



CP2 CENTER NEWS

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The Division of Pavement Management has been reorganized

Shakir Shatnawi



Shakir Shatnawi

A recent change in the new Division was the re-assignment and reorganization of personnel and responsibilities. Shakir Shatnawi, the new Division Chief, has established the following groups under his direction. They include:

- Investigations – headed by Peter Vacura. This unit includes failure investigations for all pavements, tracking and monitoring experimental test sections, new products evaluation, special studies, and training related to failure investigations.
- Policy and Planning – headed by Bill Farnbach. This unit will be responsible for strategic planning, pavement policies, project review and prioritization of SHOPP and HM programs, pavement design criteria and economic analysis, and training coordination.
- Engineering and Preservation – Kee Foo, Acting Office Chief. This unit will be responsible for procedures for pavement structural design and rehabilitation, specifications development, pavement preservation, QC/QA construction issues and innovation. Kee Foo is also the Caltrans acting co-chair for rock products.
- System Development and Performance – headed by Tom Pyle. This unit will be involved in the development and implementation of the new pavement management (PM) system. It will manage all the contracts for the new PM system including the ones for ground penetrating radar, information management and the like. It will also be responsible for sustainability issues and impacts and development of the scheme, coding and algorithms for the PMS.
- Programming and Data Collection – headed by Susan Massey. This unit handles all the tracking and budgeting for the pavement preservation, rehabilitation, and reconstruction programs. It also manages special equipment such as skid, structural adequacy of pavements, noise measurements, and the manual pavement survey program (until the automated program is up and running). It will be responsible for contract administration, and the Division budget.

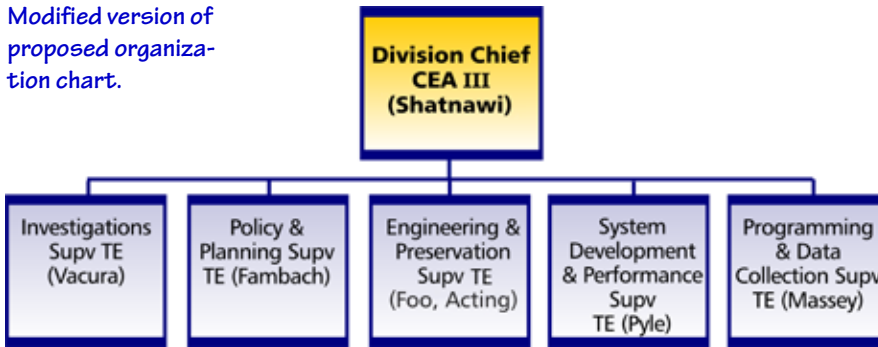
To date, new staff assigned to this unit have come from Engineering Services (Materials, Engineering, and Testing Services-METs), Design and Research. Most of the division is housed at the offices located at 2389 Gateway Oaks in Sacramento, but the engineering and preservation group will remain at the MET's facility on 5900 Folsom Boulevard. The new group is a one-stop shop for all things pavements. The METs group still houses the testing for pavement materials, but all other aspects of pavements are now contained within this new Division. See the proposed organization chart for this Division on the next page.

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Modified version of proposed organization chart.



The vision for the new Division is to provide the safest, smoothest, quietest, and most sustainable pavements for California highways. How this will be accomplished with a very limited budget is still to be determined. The goals of the Division are to:

- Build the right project, at the right time, and at the right cost using timely preservation, life

- cost assessments and long-life pavements
- Preserve and enhance California's resources and assets through recycling and environmentally friendly innovations
- Minimize exposure to workers
- Partnerships with Industry and Academia

Obvious challenges include the following:

- Declining funding for pavements
- Rapid deterioration of the pavement network
- Costly rehabilitation and reconstruction techniques
- And more

In summary, the new Division will be responsible for all pavement-related activities. This is the first time this has occurred in a long time. It is expected there will be more efficiencies in getting things accomplished. Let's hope we are able to find innovative ways for funding the programs that need to occur.



An update on the proposed Caltrans Pavement Management System

By Tom Pyle, Caltrans Division of Pavement Management



Tom Pyle

Caltrans is developing a new pavement management system (PMS) that will allow prediction of pavement performance. This new PMS will answer the "what if" questions that always face agencies who manage infrastructure. These questions include:

- If funding is not increased, what will be the health of the system in the future?
- How much funding is needed to get a certain level of performance for the network?
- How long do pavement preservation treatments last and what pavement preservation treatments perform the best in each of the climate regions?

Caltrans currently has a PMS, which was state-of-the-art when it was developed over 30 years ago, but there are now computer programs that can help better manage the entire pavement network of the State or a district. Development of a new pavement management system began in 2008. Almost \$20 million of funding has been secured to develop this system. The three main parts of the PMS will be:

1. Obtaining structural section information on the entire 50,000 lane miles of pavement – This will be done by using Ground Penetrating Radar (GPR) on the entire system. A contract for the GPR has been awarded to Fugro and should begin in early 2010.
2. Developing a new data collection process using automated vehicles – This will include collecting data on pavement distresses and ride quality. A contract for this activity is scheduled to be awarded late 2009 or early

2010 where the entire network will be monitored each year. The automated system replaced the manual method which was slow, sampled only a small portion of the network, and required constant training. This work will be managed by James Lee of the Division of Pavement Management.

3. Obtaining the pavement management software – The software will be customized to meet Caltrans' needs and to be able to answer the questions that one would expect from normal pavement management systems at the network level. The integration of pavement preservation with a pavement management system is required for the new software. Part of the pavement management system will include performance prediction models for all treatments – preservation or rehabilitation. The contract for this work is expected to begin in 2010.

Six Expert Task Groups (ETG's) were formulated for the successful development of CALTRANS state-of-the-art PMS. These ETG's are identified as follows:

- Inventory, Geometrics, and Geospatial data system
- Condition Assessment and Monitoring
- Loading, Traffic Flow, and Modeling
- Prioritization and Optimization
- Budgeting and Programming
- Feed Back and Continuous Improvement Plans

For more information on the ETG's, please contact me at tom_pyle@dot.ca.gov. It is expected that a contractor will be chosen to develop this PMS for California by November 2010.

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In addition to the development of the conventional pavement management system, it is expected that other features will be added to consider the environmental impacts of treatments. Four areas are currently being considered:

- **Use of in-place recycling:** We hope to identify corridors where recycling is most applicable. Likely areas would be rural roads where traffic volumes are low and there are long, straight sections of roads.
- **Long-life pavements:** We will be identifying areas where long-life pavements should be employed. These are most likely to be in urban areas.
- **Use of recycled materials like shingles, slag and other wastes:** These materials could be used close to the source of the waste products.

However, we do use a considerable amount of asphalt rubber (the rubber from waste tires) all over the state.

- **Urban heat effects:** We also want to look at using white pavements in urban areas. White pavements from either white rock chip seals or concrete pavement will reduce the heat in cities and lessen the need for as much air conditioning, and save energy.

In summary, the system will include the most current automated data collection systems, robust performance modeling, and web-enabled system and mapping for all users to view and report pavement data timely and accurately. The system will also provide the department with up-to-date budgeting models to help deal with the limited funding that we all are faced with.



Fog and rejuvenating seal coat test sections (2009)

By John Fox, Caltrans- D9 and Mary Stroup-Gardiner, CP² Center,

Fog seals are an emulsified mixture of asphalt, water, and surfactant. A rejuvenating seal is an asphalt emulsion with various chemicals or recycling agents. Both fog and rejuvenating seals are spray applied to an existing hot mix asphalt (HMA) pavement surface. Fog and rejuvenating surface seals have been used by a number of agencies with variable successes over the last several decades. These spray-applied seals are used to: 1) seal the surface to prevent water and air movement through the HMA layers; 2) soften (rejuvenate) the upper few millimeters of oxidized HMA surface;

- 3) improve the appearance of the driving surface; and
- 4) extend the life of chip seals.

The benefits of surface seals include reducing raveling of the HMA surface and slow cracking by reducing the stiffness of the surface layer. Spray seals are usually applied to

roadways with an open texture so the emulsion can penetrate into the upper layer of HMA. The test sections documented in this study evaluate performance properties, in the form of various field friction tests and core sampling, to determine the rejuvenating effects on the HMA for various spray-applied seal coat products. The impact of sanding on friction was also evaluated in this study.

Test sections

Three sets of fog and rejuvenating seal coat test sections were placed during the summer of 2009 (Figure 1). The Boonville test sections were the first to be placed June 7 and 8, 2009 on Highway 128 in Mendocino County between post mile markers 25.0 to 28.0. The rural roadway has two lanes and no shoulders that have AADT levels below 3,500. The existing surface was an open-graded hot mix asphalt. Boonville is located in a cool coastal California climate.

