

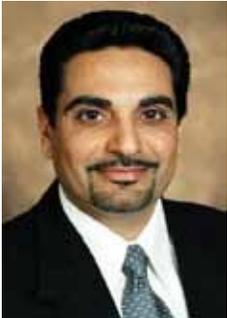


CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

No. 16

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Amarjeet Benipal

Interview with Amarjeet S. Benipal, Caltrans' new State Pavement Engineer

On September 7, 2010, Amarjeet Benipal was appointed as the new Assistant Division Chief, Pavement Management Program, in the Division of Maintenance which includes serving as the State Pavement Engineer. Amarjeet has been with Caltrans for over 20 years and has proven his skills and leadership abilities through assignments that have included Project and Design Engineer in Central Design and Project Manager in District 3 where he rose to Principal Transportation Engineer, Division Chief of Project Development. He has also assisted the Department by taking on the role of Acting Division Chief of DES and Acting Division Chief of the Division of Pavement Management.

Amarjeet obtained his B.S. in Civil Engineering in 1984 from Panjab University and has earned his Project Management Professional status. He has extensive experience with partnering with our stakeholders. His collaborative leadership style and his participation in the SHOPP process will help California be a leader in providing smooth, long-lasting and sustainable pavements

Center Staff visited with Amarjeet in October, 2010, to get his views on the questions below.

Do you have any new goals for the Pavement Management Group in the Division of Maintenance?

Our primary goal will be to manage the pavement infrastructure efficiently and effectively by utilizing new "green technologies" available to the Department. These include expanded use of pavement preservation treatments including pavement recycling. We will be working with our partners in the PPTG and other groups to implement these changes. Also, the State Pavement Engineer will clear any unresolved pavement issues with our industry partners.

Are there any plans for reorganizing the Pavement Management Program now that you are the State Pavement Engineer?

We are proposing a few changes in our organization. Moving forward, we will have the following four offices:

- **Planning and programming.** This office is headed by Susan Massey and is responsible for

planning and programming all maintenance and rehabilitation projects in the state.

- **Concrete Pavements and Pavement Foundations.** This office is headed by Bill Farnbach and is responsible for Concrete Pavement Engineering and Preservation, development of specifications for concrete pavement, and pavement foundations. The office will support concrete pavement investigations and assist District Maintenance, Materials, Design and Construction staff in delivery of projects.
- **Asphalt Pavements.** This group is headed by Peter Vacura and is responsible for Asphalt

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Pavement Engineering and Preservation and for development of specifications for asphalt pavements. The office will also support asphalt pavement investigations and assist District Maintenance, Materials, Design and Construction staff in delivery of projects.

- **Pavement management and performance.** This group is headed by Tom Pyle and is responsible for the development of the new Caltrans pavement management system.

What are your plans for the future of the Pavement Preservation Task Group?

We are currently reorganizing not only Rock Products, but also the PPTG. The Rock Products committee oversees all task groups including those on concrete, asphalt pavements, foundations, and pavement preservation. The State Pavement Engineer and Materials Engineer along with the Division of Construction will be the Caltrans co-chairs for Rock products. Tony Limas of Granite Construction will be the industry co-chair. We are working on the mission statement, trying to eliminate redundant task groups, and streamlining the overall process.

We continue to work on the 2010 specifications that are being finalized in cooperation with industry. The end of March, 2011, is the target for the 2010 specifications release.

The PPTG is also undergoing restructuring. We will be reducing the number of sub-task groups from 22 to half that number. We want to make sure pavement preservation decisions are made more quickly. A companion article describes in greater detail the changes to be made with the PPTG. Peter Vacura is now the Caltrans chair of the PPTG and he will be working closely with industry to make

the changes.

What will be the role of the Center for Pavement Preservation in your plans?

We expect the Center to continue to provide technical support and guidance, provide subject matter expertise, assist in the development of pavement preservation products, and help with the training of Caltrans personnel. The Center will also monitor innovation projects and help promote preservation through its newsletter and other publications.

Can you provide an update on the Pavement Management Project?

We have awarded two contracts of our proposed pavement management system. My staff is currently overseeing the ground penetration radar contract to obtain as-builts of all 50,000 lane miles of road. They are also starting the pavement data collection contract using an automated vehicle to obtain ride, distress, and other information related to the condition of the state highways. Both of these contracts have been awarded to Fugro Engineering in Roseville, Calif. The third and final contract will purchase Pavem software and install data beginning in 2011. Proposals from vendors are currently under review and an award should be in place early next year.

Please provide an update on other projects your group will be pursuing.

Possible projects include safety edges for asphalt concrete, precast concrete slabs for use in slab replacement, increased RHMA usage, next generation concrete grind, 2010 specifications, and warm mix asphalt.



CalRecycle offers assistance and funding through “Green Roads” campaign

By Jillianne Luong (on behalf of CalRecycle)

By promoting markets for tire-derived products the Department of Resources Recycling and Recovery (CalRecycle) is helping California inch closer toward its 90 percent tire recycling goal. CalRecycle’s “Green Roads” program furthers this effort by encouraging the use of waste tires in paving and road rehabilitation projects. The department also provides research, local assistance, and grant funding to support activities that reduce the number of waste tires going to landfills and being illegally stockpiled.

RAC applications – asphalt rubber hot mix and rubber chip seals

Rubberized asphalt concrete (RAC) consists of crumb rubber ground from waste tires that is mixed with asphalt and aggregate. This mixture forms a durable alternative to traditional asphalt concrete and can be placed using conventional paving equipment.

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Two of the most common paving applications promoted by CalRecycle are RAC and rubberized chip seal.

Rubberized asphalt concrete applications

RAC can be used as an overlay and often can be placed at a reduced thickness while maintaining a high degree of protection against reflective cracking. Studies indicate that RAC also provides increased structural strength over conventional asphalt concrete and is often more cost-effective.

Rubberized chip seal applications

A chip seal can be used effectively in cases where the existing roadway is basically sound and all that is needed is a new surface course. The crumb rubber in the asphalt binder provides greater surface flexibility, increasing the resistance to reflective



RAC is a “green” replacement for gravel in applications such as this rail line,

cracking. Two common processes that can be used to add crumb rubber to asphalt concrete are the Asphalt Rubber field blend process and the Terminal Blend process. The decision about which process to use is made on a project-by-project basis when plans and specifications are developed.

Types of rubber modified binders

Asphalt-Rubber Process (Field Blend) One method to add crumb rubber to asphalt concrete is the Asphalt Rubber Process, in which the rubber particles react with the asphalt cement at elevated temperatures prior to adding the resulting binder to the aggregate. Typically the rubber particles are about 18% or more of the weight of the binder.

Rubber modified binders (Terminal Blend Process) The second method is the Terminal Blend Process which blends the crumb rubber into the asphalt at the refinery and can be delivered directly to the project site. This process originally used less crumb rubber per lane mile than the Asphalt-Rubber Process, but now can contain from 10 to 18% or more crumb rubber modifier. An advantage of this process is that the binder can be graded just like conventional hot mix binders using the PG grading system employed by Caltrans.

RAC grants

CalRecycle offers RAC grant programs to make funding and resources as accessible as possible to a variety of projects in California. The grant pro-

grams are designed to create long-term sustainable markets by focusing on RAC users with limited or no experience in the process. Beginning with fiscal year 2010/2011, CalRecycle offers a single, consolidated application for use with the following RAC grant programs: Targeted RAC Incentive (TRI) and RAC Chip Seal. Eligible applicants include cities, counties, and qualifying American Indian tribes that fund public works projects located in California.

CalRecycle also provides RAC engineering and technical assistance to its RAC grantees and local jurisdictions through a contract with Jacobs Engineering. This assistance provides education and training on RAC usage, design, specification, construction, inspection, and technical assistance for agencies throughout California.

