



# CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

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## Pavement Preservation Task Group (PPTG) Holds General Meeting

By Roger Smith and Ding Cheng, CP<sup>2</sup> Center

The Pavement Preservation Task Group (PPTG), under the main Caltrans-Industry Rock Products Committee, meets twice a year and provides an opportunity for Caltrans and their industry partners to discuss topics relating to pavement maintenance and preservation. More than 30 people attended the PPTG general meeting held in Caltrans Translab on May 23, 2012 (Figure 1).



Figure 1. PPTG meeting held at Caltrans' Translab

To provide greater department representation on preservation related tasks, Caltrans added Chuck Suszko Chief of the Office

of Construction Standards, Division of Construction and Bill Farnbach, Chief of the Office of Concrete Pavement and Foundations, as Caltrans co-Chairs, joining Peter Vacura. Figure 2 is a photo of Caltrans co-chairs with industry co-chairs Jim Ryan (asphalt pavement) and Craig Hennings (concrete pavement).

### New Direction of Subtask Groups

The PPTG currently has several Subtask Groups dealing with specialties such as surface seals, surface recycling, concrete repair, strategy selection, training, and innovative products and processes. These Groups meet as needed and report to the PPTG



Figure 2. PPTG co-chairs Peter Vacura, Jim Ryan, Craig Hennings, Chuck Suszko, and Bill Farnbach (left to right)

General Meetings. Caltrans eventually wants to change this structure by eliminating the Subtask Groups and adopting a more "task-oriented" approach – assembling teams of people to address specific issues as they arise.

### Current PPTG Subtask Group Activities

At this point there are about 15 tasks being worked on by the Subtask Groups. A summary of these tasks is outlined below:

The **Innovations Subtask Group** reports that the process by which Caltrans considers new *Continued, next page*

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and innovative products and processes is being restructured. Of special concern is how to deal with patented proprietary products. The Public Contract Code 3400 requires that wherever possible, generic specifications must be used, but there are 'exception' situations where a proprietary product may be specified. The general plan is for vendors or manufacturers to introduce their product via the Caltrans New Products Evaluation process, Deputy Directive 45. The submittal will then be forwarded to the Pavement Related New Products Committee, who will assess the proposal to determine if the Department sees a need for the product or process being submitted. District staff may also promote innovative products or processes via the Pavement Management Council, a group made up of HQ and District representatives. If the Pavement Related New Product Committee sees a viable need for the product or process, they will then forward it to the Caltrans PPTG co-chairs. A possible task group will be formed to develop a detailed technical evaluation and monitoring plan. It will further support the specification development.

The **Surface Seal Subtask Group** is dealing with several topics including:

- reinstating fog seals and rejuvenators as pavement preservation tools
- developing a generic specification for rubberized slurry seal
- developing specifications for chip seals done with hot polymer-modified binder or terminal blend rubber modified binder
- developing specification for scrub seals
- evaluating use of asphalt rubber chip seals with warm mix additives

The **Surface Recycling Subtask Group** has the primary objective of developing an improved specification for cold in-place recycling (CIR). Several meetings have been held and the specification is near completion. Pavement Recycling Center is assisting in the evaluation of a number of projects.

The **Strategy Selection Subtask Group** is working on updating the MTAG information, and also working with the CP2 Center to fine tune the strategy selection software program. The program will be put on the Center's website for agencies to try it out.

The **Training and Outreach Subtask Group** has been focusing on developing training

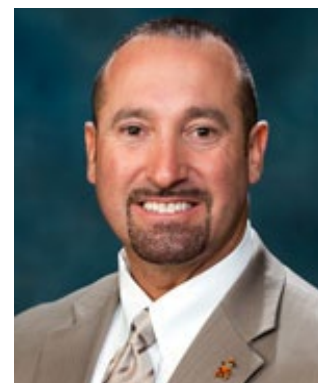
modules for mandatory prepping meetings between contractor and Caltrans personnel. So far, materials have been developed for chip seals and microsurfacing. It was also noted that additional Maintenance Technical Advisory Guide (MTAG) training should be provided to District personnel – especially in light of personnel turn over.

The **Concrete Repairs Subtask Group** is developing policies and specifications for the sealing of PCC joints, PCC spall repair, and full depth slab replacement. They are also doing field evaluation of dowel bar retrofit (DBR) using polyester grout and quieter PCC pavement using grind-and-groove treatments (aka. Next Generation Concrete Surface).

The Subtask Groups will continue to meet periodically to work on their assigned tasks.

#### *Caltrans Maintenance Chief Addresses Group*

Tony Tavares, Chief, Division of Maintenance, addressed the group and stressed the importance of the PPTG efforts to the Caltrans maintenance program. He reminded the group that the Caltrans "State of The Pavement" 2011 report is now available on the Caltrans website, and that they will soon be rolling out their new pavement management system, which relies on automated condition surveys of the 50,000 lane-mile highway system. He noted that the Caltrans expenditures for pavement preservation work increased from \$70 million in 2004 to \$235 million in 2011. He also stressed that Caltrans was very interested in exploring innovative products and ideas for pavement maintenance.



**Tony Tavares, Chief of Division of Maintenance**

#### *CP2 Center Update*

The group also heard a presentation by Dr. Ding Cheng on the activities of the California Pavement Preservation (CP2) Center. The Center provides technical support to Caltrans' PPTG activities. Two important products that have been developed by the Center are:

1. A **database** for logging and tracking projects

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involving innovative pavement preservation strategies. Any agency can enter their project information into this online database, which will finally give pavement managers a single repository for information about their many maintenance options.

2. A **strategy selection program** which follows the Maintenance Technical Advisory Guide (MTAG) guidelines for selecting viable maintenance options for a given set of pavement and project conditions. The program allows for managers to control and customize input variables such as material costs and treatment life.

The Center has proposed a training class for District maintenance personnel. Ding reminded the group of the Center's quarterly *Newsletter* - an important vehicle for disseminating information on what's happening in the world of pavement preservation. Valuable articles are

always needed.

### *Pavement Recycling Center Update*

Dr. Cheng also made a "stand-in" presentation for Dr. Dragos Andrei, technical director of the Pavement Recycling and Reclaiming Center (PRRC), on the activities at Cal Poly, Pomona under the direction of Dr. Steve Cross and Dr. Andrei. The PRRC Center is currently assisting in the field evaluation of Caltrans CIR projects and plans to establish a database for CIR projects. For more information visit their website at [www.PRRcenter.org](http://www.PRRcenter.org). They will also offer a "help desk" via their website.

The PPTG provides a valuable opportunity for Caltrans, industry, and local agency representatives to openly discuss policies and practices involved in pavement preservation. The next meeting is tentatively scheduled for November 2012.



## What's New with Caltrans Warm Mix Asphalt Concrete?

By Chuck Suszko, Caltrans; Joe Peterson, Caltrans; and Lerosé Lane, CP<sup>2</sup> Center

The use of hot mix asphalt with warm mix asphalt (WMA) technology in California has increased tremendously, and it has become a common construction technology in the last several years for Caltrans. As a result of the good performance exhibited by WMA, Caltrans has recently developed three new Standard Special Provisions (SSP's). The use of WMA on Caltrans projects will no longer require head-

quarters approval to use a non-standard special provision. On April 20, 2012, Caltrans posted these new SSP's for WMA for Caltrans projects on their website at: [http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/2006-SSPs/Updates/2012-04\\_updates/](http://www.dot.ca.gov/hq/esc/oe/specifications/SSPs/2006-SSPs/Updates/2012-04_updates/).

