



CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

No. 50

June 2019

City-County Resource Moves Forward

By John Harvey (UC Davis), Laura Melendy (ITS Berkeley), and

Gary Hicks (CP² Center)

The City and County Pavement Improvement Center (CCPIC) was officially formed in 2018 to work with local governments to increase pavement technical capability through timely, relevant, and practical support, training outreach and research. The vision for the Center is to make local government managed pavements last longer, cost less, and be more sustainable. The scope of the Center is as follows:

- Increase knowledge through on-line and in-person training, peer to peer exchanges through tech briefs, sample specifications, and other resources.
- Establish a pavement engineering and management certificated program.
- Serve as a resource, research and development center.

Information of use to city and county pavement professionals, and more details on CCPIC can be found on their webpage at: <http://www.ucprc.ucdavis.edu/ccpic/>

CCPIC is currently supported by SB-1 (fuel tax) funds provided to the University of California, and to the California State Universities. UC Davis, UC Berkeley, CSU Chico, CSU Long Beach, Cal Poly San Luis Obispo, and San Jose State University are all involved with CCPIC.



Randy Breault and Matt Tuggle, Chair and co-Chair of the CCPIC Governance Board

Oversight is provided by a Governance Board, which is chaired by **Randy Breault** (City of Brisbane), with **Matt Tuggle** (Solano County) as the co-chair. A total of 6 counties and 6 cities are represented on the Board along with representatives from the League of California Cities (LOCC), California State Association of Counties



(CSAC) and the County Engineers Association of California (CEAC). The first 'in-person' meeting of the governance board took place in Davis in the fall of 2018. Meetings are held quarterly.

Visit the CCPIC web page to see minutes of meetings and membership of the Governance Board, or to pose questions or suggestions for CCPIC.

Accomplishments and Future Plans

Training

- The CCPIC team has delivered a total of six classes to date:

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-*Asphalt Pavement Maintenance and Rehabilitation* was held three times, in Richmond, Los Angeles, and Gilroy;

-*In-place Asphalt Recycling and Stabilization Strategies* was held once in Orinda;

-*Pavement Management Systems and Preservation Strategies* was held once in Costa Mesa

-*Superpave Mix Design for Local Agencies* was held once - online.

In total, 254 city and county pavement professionals have attended these training classes.

- The first new class will be delivered in June, 2019 by web, aiming to hit the short period cities and counties have between getting contracts in place and starting construction. This class is "An Introduction to Pavement Engineering and Management" and will be given online by **John Harvey**. The class will be presented in four 2-hour sessions on June 17-20. Registration costs only \$75 per site. For more information and to register, visit: techtransfer.berkeley.edu/schedule
- Additional new classes are being prepared for the fall, as well as delivery of several existing and updated ITS Tech Transfer pavement classes at CCPIC subsidized costs.
- Establishing a complete 'Pavement Certificate' program was also discussed at the board meeting. The board requested CCPIC partners, led by UC Berkeley's ITS Tech Transfer, to update the plan and submit it for approval. The certificate program is intended to be completed in about 18 months, requiring about 80 hours of training. Core and elective courses are being identified and will be approximately 80 percent web-based and 20 percent classroom instruction.

Resource Center

- CCPIC is continuing to work on the organization of a 'Resource Center' in Southern California to go along with the one we have at UC Davis. A part-time experienced pavement engineer to operate it is expected to be on board this summer.
- Activities will include supporting the new Life Cycle Cost Analysis spreadsheet, downloadable from the CCPIC website at:

<http://www.ucprc.ucdavis.edu/ccpic/DownloadHandlerAsync.ashx?Filename=ToolDownloads/LCCA%20for%20Local%20Governments%20CCPIC%20v%209apr2018.xlsm> . This summer we will be working with piloting agencies to review their performance and cost data, and development of agency-specific life cycle cost comparisons of treatments and treatment timing, for use in their PMS decision trees. This information will also be used in one of the training courses to be developed on life cycle cost analysis for local government pavements.

- Other tasks we will be working on this summer with Long Beach State, Cal Poly SLO, and CSU Chico include visiting regional local government groups to talk about CCPIC products, demonstrating the 'peer-to-peer' exchange (see below) using the Center website, development of model specifications for concrete mixes for streets and flatwork, and asphalt compaction.