The overall objective of this effort is to increase the technical knowledge base of RAC to ensure successful projects and thereby increase local agency use of RAC. CalRecycle also supports local agencies by providing construction management oversight on RAC grant projects. Additionally, CalRecycle is developing a Cooperative Purchase Program for local agencies to counteract the cost and material availability issues faced by agencies with small quantity projects.

The training program is accomplished in several different ways including: one-on-one training sessions for agencies; group and regional training workshops; webinars; and presentations at industry seminars and conferences.

Tire-derived aggregate

Tire-Derived Aggregate (TDA) is another recycled tire product that uses many waste tires per project in various construction projects from road refurbishment to landfill drainage systems. As a replacement for conventional aggregate, TDA is a safe, reliable, and cost-effective option. TDA has superior drainage properties and reduces noise and vibration when used in light-rail projects.

Based on the success of its RAC grant programs, CalRecycle proposes to implement a TDA grant program. If implemented, the program will provide funding to local governments, public entities and private businesses for civil engineering projects using TDA. Projects that may receive grants include landslide repair, gravel replacement in landfills, rail lines, retaining walls, and other civil engineering projects.

For more information

Please visit CalRecycle’s Green Roads website, www.PavingGreenRoads.com, for more information about RAC and TDA.

Please direct specific questions on RAC or Rubber Chip Seals to Nate Gauff at Nathan.Gauff@calrecycle.ca.gov. For questions on TDA, contact Stacey Patenaude at Stacey.Patenaude@calrecycle.ca.gov.



Asphalt rubber chip seals with warm mix test strip in Caltrans District 6

By Lerose Lane and Ding Cheng (CP2 Center), and Oscar Sherrill (Caltrans)

An asphalt rubber (AR) chip seal is an effective pavement preservation technique, which has provided better performance and longer life than regular chip seals. In the past, the application temperature of asphalt rubber binder has been about 400°F to be effective in California. This temperature creates significant smoke, emissions, and odors. Due to environmental concerns, lowering the application temperature is a way to reduce the emissions to meet the California Air Resources Board (CARB) requirement.

With the advance of warm mix technologies, Caltrans tried an innovation project using a warm mix additive to reduce the application temperature of an AR chip seal. Some local agencies, such as L.A. County and the City of Roseville, have already tried AR Chip Seal with WMA and they have had successful experiences. Caltrans, partnering with Inter-mountain Slurry Seal, Inc., constructed a test strip in District 6 on I-5 from PM 37.2 to PM 45.0 on the five-foot wide northbound shoulder.

The existing asphalt concrete shoulder was exhibiting weathering and some transverse cracks. The existing pavement condition exhibited mild to moderate degrees of distress (see Figure 1).

Figure 1. Pre-existing shoulder condition.



Construction took place on September 2, 2010, between 7:00 P.M. to 12:00 A.M. for the warm mix seal coat. The five-foot wide NB median shoulder was treated from PM 37.2 to PM 45.0 for a total of 41,200 linear feet. The weather during the time of construction of the AR chip seal

with warm mix was hot and clear, around 90° F air temperature at the start time, with pavement temperatures in the 80s and 90s. The minimum pavement temperature during the warm mix asphalt rubber seal coat application was 75° F at midnight.

The application rate was 0.6 gal/yd², and it was slightly higher in the center of the five-foot shoulder due to some overlap between the two passes. The asphalt rubber binder application temperature was 340°F. The asphalt content for the 3/8-inch pre-coated hot chips was 0.5% by weight. The asphalt used for the pre-coating was PG64-16. The pre-coated chips were hot applied at 300° F.

The surface of the finished job was uniform and the screenings appeared to be adhering well. A photo of the completed job is shown in Figure 2.

The District 6 warm mix asphalt rubber chip seal project has substantially less emissions when compared to a conventional AR chip seal because of the lower application temperature. The WMA also provided a longer time for the placement and rolling of the chip. The CP2 Center will monitor the long term performance of the test strip.



Figure 2. Close-up of the completed pavement surface after sanding.



Caltrans District 1 warm mix projects

By Sean Swanson (CP² Center) and Chuck Lees, Greg Thorne and Charly Eital (Caltrans D1)

Engineers in District 1, headquartered in Eureka, Calif., have expanded their use of warm mix technologies with two more projects constructed during the summer of 2010. This continues the pilots placed in 2009 using warm mix technologies in conventional and AR mixes.

State Route 1

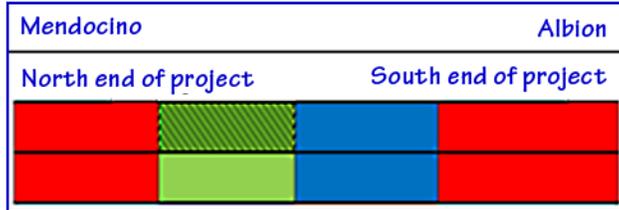
The first project was placed in late June and early July, 2010, on SR 1 between Mendocino and Albion River Bridge. The contractor for the project was Granite Construction out of Ukiah, Calif., and

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the RE for Caltrans was Chuck Lees based in Fort Bragg. The warm mix technologies selected for the open graded polymer modified mix (PG 64-28 PM) were as follows: Advera, Rediset, and Double Barrel Green method.

The layout for the paving is shown in Figure 1 which locates the different projects and where they were placed along the length of the project.

Figure 1. Two-lane route 1 paving plan



Red - DGAC
 Green - OGAC with Advera
 Green with slash - OGAC with Rediset
 Blue - OGAC (Green Machine)

A counter flow drum plant was used to produce the warm mix with polymer modified binder. The plant mix was transported from Ukiah, approximately 64 miles away, about a 1- to 1½-hour trip from the job site. The weather during construction was cool with a high of about 60° F and a low of about 54° F. The weather was also dry and the wind was calm. The mixing, laydown and compaction temperatures are summarized as follows:

Table 1. Mix temperature of SR 1

Product	Mix Temperature at plant (°F)	Mix Temperature in shuttle buggy (°F)	Mix Temperature behind paver (°F)
Control	325	NA	225-260
Control with Advera	270	240-255	225-245
Control with Rediset	270	240-250	230-235
Control with Green Machine	270	NA	240

The transport trucks were tarped to reduce the heat loss in the mix during transport. The mix was dumped into a material transfer vehicle (MTV) and then placed using a laydown machine. Breakdown compaction was done using a 10-ton vibratory compactor followed by intermediate compaction using a 10-ton pneumatic roller. Finish compaction was done using a double drum 12-ton roller. The compaction of the mix was easily accomplished. The finished thickness was to have been about one inch, but in places it was much thicker.



Figure 2. Breakdown compaction on Route 1

The finished surface is shown in the following photo. The RE mentioned the mix was initially tender but that it set up nicely within a few days.

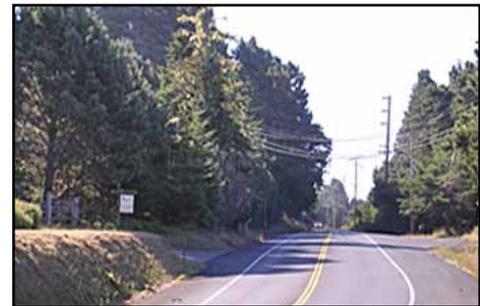


Figure 3. Finished project after striping

Overall, Caltrans was very pleased with the warm mix HMA placed on SR 1. The RE said that compaction was easy to attain even at the lower temperatures. There were few emissions at the plant and the final product looks good.

SR 101

This project, constructed in August 2010, was a short project between Arcata and Crescent City along the north coast. Granite Construction was the contractor on this project. This project consisted of cold planing and patching an existing open graded mix to remove loose materials and then placing a 1.2 inch layer of a dense-graded mix containing a PG 64-28 TR and a PG 64-28 PM binder. The proposed paving plan for the project is shown in Figure 4.