- SSP 39-055--Caltrans requires warm mix for HMA (Type A and Type B), and RHMA-G mixes
- SSP 39-105--Caltrans requires warm mix for hot mix asphalt open graded friction course (HMA-OGFC)
- SSP 39-170--Contractor's option for using asphalt concrete warm mix for HMA (Type

- A and Type B) and RHMA-G with Caltrans-approved WMA technologies

All of the new WMA specifications require a preconstruction conference be held to discuss:

- HMA production and placement
- Method for incorporating WMA technology and any impacts on HMA production and placement including requirements for compaction and workmanship
- Contingency plan

The new WMA specifications also include new requirements for proportioning WMA technologies that are in addition to the requirements of the Caltrans Materials Plant Quality Program.

SSP 39-055 is a new WMA specification which requires the use of a chemical or wax warm mix additive for HMA Type A-WMA, HMA Type B-WMA or RHMA-G-WMA. This WMA specification requires HMA or RHMA with WMA additive technology to be produced at normal production temperature, but allows for placement at both lower ambient and surface temperatures and allows for method compaction to take place at lower temperatures. The decision to use WMA

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will depend on such factors as project location, anticipated cooler temperatures with night time construction, and haul distances.

The mix design specifies both California Test 371 for moisture susceptibility and AASHTO T 324 Hamburg Wheel Track test. This specification also has several requirements based on atmospheric temperature, haul time to the project, and mix type. The HMA and RHMA must be produced at a temperature between 290 and 325 °F. Tarps must be used if the atmospheric temperature is below 60 °F or if there is 90 minutes or greater haul time with an atmospheric temperature below 70 °F.

The specifications can be edited to include the requirement for a Material Transport Vehicle (MTV) such as a "Shuttle Buggy" when hot mix asphalt has to be hauled along distance or anticipated temperatures during hot mix asphalt placement will be below 60 °F. The specification includes reduced atmospheric, surface, and compaction temperature requirements for method compaction. Both California Test 371 for moisture susceptibility and AASHTO T 324, the Hamburg Wheel Track test, must be performed for quality control every 10,000 tons of production.



SSP 39-105 is a new WMA specification which requires the use of a chemical or wax warm mix additive for open graded friction course (HMA-O-WMA, RHMA-O-WMA, or RHMA-O-HB-WMA). This WMA specification requires hot mix asphalt with WMA additive technology to be produced at normal production temperature but allows for OGFC placement at both lower ambient and surface temperatures. This specification should be used considering such factors as project location, anticipated cooler temperatures with night time construction, and haul distances. This specification has several requirements based on atmospheric temperature, haul time to the project, and mix type. HMA-O-WMA requires an atmospheric temperature of 45 °F or greater, and a surface temperature of at least 50 °F. In addition, the specification has atmospheric, surface and compaction temperature requirements for RHMA-O-WMA RHMA-O-HB-WMA and HMA-O-WMA with modified binder binder also, have individual temperature specifications. The specification requires the use of an MTV when placing OGFC with

WMA additive technology. The MTV may use a pickup head but the windrow must not extend more than 100 feet in front of the MTV.

SSP 39-170 allows the use of warm mix at the contractor's option and this specification will be included in all Caltrans projects with HMA Type A or HMA Type B or RHMA-G. Caltrans has issued a Construction Procedure Directive (CPD 12-1) to allow this specification to be incorporated into ongoing projects by a Contract Change Order.

For mix design the contractor must provide HMA test results for California Test 371, for moisture susceptibility, and AASHTO T 324 Hamburg Wheel Track test. The contractor must produce and place the mix at normal HMA construction temperatures, as specified in Section 39, "Hot Mix Asphalt," of the Standard Specifications for Method construction process projects. For both the QC/QA and Standard construction processes, HMA must be produced at a temperature between 240 °F and 325 °F. Both California Test 371 for moisture susceptibility and AASHTO T 324, the Hamburg Wheel Track test, must be performed for quality control for every 10,000 tons of HMA production. This SSP allows the use of both water injection system and additive WMA technologies from the approved WMA technologies list.

The approved, "Warm Mix Asphalt—List of Approved Technologies" website is updated regularly, and may be viewed on the Caltrans website: [http://www.dot.ca.gov/hq/esc/approved\\_products\\_list/](http://www.dot.ca.gov/hq/esc/approved_products_list/)

The water injection processes Astec Double Barrel Green and MAXAM AQUABlack System were recently added to the approved products list. There will be more manufacturers' water injection processes to follow. The additive technologies on the approved products list for Caltrans presently includes:

- Advera
- Rediset WMA
- Rediset LQ
- Evotherm DAT
- Evotherm 3G
- Sasobit

The product list will continue to expand. For the latest, check the website for approved product updates. For additional information about Caltrans' use of WMA technology, contact Cathrina Barros at (916) 227-7162.



# Caltrans Moving To Superpave Mix Design - Update

By Roger Smith, CP<sup>2</sup> Center and Joe Peterson, Caltrans

Caltrans is moving forward with implementing the Superpave mix design method and related HMA Specifications (HMA-SP), with a target date of July 1, 2014 for full implementation. In 2012, six pilot projects will be done using a pilot specification, with more pilot projects to follow in 2013. The final specification is being developed as a joint effort of Caltrans with the asphalt industry.



Troxler  
Superpave  
Gyratory  
Compactor

As Caltrans and industry "partner" in developing mix design criteria and specifications for the Superpave projects, the group will be looking at a variety of important issues including:

- Utilization of national test methods (AASHTO/ASTM)
- Mix designs utilizing rubberized asphalt concrete
- Density testing based on non-destructive testing (e.g nuclear gage) and cores
- Aggregate grading impacts on volumetric properties, voids in mineral aggregate (VMA) and voids filled with asphalt (VFA)

It's worth noting that Caltrans Superpave pilot projects can include 25% RAP with a target value of +/- 1% at mix design and +/- 3% during production. The projects may also utilize



Pine Superpave Gyratory Compactor

warm mix asphalt (WMA) technology.

Superpave mix design will require several special pieces of equipment historically not seen in California labs. These include:

- Superpave Gyratory Compactor (SGC) - for the fabrication of trial mix specimens
- Hamburg wheel rut tester - for moisture sensitivity and rutting potential

The California Pavement Preservation Center has both of these devices and is able to assist in Superpave mix evaluations.

For any further information, please contact Caltrans Joe Peterson, Chief of Office of Road Materials Testing, and visit website: <http://www.dot.ca.gov/hq/esc/Translab/ofpm/superpave/index.htm>



## CIR in California – Teamwork Towards Continual Improvement

By Don Mathews, Pavement Recycling Systems and Hamid Moussavi, Caltrans

A few years ago, Caltrans constructed 6 Cold In-place Recycling (CIR) projects. All projects were successfully built, however one required substantial repairs. In a true partnership between industry and Caltrans, the surface recycling subtask group of the Pavement Preservation Task Group (PPTG) met and discussed the issues and pledged to continually work together towards the improvement of the Nonstandard Special Provision (NSSP) for CIR. Last year alone, Caltrans constructed 27 CIR projects totaling in excess of 300 lane-miles. With the exception of one project, all were ultimately constructed within or under

budget for the CIR work.