'Peer-to-Peer' Information Exchange

A new feature has been set up for regional local government pavement groups to share information through an organized 'peer-to-peer' exchange feature on the CCPIC website. Solano County will host and manage the exchange



program in northern California on a trial basis. We are looking for a local agency to host the exchange program in southern California, and encourage other local groups around the state to try it out. Please contact **Jon Lea** at jlea@ucdavis.edu if you are interested.

Outreach and Communications

CCPIC had a table at the 2019 CEAC Public Works Officers Institute (PWOI) held in San Diego on April 3-5, 2019. Several agencies visited the table to pick up some technical information, learn about training, and take a spin through the web site. We will be working with the LOCC, CSAC, CEAC, APWA, and NACE to identify

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other meetings where it would be helpful for the Center to attend and to make presentations on the Center and its activities.

We will continue to provide updates on activities through the CP2 Center (CSU Chico) newsletter, and on training using the ITS Berkeley Tech Transfer monthly notifications of upcoming training. ITS will also be working on materials for a booth to be used at various conferences and be able to register interested parties for courses that are part of the 'Pavement Certificate' program.

News of CCPIC activities will be posted on the CCPIC website at: <http://www.ucprc.ucdavis.edu/ccpic/>.



Laura Melendy (ITS Berkeley Tech Transfer), John Harvey (UCPRC) and Eduardo Serafin (ITS Berkeley Tech Transfer)



CalAPA Spring Conference Highlights

By Roger Smith, CP² Center

The California Asphalt Pavement Association (CalAPA) once again held its Spring Conference & Equipment Show, March 20-21, at the Ontario Double Tree Hotel.

CalAPA Board Chair **Jordan Reed** (George Reed Inc.) welcomed over 200 attendees from public agencies and CalAPA Member Companies. A wide array of vendors and an outdoor display of heavy equipment provided a nice compliment to the lineup of speakers featured at this fast-paced 'learning' event. Here are a few highlights from the Conference.

Bill Knopf, CalAPA's new Regional Director for Southern California, discussed concerns about workforce development for the asphalt industry. The attracting and keeping of skilled people in the asphalt pavement industry is a big concern. Bill previously worked for the Indiana Asphalt Pavement Association's and related how they had recognized the Future Farmers of America (FFA) as a source of talented, quality young people that our industry should try to attract. Building relationships with these types of 'young people' groups could have long-term benefits for our industry.

Environmental Product Declarations (EPD) are the latest environmental documentation requirement facing asphalt materials. An EPD is basically a product 'label' declaring the quantified impacts of construction products with respect to their greenhouse gas (GHG) contribution. This information should help California industry meet the goals of AB92 legislation for reducing GHG by 40% by 2030. Although EPD are not yet required for asphalt products, it's probably only a matter of time.

Jacquelyn Wong (Caltrans) outlined Caltrans' work in preparing to comply with these requirements.



Equipment vendors at CalAPA Conference

Pavement smoothness specifications continue to be an important issue for Caltrans pavements, and they've partnered with industry via a joint committee. **Tom Pyle** (Caltrans) and **Don Mathews** (PRS) provided insight into the committee's work and the revised specification for pavement smoothness. The joint Caltrans-Industry committee has settled on some new concepts for how smoothness specifications will be structured. The revised specs will still be based on International Roughness Index (IRI) measurements via the high speed Inertial Profiler, but there is a new requirement for advance profile measurements on the existing pavement. The new requirements for finished smoothness will be based on this initial roughness and the number of "opportunities" the contractor has for improving smoothness.

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Tom Pyle (Caltrans)

Examples of 'opportunities' would be milling, or each lift of overlay paving. The specification will also be based on a "% improvement" criteria in some cases. There will be pay incentives for exceptional smoothness levels, and disincentives for smoothness that falls short. Grinding of very rough spots will still be a requirement.

Three concurrent afternoon breakout sessions provided speakers and discussions on Materials, Recycling and Construction practices.