Figure 4. Four lane hwy 101 paving plan



Red - PG 64-28 TR
 Green - PG 64-28 PM with Advera
 Blue - PG 64-28 PM

The mix design for the ½-inch Type A HMA overlay used 5.3% asphalt binder. The terminal blend rubberized binders were provided by Paramount from Elk Grove, Calif. The mix temperatures were recorded at several sites in the paving operation.

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The data below summarizes this information.

Table 2. Mix temperatures at paving sites

Product	Mix temperature at plant (°F)	Mix temperature behind the paver (°F)	Mix temperature at initial compaction (°F)	Mix temperature at final compaction (°F)
Control TR	325	290-300	270-280	220
PM with Warm mix Advera	310	280-290	265-275	220

Some problems were encountered with the introduction of the warm mix additive. These included the warm mix additive feed system which wasn't working properly and there was some loss of additive during the mixing process. As a result, all warm

Figure 5. Behind the paver with HMA



mix terminal blends planned were not placed. The remainder of the project went well. Figure 5 illustrates part of the construction process

Greg Thorne was the RE on the project. Overall, he was pleased with the long hauls and the workability of the pavement in the weather below 60°F, except for the prob-



Figure 6 Finished paving with striping

lems with introducing the Advera into the mix. The plant lost around 1% of the Advera mix on the first day which was around 500 lbs for the day. The second day the Advera pump was also unsuccessful so the warm mix terminal blends were not placed as planned.

Summary

The Center will monitor these projects over the next few years and include them in its pavement preservation database. For more information on the warm mix projects, contact either Dr. Gary Hicks or Dr. Ding Cheng at the CP² Center.



Bonded wearing course as a pavement preservation strategy in Caltrans District 4

By Sara Alzate (Road Science LLC)

The first bonded wearing course (BWC) placed in the state of California was executed in 1998 by Los Angeles County on Lark Ellen Road. After this project and a couple more in San Jose and Santa Clara, Caltrans decided to bid the first project on a state highway. Approximately, 32 miles of a BWC application were placed under Contract 03-1M8804 on Highway 50 over Echo Summit. The mix used was a 3/8-inch Alpine gradation HMA with an emulsion application of 0.20 gal/yd². The general expectation was for this pavement to last three to five years based on the extreme weather conditions, mainly the snow fall, daily freeze thaw cycles, and studded tire wear. Since the 1998 demo project in L.A. County, approximately 2,500 lane miles of BWC have been applied in California by Caltrans, and many Cities and Counties.

BWC is a thin or ultra thin application of a polymer modified or rubberized hot mix asphalt placed immediately on a uniform, undisturbed and uncontaminated polymer modified asphaltic emulsion

membrane. BWC is a pavement preservation strategy with advantages such as:

- High wear resistance
- Noise reduction
- Improved ride
- Improved skid resistance
- Hydro-planing reduction
- Back tire splash reduction

The BWC process is executed using an integrated distributor/spray paver to place the system (polymer modified membrane and HMA) in one single pass. Another piece of equipment used in the process in California is a material transfer device (MTV), which serves to feed certain types of pavers which have elevated feeders. It has the additional advantage of redistributing the heat more uniformly in the mix and reducing segregation. Typically a skip loader creates straight joint lines for better construction practices and two small tandem steel compactors to compact and smooth the HMA application.

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In 2010, approximately 450 lane miles of BWC were placed in California. The process has been well received by the public and Districts with excitement due to its many obvious advantages.

State Route 1 in Sonoma County

In 2010, Contract No. 04-1E7304 was awarded to George Reed Inc. This project is located in District 4, on Route 1, Sonoma County, near Gualala from Sea Walk Drive to Gualala River Bridge. The project consisted of a total of 7.9 miles on a two way road with two lanes and several turn-pockets for residential access or approximately 16.2 lane miles of BWC construction.

Existing pavement condition of north direction of State Highway 1 from PM 50.5, top photo, and PM 56, below.



District 4 selected this stretch of road to be built with a Polymer Modified Gap-Graded HMA mixture at a target lift thickness of $\frac{3}{4}$ inch. The average production was 1,115 tons per day.

The road condition in general was subjectively rated as fair to good. The main distresses on the existing surface included oxidized and raveled chip seal and asphalt concrete with low and medium severity longitudinal cracks. A few spots were identified with low severity fatigue failure, probably due to drainage issues aggravated by logging trucks.

This main road serves the tourist and the residential traffic along Route 1 in Sonoma and Mendocino Counties

and the logging trucks coming from the north.

Prior to construction, the Resident Engineer and the key people involved in inspection of the project participated in a Just in Time Training (JITT) meeting to better understand the process, since this is the first time this office was in charge of a BWC project. A review of the inspection, materials, equipment, process and best practices were discussed in an interactive meeting. It is believed that bringing the expectations and experiences of the agency and the Contractor to the same level lead to more successful projects. In the case of BWC projects there are several unknowns even though the technology has been around for several years. This is the reason many Districts, agencies and contractors prefer to

discuss the process with experts prior to the start of the project.

The project started on the north end at PM 58.5 in the south bound lane. A RoadTec SP 200 was used as the integrated distributor/spray paver and a Shuttle Buggy, RoadTec SB2500D for the MTV.

The City of Gualala is in the California coastal region. Although the project was initiated in late August, which still is warm in most of California, there was concern over temperature variations during construction because of the coastal climate. This was the main topic of discussion during the JITT and the pre-paving conference. The marine layer tends to hit the area very frequently and the dense fog and low temperature, worsened by the long hauls (a 2.3-hour haul from the Bodean Company plant) make BWC paving very challenging.

BWC has two main components, a relatively high air void content HMA and a rapid set polymer modified emulsion. These two components are very sensitive to temperature. The first one, due to the gradation and the thin application will lose temperature at a faster rate than a conventional dense graded application (usually >1.5 inch). The second one will develop strength and cohesion after a certain percentage of water has left the system.

An experienced applicator/agency will consider all the environmental conditions to plan better to obtain the best performing BWC. When temperatures of the HMA drop too much before rolling, the workability of the mix will not be enough to seat the HMA adequately, and raveling is the most common distress of early failure.

When the surface of the existing road is wet and the weather conditions are cold and foggy, the mixture cools, making it more difficult for the emulsion to break. This means the system is not fully cured for the first few hours. This is the reason it is usually recommended to maintain the HMA temperatures as high as possible at the back of the screed and not pave under



Type of distresses in Route 1. Longitudinal cracking, above, and chip seal raveling, below.



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extreme weather conditions such as rain or forecasted rain in the 24 hours following construction.

In the Gualala project the two extremes were experienced. With high temperatures and sunny conditions, the project ran smoothly. When the conditions changed to fog and damp surfaces, the Contractor and District 4 worked together to maintain the temperatures of the materials (HMA above 280°F measured at the back of the screed) and had permanent quality control of the emulsion and the mix.

The project lay down was discussed prior to the initiation of the construction and the Contractor

marked areas that had to be cut to ensure straight joints and minimize hand work.

Some of the hand-work areas presented challenges during construction due to the limited access of the equipment. In isolated areas a few rocks were lost early on in hand work areas. However, in general the Route 1 project near Gualala was determined to be another success story for BWC.

In the past, District 4 might have used either a chip-seal or a conventional thin overlay. The BWC application was selected since the District wanted to create a seal and also get the advantages in durabil-

ity of a thin HMA overlay with the least traffic interruptions. In 2010, Caltrans decided to apply this BWC with a total bid cost of \$1,134,399.00. The in-place cost was approximately \$9.95/yd², which included grinding, defined dig outs, traffic control, mobilization, shoulder backing, thermoplastic striping, and other costs associated with a 2.3-hour haul. The expectations are to have 10 or more years of a smooth and crack resistant wearing surface.

Next Generation of Bonded Type of Pavements

The concept of bonding a high quality HMA wearing course in such a thin application to the road was the first step in a series of developments that have been in the mind of transportation researchers for some years. The question to be answered is how to optimize the durability of the road and at the same time be able to evaluate it.