However, there were some issues with respect to inconsistent materials, timing of overlays and a lack of consistency amongst the Districts in enforcement of the NSSP. Again, in teamwork fashion, the recycling subtask group began addressing a number of issues over the last few months for further improvement of the CIR process, as well as the NSSP and Lab Procedure # 8 (LP-8) - *Method of Test for Determining the Percent of Emulsified Recycling Agent to Use for Cold Recycling of HMA*. The following is a discussion of some of

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the more significant issues that have recently been resolved or are currently under consideration.

Some of the performance issues appear attributable to the properties of the binder in the existing pavement to be recycled, and how the combined binders (added emulsion binder and existing binder) react under extreme weather conditions. Therefore, a **penetration** requirement of 30 -150 for the residual asphalt of the emulsion was added to the NSSP. Also, the residual asphalt will be required to be obtained via the evaporation method - as opposed to the distillation method.

In addition, LP-8 may be amended to include additional compaction, stability and raveling testing at higher and wider temperature ranges. The hope is the actual construction project temperatures are better modeled during the **mix design** stage. To further improve the mix design appropriateness, CIR mix design field sampling guidelines are being prepared in the hopes of obtaining uniform characterization of the roadways.

The **calibration** of the CIR equipment trains can be conducted in and by any Caltrans District. The calibration is good for 6 months statewide. Individual calibration by each District is no longer required. Calibration of the water meter is still required, but the accuracy of the water feed must be within 1.5% of the target value.

A temporary requirement to have **cement** slurry added in all projects is under review. To date, it has been agreed that portland cement, if required or necessary by virtue of the mix design, will be allowed to be applied in either a dry or slurry form. It is still under discussion as to whether the cement will be mandatory and/or if lime slurry will be allowed. The quality control/quality assurance (QC/QA) and acceptance guidelines for the emulsion characteristics are being reviewed. The issue is whether testing has to be conducted by an AASHTO-certified lab and what will be the required frequency

of testing and reasonable turn-around times for acceptance test results.

Certification testing for emulsions is relatively new. Currently, the emulsion manufacturers typically conduct their own certification testing and are not AASHTO-certified. It may be some time before there are ample AASHTO-certified labs available to reasonably implement a substantial QC/QA requirement for emulsions. The **smoothness** recommendations in the NSSP are also being revamped. Current requirements to run the profilograph on the CIR surface, even though an overlay is proposed, and the means by which defects are to be corrected has proven to be unrealistic and difficult to implement. In some instances it may have contributed to damage to the CIR experienced on some of the projects by virtue of leaving the



**CIR Equipment Train on SR 62. Adjacent Lane Already Recycled with Sand Blotter**

CIR exposed to traffic for several weeks while the smoothness issues were addressed. In addition, only reworking and recompaction (or removal and replacement) are options currently allowed as a corrective measures. Following the NSSP verbatim would result in the near complete removal and replacement of the CIR, since the thick lifts will usually result in some bump defects. The challenge is therefore to

provide a specification which results in a road that is smooth for the traveling public, but minimizes any time until placing the overlay. An increase in must-grind bump height is also being considered, along with allowing bump corrections via trimming, cold milling, micro-milling and/or abrasive grinding.

The last item currently under consideration is the inclusion of a standard bid item for CIR repair using a nominal amount of pre-stockpiled cold mix. CIR is intended to recycle a distressed roadway often consisting of dissimilar materials via years of patching, surface treatments and overlays. CIR requires time to cure and develop full strength. During the cure time, it is vulnerable to the shear forces of traffic. Sometimes there are small isolated sections of

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the CIR that require maintenance until the final surfacing is placed. By providing a nominal amount of repair material onsite prior to construction, the repairs can be swiftly completed as they develop, prior to them expanding while waiting on approval and/or deliveries. However, whether this will lead to potential claims as to the cause of the damage, the quantity of cold mix to be pre-stockpiled and

if the cold mix can be left permanent as part of the CIR all still need to be addressed. Regardless of the final outcome of any of the items being addressed, the key to CIR success is a team working together to resolve all issues to the satisfaction and benefit of everyone involved. Caltrans and Industry will be continuing their work via the PPTG to improve the CIR specifications.



## Asphalt Rejuvenating Emulsion Treatments Exceeding Expectations In Santa Barbara County

by Scott McGolpin, Santa Barbara County and Phil Vandermost, Western Emulsions

Public agencies willing to investigate and adopt pavement preservation strategies are being rewarded with cost savings, improved roadway quality, and increased public satisfaction. For Santa Barbara County, using polymer-modified rejuvenating emulsion (PMRE) strategies and partnering with industry has yielded results beyond expectations and even some national attention.

Santa Barbara County launched its pavement preservation program in 1999, inserting a new philosophy of treating its good roads first, thereby slowing down the deterioration of its pavement network. By 2003 the County program focused on fog seals and microsurfacing cape seals using PMRE technology, a preventive strategy to reverse the oxidation and surface rock loss on its good roads. Over time this approach saved a significant portion of the maintenance budget, by which they were able to direct toward raising the level of service on their most distressed roadways. During the past nine years, the agency has continued this highly effective program to hedge against lower funding levels and an aging network of roads.

nation, is faced with dwindling resources and ever-increasing pavement needs," said Santa Barbara County Public Works Director Scott McGolpin. "We are constantly looking for cost effective solutions to maintain our over 1,600 lane-mile system. These treatments have served us well and preserved the integrity of these paved surfaces."

The County's public works staff was thorough in following up and documenting the performance of the treatments over time to judge their effectiveness and value.

Through its recent analysis, the County also declared success with its microsurfacing cape seal treatments, used as an alternative to asphalt mill & overlays. It found that these special cape seals, which use a PMRE scrub application for the chip binder - followed by microsurfacing, are exceeding expectations for keeping pavement cracks sealed and protecting the road base from moisture.

These microsurfacing cape seals are less than a third of the cost of an asphalt mill & overlay, and have allowed the County to treat almost four times the amount of roadways for the same investment. Furthermore, the County has

"The County, like local agencies across this

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Scrub Seal  
Spreader



been able to quantify an expected 8 – 12 year life extension of roadways treated with these cape seals, and even longer with subsequent preventative surface treatments.

The County's Central Region Road Maintenance Superintendent, Don Mason, said, "As a trial, and without enough funds for a larger project, we applied a scrub-micro (microsurfacing cape seal) product to a structurally sound but severely distressed roadway with a PCI of just 5. Our intent was to use the cape seal as a stopgap for a year or so until additional funding was obtained for an overlay. While the surface is far from smooth, it has performed remarkably well and beyond expectations. The heavy truck traffic stopping, starting and turning has caused no failures over the past two years, and there has been surprisingly little loss of surface material."

Santa Barbara County Public Works has made an effort to partner with industry, particularly in identifying new products and processes. At the outset of its pavement preservation program, the County reached out to Western Emulsions to learn more about its PMRE products. Their PASS-QB has since become a staple

of the County's fog seal program. Their PASS-CR product is used in the cape seals for the chip layer.

In turn, over the course of the past decade supplying products for Santa Barbara County, Western Emulsions has taken a stakeholder approach to ensuring its products are optimized to the needs of the County and providing training and field support for the applications.

The County is also considering trying a Western Emulsion process that combines its PMRE products with a black sand abrasive to mitigate initial slickness of the fog seal treatment and increase pavement friction of the wearing course.

Santa Barbara County's program has been the subject of numerous newspaper and magazine articles and attracted national recognition and awards. Agencies have traveled from as far as Texas to study the County's program and neighboring agencies such as Los Angeles County have adopted best practices from the County's program in creating its own pavement preservation program. For more information contact Scott McGolpin at: [mcgolpin@cosbpu.net](mailto:mcgolpin@cosbpu.net).

