculty at these universities will work as part of the Center to provide more effective delivery of our services in Southern California.



Left to right front row: Ed Hohmann, Dean, Cal Poly Pomona; Mahyar Amouzegar, Associate Dean, CSU, Long Beach; and Mike Ward, Dean, CSU, Chico. Back row: David Dowell, Vice Provost, CSU, Long Beach; and Shakir Shatnawi, Caltrans.

### Upcoming pavement preservation events

**World of Asphalt**, March 9-12, 2009, Orlando Fla., [www.worldofasphalt.com](http://www.worldofasphalt.com)

**California Pavement Preservation Conference**, April 8-9, 2009, Oakland, Calif., [www.cp2info.org/conference](http://www.cp2info.org/conference)

**National Conference on Preservation, Repair, and Rehabilitation of Concrete Pavements**, April 22-24, 2009 St. Louis, Mo., [www.fhwa.dot.gov/pavement/concrete/2009cptpconf.cfm](http://www.fhwa.dot.gov/pavement/concrete/2009cptpconf.cfm)

**Fourth Rubber Modified Asphalt Conference**, May 8-9, 2009, Akron, Ohio, [www.rubberdivision.org/meetings/rmac.htm](http://www.rubberdivision.org/meetings/rmac.htm)

**12th AASHTO/TRB Maintenance Management Conference**, July 19-23, 2009, Annapolis, Md., [www.marylandroads.com/businesswithsha/aashto/oom/2009aashtoconference.asp](http://www.marylandroads.com/businesswithsha/aashto/oom/2009aashtoconference.asp)

**Asphalt Rubber 2009, November 2-4, 2009, Nanjing, China**, [www.consulpav.com/ar2009/](http://www.consulpav.com/ar2009/)

**Developing a Research Agenda for Transportation Infrastructure Preservation and Renewal**, November 12-13, 2009, Washington, DC, [www.trb.org/news/blurb\\_detail.asp?id=9834](http://www.trb.org/news/blurb_detail.asp?id=9834)

**First International Conference on Pavement Preservation**, April 12-16, 2010, Newport Beach, Calif., [www.pavementpreservation.org/icpp/](http://www.pavementpreservation.org/icpp/)



### Ferrara discovers that In Italy, even potholes are ... artistic

In July 2008, Tom Ferrara traveled to Italy to live in a small town and sit in on a media arts class. Along the way he checked out some pavements. As you can see on the left, Italy has problems similar to those in California, but their distress takes the shape of art. The example on the left can be seen as a rendition of typical Italian subject matter, e.g., Madonna and Child, or as Tom would have it, a mermaid and a peanut. The photo was taken in a minor urban street in Rieti, Italy.