BWC quality control so far has been focused on the materials involved prior to its placement. This

Environmental conditions during construction. Fog and low temperatures, top, and optimum weather conditions, below.



Laydown plan of a turnpocket.

ensures the process follows specifications for adequate functioning of the equipment and temperatures during placing and compaction. However, the performance optimization of the new system, membrane and HMA, is not fully followed or evaluated. Research has shown that the properties of the thin applications in the crack resistance and strength of the bonding can be measured by laboratory testing, which allows design and control to optimize the construction process and the pavement performance. Being able to measure the performance of thin overlays opens a world of possibilities for agencies and contractors. Relying only on one specific type of mix and a set rate of emulsion application is no longer the performance definition. The way to the future of thin overlays is finding the appropriate combination of type of mixture and type of tack/emulsion to perform above a minimum performance based threshold.

Still more research and data collection on projects is necessary, but California is on its way to utilize performance based specifications that will result in longer lasting and more cost effective pavements. In addition to preservation this approach can also be applied to rehabilitation strategies. Specifically when dealing with structural overlays, enhanced bonding of layers increases the overall structural

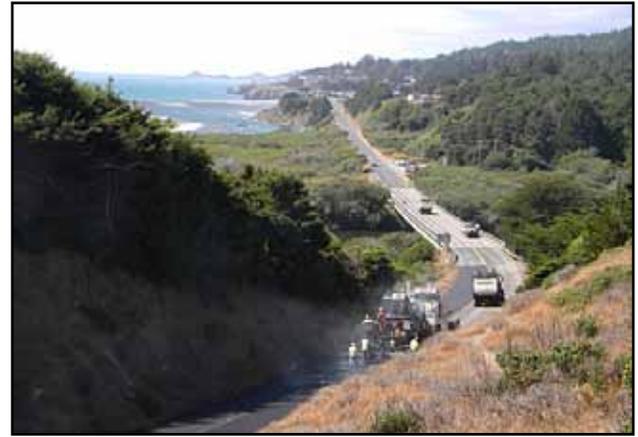
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Rolling operations.

adequacy of the pavement resulting in increased life and/or possible lift thickness reduction.

The BWC on State Route 1 near Gualala is a prime example of how current tools and specifications can be used to extend pavement life. Specifications and preservation/rehabilitation options evolve and constantly improve. It is the responsibility of agency and industry to make specifications and roads a more certain science and optimized system, where the plan and design expectations are accomplished and measurable in the field. The ultimate goal is to produce more durable, better roads in times where stretching the dollar is a must.



Finalization of the project, Gualala River Bridge.
George Reed Inc.

Pavement Recycling and Reclaiming Center at Cal Poly Pomona

By Dragos Andrei (Cal Poly Pomona)

This summer, the California Department of Transportation (Caltrans) awarded Cal Poly Pomona a \$1 million, three-year contract to provide technical assistance, perform research, and develop and deliver training in the area of pavement recycling and reclaiming.



Cold in-place recycling train in California City.

Based on this initial funding and in response to a call for support from the pavement recycling industry as well as public agencies, a university center dedicated to the advancement of pavement recycling and reclaiming was established at Cal Poly Pomona under the auspices of the Civil Engineering Department and the College of Engineering at Cal Poly Pomona. Cal Poly is one of the top 10 public schools for undergraduate engineering education

in the nation, according to the latest US News Best Colleges Rankings.

The Asphalt Recycling and Reclaiming Association (ARRA) will also support the Center. At the Semi-Annual ARRA Meeting that took place last week in Chicago, executive director Mike Krissoff announced that ARRA will sign a three-year contract with the Center.

The purpose of the Pavement Recycling and Reclaiming Center (PR²C) is to provide pavement design professionals and public agencies with the knowledge and tools necessary to use pavement recycling and reclaiming as a feasible and competitive alternative to traditional pavement maintenance and rehabilitation strategies. The Center's vision is to become a resource to all of North America and possibly the world.

Led by a Board of Directors, the Center is currently managed by Dr. Dragos Andrei, Associate Professor in the Civil Engineering Department. Dragos is a practicing pavement engineer licensed in California and Texas and an active member of the Transportation Research Board (TRB) and the California Pavement Preservation Task Group (PPTG).

The goals of the PR² Center are to:

- Facilitate the successful implementation of pavement recycling and reclaiming strategies by public agencies through the development of standards, specifications and technical guidelines.
- Act as a credible third party for public agencies and industry.
- Provide technical assistance, training, and certification programs to public agencies and

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- industry.
- Disseminate information relative to pavement recycling in the form of reports, presentations, tech sheets, and newsletters.

Specific objectives of the PR² Center are to:

- Develop and maintain a website for the Center which will be used to disseminate information on pavement recycling and reclaiming strategies. The Center's activities, newsletters, reports and tech sheets also will be included on their website.
- Develop and maintain a database of pavement recycling projects, including construction and performance information. The information will include project location, limits, traffic, environment, pavement condition before and after recycling, materials testing results during and after construction, and other pertinent information. The data will be used in support of the Center's research activities.

- Develop and maintain a technical library of reports, technical papers, presentations, photographs and videos related to pavement recycling and reclaiming. The library will be made available online on the Center's web site.
- Provide technical support (help desk) to agencies and contractors that register their projects with the PR²C.
- Engage in externally funded research in pavement recycling and reclaiming.
- Promote effective pavement recycling and reclaiming practices and technologies within the United States and the world through the development and delivery of training materials and the organization and participation in conferences and workshops on pavement recycling and reclaiming.

For more information about the PR²C, please contact Dr. Dragos Andrei, Technical Director, at 909.869.2487, or dandrei@csupomona.edu. The PR²C website is under construction and will become available January, 2011.



City of Roseville maintains city streets using a double chip seal containing AR warm mix and terminal blend rubber modified binder

By Lerose Lane, Ding Cheng, and Paul Gowan, (CP2 Center); and Nina Buelna (City of Roseville)

The City of Roseville, Calif., has implemented an innovative maintenance project to give their City streets new life and a new look with double chip seals. The project, performed by Intermountain Slurry Seal, Inc., a subsidiary of Granite Construction, used warm mix technology with AR and a terminal blend rubber modified binder in the project. Their California Chip Area Manager, Marc Bertsch, has been instrumental in promoting warm mix technology in California.

On September 30, Center Staff traveled to Roseville to observe the first day of construction. They met with the Resident Engineer, Nina Buelna, and the contractor's manager, Marc Bertsch, in the field to discuss many of the construction details. While on site, several streets received the warm mix AR chip seal treatment as shown in the Figure 1.

The double chip seals are a preventative maintenance treatment for various city streets within the City of Roseville. The existing pavements in this area were about 25 years old and had not received any major maintenance until the City of Roseville initiated repairs in preparation for this project. The repairs included dig outs or skin patches, where there was rutting or extreme alligator cracking. The repair work was performed by City maintenance crews.

The double chip seal consisted of two layers. The first layer was an asphalt rubber warm mix chip

seal with 3/8-inch pre-coated hot applied chips. The warm mix was added and mixed with the asphalt rubber binder in a modified asphalt transport with internal agitation.

The second layer was a modified binder seal coat using PG76-22TR, which has tire rubber and polymer modifications, and 1/8 inch pre-coated hot applied chips.

The AR binder was applied at a rate of 0.60 gal/yd² and the 3/8-inch chips were applied at a rate of 30 lbs/yd². The second layer was a PG76-22TR binder with 1/8-inch pre-coated hot applied chips where

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Figure 1 warm mix AR seal coat in construction

Figure 2. Emissions from asphalt rubber binder applied at 340°F.



the binder was applied at a rate of 0.25 gal/yd² and the chips were applied at a rate of 9-10 lbs/ yd². The warm mix asphalt rubber binder was applied at a temperature of 335 to 340°F, which is a 60°F reduction from the normal application temperature of asphalt rubber chip seals. The temperature reduction lessens the energy used in the heating process, and also reduces the emissions (see Figure 2).