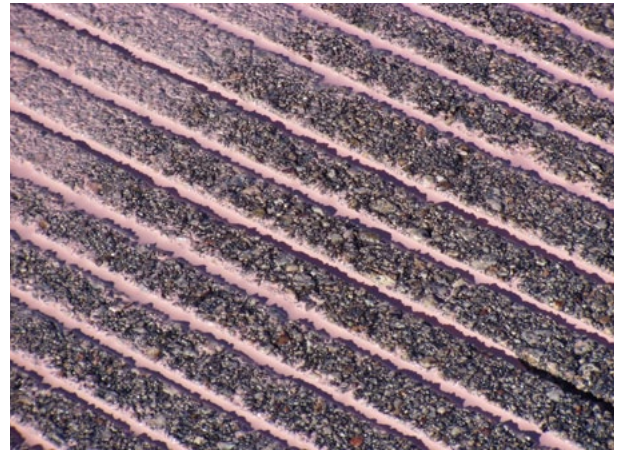


## Reclamite on Airport at Paso Robles

By Jim Brownridge, Tricor Refining LLC

The rapidly growing Paso Robles wine country has increased the air traffic at the city owned municipal airport. Both the California Highway Patrol and California Department of Forestry (Cal Fire) also maintain a base and aircraft here. The City of Paso Robles received FAA funding for miscellaneous ground work that also included pavement crack sealing and a surface treatment application. The major concern in choosing a seal was the fact that the runway features a grooved asphalt surface so it was imperative the surface grooves were not plugged with asphalt or filler.

The Paso Robles airport was constructed in 1943 by the federal government as the Estrella Army Airfield. After World War II ended under the War Surplus Act of 1949, the airport was transferred to the County of San Luis Obispo. It was then acquired by the city in 1973 and is currently under the direction of airport manager Roger Oxborrow. The main runway 1-19 is 6000 ft x 150 ft wide. Its maximum weight



Close Up of Rejuvenator on Grooved Runway Pavement

load is 150,000 lbs which would accommodate Lockheed C-130's and Boeing 737 type aircraft. The secondary runway is 4700 ft x 150 ft wide and can handle weights up to 60,000 lbs.

In 1984 the runway received a 4-inch (100 mm) overlay that included one inch of OGFC (open grade friction course). This surface was overlaid in 2001 with a 4-inch (100 mm) HMA mat and a similar OGFC surface. The goal with the FAA funding was to preserve the runway

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to provide life extension.

The City consulted with John Smith of Tartaglia Engineering, Atascadero, CA, to design and prepare the bid. The successful contractor was Cal Portland Construction, Santa Maria, CA.

Longitudinal cracks between paving passes were routed and filled with Deery 200 hot applied sealant. This work was completed at night. The Reclamite® asphalt rejuvenator was applied the following week. The main concern was the moving target of weather. Already late in the year (November 2011) both the city and the engineering consultant wanted to complete this work.

Fortunately the weather pattern was favorable and the rejuvenator fog seal was applied in one day by Western Oil & Spreading (WOSS), Santa Paula, CA. The work started at 9 AM with an ambient air temperature of 49-51°F, with a mix of sun and clouds. As the day progressed, the ambient temperature increased to a high of 60°F, with pavement temperatures in the mid 70's.

Based on several test sections placed earlier on

the runway, Jim Brownridge, Marketing Manager with Tricor Refining, LLC set the application rate of the rejuvenator at 0.10 gallon per square yard of the Reclamite emulsion diluted (1:1) with water. The goal was to maximize surface penetration with little or no surface residual and no sanding or gritting of the surface. This was achieved with rapid absorption of the emulsion.

It had been scheduled to close this runway for a minimum of 4 days, but due to the excellent absorption and good weather, it was reopened only 3 days later. A good thing, as the State of California raised the alert level for forest fires and the first morning two U.S. Forest Service aircraft landed, one a new BAE-146 four engine bomber – the first of its type to land in California.

"The City of Paso Robles was under budget restraints and received FAA funding to assist in needed restoration work at the city owned airport. Preservation was our focus for the pavement and we accomplished this on time and within budget by using the combination of DEERY hot pour rubber crackfiller and RECLAMITE asphalt rejuvenator. The two accomplished our goal and funds permitting, we expect to continue with a preservation program," said airport manager Oxborrow.



**Application of Reclamite Rejuvenator**

## Virginia DOT Combines Three Cold Recycling Strategies on I-81 Project

by Brian K. Diefenderfer, Ph.D., P.E. and Chaz B. Weaver, P.E., P.E.M. of Virginia DOT

In the first U.S. highway reconstruction effort combining three pavement recycling processes in one project, the Virginia Department of Transportation (VDOT) rehabilitated a section of Interstate 81 in the shadow of the Blue Ridge Mountains during the 2011 construction season.

VDOT rehabilitated a 3.7-mile section of I-81 southbound near Staunton using cold in-place recycling (CIR), cold central-plant recycling (CCPR) and full-depth reclamation (FDR). The three specialized processes have the potential to revolutionize how aging roads are rehabilitated via pavement recycling.

Roanoke-based Lanford Brothers Co. Inc. was the prime contractor for the I-81 In-Place Pavement Recycling Project. VDOT awarded the contract for \$7.6 million.

The high-profile project was so successful that in early 2012 it received a national award from the Asphalt Recycling & Reclaiming Association (ARRA) and Roads & Bridges Magazine.

### *Cold Central Plant Recycling (CCPR) Using Foamed Asphalt*

After rebuilding the shoulders to accommodate work zone traffic, Lanford first milled the top 10-inches of asphalt from the right-hand lane using two large cold mills and brought it to a mobile cold recycling plant near the interstate, adjacent to the work zone. There the materials were stabilized with a combination of foamed asphalt and portland cement. This process is called cold central-plant recycling (CCPR).

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Meanwhile, a subcontractor, Slurry Pavers, Inc., Glen Allen, Va., stabilized the revealed, existing aggregate subbase – which had deteriorated to the point of causing damage to the overlying bound layers – with 3 percent lime kiln dust, a reclaimed industrial byproduct, to a depth of 12 inches using a reclaimer. The stabilized materials were compacted in-place with padfoot and smooth drum rollers.

The milled, recycled materials from the mobile cold-recycling plant then were used to pave a new base course over the stabilized aggregate subbase to a 6-inch compacted depth. After paving the CCPR material using a conventional paver, a 12-ton and a 14-ton double steel-drum vibratory roller were used with a 10-ton pneumatic tire roller to compact the mixture. This later was topped with a 4-inch intermediate course of conventional hot-mix asphalt and a 2-inch surface course of stone-matrix asphalt.

### *Cold In-Place Recycling (CIR)*

In the second phase of the project, subcontractor Reclamation Inc. of West Hurley, N.Y., used a larger cold recycler to perform cold in-place recycling (CIR) in the left-hand passing lane. For this work, the top 2 inches of the pavement was milled off, and the next 5 inches was recycled in place using foamed asphalt and portland cement as the stabilizing agents.

The cold recycler was equipped with an on-board paving screed so the machine was able to mill, stabilize, and repave the roadway in one pass. The CIR layer then was compacted using a pair of 16-ton double steel-drum vibratory rollers and a 25-ton pneumatic tire static roller. The left lane was then topped with a 2-inch hot-mix asphalt intermediate course and a 2-inch surface course of stone-matrix asphalt.