The Alturas sections were the second set to be placed. Alturas is located in the upper northeast portion of California near both the Oregon and Nevada state lines. This area has a cool, mountainous climate with winter snowfall. The project is located on Highway 395 in Modoc County between post miles 23.3 to 25.0. The existing surface was 1/2 inch rubberized gap graded hot mix asphalt with high void content low binder content (about 7%), and containing about 40% of a sandstone type aggregate that tended to disintegrate when wet under traffic. The highway is two lanes without shoulders.

The Bishop project was located on Highway 395 in Inyo County between post miles 118.47 to 120.58. The existing surface was a new 3/4 inch dense graded hot mix asphalt pavement which was constructed with a PG64-28 binder. The pavement had been placed approximately 30 days prior to the application of the seal coat test sections. The climate in the area is a high mountain desert climate with variable light snowfall in the winter.

Six products were evaluated in this study: Topien C, CQS-1h, PASSQB, Styraflex, CRF and Relcamite. The

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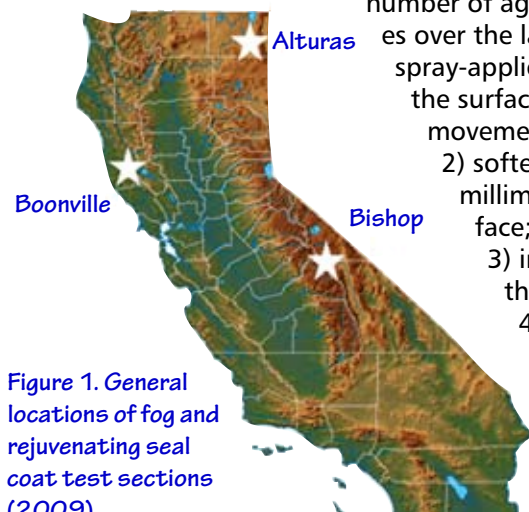


Figure 1. General locations of fog and rejuvenating seal coat test sections (2009).

Boonville test sections layout		Alturas test sections layout		Bishop test sections layout	
Post mile		Post mile		Post mile	
Control	25.6	Topien C (Sanded)	24.56	Control	118.57
	25.79	Topien C (Unsanded)	24.75		118.76
Topien C	25.79	CQS (Sanded)	24.85	Topien C (Sanded)	118.85
	25.98	CQS (Unsanded)	25.04		119.05
CQS	26.07	Pass QB (Sanded)	25.13	CQS	119.14
	26.26	Pass QB (Unsanded)	25.32		119.33
Pass QB	26.35	Styraflex (Sanded)	25.42	Pass QB	119.43
	26.54	Styraflex (Unsanded)	25.51		119.62
Styraflex	26.63	CRF (Sanded)	25.61	Styraflex	119.71
	26.82		25.8		119.9
CRF (Sanded)	26.91	Reclamite (Sanded)	25.89	CRF (Sanded)	120
	27.1		26.08		120.19
Reclamite (Sanded)	27.19			Reclamite (Sanded)	120.28
	27.38				120.48

Figure 2. Test section layouts for three projects.

test section layouts for all three locations is shown in Figure 2. Manufacturer's recommendations were to always sand the CRF and Reclamite so these sections were always sanded in all locations. For the Alturas test sections, half of the other test sections were sanded and half were left unsanded so that the impact of sanding on friction could be assessed. In Bishop the Topien C section was sanded in addition to the CRF and Reclamite sections. The Topien C was sanded only because the load was contaminated and the material did not set as expected by the time the traffic control needed to be lifted. This demonstrates the importance of one of the fog seal best practices of having sand ready if needed.

Field testing

Table 1 shows the results from the friction measurements collected from this study. In general, the friction after seal coat applications is between 50 and 60% of the original friction measurements. This is for the older open- and gap-graded existing pave-

ment surfaces. When these seal coats are sanded, the friction measurements are between 80 and 100% of the original values. When seal coats were applied to the fresh dense-graded hot mix asphalt, the friction values decreased substantially. The friction after application, with no sanding, was only 15 to 25% of the original friction. Sanding improved the friction to between 46 and 75% of the original values.

Conclusions

A conclusion from this study is that sanding of fog and rejuvenating seal coats should be completed before opening to traffic. Sufficient time after ap-

plication of the seal coat and before sanding is needed to allow time for penetration of the material, especially in the case of CRF and Reclamite. With other materials that actually set, the right time to sand is after the emulsion has broken, but while there is still some tack to hold the cover material. Care should be taken if low permeability surfaces such as fresh dense-graded hot mix asphalt pavements are to be sealed. In this case, sanding may not be sufficient to retain desirable friction characteristics. Minimum friction requirements need to be met before opening the roadway to traffic in all cases.

Caltrans' bridge deck seals currently require a commercial quality dry blast sand which meets a No.8 x 20 gradation, applied at 2 lbs/sq yd, and meet a minimum Caltrans' skid value of 0.35. Further investigation is needed to determine how tightly the gradation of the sand needs to be controlled for fog and rejuvenating seal coats.

Product	Percent of Original Skid Number (ASTM)*					
	Boonville		Alturas		Bishop	
	Sanded	Unsanded	Sanded	Unsanded	Sanded	Unsanded
Control	--	99.80%	--	99.00%	--	97%
CQS	--	52.70%	75.00%	52.40%	--	25%
Topien C	--	56.70%	87.60%	67.20%	75%	--
Pass QB	--	50.00%	84.90%	50.90%	--	19%
Styraflex	--	49.40%	86.20%	60.30%	--	15%
CRF	99.10%	--	93.00%	--	53%	--
Reclamite	100.00%	--	83.70%	--	46%	--

* Ratio of skid number before application to skid number after application. The Control percents represent the ratio of two days of testing.

Paving rubberized hot mix asphalt (type G) with warm mix asphalt technology on the North Coast

By Wesley Johnson and Michael Stapleton, Caltrans, District 1

September 15, 2009 marked a paving milestone for the State of California. The Rio Dell/Scotia rehabilitation project, located on State Route 101, 20 miles south of Eureka, was the first project in the State to utilize the addition of Warm Mix Asphalt technology into Rubberized Hot Mix Asphalt-Gap Graded (RHMA-G) placed in the traveled roadway. This use of Warm Mix Asphalt technology was introduced as part of a contract change order for a one-day trial of the Warm Mix Asphalt additive Evotherm™ in order to evaluate RHMA-G production and placement at lower temperatures. Success with this technology would mean many other projects using Rubberized Hot Mix Asphalt (RHMA) could have successful paving operations in cooler environments in the future.

Placement of RHMA on the North Coast of California has always been challenging due to the low ambient air temperatures and wet, misty conditions. Additionally, air quality has always been a sensitive issue in this pristine environment and previous rubberized asphalt projects have met opposition due to odors emitted from the rubber product during production, transport, and placement. Using rubberized hot mixes provides the benefits of a resilient, longer-life roadway as well as diverting waste material from valuable landfill space. Introducing Warm Mix Asphalt technology into the rubberized hot mix production process would allow the RHMA-G to be produced at lower temperatures and provide an overall energy savings as well as lower hydrocarbon emissions and off-gassing of noxious fumes. Any effort to promote an increase in the use of rubberized hot mix should be considered a “win-win” situation for the environment as well as maximizing scarce road-building dollars due to cost savings by lower energy use and reduced pavement thickness by using RHMA-G.

The trial of the additive Evotherm™ was introduced for one day of paving during the 19 days of paving on this project. The RHMA-G for this project was being produced at the hot mix plant owned by Granite Construction Company at Scotia, California and placed by a Granite Construction crew on the grade using a train of paving equipment that included a Roadtec SB-2500B Material Transfer Vehicle (MTV). The Warm Mix Asphalt trial was conducted at Post Mile 54.23 to 56.19 in the north-bound number 2 lane and shoulder of HUM-101. The hot mix plant is located within the limits of the job and the haul distance to the trial location was 3.3 miles with average haul times of 15 minutes. This short haul distance permitted quick response and adjustments to temperature sensitivity issues noted on the grade.



Paving train; note lack of smoke.

During the one day of Warm Mix Asphalt production, the continuous drum, hot mix plant was operated between 300° F and 230° F. The day began with the plant operating at 300° F for the first few truck loads to warm the paving equipment then the temperature was lowered incrementally to evaluate the effects on the paving operation. Plant production temperatures were lowered at approximately each 500 tons produced and correlated with field compactive effort. Placement of the Rubberized Warm Mix Asphalt-Gap Graded (RWMA-G) was reviewed for roller performance and field densities averaged 92% relative compaction. Plant temperatures were lowered to 270° F, 250° F, 240° F, and 230° F. A breakdown occurred at the lowest production temperature as the cooler, more viscous mix appeared to cause a high amperage draw of the motors powering the slat conveyor causing a temporary plant shutdown. Once production was resumed, plant temperature was raised to 240° F then to 250° F to finish the day's production of RWMA-G. The average temperature drop of the RWMA-G between the MTV hopper and the mat immediately behind the screed was 9° F. Mat temperatures immediately behind the screed ranged from 210° F to 264° F and averaged 233° F.