The warm mix additive was a wax type product provided by Engineered Additives Inc. This warm mix

additive in the asphalt rubber binder also allows the contractor more time for rolling the screenings/chips.

The project was placed during daytime and went down without any significant problems. The finished surface appeared uniform as shown in Figure 3. The lower emissions, lower cost, and fast application made this a desirable maintenance project for the City.

The double chip seal for this contract cost the City of Roseville less than \$5.50/yd². The use of the warm mix additive lowered the cost of this application \$1.25/yd² compared to last years bid prices for a similar project. The cost to overlay the same streets with one inch of HMA would be more due

to increased working days requiring traffic control and grinding conform areas along the concrete curbs and gutters.

The CP² Center will study the effect that the warm mix additive has on the AR chip seal and monitor this project throughout its life. A yearly review will include monitoring for rock loss, reflective cracking, and flushing.

We appreciate the financial support of CalRecycle for this important and meaningful study. We would like to extend our gratitude to Nate Gauff and Bob Fujii of CalRecycle for their continuous support of this project. The CP² Center also thanks Nina Buelna, City of Roseville and Marc Bertsch, Intermountain Slurry Seal, Inc. for providing valuable information during this project.

Figure 3. Appearance of final mat after application of the 1/8-inch chips.



Update on federal re-authorization

by Steve Healow (FHWA California Division)

Background

Since SAFETEA-LU expired on October 1, 2009, Congress has passed five Continuing Resolutions (CRs) to temporarily extend spending authority for the federal-aid highway program. The most recent CR was adopted and signed into law on March 18, 2010. Among other things it extended the current authorization of SAFETEA-LU through December 31, 2010. To put this in perspective, consider SAFETEA-LU was signed into law in 2005 after a two year delay and twelve Continuing Resolutions. Also consider Congress has delayed an aviation transportation reauthorization since 2007 and recently passed the sixteenth continuing resolution. Compare this with the 208th Congress which completed the entire aviation reauthorization process in seven months back in 2003.

The reader may recall Rep. Jim Oberstar's (D-MN) August 2009 announcement that after two years of development within the House Transportation and Infrastructure (T&I) Committee the Surface Transportation Authorization Act (STAA), a six-year \$450B spending plan, was ready to become law. STAA was intended to transform federal surface transportation to a performance-based framework with emphasis on safety, mobility, system preservation and intermodal connectivity. The bill would streamline the U.S. Department of Transportation, cut seventy-five programs and consolidate highway funding under four categories: critical asset investment, highway safety improvement, surface transportation, and congestion mitigation and air quality improvement. The proposed bill would raise annual appropriations 57% above the current \$34B per year while creating or preserving an estimated six million jobs.

Oberstar's announcement was met with indifference by a Senate and White House preoccupied

Continued, next page

with their own legislative agenda, including the \$930B health care reform, the \$700B Wall Street bailout, the \$830B cap-and-trade, the \$787B American Reinvestment and Recovery Act and other priorities. The White House announced it would delay considering STAA until late in 2010 or early 2011 because it wasn't clear where the \$450B for STAA would come from without adding to the deficit or raising taxes.

Oberstar warned: "Inertia becomes the enemy of progress...delay is unacceptable...extension of the current law is unacceptable. This is the moment to move."

Oberstar subsequently tried other methods for funding STAA. In March, 2010, he unveiled a modified bonding proposal which would deposit \$130B in Treasury Bonds into the Highway Trust Fund (HTF). Repayment of the bonds would be delayed for the first four years with repayment beginning around 2014/2015 using increased highway user fees. The plan was intended to provide \$450B for STAA over six years based on current HTF revenues.

Six weeks ago there was new movement. In a Labor Day speech in Milwaukee, President Obama proposed a \$50B transportation stimulus as an "advance" on STAA. Thus encouraged Oberstar expressed optimism for making progress on STAA during the 111th Congress' November-December lame-duck session, though he stopped short of discussing a timeline. The process suffered a setback on November 2 as 18-term Congressman Oberstar was voted out of office. In addition, thirteen other House Democrat members of the T&I Committee lost their bids for re-election.

It remains to be seen how big a setback the loss of Oberstar will be. Rep. John Mica (R-FL), a ranking minority member of the House T&I Committee, is expected to assume the chairmanship when the 112th Congress convenes in early January. Mica is no less a champion for STAA. In his view it was the best available opportunity to address unemployment while bolstering the economy. However he believes Congress and the White House delayed too long to pass STAA in the 111th Congress.

Because of their common interest in mass transit and high-speed rail, Rep. Mica should get along well with the current administration; however they are frequently at odds. In Rep. Mica's view surface transportation authorization will not happen during the 111th Congress, nor is he confident that the president's \$50B stimulus will advance. However he insists his top legislative priority in the 112th Congress will be a long-term federal surface transportation authorization.

Any member of Congress or the White House may draft a transportation bill. In the House, the drafting is typically left to the T&I Committee for policy and the Ways and Means (W&M) Committee for financing. Their version is forwarded to three Senate committees: Commerce, Science, and Transportation (CST), Environment & Public Works (EPW), and Banking, Housing and Urban Affairs (BHUA). All versions go to a conference committee, which resolves the differences. T&I is the largest committee in Congress with 74 members. W&M is next with 41. Add to that a total of 69 members from the three Senate Committees and we have a total of 164 lawmakers directly involved in preparing the bill. Our lawmakers were assisted by 2,000± lobbyists from 1,700± special interest groups which contributed over \$45M during the first six months of 2009 lobbying Congress on the STAA.

What's the holdup?

Our elected officials are on the horns of a dilemma. Before they re-authorize the surface transportation program they want assurance the legislation will be fully funded without raising the deficit or taxes.

They also want to avoid having to replenish the HTF from the General Fund, as they have done three times in the past two years (\$8B in Sept., 2008, \$7B in Aug., 2009, and \$19B in March, 2010). By law there is no deficit spending from the HTF. Fuel taxes make up the bulk of HTF revenue, but the revenue stream is depleted due to our fuel efficient vehicles and reduction

in vehicle-miles traveled (VMT). Thus, Congress is searching for other viable revenue streams. A VMT tax has been proposed. Other proposals include:

- Cash flow into the HTF is running at \$23B/year; so let that be the funding level for the continuing Federal-aid Highway Program.
- Disbursements under the existing Continuing Resolution are running at the rate of \$36B/year; so let that be the funding level for the continuing Federal-aid Highway Program.
- From AASHTO: convert the gas tax from flat rate to a sales tax, 8.4% for gas and 10.6% for diesel. This would tie fuel taxes to the price of fuel, and revenues would increase as the price of fuel rose. It is expected to raise revenue and HTF disbursements by approx. 15%.

What's the current status?

On November 18, Congressional leaders will meet at the White House to discuss their agenda for the lame-duck session. The White House has identified infrastructure as a priority. Their proposed \$50B

The White House has identified infrastructure as a priority...Washington insiders expect a modified STAA will become law in the next 12 to 24 months.