On another portion of the project VDOT needed a process that could go in very deep, fix the entire pavement structure and get out very quickly. With the mobile recycling equipment and portable cold-mix plant available, VDOT could do that efficiently and accelerate construction as much as possible.

The reconstruction work also included the addition of prefabricated edge drains on both sides of the roadway. The product used was pre-wrapped with a geotextile filter and

brought to the site on rolls which also accelerated construction to get workers in and out as fast as possible.

### *A 'Win-Win' Solution*

The project was a win-win for several groups. The pavement designers appreciated it because it repaired those deep failures, fixing the entire pavement structure, as opposed to putting a bandage overlay on

top requiring continual maintenance. The recycling process is also "green", so fewer materials were trucked in and out of the site. But the accelerated construction was very important because it allowed the contractor to get in, fix the deep problems and get out very quickly. It eliminated, as much as possible, the inconveniences to motorists associated with a lengthier construction process. The accelerated construction was a huge advantage.

**Note to readers:** VDOT's research division, the Virginia Center for Transportation Innovation and Research (VCTIR), previously analyzed the performance of full-depth reclamation and recommended the process to restore the pavement's substructure. Full-depth reclamation strengthens the underlying foundation by mixing additives in with the existing material and re-compacting it. The 2011 VCTIR report is available at: <http://vtrc.virginiadot.org/PUBDetails.aspx?Id=298149>.



*Finished Project Photo in June 2011*





## PCC Profile Testing on Chicago's I-290

By John Roberts, International Grooving and Grinding Association

In the summer of 2010, Project ACIM-290-4(118)091 was constructed on I-290 in Chicago between Austin Avenue and Sacramento Blvd. in both directions. The project, which extended for approximately 3.8 miles, consisted of overlaying three to four lanes of the existing plane jointed Portland Cement Concrete Pavement (PCC) pavement in each direction with Stone Mastic Asphalt (SMA) hot mix from Austin Avenue to Kostner Avenue and from Homan Avenue to Sacramento Blvd. Conventional Diamond Grinding (CDG) was used to resurface the existing Continually Reinforced Concrete Pavement (CRCP) between Kostner Avenue and Homan Avenue. A joint venture between Quality Saw and Seal, and Safety Grooving and Grinding, provided the diamond grinding in July of 2010. The diamond grinding on this project received an award for its ride quality.

### Noise Measurements

The project was evaluated for tire-pavement noise shortly after completion of the diamond grinding in 2010. The CDG and SMA surfaces were comparable in noise level with the CDG registering at 103.7 dBA and the SMA at 103.4 dBA.

### Profile Testing

The International Grooving and Grinding Association (IGGA) believed it advantageous to conduct profile / smoothness testing of both the SMA and CDG surfaces to enable a comparison of the ride characteristics. Ames Engineering of Ames Iowa was hired to conduct profile testing of the project.

In September 2011, Ames conducted the profile testing of I-290 between Austin Blvd. and Sacramento Blvd. Testing was conducted during the late evening. The three outside lanes were tested in both directions, on both the Stone Matrix Asphalt (SMA) overlay and the Conventional Diamond Grinding (CDG) surfaces. The profile testing was conducted to compare the SMA ride qualities to the CDG ride qualities.

The Ames Engineering profile van measured the profile in each wheel path simultaneously. Two RoLine sensors are mounted on a cross member which attaches to the front bumper.

The RoLine sensors are positioned approximately 12 inches about the pavement. The RoLine Footprints are positioned 72 inches apart (center to center).

At the same time that profile measurements are obtained, still photos are taken at approximate 150 foot intervals allowing correlation between the profile results and a roadway image. The image is captured using a camera mounted to the windshield just below the rear view mirror. Both the images and profile data are linked to GPS coordinates.

### Results

The project average Profile Index (PI) result for the SMA surface was 23.1 inches/mile, compared to a project average of 20 inches/mile for the CDG surface. In addition to the CDG average being 3 inch/miles less, the variability was approximately half that of the SMA section.

The Standard Deviation for the Asphalt



Ames Engineering Profile Van

Concrete (AC) section was 6.3 inches/mile as compared to the CDG which was 3.9 inches/mile. While 90 percent of the CDG surface exhibited a PI of 25 inches/mile or less, only 61% of the SMA surface achieved this.

The results indicate that the CDG surface was smoother by approximately 3 inches/mile, and that the smoothness variability was approximately half that of the SMA surface. With the increased emphasis worldwide toward safe, smooth and low noise pavement surfaces, CDG has proven to be an economical and environmentally safe choice for today's roadway specifiers. The travelling public and surrounding communities will notice the reduction in tire/pavement noise while the transportation authorities will benefit from the safe, smooth and long-lasting pavement surface provided by CDG.





# ISAP 2012 International Symposium on Heavy Duty Asphalt Pavements and Bridge Deck Pavements Held on May 23-25, 2012

Over 300 attendees from 20 countries attended the ISAP symposium held in Nanjing China. The conference was hosted by the International Society of Asphalt Pavements and the Jingsu Provincial Communication Department. The conference was preceded by a one day workshop on topics including Intelligent Compaction, Characterization of Materials used for Bridge Decks, and a TRB construction workshop. Jiu Yu of JSTRI was the conference chair.



Gary Hicks at the 2012 ISAP Conference

- on pavement materials
- 3 Sessions on construction and maintenance
- 2 Sessions on pavement structure

California was represented at the conference by Dr. Gary Hicks of the CP<sup>2</sup> Center who gave 2 presenta-

tions, one on the Use of Epoxy Asphalt for a steel Bridge Deck in Portland Oregon and another on the Development of a Pavement Preservation Database for Alaska DOT&PF. Dr. Haiping Zhou of Caltrans gave a presentation on the use of asphalt rubber in California, while Dr. John Harvey of UC Davis participated in the workshop and gave a presentation on heavy duty pavements in north America. Information on the conference can be found on the conference website at <http://www.isap2012.net/>.

ISAP 2012 Conference in China



The conference consisted of numerous sessions including the following:

- Opening session
- 3 Sessions on bridge deck paving
- 6 Sessions



## Carl L. Monismith Inaugural Lecture in Pavement Engineering

By Gary Hicks, CP<sup>2</sup> Center

The Geo-Institute (G-I) established a Lecture in recognition of Professor Carl L. Monismith's contribution to Pavement Engineering. Professor Monismith's teaching and research career in pavement technology at the University of California, Berkeley, spans

more than 50 years. Throughout this period he has mentored numerous graduate students that have disseminated advances in

pavement technology around the world.

Professor Monismith has published extensively on pavement technology and in the areas of pavement design and rehabilitation as well as



Carl Surrounded by Friends Gary Hicks and Rita Leahy

pavement management. He has been an active contributor to the Transportation Research Board (TRB), the American Society of Civil Engineers (ASCE), the Association of Asphalt Paving Technologists (AAPT), and the

International Society of Asphalt Pavements (ISAP). His work has been recognized by numerous awards, including ones from ASCE, TRB, NAPA and The Asphalt Institute.