Sampling was conducted to provide RWMA-G material for future performance testing including Beam Fatigue, Hamburg Rutting test, binder testing, and moisture sensitivity (California Test Method 371). These test results will be compared against the control RHMA-G mix and evaluated for differing characteristics affecting long-term performance.

In addition to using Evotherm™ as a Warm Mix additive, the RWMA-G produced on the test day

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RHMA-G sampling process.

included a trial with and without the addition of Liquid Anti-Strip (LAS) chemicals. The purpose of the trial within a trial was to review the moisture sensitivity properties of the RWMA-G with and without LAS to verify if the Warm Mix additive provided anti-strip capability.

Overall, the day's production and placement of RHMA-G with Warm Mix Asphalt technology went well with approximately 2600 tons placed within contract specifications. In the near future, other opportunities to use rubberized hot mix will be forthcoming in District 1 and Warm Mix Asphalt additives will most certainly be used to provide the expected dollar and environmental savings. Stay tuned.



California's SR58 quiet concrete pavement research continuing to provide quiet results

By Larry Scofield, ACPA

In 2003, Caltrans constructed a new section of concrete pavement on SR58 to bypass the City of Mohave in Kern County. The newly constructed four-lane concrete pavement was selected as a test bed for concrete pavement research in California. This location was chosen to evaluate both concrete pavement surface textures and one bridge deck texture technique. At the time of construction three concrete pavement surface textures were constructed consisting of a Caltrans standard longitudinal tined section, a burlap drag texture, and a longitudinal broomed texture. For the bridge deck research, a skewed (30 degrees) transverse broomed

texture was constructed to compare against the Caltrans standard transverse tined bridge deck texture. Upon completion of the construction it was decided to construct eight ad-

To evaluate this research, Caltran's Bruce Rymer, Senior Engineer with the Division of Environmental Analysis, contracted with Illingworth and Rodkin, Inc. (I&R) to conduct the tire-pavement noise research in March 2003. Prior to opening the roadway to actual traffic, Dr. Paul Donovan, of I&R, used several techniques to evaluate the sections. On-Board Sound Intensity (OBSI) was used to evaluate the tire noise produced by each surface type. In addition, wayside measurements were obtained by driving a reference vehicle past microphones positioned alongside the roadway as indicated in the photos on this page.¹ Interior vehicle noise and sound propagation measurements were also obtained at the test site locations. Caltrans also contracted with the Volpe Center Acoustics Facility to conduct additional passby testing with multiple vehicles on the originally constructed three concrete surface textures.

Concrete pavement research results

To date, five reports have been prepared on the Mohave test site and the results have been used to supplement additional research efforts in regards to joint slab effects and acoustic longevity of concrete pavement textures.^{1,2,3,4,5} The findings from this California quiet concrete pavement test bed are discussed in the following sections by topic area.

Comparison of as-constructed noise levels

For the original three texture test areas (e.g. longitudinal tined, burlap drag, and longitudinally broomed) it was determined that the drag and broomed textures were essentially equal in level (e.g. noise level) but approximately 2 dBA quieter

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Individual passby testing with reference vehicle

ditional test sections consisting of diamond ground/grooved textures. The eight diamond grinding/grooving sections were constructed within the three original texture test areas providing a total of eleven concrete pavement test sections at the Mohave site.



OBSI test method

than the standard longitudinal tined surface used in California.¹ It was also noted that for frequencies below 1600 Hz the longitudinal tined surface was particularly higher in level than the other two surfaces.¹ It was also noted that the SR58 longitudinal tined surface was approximately 1.5 dBA higher in level than other longitudinal tined surfaces and it was assumed that this was a result of the joint slap effect present at this location. However, the tining did exhibit more positive texture than typically experienced which may also be the reason for the elevated levels.

Upon completion of constructing the additional eight diamond grinding/longitudinal grooving sections, I&R evaluated all eleven sections in June 2003. The results of the OBSI testing are indicated in Figure 1.¹ As indicated, six of the eight new test sections produced higher levels than the original as-constructed drag and broom textures. Only the conventional diamond ground (CDG) surface with 0.105 inch spacers resulted in noise levels lower than any of the original constructed texture.

The CDG with 0.105 inch spacers produced lower levels than the CDG with 0.120 inch spacers. The longitudinally grooved surfaces produced slightly noisier textures than the original construction textures. For the longitudinal grooved surfaces, the greater the cross sectional area of the groove the greater the increase in noise. The longitudinal tined sections, representing the Caltrans standard practice, resulted in the noisiest texture.

Evaluation of joint slap effects

The existing transverse joints on this project were randomly spaced between 11 feet and 14 feet, and used a 1/2-inch wide reservoir design with recessed silicone sealant. When the original three textures were evaluated, it was determined that the joint slap effect contributed approximately 2 to 3 dBA to the overall level of the roadway for the drag and broomed textures. The joint slap effect was most pronounced at frequencies below 1600 Hz¹. The joint slap effect was also evident in the wayside measurements as well and increased the wayside measurement 1 to 1.5 dBA in level for the broom and drag textures.¹ In 2009, Dr. Donovan, under contract to the American Concrete Pavement Association, developed a spreadsheet solution for predicting joint slap effect based on the transverse joint geometry. This work was based on results

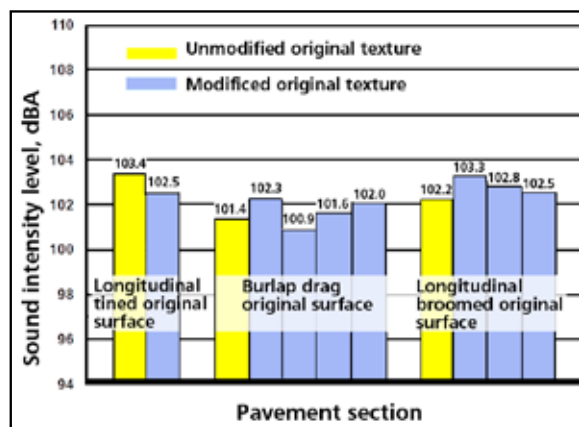


Figure 1. OBSI results for all eleven pavement textures using aquatred 3 test tire at 60 mph.³

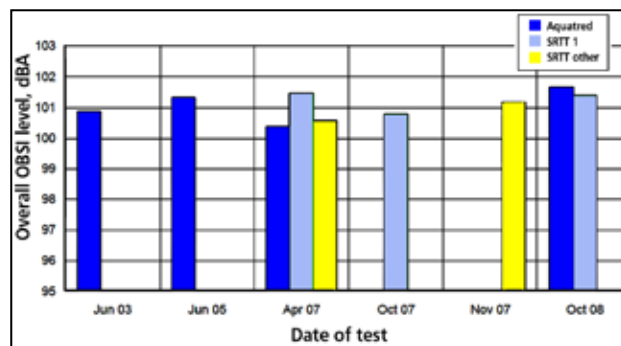


Figure 2. OBSI results over time for the CDG section with 105 spacers for all tires tested at 60 mph.

from SR58, Purdue University, and General Motors.⁷ Evaluation of acoustic longevity

The SR58 sections have also been used to evaluate the acoustic longevity of CDG surfaces⁶. Figure 2 indicates the test results for the CDG section constructed with 0.105 inch spacers. As indicated there is less than a 1 dBA change in the five year period of evaluation.

Quiet bridge deck surface texture results

The short segment of bridge deck evaluated in the study (e.g. skewed transverse broom texture) produced results similar to the longitudinal tined concrete surface. This was determined to be approximately 4 to 6 dBA quieter than transverse tined textures tested.

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Update of the American Recovery and Reinvestment Act (ARRA) and new federal legislation

By Steve Healow, FHWA, California Division

- 4,845 projects under construction (as of October 23) in all 50 States plus DC, PR, and FLH
- The total obligated funds of projects under construction are \$12.827 billion and \$3.263 billion expended
- 8,477 transportation projects authorized
- State DOTs and FHWA have obligated 75% of \$26.81 billion available for roads and bridge projects (as of Nov. 4)

Much has happened since the American Recovery and Reinvestment Act (ARRA) was signed into law on February 17 in Denver. In early August 2009 \$7 billion was transferred from the Treasury Fund to the Highway Trust Fund to keep it solvent through September 30, the end of the federal fiscal year. On September 24, the House and Senate conferees approved a one month continuing resolution (CR) to extend highway and transit programs through October 31. On October 30 a second CR was signed into law for the November 1 to December 18 time frame. Action on the 2009 Surface Transportation Authorization bill, sponsored by U.S. Rep. James Oberstar (D-MN), stalled in the House of Representatives due to conflicting priorities and lack of broad-based support.

ARRA included a massive \$787B economic stimulus package to spur the economy and reverse the climbing unemployment rate, currently at a 26-year-high at 9.8% nationally (12.2% in California). ARRA funds are distributed through 28 federal agencies. Up to \$85B may flow to California from all sources (see Figure 1). \$48B will be distributed through the U.S. Dept. of Transportation for roads, rails, transit and airports; this includes \$4.7B for California. \$26.8B will be distributed by the Federal Highway Administration for highway and bridge projects, including \$2.6B for California. Already California has obligated \$2 billion — or 79% — of that money on 620 projects, according to a September 14 announcement by Governor Schwarzenegger.