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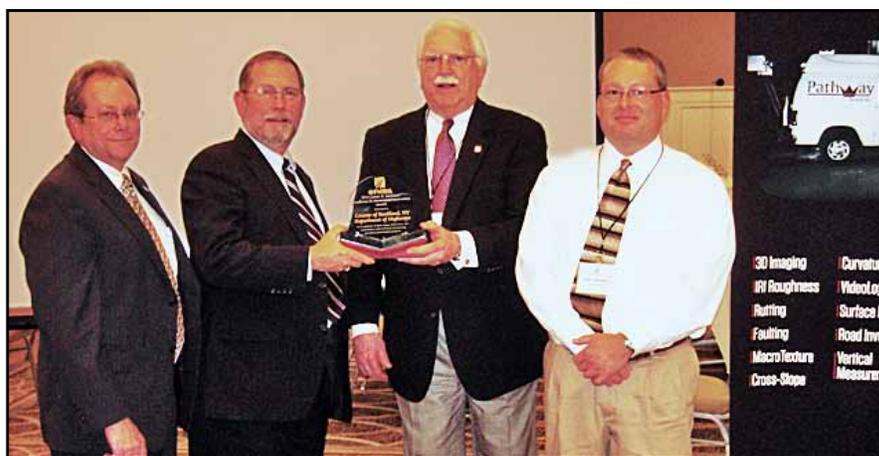
infusion into surface transportation infrastructure emphasizes preservation of the existing highway and transit systems and transit expansion. As for proposed changes to STAA the White House favors consolidating programs, integrating rail programs and a continued focus on livability and climate

change. This legislation will avoid the traditional formulas and earmarks with focus on efficiency and accountability. Washington insiders expect a modified STAA will become law in the next 12 to 24 months.



FP² Inc update

The Board of Directors of FP² Inc. met in late October in Des Moines, Iowa, as part of the Midwest Pavement Preservation Partnership meeting. The annual awards banquet was held during the same meeting and the 2010 James B. Sorenson



Jim Moulthrop, FP² Inc (center right), and Eric Thibodeau, Chair of the NEPPP (on the right) recognize County Superintendent of Highways Charles H. (Skip) Vezzetti and Engineer Andrew M. (Andy) Connors (on the left).

"Excellence in Pavement Preservation Award" winner was awarded to Rockland County, New York for their impressive pavement preservation program. Unfortunately, representatives from Rockland County could not arrange to attend the presentation and receive the award. As a result, the award was presented at the Northeast Pavement Preservation

Partnership meeting in Portsmouth, N.H. in early November. Representatives from the County, Superintendent of Highways Charles H. (Skip) Vezzetti and Engineer Andrew M. (Andy) Connors, made a short presentation on the results of their program.

During the Board meeting, proposals for a 2012 National Conference and a 2014 International Conference on Pavement Preservation were evaluated and the decision was made to have the National Center for Pavement Preservation (NCP) at Michigan State University host the meeting at a location yet to be determined in the United States. The National Center is exploring several venues and they hope to make a decision by the Transportation Research Board meeting in January, 2011.

Regarding the 2014 International Conference, the Board selected France as the winning proposal. A consortium of industry organizations in France plan to tie the meeting in with another conference in order to attract a large audience.

FP² Inc. continues to work with our lobbyist, Williams and Jensen, in Washington to promote the insertion of preservation language in the multi-year highway bill. The recent election results and the resultant feedback from Washington is that a new bill will probably not emerge until the next Congress is seated in January, 2011. The leadership on the House Transportation and Infrastructure Committee will change but the Senate Environment and Public Works Committee leadership will not. It is too early to tell when a bill will emerge.



Tire recycling conference held in Toronto, Canada

The 2010 Annual Rubber Recycling Conference was held September 29 through October 1, 2010. The conference covered such topics as:

- Tire derived fuel
- Recreational surfaces
- Asphalt rubber
- Tire derived aggregate

Dr. Gary Hicks of the CP² Center was invited to give one of the three presentations on rubberized asphalts in cold climates. The other presentations were given by Dr. Barry Takallou of CRM Inc., and

Gary Shaw of Grey County in Ontario, Canada. Grey County has used the wet process, terminal blends and the dry process to a very limited extent. They would like to increase the use of crumb rubber in asphalt pavements in the future.



Pavement Preservation Task Group (PPTG) meets in Sacramento

The PPTG co-chairs held a meeting to discuss the reorganization of the group as well as future plans for the PPTG. For more details on the meeting, please go to the PPTG website at www.cp2info.org/taskgroup to check out the results of the meeting and the decisions made.

Reorganization of the PPTG

Bill Farnbach (Caltrans), Hans Ho (Telfer Oil), and Craig Hennings (ACPA-Southwest), the PPTG co-chairs announced at a meeting on October 29, 2010, that the PPTG is being reorganized. The primary reasons for the organization are to minimize the number of subtask groups from the current 22 to something much less to more effectively utilize the limited resources of Caltrans. This is also expected to eliminate duplication between the PPTG and other task groups under the Rock Products organization. The proposed organization chart is shown below.

The co-chairs are still requesting comments on the organization chart. At present, most of the old subgroups are included in the proposed chart with the exception of the pavement management sub-group. Several of the others have been transferred to the HMA task group.

Work priorities

The PPTG co-chairs also review the priorities for the planned work for 2010/2011. This includes activities such as:

- Finalizing the 2010 specifications
- Developing specifications for
 - o Fog and rejuvenating seals
 - o Cold in-place recycling
 - o Rubberized slurry seals
 - o Full depth and particle depth concrete repairs
 - o Scrub seals
 - o Hot in-place recycling
 - o Tining of concrete pavements
 - o Modified binders for chip seals (terminal blends)
 - o Warm mix asphalt rubber chip seals
- Developing quiet pavements for both asphalt and concrete
- Developing Just In Time Training (JITT) for chip seals and microsurfacings

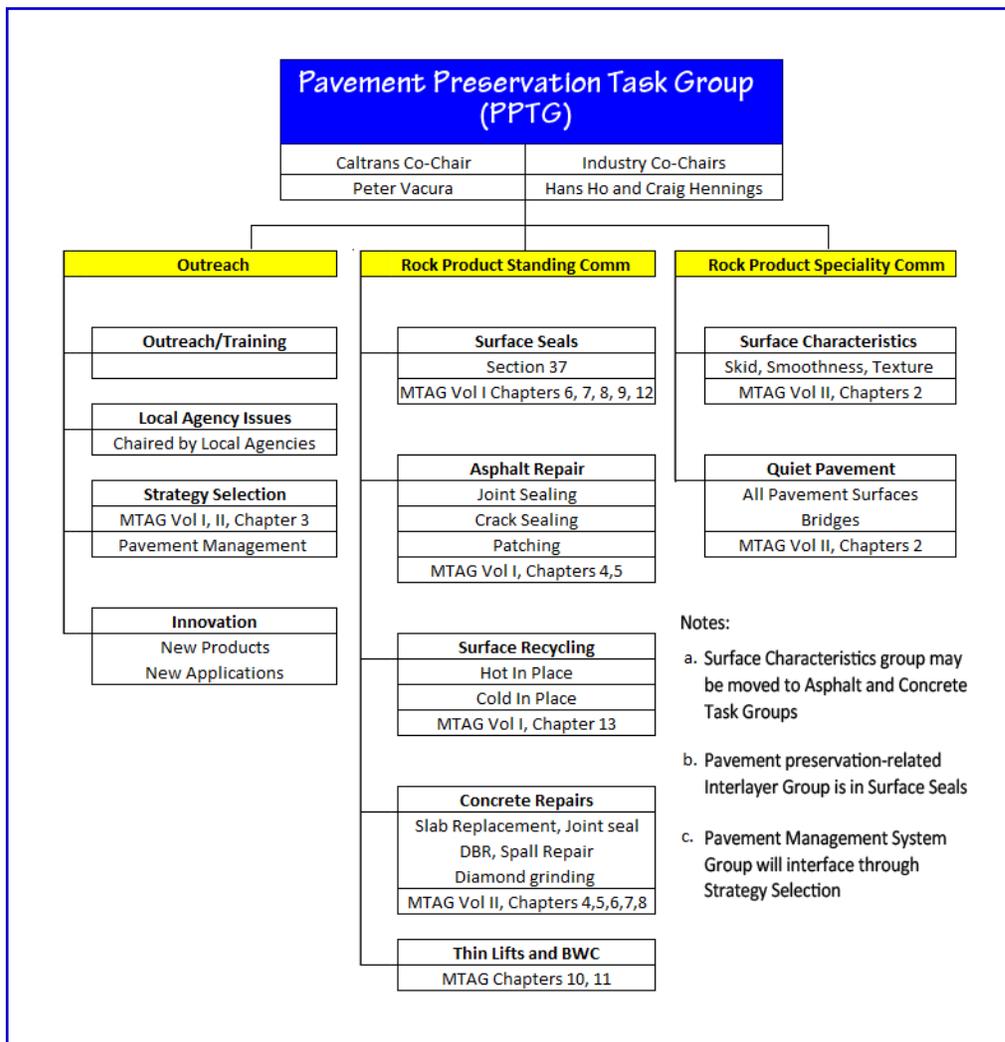
These priorities were established by Caltrans with input from their industry partners.