Professor Monismith presented the first lecture at the ASCE Geo conference held in Oakland CA in March 28, 2012. The title of his lecture

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A Half Century of Achievement

was "Flexible Pavement Analysis and Design - A Half Century of Achievement". The C.L. Monismith Lecture will be awarded annually for outstanding research contributions in Pavement Engineering. Nominations for the next lecture will be considered from any G-I or ASCE member or the technical committee. The Lecturer will be presented with a plaque and an honorarium, as allowed by funds endowed for this purpose. Funds endowing this Lecture are being raised through tax deductible donations to ASCE (ASCE's non-profit Tax ID number is 52-1891243). Current donors have been

recognized on the G-I's web site located at: <http://www.asce.org/ContentWide.aspx?id=25769805541>. Future contributions are still needed and should be sent by personal or corporate check issued to:

American Society of Civil Engineers (ASCE)/Monismith Lecture  
1801 Alexander Bell Drive  
Reston, VA 20191

We hope you can help with this effort. I am proud to say I was one of Carl's students and have donated to this cause.



## Statewide Roadway Needs Assessment

By Theresa Romell, Metropolitan Transportation Commission (MTC)

The first step in any asset management plan is to know the current state of the asset. Only then can a desired level of service be set and a plan for how to achieve that goal be

developed. Regular updates of asset conditions and the availability of resources needed is also critical for monitoring progress towards meeting set goals. While it has been clear for some time that California's local roadways are deteriorating and there are insufficient funds available to maintain the system in a state of good repair, only in recent years has a concerted effort been made to quantify this problem with a statewide assessment.

The "Statewide Local Streets and Roads Needs Assessment", initiated in 2008 and currently undergoing its third biennial update, is a joint effort among California's cities and counties, Regional Transportation Planning Agencies (RTPAs), the

League of California Cities (League) and the California State Association of Counties (CSAC).

The project is being funded through contributions from stakeholders. The initial assessment in 2008 was spurred on by a \$250,000 contribution from the County of Los Angeles. Many other cities and counties also contributed, raising enough money to pay for the 2008 project as well as the 2010 update. For the current assessment and the planned 2014 update, RTPAs were asked to pay for fifty percent, with cities and counties sharing equally in the remaining cost.

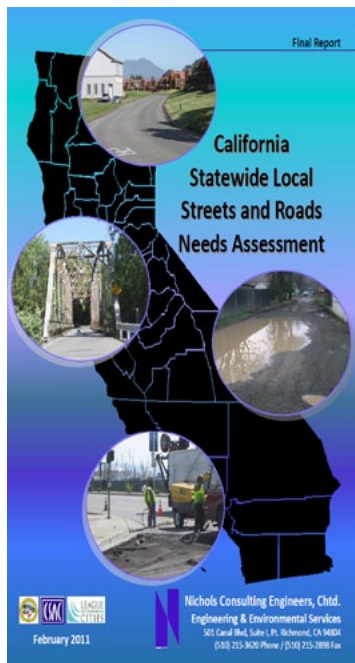
In 2009, CSAC and League staff used the comprehensive data derived from the first assessment to advocate against, and avoid significant cuts to local transportation funding, including the proposed re-direction of the Highway Users Tax Account (HUTA) revenue, which would have held devastating consequences for roadway conditions. The report played a significant role in maintaining existing state funding levels and given on-going state budget issues, the importance of continued assessments is evident.

The basic questions to be addressed by this project are:

- What are the pavement conditions of the local streets and roads in California?
- What will it cost to bring the local street and road system (including pavements and essential components) to a state of good repair and maintain them at that level over the next 10 years?
- What is the funding shortfall and what impacts will various levels of funding have?

Based on information gathered for the 2010 assessment, approximately \$56 billion of additional funding is needed to bring the road system to a state of good repair and a total of \$79 billion for a functioning system over the next 10 years. This is \$7.5 billion more than what was estimated in the 2008 study. Further, in 2008, the pavement condition index average in the state was 68. Two years later, it was 66, indicating that adequate funding is not available to even maintain existing conditions, let alone improve them. The results of the 2012 assessment will likely confirm a further downward trend in roadway conditions, or at a minimum, illustrate that even if we can keep

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conditions level, the cost required to eliminate the maintenance backlog will continue to grow.

As a result of the economic downturn, the past two assessments were focused largely on preserving existing funding for local streets and roads. The fact that existing state sources of funding were preserved was in itself, a success.

However, California's budget turmoil seems to be unending, and there may never be a "good" advocate for additional revenues. The longer local agencies must defer needed maintenance as a result of inadequate revenue, the more expensive the problem will become. Therefore, the 2012 assessment will seek to convey a sense of urgency for fixing our local streets

and roads and emphasize the importance of increasing funding for maintenance now.

The 2012 assessment will provide not only a technical report on street and road conditions in the region and the impact of various levels of revenue to meet the maintenance needs, but also frame the problem in terms of what resonates with the public – environment, economy, safety, and equity, central themes in communicating the findings of the assessment to decision makers and stakeholders.

For more information about the 2012 Statewide Local Streets and Roads Needs Assessment, please contact Theresa Romell at [tromell@mtc.ca.gov](mailto:tromell@mtc.ca.gov), or visit [www.savecalifornia.org](http://www.savecalifornia.org).



## PCCAS Holds Conference in Fontana

The Pacific Coast Conference on Asphalt Specifications held its official periodic conference on May 15-16 at the Caltrans Regional Lab facility in Fontana. This 7-state group, involving California, Arizona, Nevada, Oregon, Washington, Alaska and Hawaii, has a goal of promoting uniform and effective asphalt specifications throughout the Pacific Coast states. The group has three committees: the Paving Asphalt (& Mix) Committee, the Emulsion Committee, and the Recycling Committee.

All reported on their activities from periodic meetings, which are held throughout the year and are open to anyone. For more information go to [www.pccas.org](http://www.pccas.org).

Professor Carl Monismith (UC Berkeley) presented the keynote address, an overview of the history and accomplishments of the PCCAS. Representatives from The Asphalt Institute and NCAT made presentations on topics of national interest. Larry Santucci was honored for his many years of service to the Conference.



## Caltrans' Local Assistance Programs Via CSU, Sacramento

The Caltrans Division of Local Assistance has partnered with California State University Sacramento's (CSUS) College of Continuing Education to provide training and technical assistance as part of the Cooperative Training Assistance Program (CTAP) and Local Technical Assistance Program (LTAP). The programs were previously managed by the Institute of Transportation Studies at U.C. Berkeley. These programs provide subsidized, practical training for transportation professionals in California's cities, counties, and regional transportation agencies. On April 6th, CSUS launched the Local Assistance Training website, [www.cce.csus.edu/conferences/caltrans/localassistance/index.htm](http://www.cce.csus.edu/conferences/caltrans/localassistance/index.htm) where you can access information

and register for upcoming courses. They currently have 9 course offerings of the Federal-Aid Series scheduled throughout the State.

Caltrans will be working closely with CSUS to provide additional training such as the RE Academy, Short Courses, and Road Shows in the near future. Please visit the site to register for courses, request information, provide suggestions/feedback, etc.



The program will be under the administration of Deniz Anbiah, Chief of Caltrans Division of Local Assistance.



## CalAPA Regional Technical Committee Meetings

The new statewide California Asphalt Pavement Association (CalAPA) will hold regional Technical Committee meetings at various locations in California. At these informal meetings, agency and industry representatives

can share technical information and specification updates, and discuss strategies to improve HMA pavements. Meetings are open to anyone with an interest in asphalt pavement technology.