Representative Oberstar is "pleased with the progress" of ARRA-funded transportation infrastructure projects, adding "The timeline has moved very smoothly." Since the administration began handing

out the transportation funding in March, Transportation Secretary Ray LaHood and other DOT officials have made numerous public appearances around the country to tout the investments benefits, economic and otherwise. "I've been to 30 states and 60 cities," LaHood says. "Everywhere I go I see orange cones and orange barrels."

ARRA has been attacked by opponents for not providing the desired effect of easing the country's dour financial picture or cutting the unemployment rate. Critics have charged that fast road projects amounted to a lot of resurfacing and not much real investment. A White House report dated February 13, 2009, estimates ARRA will save or create 3.5M jobs over the next two years (396,000 in California) with over 90% of the jobs in the private sector.

However, the administration believes employment will get worse before it improves. "It's not going to be a pretty picture on unemployment by the end of December," LaHood predicts. The unemployment rate for construction workers was estimated at 16.5 percent in August, the highest of any industrial sector. However, the number of unemployed construction workers had dropped by 483,000 since February, and the value of new contract awards for highway and bridge projects in the summer of 2009 exceeded the value of those awards in the summer of 2008 by almost \$4 billion, according to an Associated General Contractors analysis of Bureau of Labor and Statistics (BLS) data. Since the recession began in December 2007, the economy has suffered a net loss of about 8 million jobs, based on revised figures reported October 2. More than 15 million people are unemployed. Over 300,000 long-term jobless workers saw their benefits expire in September. Unemployment in the U.S. reached a 28 year high in September at 9.8%. The previous high for the U.S. was in December of 1982 at 10.2%. In California the August unemployment rate was 12.1%. The previous high in California was 11.8% in February 1982.

Aside from the BLS numbers, the recent experience of businessmen adds urgency and clarity. "We have lost 37 percent of our workforce in the last 18 months. We are in a depression," said Toby Mack, President and CEO of Associated Equipment Distributors of Oak Brook, Illinois.

State and local officials count on federal cash for ambitious new projects, said Greg Cohen, President of the American Highway Users Alliance. If they don't know how much they're getting from Washington, they would likely spend their transportation budgets on maintenance work, like repaving existing roads instead of building new ones. In addition, Cohen said, private contractors who design and execute the projects can't do long-term planning, buy equipment or hire extra employees, creating a ripple effect on the entire economy.

\$85 billion in benefit to California (est.)



Source: <http://www.recovery.ca.gov/>

ARRA Road Projects in California

In California approximately 620 ARRA-funded projects encompass roadway repair and rehabilitation, construction of new bridges and roads, and improvements for pedestrians. The largest project, with \$192 million in ARRA funds, will construct a new two-lane bore for the Caldecott Tunnel on



Dignitaries turn a shovel of San Bernardino dirt in the September 15 ceremony celebrating the nation's largest ARRA-funded highway project to begin construction to date.

Route 24 between Orinda and Oakland. Other highway projects which received windfalls include the San Bernardino I-15 widening (\$128M), San Francisco's Doyle Drive replacement (\$50M), and the S.R.91 widening in Orange and Riverside Counties (\$48M).

Continuing Resolution #1 and the rescission

On September 24 House and Senate conferees agreed on a one-month continuing resolution (CR) to fund federal government programs through October. The legislation included a one-month extension of surface transportation programs (SAFETEA-LU). The CR did not repeal the \$8.7 billion rescission required by SAFETEA-LU. Thus, on October 1, state highway officials across the nation suddenly had \$8.7 billion fewer federal highway trust fund dollars to spend.

Congress included the \$8.7 billion rescission in SAFETEA-LU six years ago as a way to make the original bill's total funding fit within federal budgeting parameters. At the time, the intent was to find other budget offsets to prevent the rescission from actually being implemented.

Continuing Resolution #2

On October 30 the House and Senate approved a second continuing resolution (H.R. 2996) that keeps the government funded through December 18 and also extends highway and transit law for the same time frame, giving a minor victory to Oberstar, who continues to rally for support for a House-passed extension (H.R. 3617) through December 31, several weeks after the CR expires.

House Transportation and Infrastructure Committee Spokesman Jim Berard advised that between now and the December 18 deadline, a few different things may happen. One may be moving to a long-term bill and another may be coming to an agreement on another extension for an indeterminate amount of time. "Chairman Oberstar would like to see the long-term bill on the House floor by Christmas, but we are still in a holding pattern to due health care," said Berard. "And the Ways and Means Committee on the House side has to mark up the revenue title of the [Oberstar] bill before we can even bring it to the House floor."

The next transportation authorization bill

Representative Oberstar has been pressing for action this year on his six-year highway and transit policy rewrite, which would structurally reorganize the Department of Transportation and authorize \$450 billion in contract authority, a binding guarantee to states to enter into transportation projects, a unique budget mechanism which insulates transportation work from potential funding changes in yearly appropriations bills.

"The surface transportation reauthorization bill is going to do the big, futuristic projects," Oberstar said. The backbone of his vision is a National Transportation Strategic Plan that is international in nature and national in scope. A major theme of this plan calls for a national transportation policy, as opposed to the Department of Transportation's (DOT) current policies that are administered by separate departments — each of which focuses on a single mode of transportation.

Unfortunately transportation re-authorization is being shunted aside by other priorities. The heated debate over health care reform "is just sucking all the oxygen out of the room," as one transportation lobbyist put it. There is also a big debate over what to do about global climate change, as lawmakers struggle with health care reform, two wars, and a depressed economy. Because of those priorities and next year's mid-term elections, the Obama Administration has signaled its desire to "kick the can down the road." It is proposing an 18-month extension of the current bill — at current spending levels.

In summary, long-term fixes to the nation's highways and other transportation infrastructure are postponed indefinitely. As of late October the Senate Environment and Public Works (EPW) Committee, chaired by Senator Boxer, is conducting hearings on the proposed Clean Energy, Jobs and American Power Act. As this article goes to print there are no hearings scheduled for the next Transportation Authorization Bill.





Update on the FP²

By Jim Moulthrop, Executive Director

Foundation for Pavement Preservation = FP², Inc.

Changes have occurred with the Foundation. As a result of a strategic planning session held in Atlanta, Georgia, in October 2008, and several planning task force meetings that followed in January and March 2009, the Foundation for Pavement Preservation has established new goals for the future of pavement preservation. When first formed, the Foundation set out to make the highway community and agencies aware of the need for pavement preservation and advocate for acceptance. We have accomplished that goal and the Board of Directors decided to move on and create a new mission.

During the Board's meeting in May 2009 in Washington, DC, it was decided that the current status of the Foundation, a public charity, would not permit them to fulfill a new key goal of advocating for preservation policies with Congress during their deliberations with new legislation to replace the existing SAFET-LU.

The Board discussed the formation of a new entity, a non-profit trade organization that would allow advocacy. Hence, a new entity, FP², Inc., has been formed, effective July 8, 2009. FP² Inc. will now have the ability to deliver far more to its supporters, without the restrictions of being a charity. We have already been met with great acceptance and current commitments for 2010 are more than double the financial support than in recent years.

The current Foundation for Pavement Preservation has sufficient funds to continue to participate in trade shows and provide financial support to the National Center as it has since the beginning of the Center. It is anticipated that these funds will expire at the end of 2009, and at that time the Foundation will be dissolved.

FP², Inc. has obtained the services of a firm in Washington, DC, to help get the preservation message to

Our mission:

Advocating national policies, promotional activities, and research programs that advance pavement preservation.

members of Congress, so that whatever legislation emerges in the form of a new transportation bill will contain the appropriate language to further our cause.

The James B. Sorenson Excellence in Pavement Preservation Award

For the past several years the Foundation for Pavement Preservation has awarded an Excellence in Pavement Award to an agency that has developed and applied a comprehensive pavement preservation program. Nominations are solicited by an awards committee of the Foundation chaired by John Rathbun of Cutler Repaving Inc. of Lawrence, Kansas. The award is presented to the winning nominee at one of the Pavement Preservation Partnership meetings held throughout the United States.

This year the Foundation decided to name the award in honor of the late Jim Sorenson, a passionate leader in the

movement to encourage agencies to adopt a pavement preservation program. This year's award was presented to the California Department of Transportation for their leadership in protecting the State's



John Rathbun, Shakir Shatnawi and Butch Wlaschin, FHWA, with award.

infrastructure with a cost-effective preservation program. The award was presented to Caltrans at the Foundation's award banquet during the Rocky Mountain Pavement Preservation Partnership meeting in Salt Lake City, Utah, on October 15, 2009. The announcement of the award was made by John Rathbun and was accepted on behalf of Caltrans by Dr. Shakir Shatnawi, head of the Division of Pavement Management.

Plans are being made to provide a copy of the award to Jim's family.