MTAG updates

The CP2 Center will be updating several of the chapters of the flexible and rigid pavement MTAG and adding a few new chapters, including pre-overlay treatment for rigid pavements and pre-overlay treatment for flexible pavements. They will be in contact with the old PPTG subgroups to solicit input on what needs to be changed. The updates are expected to begin in December, 2010.

PPTG meeting plans for 2011/2011.

At the present time there are no plans for meetings in 2010. The annual meeting scheduled for December in Los Angeles was canceled. It is expected that a schedule of meetings for 2011 will be forthcoming along with a detailed list of deliverables expected from the group.



Perspectives on concrete pavement sustainability

By Craig Hennings (ACPA Southwest)



Concrete pavement and the environment were in the spotlight at the first “International Conference on Sustainable Concrete Pavements” in Sacramento, Calif. Experts from around the world converged on Sacramento to share their views about solutions to the world’s infrastructure needs. The national

ACPA organization, along with the Southwest chapter, was a major sponsor of the event.

“ACPA’s participation in this conference signifies the importance of sustainability in transportation construction, both today and in the future,” says ACPA President & CEO Gerald F. Voigt, P.E., adding that “as the specifiers and decision-makers become increasingly aware of the importance of sustainability, we will be there to emphasize the many ways concrete pavements can help our transportation agencies, industry, and society at large.”

Voigt shared the podium with three other keynote speakers, including:

- King Gee, Associate Administrator, Federal Highway Administration, Washington, D.C.
- Tony Tavares, P.E., P.M.P., Chief, Maintenance Division, California Department of Transportation
- Tom Cackler, P.E., Director, National Concrete Pavement Technology Center, Ames, Iowa
- Dr. Surabi Menon, Physicist and Staff Scientist, Lawrence Berkeley National Laboratory,

Challenging conventional attitudes and views

The presenters called on those gathered for the event to “think about ways they can contribute to making concrete paving materials contribute even more to energy efficiency and sustainability, while also overcoming challenges that impede the adoption and implementation of sustainable practices.”

He called on participants to break through barriers, including metrics that do not completely capture the

sustainability attributes, specifications that do not require more sustainable practices, and factors that limit demonstration projects and workforce training.

Lief Wathne, from ACPA, in his presentation titled “Sustainability and Pavements: Are We Focusing on the Right Things?” challenged participants to rethink the ways they evaluate environmental performance. He urged participants to consider operational issues, particularly fuel use and surface reflectivity, as well as the more commonly considered variables such as recycling, the use of industrial by-products, and resource conservation.

ACPA’s Robert Rodden’s presentation focused on “Structural and Hydrological Design of Pervious Concrete Pavements,” giving participants a preview of ACPA’s soon-to-be-released PerviousPave software for designing pervious concrete pavements.

In addition to these presentations, topics presented covered recycling concrete materials, optimized design, Life Cycle Assessment measurement developments, use of industrial by-products, and second hand benefits of using light colored concrete pavement to reduce smog, urban heat islands, cleaning the ground water, and reducing electrical demand for cities.

Participation far and wide

The event drew more than 200 attendees from 35 states and 13 countries, according to Shiraz Tayabji, Ph.D., P.E., Fugro Consultants, Inc. He added that more than 50 representatives from 25 highway agencies also participated, with many highway agencies reporting their current sustainability practices and directions.

The conference focused on efforts to design and construct more sustainable concrete pavements, Tayabji reports. For copies of the proceedings, contact Shiraz Tayabji, Fugro Consultants, Inc. at stayabji@aol.com.

King Gee (left) presents a plaque to Dr. Surabi Menon, Lawrence Berkeley National Laboratory. Menon was one of the keynote presenters at the conference and spoke about “Potential Global Cooling Benefits from Reflective Pavements.”

Photo: Shiraz Tayabji



Bill Farnbach, Caltrans Division of Pavement Management, outlined the State’s efforts to make concrete pavements more sustainable.

Photo: Craig Hennings

CalAPA “Paving Green” conference held in Sacramento

The California Asphalt Pavement Association held a conference on “green technologies” on October 28, 2010, at the Radisson Hotel in Sacramento. The conference had more than 100 attendees from government, industry, and academia. The confer-

- “Caltrans’ commitment to green initiatives” – Steve Takigawa, Caltrans Deputy Director of Maintenance and Operations
- “Future trends in warm mix asphalt and other ‘green’ road-building techniques” – Dr. Howard Marks, P.E., National Asphalt Pavement Association (NAPA)

ence touched on the latest developments on warm mix asphalt, using recycled materials, long life pavement, porous asphalt, and pavement recycling. Following are presentations given by the various speakers:

- “Warm mix asphalt study & test track evaluation” – Dr. James M. Signore, P.E., University of California Pavement Research Center
- “The latest rap on RAP – Recycled asphalt pavements” – Gerry Huber, Associate Director of Research, Heritage Research Group

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- "Porous asphalt pavements for storm-water control" – Roger Smith, Asphalt Pavement Consultant
- "Implementation of warm mix asphalt specifications in California" – Tony Limas, Quality Management Specialist, Granite Construction
- "Long-life asphalt pavements in California" – Carl Monismith, P.E., University of California Pavement Research Center
- "Critical factors in the design and construction of asphalt rubber projects" – Jack Van Kirk, P.E., Director of Asphalt Technology, George Reed Inc.
- "Recycled asphalt shingles – an emerging market?" – Gerry Huber, Associate Director of Research, Heritage Research Group

All the presentations can be found on the CalAPA website: <http://www.californiapavements.org/pave-green.html>.

The conference concluded with a panel of agency, academic, and industry experts answering questions from the audience. The panel experts included Caltrans state pavement engineer Amarjeet Benipal, Carl Monismith, Skip Brown, Jack Van Kirk, and Tony Limas.

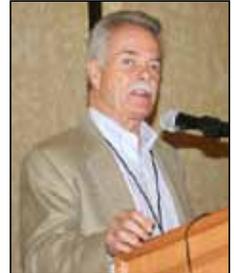
Left to right, Jeff Bliss, Russell Snyder, Lance Brown, Steve Takigawa



APACA annual pavement conference held in Ontario

The third annual meeting of the Asphalt Pavement Association of California (APACA) was held in Ontario, Calif., on November 4, 2010. Nearly 200 people attended the meeting which included presentations on the following topics:

- Local agency funding- Will Kempton (Orange County Transportation Administration)
- Warm mix asphalts – Matt Corrigan (FHWA) and Cathrina Barros (Caltrans)
- Recycled asphalt paving and roofing shingles – David Newcomb (NAPA)
- Statewide Needs Assessment – Margot Yapp (NCE)
- Pavement management – Imelda Diaz (LA County)
- National Asphalt Issues – Larry Lemon (NAPA)
- Asphalt supply – Bill Thorpe, (The Asphalt Institute)
- Pavement preservation treatments – Gary Hicks (CP2 Center at CSU, Chico)
- Caltrans Hot Topics Related to Asphalt – Jim St. Martin (APACA)



Will Kempton



David Newcomb



Cathrina Barros

The presentations were followed by a panel discussion in which the audience had an opportunity to quiz the topic experts. All presentations can be found on the APACA website at http://www.apaca.org/Technical_Info/annual_archives/2010.shtml.