*Continued, next page*

The various regional technical committees have meetings scheduled for the following dates:

- San Diego Technical Committee – 4th Wednesdays
- Los Angeles Technical Committee - Wednesday, June 6th
- High Desert Technical Committee - Thursday, July 19th
- Central Valley Technical Committee - Wednesday, June 20th (Bakersfield)
- Central Coast Technical Committee - Friday, July 13th (Santa Maria)
- Bay Area Technical Committee - Tuesday, June 5th (San Leandro)
- Sacramento Technical Committee - TBA

At the recent meeting of the Bay Area Technical Committee in San Leandro, topics included :

- Technical updates / overviews by CalAPA (Topics included: WMA, smoothness, Superpave mix design, RAP & RAS use, Safety Edge for joints, Hamburg wheel track test, APA test)
- Caltrans Specifications updates
- Activity reports by local agencies
- Special presentations on APA & Hamburg tests

For more information on future CalAPA meetings visit their website: <http://calapa.net/technical.html>



## FHWA News and Update

by Steve Healow, FHWA  
California Division Office

**S**ave the date! Are you interested in sustainable pavement preservation practices? Would you like to reduce energy consumption and emissions while improving pavement performance? Can you use more information on in-place recycling, (hot-in-place, cold-in-place), or full-depth reclamation? If your answer to any of these is 'yes', then plan to attend the **Western Region In-Place Recycling Conference** on Sept. 11-13, 2012, at the Radisson Hotel adjacent to the Ontario Airport. Check this newsletter and the following site for more information: <http://www.pavement-preservation.org/conferences/regional-in-place-recycling-conferences/2012-workshop/>

The "Building A More Durable Asphalt Pavement Workshop" presents "**Best Practices for Longitudinal Joints.**" If you're interested in building more durable asphalt pavements by improving density at longitudinal joints, this free 4-hour workshop may be for you. See more details at: <http://www.fhwa.dot.gov/publications/focus/12may/12may01.cfm>

Those of you following the federal highway reauthorization bills will be relieved to learn that fourteen U.S. Senators and thirty-three members of the House convened a conference committee on May 8 to resolve differences between S. 1813 and H.R. 4348. The pressure is on as the 9th continuing resolution extending SAFETEA-LU funding will expire at the end of June, 2012.

Are you familiar with the Transportation

Curriculum Coordination Council's (TCCC) development of 90+ web-based, self-paced short-courses now available through the National Highway Institute web page? The courses cover pavement preservation treatments for rigid and flexible pavements and materials sampling and testing. New courses are being added, including 'Superpave for Construction'. Take a few minutes to visit the NHI web page, (<http://www.nhi.fhwa.dot.gov/default.aspx>), use the 'Search for a Course' function to find TCCC and look at the dozens of courses available.

If you have pavement preservation responsibilities for two-lane rural routes which coincidentally have recurring pavement edge drop-off, here are two viable mitigation treatments which will help errant drivers recover from drifting off the road. The quick and easy solution is backfilling with granular material. A second mitigation treatment, the Safety Edge, is constructed in conjunction with an overlay. The Safety Edge is made possible by Edge shoe, to the paverscreed. The result is a 30-degree tapered wedge as opposed to a vertical edge of pavement. See more information at: <http://www.fhwa.dot.gov/everydaycounts/technology/safetyedge/intro.cfm>

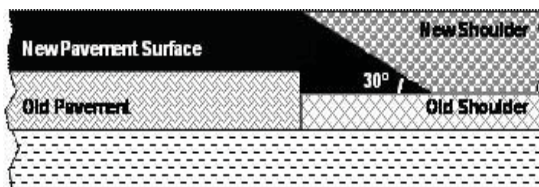
For more information on any of these items, contact Steve Healow at the FHWA California Division Office at (916)498-5849.



### Pavement Edge Drop-off Corrected by Backfilling with Granular Material



### Safety Edge



Safety Edge Leaves a 30-Degree Tapered Wedge

## CalRecycle's Strong History of Support for Asphalt Rubber Use

By Nate Gauff, CalRecycle

Supporting the use of waste tire rubber in pavement applications is one of the many ways the California Department of Resources Recycling and Recovery (CalRecycle) carries out its mission to protect the environment and preserve resources. CalRecycle, and its predecessor the Integrated Waste Management Board, have a 20 year history of providing assistance to local and state agencies to facilitate the use and development of rubberized pavements. From initial support of Caltrans' laboratory and field research efforts, to more recent technical assistance and grant awards to local governments, CalRecycle's support has evolved while maintaining the goal of increasing the use of rubberized pavement materials by all entities within California.

In the last ten years alone, CalRecycle has awarded over \$55 million in grants to local governments to help fund rubberized pavement projects including \$41 million for overlays and \$14 million for chip seals.

Over the past 15 years, CalRecycle has spent over \$4 million to provide technology transfer, technical assistance and training to local governments - initially via Technology Centers operated by Los Angeles and Sacramento County



personnel, and more recently via contracts with private engineering firms MACTEC Engineering and Consulting, Inc (now AMEC) and Jacobs Engineering, Inc. CalRecycle is currently finalizing a contract with Quincy Engineering, Inc to continue these services for local governments.

Finally CalRecycle has awarded nearly \$5.25 million dollars to support various rubber pavement research projects, including \$3.8 million dollars to Caltrans and \$0.75 million to the CP<sup>2</sup> Center. CalRecycle is finalizing another research contract with the CP<sup>2</sup> Center to develop pavement management system (PMS)

performance curves for rubberized materials.

CalRecycle has facilitated the use of rubberized pavements via grant funding, helped to promote their increased use by expanding local agency's knowledge base via technology transfer and training and assisted the development of new types of material available for use via funding for various research efforts.

CalRecycle has a proven track record of support of the use of tire rubber in pavement applications and plans to continue these efforts in the future. For more information visit our website at: <http://www.calrecycle.ca.gov/tires/grants/default.htm>



## North Counties Road Superintendents Workshop

By Leros Lane, CP<sup>2</sup> Center

The North Counties Road Superintendents Workshop held their 13th Annual Meeting on April 18, 2012 at the Rolling Hills Casino in Corning, CA. Speakers included Bob McCrea, P.E., (Western Emulsions, Inc.) on "Taking Care of Your Best Roads First". He spoke about fog seals, rejuvenating seals, and texture seal coats, and noting that fog seals consists of SS-1h, CSS-1h, and CQS-1h, and they last 1 to 1-1/2 years. Rejuvenating seals use special light, aromatic oils.

Kevin Donnelly (Western Emulsions, Inc.) talked on "Changing Strategies; From Worst First to Best First". He touted that fog sealing is a cost-effective maintenance operation in the long term. As an alternative to crack sealing, Kevin recommended a scrub seal, followed by a cape seal. A micro surfacing on a scrub seal could provide a 7-12 year extension on

pavement life. LA County eliminated their mill and fill program with this strategy.

James Emerson (Pavement Recycling, Inc.) spoke on Cold in Place Recycling (CIR) and Full Depth Reclamation (FDR). James believes that CIR could extend the life of a pavement for 9-years. To be cost effective, he recommended project size with a minimum of 500,000-1,000,000 yd<sup>2</sup>. CIR can be performed at a 2-3 mile/day rate of production when there are no concrete structures, or utilities to deal with. The cost for a 4 inch depth is approximately \$8.00/yd<sup>2</sup>. The weather should be 60 °F and rising, so projects usually are constructed between May-September. Every job should have a mix design developed from cores. Production rates may run from 460-600 tons per hour. He recommended that the CIR be finished with two-25T pneumatic rollers, and be capped with minimum 1.5 inch HMA overlay. CIR also

*Continued, next page*



creates a smaller carbon footprint.