Rubber hits the road in Yuba City!

By Ben Moody, Yuba City DPW, and Gordon Rayner CPM

Yuba City was fortunate this year to have a decent budget for performing some pavement preservation work. One contract involved a polymer modified asphalt-rubber cape seal of hot rubber chip with a Type II slurry surface coating. Another was an annual conventional Type II slurry seal contract. As it turned out, the slurry contract was scheduled to begin just as the Cape Seal work was finishing.

Just prior to beginning the slurry contract, Ryan Bangle with CPM asked if the City would like to do

a trial section of AROS (Asphalt Rubber Oxidation Shield), a new type of slurry using an Asphalt Rubber Binder composed of 15% rubber from recycled tires. According to the producer, Asphalt Rubber Systems, the base thermoplastic adhesive is prepared in accordance with ASTM D6114-97 for Asphalt Rubber Binder and is then compounded and emulsified into a smooth, waterborne emulsion.

Ryan explained that the AROS slurry would use the same Type II aggregate the City had specified for the slurry contract but with a higher application rate of 23 pounds of aggregate per square yard. Ryan also suggested the trial be placed on

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the east end of a street that was already covered on the west end by the hot rubber Cape Seal. The street, Woodbridge, was heavily eroded with a lot of cracks and a few distressed areas – a good trial area. AROS is promoted as an excellent product for protecting roads in their early to moderate stage of deterioration with a dense new wearing surface.

Yuba City was new to both processes: hot Asphalt Rubber-Cape Seal and the AROS emulsified Type II slurry. Therefore, Yuba City felt it was worth placing the trial and watching the performance of both products.



Condition prior to the slurry.

CPM began the slurry contract and scheduled the AROS work for early morning on July 28, 2009. City forces had already filled the cracks with a hot rubber material. CPM representatives walked the street and



Below: condition upon completion. Right: condition six weeks later.

marked out areas which they felt needed some additional attention. These were some minor broken areas that had begun to sink; one was a lateral pipe line that had depressed.

CPM delivered the crumb rubber modified AROS emulsion to the stockpile and the crews made the change from regular CQS emulsion to the AROS emulsion for the trial. The RoadSaver™ slurry units had already been calibrated for the AROS emulsion and these machines were set to produce the desired mix design using 18% emulsion. On arrival at



Construction process.



the project site, the first order of work was to pre-treat the cracked and sunken areas selected by CPM.

While most of these areas were less than an inch in depth, one was notable as being over 1½" deep just three feet from the curb.

With the desired areas treated, the crew began placing the AROS Slurry with a half pass down each side of the street. They began on the side of the street opposite the deep repairs, as crews worked City staff and outside agencies gathered next to one area of 1½" deep repair to watch the loaded slurry truck drive across it just 40 minutes after placement (expecting to see the wheels sink); surprising to all, the material was firm and held the estimated 55,000 pound weight of the loaded truck!

The total AROS application was completed in slightly more time than the standard slurry would take, due mainly to the pre-treating of selected areas and to the change to the heavier application rate. The finished surface was similar to what we would expect from thick slurry. The joint between the AROS slurry and the hot rubber Cape Seal offers an interesting comparison. Today, several months later, the AROS material seems to be holding up well, with none of the depressions or major cracks reappearing, and none of the crack fill material revealing itself at the surface.



Yuba City looks forward to reviewing the performance again next spring. If the AROS slurry continues to perform as it has so far, it may well offer an additional, affordable solution to handle differing pavement problems throughout the City.

City of Lancaster: Where preservation, planning and innovation meet

By Jon Cantrell and Stephen Carrillo, City of Lancaster

This article was written as a combined effort with Road Science, LLC.

A 2006 study of pavement conditions showed that the City of Lancaster had over 1,765 lane-miles of paved roads with an average Overall Condition Index (OCI) of 71 out of 100. The study indicated that 59% of the roads were considered to be in good condition, 19% in fair condition and 22% in bad condition. Although the majority of the City's road network was considered to be in good condition, it was benefiting from new construction over the previous five years. In order to effectively maintain the network, the next step was to design a plan for better roads: preserve the good ones and rehabilitate the bad ones. But Lancaster wasn't complacent with relying on conventional methods; what differentiates Lancaster from other cities is



Overview of recycling operation

its serious engagement in applying Green technologies.

The City of Lancaster realized that since virgin aggregate availability was decreasing, costs for new construction and rehabilitation were drastically

increasing. At the same time, green house emissions and noise became important considerations in deciding how to approach projects when Band-Aid fixes would no longer do. More than ever, the City needed innovative strategies to rehabilitate and maintain their roads that would be cost effective, longer lasting, and Green.

The city engineers researched available Green recycling technologies: Full-Depth Reclamation (FDR), Cold In-Place Recycling (CIR) and Cold Central Plant Recycling (CCPR). These recycling technologies presented promising potential. The city found that these technologies not only aligned with their environmentally conscious agenda, but also presented additional advantages such as reduced construction time and quicker release to traffic, thereby minimizing the inconvenience to residents. The City was also interested in defining just how cost-effective these strategies could be.

FDR impressed the City as an option for reconstruction. This option is generally considered when strengthening of the pavement structure is a must. From the FDR options that were evaluated, flexible FDR stabilized with Engineered Emulsion (EE) was the preferred one. The City found it an attractive solution for several reasons: 1) the ability to open

to traffic quickly after the material is compacted, 2) its ability to handle traffic until capped-off several days after its reconstruction, 3) the cost savings over traditional reconstruct remove and replace methods, and 4) reusing and recycling the materials that were already in place.

CIR with bituminous engineered emulsion became a good option for aged asphaltic pavements, where the functional condition had decreased dramatically but the structure thickness was adequate to manage the traffic load. CIR breaks the crack pattern on the surface, and the addition of a small amount of bituminous emulsion helps regain the structural integrity lost by the cracking. CCPR with bituminous EE provides the same results as CIR when disrupting crack patterns, but is a better solution for roads too small or curvy to fit the large equipment required by the CIR operations, i.e. narrow neighborhood streets and cul-de-sacs.

The expectation of applying recycling technologies is to preserve the existing roads in a smarter way. For Jon Cantrell, Senior Construction Manager of the City of Lancaster, road technologies have to be comparable to other growing technologies. He recalls how thirty years ago, 1.5 megabit floppy disks were the norm for data storage; now we are able to carry more than 500 gigabytes in an external memory drive small enough to fit on a keychain. Asphalt technologies have to advance in the same way. The City of Lancaster is a progressive city and its engineering department wants to make full use of successful state-of-the-art technologies. By doing so, they will provide the absolute best value for the construction dollar.

A Pavement Management System (PMS) has been a crucial part of the project planning developed by the City of Lancaster. External consultants and a leading company in asphalt technologies were involved during the project's analysis. During the decision making process, recycling options were also compared with conventional mill and fill practices, surface treatments with short life expectancies or remove and replace reconstruction methods. The applicability was sorted by cost-efficiency, traffic control, and quick releases to traffic and availability of experienced contractors.

After researching technologies, consulting with experts, and doing a cost analysis, a \$4.5 million public works contract was awarded to Granite Construction with Pavement Recycling Systems as the recycling subcontractor. The roads to be rehabilitated with innovative emulsion recycling technologies were a total of 19 lane miles.

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Condition of 60th Street West. Left side shows condition before CIR. Right side shows CIR surface at 3% emulsion content.



- Avenue K from 30th Street East to 50th Street East was selected as a perfect candidate for FDR with engineered asphaltic emulsion since it had a need of structural strengthening. Due to the ambient temperatures and the dry conditions in Lancaster, flexible systems were preferred in bases. The road was capped half with polymer-modified hot mix asphalt and the other half featured warm mix asphalt for performance comparison.
- 5,700 feet in a neighborhood known as Avenue H and 8,100 feet in a neighborhood known as Avenue H-8 were selected as candidates for CCPR with EE. Additional millings were required to make up for the total thickness designed.
- 11,600 feet in a neighborhood known as

40th Street East and 60th Street West from Ave J-8 to Ave J-4 were selected to be CIR candidates using engineered emulsion.

Avenue K will help to build knowledge and a clear comparison on emissions between HMA and WMA. It will also be a point of comparison for cost effectiveness between conventional reconstruction methods and FDR with EE. The neighborhoods and 60th Street West will

be an important direct comparison of what some agencies in California are now pursuing as maintenance strategies. CIR projects up to 4-inches thick with thin overlays at 1.25-inches or less are allowed

as maintenance under the California Department of Transportation (Caltrans) parameters. The City plans to closely monitor these roads over the coming years to analyze long-term performance and cost effectiveness compared to older, conventional methods. The city has a plan: as part of the PMS, a portion of the network roads will be inspected and updated annually for OCI calculation purposes. All of this will result in realistic life cycle cost with the satisfaction of Green technologies and no more Band-Aids.