During the breaks and at lunch the attendees had an opportunity to visit with 20 exhibitors showing their wares.

Upcoming pavement-related events

2011 California Chip Seal Association Annual Meeting, February 2-3, 2011

The Pavement Preservation Conference sponsored by the CCSA will be held at the Doubletree Hotel/Conference Center – Ontario, CA. For more information, please check out the association website at www.chipseal.org. The program and registration information will be posted on the website in the near future.

California Pavement Preservation Conference

Since the International Conference on Pavement Preservation, there has been considerable discussion on the importance of having another pavement preservation conference in 2011. Caltrans is unlikely to provide financial support or a large number of attendees for the conference because of funding issues. However, it is expected there will be a meeting

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in January, 2011, to discuss the need for a 2011 meeting. We hope both local agencies and industry will support this important meeting. If interested in participating in the planning process, contact either Laura Melendy at melendy@berkeley.edu or Gary Hicks at rg Hicks@csuchico.edu.

Other upcoming events around the U.S.

January, 2011

23-27 – TRB 90th Annual Meeting, Sheraton Washington., Washington, D.C. www.trb.org

25-28 - Slurry Systems Workshop. Holiday Inn International Dr., Orlando, Fla., www.slurry.org

February, 2011

2-3 – Pavement Preservation Conference. Double-tree Conference Center/Hotel, Ontario, Calif., www.chipseal.org

6-9 -56th Annual Meeting of NAPA. Waldorf Astoria Orlando and the Hilton of Bonnet Creek, Orlando, Fla., www.hotmix.org

21-25 – AEMA-ARRA-ISSA Annual Meeting. Westin La Paloma Resort, Tuscon, Ariz. , www.aema.org

March, 2011

13-16 – Integrated Transportation & Development for a Better tomorrow, Chicago, Ill., www.tanddi.org/events

22-26 – CONEXPO. Las Vegas, Nev., www.conexpo-conagg.com



Center news

Caltrans support for the Center

The Center budget was cut from \$1.8 million to \$800,000 for a three-year period. Therefore, the services provided in the past have to be reduced substantially. The Caltrans contract manager for the new Center contract is Hector Romero, Senior Transportation Engineer and Chief of the Pavement Preservation Design Branch. The Center has been actively pursuing other projects with CalRecycle, local agencies, NCHRP, and industry. We are still alive and well, but must rely on others beside Caltrans to continue our work. Some of the Center's new projects are discussed below.

Alaska project on pavement preservation

The Center has recently been awarded a contract with the Alaska University Transportation Center (AUTC) to develop a pavement preservation program for the state of Alaska. It will involve working with the University of Alaska-Fairbanks and the University of Alaska-Anchorage. The project started in November, 2010, and a kickoff meeting is scheduled in Anchorage in December, 2010, to initiate



the work efforts. Additional information on this project will be included in the next newsletter. Dr. Gary Hicks is the project manager on this project.

Enzymes project

The Center just completed a study on the use of enzymes to stabilize local materials. The work was done for Lake County and involved testing soils using the R-value and a static triaxial test. The R-value test results did not reflect the same level of performance as found in field studies. The triaxial test was more promising. Gravel equivalent values were estimated for the various enzyme treated soils. For more information on this project, please contact Dr. Ding Cheng.



CalRecycle projects

Earlier this year, The Center received two projects from CalRecycle. The first project is to evaluate the use of warm mix technology with asphalt rubber (AR) or terminal blended rubberized asphalt binders when used in chip seals or in HMA. In the summer of 2010, we monitored projects in Caltrans D1 and D6 as well as projects with the City of Roseville, City of Stockton and the County of Los Angeles. As a part of this project we are setting up a binder laboratory, which will include all the Superpave PG grading test equipment. For more information on this project, contact Dr. Gary Hicks.

The second project is to update a study done in the late 90s on the cost effectiveness of AR binders in chip seals and HMA. This will also include an evaluation of the cost effectiveness of terminal blend rubberized asphalt binders. For more information, please contact Dr. Ding Cheng.

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*Bird's-eye view of an Alaska highway roundabout.
Photo by Todd Paris,
UAF Marketing &
Communications.*



Center Help Desk

The help desk to local agencies funded by Caltrans in the past has "closed its doors." Hopefully this closure is only temporary. There are no funds being provided by Caltrans to continue this operation. Unless the Center can find new sources of revenue to support this effort, this popular service will no longer be available. Caltrans, local agencies and industry made extensive use of this service in the past.

Center newsletter

The Center newsletter will continue despite a reduction in the funding to produce it. We surveyed those receiving the newsletter during the summer of 2010 and found that the recipients of the newsletter liked it very much. The survey showed that 96 percent of those responding thought the newsletter is useful and 93 percent think the newsletter effectively promoted pavement preservation. Generally, people think that the newsletter is very informative. It presents a range of topics from general information on pavement preservation, best practices and experiences by other agencies, to deployment of limited resources as effectively and efficiently as possible to preserve pavements.



Tom Ferrara

Tom Ferrara, first CP² Center Director, passes away in Chico

Dr. Thomas (Tom) Ciro Ferrara passed away peacefully Nov. 13, 2010, at his home in Chico after a short battle with ALS. He was 63 years old.

Tom attended the University of California at Davis, where he earned a Bachelor's degree (1969), Masters Degree (1970), and PhD in Civil Engineering (1975). After graduating from UC Davis, Tom began his teaching career at Ft. Lewis College in Durango, Colorado, then moved to Chico State in 1973, where he remained for 36 years. During his time at Chico State, he held the position of Civil Engineering Department Chair from 1984-1993. He was a member of the American Society of Civil Engineers and served as faculty advisor for the student chapter for many years. He was presented with awards from the American Society of Civil Engineers Student Chapter for outstanding service in 1978, 1982, 1992, and 2000, as well as many other awards and recognitions from both colleagues and students.

Tom was beloved by his students for his ability to simultaneously expect high achievements while encouraging them to do more than they knew they could. Tom served as the first Director of the California Pavement Preservation Center, which was established in July, 2006, for a period of 2½ years, then served as the Department head again in 2008/09. He retired from Chico State in 2009.

Tom was an active member of both the Chico and Paradise stamp clubs for over 35 years, attending several stamp shows annually throughout northern California. He was a Hospice volunteer for more than 15 years, and for many years was an active member of the Sierra Club and Toastmasters International. Always an active member of the community, Tom loved local artistry, live music performances, and took great pleasure enjoying food and wine with his many friends.

His love for travel and adventure led to visits to China, Africa, Japan, Taiwan, multiple trips to Italy and Europe, Central America, Mexico and more. Tom was an avid golfer, playing at Bidwell Golf Course and Butte Creek Country Club in Chico and other courses while traveling including Pebble Beach 2001. His final trip was to Hawaii in October, 2010, where he spent the week surrounded by his children and grandchildren.

He is survived by his son, Tony (Lauren) of Sacramento; his daughter, Norae (Devon) of Daly City, and three grandchildren, Vincent, Leah, and Maasai. A Memorial Service for Tom was held at Bidwell Chapel on Nov. 20. Tom's family invites donations to promote ALS research. Checks may be made out to UC Regents, c/o Bidwell Chapel in Chico, Calif., with "ALS Clinic" in the memo line, or can be made online at www.ucdmc.ucdavis.edu/giving/.

Mary Stroup-Gardiner departs CP² Center for consulting work

Dr. Mary Stroup-Gardiner left the CP² Center in August, 2010. She came to the Center from Auburn University in December, 2007, and served as the Director from December 1, 2008, until December 31, 2009. Dr. Stroup-Gardiner remains in Chico, Calif., where she has established the consulting firm Gardiner Technical Services LLC with her husband John Gardiner. We wish Mary and John the best in their new endeavor.



Mary Stroup-Gardiner