Butte County presented a film on the "Climate Initiatives Program" developed by Sonoma County and the City of Napa. Its purpose is to roll back the carbon emission levels to meet the 1990 levels, and its goal is to reduce the carbon levels by 25% below the 1990 levels. The Bay Area plan is to have a 15% reduction of carbon levels by 2030. 62% of the Bay Area emissions are from transportation. For every one mile of roadway, there are 130,000 pounds of greenhouse emissions.



The agencies present included the counties of Butte, Shasta, Nevada, Lake, Tehama, Marin, Sacramento Yuba and the City of Lakeport.

Each agency gave a brief summary of their maintenance departments' activities. All are faced with reduced funding and staffing and having to make their maintenance programs very cost effective.

For more information on this group contact Stephen Stangland (Lake County) at [stephens@co.lake.ca.us](mailto:stephens@co.lake.ca.us).



## FP<sup>2</sup> Update

By Jim Moulthrop, FP<sup>2</sup>

**T**he Foundation for Pavement Preservation (FP<sup>2</sup>) continues to be engaged in the ongoing effort to pass a comprehensive federal transportation bill in Washington. The extension of the current legislation runs until June 30th, 2012.

FP<sup>2</sup> has also been in discussions with the National Center for Asphalt Technology (NCAT) at Auburn University regarding their plans to include a number of pavement preservation treatments in the next cycle of test track trials beginning this summer. Nine state DOTs have indicated their desire to financially support this effort for the three year loading cycle. The preservation industry, though FP<sup>2</sup>, is interested in participating in the study and will conduct a

recruiting effort in late May and June of 2012 to raise the necessary funds to participate. The opportunity to develop life extension and life cycle cost information for different preservation treatments as well as performance information will provide the industry with data that has been elusive to date.

Plans are being finalized for the National Conference on Pavement Preservation which will be held in Nashville, TN during the last week in August, 2012. Sponsored by FP<sup>2</sup> and organized by the NPPC, a terrific technical program has been put together. The demonstration committee has arranged for live demonstrations of several preservation techniques as well as other treatments done in advance of the meeting for logistical reasons.

For information on any of these issues visit the FP<sup>2</sup> website: <http://fp2.org/>



## CP<sup>2</sup> Center Laboratory Update: Asphalt Mix Testing

By Ding Cheng, Director CP<sup>2</sup> Center

### Background

**S**ome new things are happening at the California Pavement Preservation Center at CSU, Chico. With the funding support or donations from CalRecycle, Caltrans, U.S. Forest Service, and industry support, the Center is developing an asphalt pavement laboratory to serve both research and teaching needs at Chico State University. The Center has had access to the aggregates and concrete laboratories, but did not have any asphalt testing capabilities until just recently.

Although Caltrans has been using Superpave specification for asphalt binders for several years, they are just now moving to Superpave mix design methods. The CP<sup>2</sup> Center's asphalt-lab is already equipped with most of the

special equipment needed for this purpose. Let's take a closer look at our Superpave asphalt mix testing capabilities.

### Asphalt Mixture Testing Equipment

The Center has acquired several pieces of equipment for testing asphalt mixes, including the following:

- **SGC** - The Superpave Gyrotory Compactor (SGC) is used in the Superpave mixture design system to prepare asphalt concrete specimens (briquettes) for determining volumetric and mechanical properties. CP<sup>2</sup> Center has used the SGC on a number of projects using rubberized hot mix asphalt with warm mix additives. Caltrans has equipped all their District labs with SGC's as they change from the Hveem method of mix design to the Superpave method. *Continued, next page*

- **APA** – The Asphalt Pavement Analyzer (APA) shown in Figure 1 is a multifunctional Loaded Wheel Tester (LWT) used for evaluating permanent deformation (rutting), fatigue cracking and moisture susceptibility of both hot and cold asphalt mixes. Of particular importance is the fact that the APA can be used to conduct the Hamburg Wheel-Track Test on asphalt mixtures (AASHTO T324). Caltrans



Figure 1. Asphalt Pavement Analyzer (APA) Tester

proposes to use this test to help evaluate the moisture sensitivity of asphalt mixes.

- **Mix Permeability Test Equipment** -- The Center has both lab and field equipment to measure water permeability of asphalt mixes. This has been very useful in our work to show the permeability of mixes.

- **Other Equipment** – We also have the NCAT ignition oven for determining binder content, various volumetric tests, e.g. Rice specific gravity, bulk specific gravity, and a Corelok device from InstronTek (Figure 2), as well as the conventional Marshall Mix design equipment. We are planning to add a beam fatigue device this year. Unfortunately, we currently lack space for much of the equipment and are working with industry and others to find space. The Knife River Company has been generous enough to house some of this equipment at their Chico facility.



Figure 2. Corelok Vacuum Sealing Device



## MARK YOUR CALENDAR

### National Conference on Pavement Preservation, August 27-30, 2012.

Sponsored by the Foundation For pavement Preservation (FP<sup>2</sup>) and organized by the organizing committee and technical committee, a terrific technical program has been put together. The demonstration committee has arranged for live demonstrations of several preservation techniques as well as other treatments done in advance of the meeting for logistical reasons. Larry Galehouse of the National Center for Pavement Preservation is the chair of organizing committee of this event. For more info visit: [www.nationalpavement2012.org/](http://www.nationalpavement2012.org/)

**CalAPA Regional Technical Committee Meetings** over the summer months at various locations around California. For more information see the article elsewhere in this Newsletter and visit: <http://calapa.net/technical.html>

**2012 AASHTO SCOM/TRB Maintenance Conference.** The conference is hosted by the

Washington State Department of Transportation on July 14-19 in Seattle, Washington. For more information visit: <http://www.wsdot.wa.gov/partners/scom2012/>

**Western Region In-Place Recycling Conference** on Sept. 11-13, 2012, at the Radisson Hotel adjacent to the Ontario Airport. For more information visit: <http://www.pavementpreservation.org/conferences/regional-in-place-recycling-conferences/2012-workshop/>

The **AR 2012 Conference** will be held in Munich, Germany on October 23-26. This Conference, like previous AR Conferences, will mainly focus on all aspects of the design, life cycle cost, construction, research, energy and environmental benefits, maintenance, recycling, tire/pavement noise reduction and production of asphalt rubber as a binder or use in a hot mix. Papers on environmental aspects related to the use of asphalt rubber binders are also encouraged. For more information visit: <http://www.consulpav.com/ar2012/english/>

Caltrans established the California Pavement Preservation (CP<sup>2</sup> Center) CSU, Chico in July 2006, and fully funded the Center in January 2007. Dr. DingXin Cheng is the current Director of the Center.

The purpose of the Center is to provide pavement preservation support services to Caltrans and other public agencies, and to industry. Unique services include developing educational programs in pavement preservation, providing training and staff development opportunities, providing needed technical assistance to public agencies and industry, and managing/conducting research and outreach services, such as this newsletter.

The Center works closely with the Pavement Preservation Task Group (PPTG), a statewide volunteer group consisting of members from Caltrans, Federal Highway Administration (FHWA), industry, various public agencies and academia to help promote cost-effective pavement preservation.

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 CP<sup>2</sup> Center, 35 Main Street, Suite 205, California State University, Chico, Chico, CA 95929-0603  
 Subscriptions by e-mail: contact [CP2C@csuchico.edu](mailto:CP2C@csuchico.edu) to add your name to the distribution list