Construction of the CIR projects started on October 26, 2009. Environmental conditions were a challenge. Strong winds and below average temperatures hit the City in the last week of October. This late construction season project was planned to be completed by the second week of November before



60th Street west during construction of last lane of CIR.

significant drop in temperature occurred during nights. 60th Street West was constructed in a one day shift and then overlaid after two days of curing. The traffic was released after two hours following the three-inch thick/deep CIR project.

Public agencies throughout the country face the same issues; dwindling budgets, deteriorating roadways, disappearing material sources and a host of ecological concerns. The objective and responsibility of these agencies is to provide the best quality product at the best price with minimal impact to the environment. The team in Lancaster (comprised of the City's Capital Engineering Division, Granite Construction Company, Pavement Recycling Systems and Road Science, LLC) accepted the challenge, and the proof is in the pavement. For more information on this project, please contact Jon Cantrell at jcantrell@cityoflanasterca.org or Sara Alzate at salzate@roadsciencellc.com.



60th street west after being opened to traffic.





Mike Miles, Caltrans

2009 Asphalt Pavement Conference held in Ontario, California

The Asphalt Pavement Association of California held its second annual conference on November 5, 2009, in Ontario California. Over 180 attendees enjoyed a day of outstanding presentations on the sustainability of asphalt pavements. Complementing the presentations were 19 exhibitors sharing their insight on materials, equipment and construction techniques. Mike Miles, Deputy Director for Caltrans in charge of maintenance and operations started the conference by discussing the state of California pavements. He indicated that 67% of all pavements are asphalt and that 25% of the pavements are in a state of distress. Caltrans needs over \$6 billion compared with the \$1.6 billion it has to take care of the distressed roads. Bond issues and the ARRA have helped, but it is not enough. Caltrans has been looking to innovative treatments to protect its infrastructure including preservation, warm mixes, recycling, asphalt rubber and terminal blends containing rubber.

Larry Santucci of the University of California moder-



Moderator, Larry Santucci

ated the rest of the day's events including presentations on the following;

- Warm mix asphalt
- Hot recycled asphalt concrete and Hot mix containing asphalt shingles
- Cold recycling including central plant, in place, including both partial depth and full depth reclamation
- Terminal blends containing crumb rubber
- Asphalt rubber usage in California
- Long-life or perpetual pavements
- Strategy selection for preservation treatments

The wrap-up for the conference was a workshop on experiences with sustainable technologies by agency and industry speakers. It included speakers from Contra Costa County, Caltrans, APA of California and Los Angeles County. All of the presentations from the event can be found on the website located at www.apaca.org. Next year's conference will be held on November 5, 2010. The location is still to be determined.



Speaker, Dave Newcomb, NAPA

Sustainability conference on asphalt rubber preservation treatments held in Monterey, California

A two-day workshop was held on October 22-23, 2009, to discuss pavement preservation treatments that contain recycled tire rubber. Over 60 people attended the meeting. Dr. Jon Epps of Granite Construction led off the conference with a history of the use of asphalt rubber and discussion of the terminology used to describe various asphalt rubber products, process, and the like. He pointed out there is some confusion in the various terms used, not only between states, but many times within states.

This was followed the first day by several excellent presentations on the following topics:

- Use of asphalt rubber in crack sealants and crack fillers.
- Design of asphalt rubber binders for chip seals and hot mixes following the Caltrans' new specifications for these products which will be coming out in 2010.
- Various pavement preservation strategies used by Caltrans, several of which contain asphalt rubber and/or terminal blends. He also indicated that the funding situation, particularly for pavement rehabilitation, will not be good for the next few years.
- Use of asphalt rubber chip seals and the importance of advance public notification and quality control aspects to ensure a successful job. Also discussed was the use of asphalt rubber

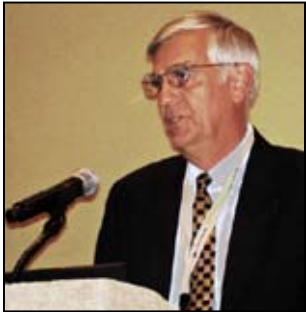
products on badly deteriorated pavements including the needed surface preparation.

- Mix design practices for both gap-graded (RHMA-G) and open-graded mixes (RHMA-O). It was noted that a trend in lower asphalt rubber binder contents have caused some early distress. These lower binder contents are being addressed in the new design criteria for these mixes.
- Best practices when using asphalt rubber hot mixes.
- Importance of quality assurance at the plant and on the grade. The importance of project selection, design, specifications, construction and maintenance in the QA life cycle was emphasized.
- Review of the research by several agencies including the Corps of Engineer's Caltrans, CIWMB and others.
- Discussion on the major changes in the Section 39 specifications for asphalt rubber hot mixes.

The day was concluded with a presentation by Dr. Barry Takallou, President of the RPA Board of Directors, on the important properties of asphalt rubber binders and mixes.

The second day began with a presentation on the California Pavement Preservation (CP²) Center by Dr. Gary Hicks. He described the status of the current Caltrans work as well as the work for other clients.

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Jon Epps of Granite Construction discussed the history of asphalt rubber and issues with regard to terminology.

The Center is expected to be funded for another three years beginning in January 2010. Other presentations on day two included:

- Discussion of chip seal test sections containing asphalt rubber and terminal blends placed on high traffic roads in a very hot climate. Most materials showed signs of bleeding in the of the chip seals within 2 years. One of the products, a polymer modified asphalt rubber, performed better than the other products.
- Discussion of the Caltrans' quiet pavements work done at UC Davis. It was reported that older pavements and rougher pavements are noisier. The RHMA-O mixes are reportedly the quietest mixes.

- Discussion of a LCCA study of asphalt rubber vs. conventional mixes indicating the cost effectiveness of asphalt rubber products. The study needs to be updated to include current costs and treatment lives.
- Discussions on the use of the MEPDG with preservation treatments and the environmental benefits of asphalt rubber pavements.
- CIWMB current grant programs for asphalt rubber and terminal blends.

Doug Carlson of RPA wrapped up the meeting by indicating asphalt rubber use in California is growing. Barriers are being overcome through technology transfer. All presentations can be found on the RPA website at www.rubberpavements.org.



California concrete pavement workshop well attended

Over 80 people attended the October 8 workshop at the Sacramento Convention Center. Attendees included representatives from Caltrans, local agencies, FHWA, industry and academia. The conference was organized by ACPA and was also sponsored by Caltrans, FHWA and the Tech Transfer program at the University of California at Berkeley.

After opening remarks by Craig Hennings, ACPA Executive Director, Rick Land, Caltrans Chief Engineer discussed the state of the concrete pavements in California. He noted that without the support of industry, projects such as the bay bridge, the Caldecott tunnel and long-life pavements could not have been accomplished. Many concrete

pavements designed for 20 years in the 60's have lasted 40 years or more. Despite the lack of funding for rehabilitation projects from the State, Caltrans is busy putting projects down with bond monies as well as funds from the ARRA stimulus packet. All of the newly designed pavements are engineered to last 40-50 years and, with the use of timely preservation, could last up to 100 years.

Walter "Butch" Waidelich, FHWA Administrator-California Division, then reported on the status of federal funding and re-authorization followed by a discussion of Life Cycle Assessment for concrete pavements by Dr. Nick Santero of the Lawrence Berkeley National Laboratory.

Following a break in the exhibit area, breakout sessions on benefits of concrete pavements (both fuel economy and life cycle cost analysis) as well as a

concrete pavement preservation workshop provided the opportunity for some detailed discussion on these topics. The morning session was concluded with a presentation by Dr. Shakir Shatnawi, Caltrans State Pavement Engineer, on an Overview of his new Pavement Division.

The afternoon began with a presentation by Dan Huffman of the NRMCA on Sustainability of Concrete. He discussed the green highways project and the benefits of concrete included costs, light reflectance, heat island effects and more. He also discussed the use of pervious concrete and its advantages. This was followed by breakout sessions on pavement design (long life pavements and ride quality issues) as well as Continuously Reinforced Concrete Pavement (CRCP) technology. Caltrans built a CRCP project in the 40's that was just overlaid and they plan on trying more.

Craig Hennings closed the conference by stating "with all benefits of concrete that you learned today, you should be asking yourself 'Why aren't we using more concrete pavements?' If you're driving or flying this afternoon: remember, you will be using concrete pavement! We all use concrete pavement, and we know it to be the 'green solution' for pavement as we move forward in the 21st Century. We also know it to be safe — and durable. Concrete pavement is sustainable, a very positive word in the environmental vocabulary. Whether concrete pavement is a 50-some-year-old Interstate or part of a newly constructed runway out there, it is the pavement that can be counted on. To have a longer than expected service life in pavement, concrete pavements must be well designed, well constructed, and well maintained." All presentations can be found on the conference link at www.acpa-southwest.org/workshops.htm.



Richard Land, Caltrans



Craig Hennings,
ACPA



Butch Waidelich,
FHWA



CalAPA conference hears from Caltrans' Iwasaki

By Russ Snyder, Executive Director, CalAPA

Caltrans' Director Randy Iwasaki, speaking to an asphalt pavement industry conference, gave a frank assessment of "strained" transportation funding, the importance of the Caltrans-construction industry partnership and green initiatives. Iwasaki, who took over the top job at the State Highway Department earlier this year from Will Kempton, delivered the keynote address at the filled-to-capacity "California Asphalt Pavement Forum" November 12th organized by the California Asphalt Pavement Association (CalAPA) at the Doubletree Hotel in Sacramento.

Addressing one of the chief concerns of the construction industry in a recession economy – highway funding Iwasaki said, "There's not a lot of money pouring into the coffers of transportation to deal with this aging infrastructure. You see it every day in the pavement."



Caltrans Director Randy Iwasaki, speaking at the CalAPA conference, outlined the agency's highway program, funding, and priorities. Among the participants at the conference were, from left, Russ Snyder, Tony Limas, Jack Van Kirk, Iwasaki, Jeff Reed, and Skip Brown.

Overall, Iwasaki said, Caltrans estimates it would take about \$6.5 billion a year to properly maintain California's immense surface transportation system, but that only a fraction of that is being spent in any given year.

"Transportation funding is strained," he said, "and so we have to really watch it." Funding has been further hampered by the economic downturn, which has curtailed gasoline consumption and subsequently the gas taxes that pay for transportation investment.

"Our economy depends on a safe and efficient transportation system," Iwasaki said. "If you take a look at ... the growth of VMT (vehicle-miles traveled) over the years, and you look at the growth of the economy in California, they're pretty much parallel. And you look at today, when VMT is going down, and look at the economy, it goes down."

But despite the lower revenues available for trans-

portation, the federal economic stimulus bill has helped soften the blow, he said.

"The Recovery Act, it couldn't have come at a better time for California," he said, noting that California currently is able to funnel that money toward 370 projects for \$1.26 billion worth of recovery dollars. The total amount California received for streets and highways was \$2.57 billion. To critics who charge that the stimulus money has not made its way to projects quick enough, Iwasaki said that California has awarded more projects worth more dollars than any other state, but that "you may not see a lot of it because they're just starting."

Another factor, he said, is that local projects that may be underway have not yet sought reimbursement from the State.

On other matters, Iwasaki, a 26-year Caltrans veteran, stressed the importance of the partnership between Caltrans and the construction industry in delivering the best transportation program possible.

"Partnership – partnering with the construction industry – (is) very important," he said. "We don't build anything, the last time I checked. What we do is that we'll design the projects, we'll get them environmentally cleared, but the contractors build the projects. And that's why I try to remind everybody that we work together to build a safe and efficient transportation system."

And investing in good transportation also makes good economic sense, he noted, citing estimates of between 18,000 and 33,000 jobs that are retained or created for every billion dollars in public works construction.

Caltrans and our partners ... create jobs," he said. "We're good for the economy." He also voiced support for the Pavement Preservation Program, saying it provided a good value for taxpayers with relatively little overhead. He also said the various "green" initiatives Caltrans and the construction industry are advancing, such as the use of Warm Mix Asphalt and more recycled asphalt, are helping road construction and maintenance be more environment-friendly.

Speaking to the conference earlier in the day, Caltrans State Pavement Engineer Dr. Shakir Shatnawi echoed a similar partnership theme, saying, "We're all in this together. There's no other way to be."

Shatnawi also expressed support for the concept of joint Caltrans-industry training and joint certification for asphalt test methods. The conference also featured a presentation by Colorado Asphalt Pavement Association Executive Director Tom Peterson on the successful joint training and certification program underway in Colorado. A joint Caltrans-industry "task group" has recently formed under the auspices of the Caltrans-Industry Rock

Continued, next page

Products Committee to explore implementing such a program in California.

Tony Limas, Technical Services Manager with Granite Construction, presented the very latest on Warm Mix Asphalt, including a rundown of the various pilot projects that have been done in California. Granite Construction has extensive Warm Mix Asphalt experience in California and across the nation. The National Asphalt Pavement Association estimates that within five years more than half of all asphalt produced will be of the warm mix type, which can be produced at lower temperatures, emits less pollutants and uses less fuel to make.

Skip Brown, president of Delta Construction Co. of Sacramento, and founder of Asphalt Consulting Services, LLC, updated conference attendees on the state of the new Caltrans pavement smoothness specification as it relates to asphalt. Of particular interest is language being hammered out between Caltrans and industry representatives on thin-lift overlays?

Major changes to the Caltrans Section 39 asphalt specification were outlined in detail by Jack Van Kirk of George Reed, Inc., and later dissected in a panel discussion that featured Teichert Aggregates Quality Control Supervisor John Schmidt. CalAPA plans to sponsor a series of seminars around the state to educate contactors and city and county public works agencies of the signification changes to the specification and the impact the changes will have on projects.

Asphalt pavement consult and former CalAPA Executive Director Roger Smith gave a presentation on specialty mixes, including porous pavements and intersection mixes, and Twining Labs Technical Services Manager Tom Carter gave a comprehensive presentation on recycled asphalt pavement (RAP).

The event was sponsored by Granite Construction, Maxam Equipment, MeadWestvaco, Sasol Corp., PQ Corp. and Valero Refining. All conference presentations are available to download at the CalAPA website: www.californiapavements.org.



PPTG news

All-members meeting

There will be a general meeting of the PPTG members on Monday, December 7, 2009, at the Caltrans office located at 2800 Gateway Oaks Drive, Sacramento, in the Yosemite rooms.

At the meeting, the election for industry representatives for the flexible pavement co-chair and the rigid pavement co-chair positions will be held. Also, the results of the elections for the industry sub-task group co-chairs will be announced. The CP² Center has been assisting the PPTG in conducting the nominations and elections for the sub-task group co-chairs. In October the Center requested submittal of nominations from members of the sub-task groups. After receiving the nominations, the CP² Center sent election ballots to the members in mid-November. The members sent their votes to CP² for verification and counting. Caltrans sub-task group co-chairs are not elected but rather are appointment and remain the same until the co-chair is unable to serve.

Other topics to be covered at the meeting include:

- Update on the Division of Pavement Management
- Update on the CP² Center
- PPTG subgroup reports

Accomplishments in 2009

This year the PPTG was very successful in meeting the May 19 deadline, set by Caltrans, for submission of new or revised standard special provisions (SSPs). There were four SSPs submitted for the Bonded Wearing Course (BWC): conventional gap-graded (39-640) and open-graded (39-700) and; rubberized gap-graded (39-660) and open-graded (39-680).

Also, micro-surfacing (37-600), crack treatment (37-400) and one for asphalt rubber chip seal (37-030) were posted as well. All of these will be incorporated into the 2010 Standard Specifications.

The Chip Seal and Binder sub-task groups jointly developed a new Non-SSP (NSSP) for Polymer modified binder chip seal that provides two binder options. The first option is a PG76-22 PM and the other option is a PG76-22TR. For a copy of this specification, please contact Larry Rouen at larry_rouen@dot.gov.ca.

The PPTG co-chairs met once this year on May 27, 2009. One of the main items accomplished at this meeting were some amendments to the PPTG charter. Briefly, it limited voting for the PPTG co-chairs and the sub-task co-chairs to one vote per company. For more details on the meeting, please check out the PPTG website at www.cp2infor.org/task-group.

The strategy selection sub-group continued to make progress in several areas. They have developed software to assist users in strategy selection as well as a database for pavement preservation projects. Please see the articles in the Center news section for more details on these topics.

Finally, the Southern California local agency sub-group met on November 16, 2009 to hear an update on the PPTG and the Center. They also discussed the need for collecting information on preservation jobs completed by local agencies around the State. This includes specifications and information on how the preservation treatments have performed. If interested in helping with this effort, please contact Erik Updyke, the local agency co-chair at eupdyke@dpw.co.la.ca.us.

Continued, next page



Plans for 2010

Due to the State budget crisis there were no MTAG training seminars held in 2009; however, two seminars are being planned for 2010. One will be held in Northern California and the other will be held in Southern California. No dates have been set for either seminar. Expect an announcement early in 2010.

There will be one meeting of the PPTG sub-task group co-chairs and one meeting for the general membership. One will be held in the North and one in the South. No dates have been set yet.

Sub-task groups that helped develop the new SSPs will be called upon to update their MTAG chapters to reflect the new specifications.



CP² Center news

Caltrans Pavements Academy

Center staff is currently working on the development of a Pavements Academy for Caltrans personnel. Dragos Andrei of Cal Poly Pomona, Shadi Saadeh of CSU, Long Beach and Mary Stroup-Gardiner of CSU, Chico are involved in this effort. A course outline has been developed and the team is now developing the course materials on a variety of pavement related topics. The materials are scheduled to be completed by the end of summer 2010. For more information on this effort, please contact Mary Stroup-Gardiner at mstroup-gardiner@csuchico.edu.



Spring 2010 plans for the Pavement Preservation Certificate Program

On-line classes for the Introduction to Pavement Preservation and Rigid Pavement Preservation will be available in the spring 2010 semester. For more information, please contact Mary Stroup-Gardiner, Center Technical Director at mstroup-gardiner@csuchico.edu.

Strategy selection software

A draft of the flexible pavement treatment strategy selection software has been developed by the CP² Center. The software is a web-based program and has three major components. The first component is preliminary selection of feasible flexible pavement treatments. It is based on Caltrans MTAG chapter 3 on strategy selection (Figures 3-3 and 3-4). There are 30 flexible treatments listed in the program, from crack sealing to dig outs. Based on a user's selection for non-crack related and/or crack related distresses, the software can quickly produce a preliminary list of treatments that meet the user's selection criteria. The second major component is simplified cost analysis. This component provides an engineering economic method to calculate equivalent annual cost (EAC) for each previously selected flexible treatment based on expected treatment life, costs, and interest rates. The third major component is called expert based ranking system. The Center is developing a knowledge based expert system where the system asks critical questions for

the user to answer to narrow down solutions. It provides recommendations on score and weight factors for each selection criterion. Finally, it uses a utility function to rank treatments according to their final weighted scores. The following is the link to the program: <http://ceresearch.ecst.csuchico.edu/TreatmentSelection/>. For questions on the software, please contact dxcheng@csuchico.edu.

Pavement preservation database

The CP² Center has also developed a pavement preservation database. Many times, the valuable construction and maintenance history for projects are lost over a number of years. Or it may be kept somewhere, but it is difficult to find the data. The objectives of the database are to help agencies to record their pavement preservation projects and innovations into a centralized online database, and to track the long term performance of these pavement preservation projects. The database can also help to disseminate the knowledge of pavement preservation. The database has opportunities for general and advanced users. Anyone can create an account through online website and become a general user. A general user can view and search pavement preservation projects in the database. However, a general user cannot create new or edit existing projects. General users can be upgraded to advanced users, and start to add or edit their pavement preservation projects. The pavement preservation database can store both flexible and rigid pavement preservation projects. The database is managed by the CP² Center staff and stored at the College of Engineering of CSU Chico. If you have any questions or suggestions about the database, please contact Professor Ding Cheng at dxcheng@csuchico.edu. The website of the database is: www.ecst.csuchico.edu/cp2c/software/pptdb

Innovation database

The objectives of creating the innovation database are to help Caltrans streamline the process for implementing innovation and new products in the areas of pavement preservation and to encourage technical transfer through dissemination of information through a web site. Version 1.0 of the Innovation Database has been developed by the PPTG innovation subgroup and the CP² Cen-

Continued, next page

ter. The database is capable of receiving innovation proposals, storing comments from reviewers, and approving innovations by a Caltrans PPTG Chair. Caltrans' new innovation projects, such as RAC-O-HB, Interlayer, Fog and Rejuvenation Seal, Chip Seal, Warm Mix, CIR, and European quiet pavement are being stored in the database. New functions have been added to the database. Users can create usernames and passwords directly from the website. The innovation database is linked to the pavement preservation treatment database so the performance of the innovation projects can be tracked over the years. The website can be accessed by clicking on the following link: www.ecst.csuchico.edu/cp2c/innovation_database/. For question on this database, please contact Ding Cheng dxcheng@csuchico.edu.

Center staff provides instruction on asphalt recycling



Gary Hicks (CP² Center) and Blair Barnhardt (Atlanta Paving) were instructors in a two-day FHWA course on asphalt recycling for a delegation from South Korea on October 19-20, 2009. Topics covered were hot recycling, cold recycling, cold planing, and full depth reclamation. Gary and Blair are certified instructors for NHI. The delegation consisted of members from industry, government and research institutions. The photo above shows the group at the end of the course.

Center staff participates in public works conference

The annual Northern California APWA Conference was held at the San Ramon Marriott on September 9-10, 2009 with more than 200 agency personnel from the Bay Area and more than 35 vendors present. Gary Hicks of the Center and Scott Dmytrow of Telfer Oil gave a presentation on "The Politics and

Funding of Pavement Preservation" as part of the roadway sessions. The presentation can be found on the Center website at www.cp2info.org/center. The presentation is the start of a guide for agencies on how to develop a pavement preservation program by learning from the experience of others. Other topics discussed at the conference related to pavements include:

- Design for thin HMA overlays
- Full depth reclamation
- Pervious concrete pavements

For more information on the conference please contact Gary Hicks at the CP² Center at rghicks@csuchico.edu or Scott Dmytrow, Northern California APWA Education Director, at scott.dmytrow@telferoil.com

Innovation update

Mary Stroup-Gardiner is leading the effort on the documentation of the following innovation projects constructed by Caltrans:

- Warm mix test section at Morro Bay, District 5
- Asphalt rubber and terminal blend chip seal test sections, District 11
- Fog and rejuvenating seal test sections in Districts 1, 2, and 9
- Cold in-place recycling projects constructed in District 6

Other projects planned for 2010 include the following:

- Concrete quiet pavement test section, District 11
- REAS test sections in District 7 and 11
- Chip seal over Fabric test section, District 6.

For more information on these projects, please contact Dr. Stroup-Gardiner, mstroup-gardiner@csuchico.edu.

Center Help Desk

The Center help desk often receives questions like the following two examples for which it provides answers. If you have questions that you would like answered, please contact R. Gary Hicks at rghicks@csuchico.edu.

Is this a candidate for preservation or not?



Continued, next page

We receive numerous calls requesting whether a given project is a good candidate for preservation. Here is an example. What steps are needed to determine whether this is a candidate for preservation? Please let us know what you would do.

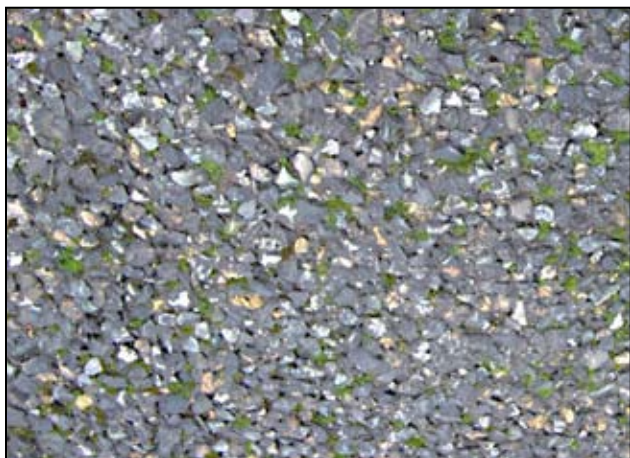
A new type of "green" pavement in Northern California

In heavily shaded and wet areas, moss can grow on pavements and create a slippery surface. On driveways, we can remove the moss using pressure washing or chemicals. On pavements, these techniques may not be very cost effective or environmentally acceptable. Snow plows or studded tires can remove the moss at high elevations. But what

about areas where there are no snow plows or studded tires? On the left is a photo of moss on a pavement in the northwest part of the State. Does anyone have any creative ideas of how to solve these problems?



Close-up of green pavement



California hosting national and international conferences scheduled for spring, 2010

AAPT meeting to be held in Sacramento in March 2010

The Association of Asphalt Paving Technologists (AAPT) Annual Meeting and Technical Sessions will be held in Sacramento, California at the Hyatt Regency at Capital Plaza on **March 8-10, 2010**. Randell Iwasaki, Director of Caltrans, will provide the opening remarks. AAPT is one of the most prestigious asphalt organizations in the United States. Jim Moulthrop of Fugro (and Executive Director of the Foundation for Pavement Preservation) is its current President, and the AAPT Board has put together an interesting program. For more information, including the meeting schedule, please view their website at www.asphalt-technology.org/. If you are interested in being an exhibitor or a sponsor, please contact the AAPT Office at aaptinfo@gmail.com. The conference hotel is across the street from the State Capitol.



First International Conference to be held in Newport Beach in April 2010

Caltrans, FHWA and the Foundation for Pavement preservation are the primary hosts of this important event to be held in Newport Beach on **April 13-15, 2010**. The conference program and registration information can be found on the conference website at www.pavementpreservation.org/icpp/. Speakers in the opening session will include Randell Iwasaki, Director of Caltrans, as well as prominent industry speakers all concerned with preservation of the highway infrastructure. Information on becoming a sponsor or and exhibitor at this event can be obtained by contacting Helen Bassham at conferences@techtransfer.berkeley.edu. We look forward to seeing you in Newport Beach in April 2010.



Upcoming events

January 2010

20-21 – California Chip Seal Association Annual Meeting. Seaside, Calif.

www.chipseal.org/2010_conference.htm

26-29 – Slurry Systems Workshop. Texas Station Hotel & Casino, Las Vegas, Nev.

www.slurry.org

March 2010

2-6 – AEMA/ARRA/ISSA Annual Meeting. Trump International Beach Resort, Sunny Iles Beach, Fla.

For a complete listing of upcoming events listed with CP², go to [www.CP²info.org/center](http://www.CP2info.org/center).

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