Experiences with 'cold' recycling

- both Cold In-Place Recycling (CIR) or Cold Central Plant Recycling (CCPR) - were presented by three southern California agencies: Los Angeles County (**Van Truong**), City of Corona (**Nelson Nelson**) and City of Highland (**Carlos Zamano**.) Los Angeles County wins the prize for some of the largest CIR projects, with some covering 9 miles! Most projects involved CIR of the HMA layer to a depth of 3 inches and placement of a final cap of 1.5" to 2" asphalt rubber hot mix (ARHM). These projects reported significant savings in dollar cost, energy use and greenhouse gas impacts.

Partnering with neighboring municipalities also made sense on some projects, and produced 'economy of scale' for cost savings.

The San Diego Region has formed a 'Building Better Roads Working Group' to address regional concerns about material availability, pavement quality and use of newer pavement technologies. Two speakers focused on the activities of this new group – Bill Morgan of San Diego County Public Works, and Kristin Gaspar, Chair of the SD County Board of Supervisors. Topics such as RAP use, regional HMA mix designs, fiber-reinforced HMA, roller-compacted concrete and contracting efficiencies will be addressed through task groups with pilot projects planned. This effort could well be a model for other regional efforts across the state

Another breakout session on best practices for paving equipment and operation was presented by **Todd Mansell** (Caterpillar), with lots of useful tips for quality asphalt paving.

Kudos to **Russell Snyder** CalAPA Executive Director, and **Brandon Milar** and **Sophie You**, for pulling off another very successful Conference.

The CalAPA Fall Conference will be held in Sacramento November 6-7 2019.

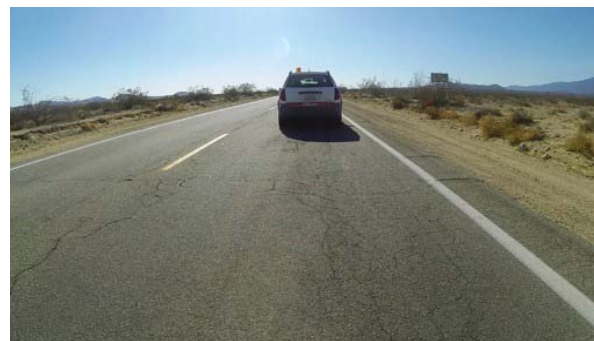
For more information, on the Conference and presentations go to: calapa.net



CIR in San Bernardino County

By Marco Estrada, PRS

On State Route 247 near Lucerne Valley in San Bernardino County, Pavement Recycling Systems (PRS) performed Cold In-place Recycling (CIR) on over 230,000 SY of old asphalt pavement. The distresses in the existing pavement were block cracking and alligator cracking, but the underlying base showed no signs of failure which made this the perfect candidate for CIR. The project required 3.5" of CIR with a 2.5" RHMA cap on top. The CIR process has an incredibly small 'footprint' that allows for minimal lane closures and a reduced impact to the regional traffic. Traffic was fully opened at the end of each day and in between the CIR and RHMA processes. Matich Corporation led the project as the Prime Contractor as well as the supplier for the rubberized hotmix asphalt (RHMA) that would overlay the CIR. Ergon Asphalt & Emulsions supplied the emulsion for the CIR process. The emulsion used was a CIR-EE mixed in at a rate of 2.75%.



Existing Pavement Condition on SR 247

PRS used a Caterpillar PR-1000 milling machine as part of their CIR train of equipment. The cold, wet CIR mix was deposited in a windrow for placing with a Caterpillar AP-1055 paving machine. Rolling was done with a 25-ton rubber-tire roller and Caterpillar P380. Overall, the project consisted of 19 days of CIR work and 18 days for the RHMA overlay, both portions were completed fully on-schedule.

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Using CIR and recycling all the old asphalt pavement in-place not just cuts out the need to produce virgin asphalt by reusing materials in-place, it also reduces or eliminates the need for



CIR equipment train (rear view)

hauling of materials offsite. In total, this project eliminated approximately 4,000 truckloads of material, which greatly reduced traffic and CO₂ emissions. This was not the only positive environmental impact provided on this project; the use of RHMA eliminated roughly 70,000 tires from landfills.

Mike Ristic, the Maintenance Engineer for Caltrans District 8, is no stranger to the CIR process. He talked about his experiences with the process, "2011 was when we started our first CIR project with SR 62 and US 95. Both projects came out great, as well as every CIR project we have done over the years. Overall, in District 8, we have done over 200 lane miles of CIR and plan to add more lane miles every year." He went on to talk about the benefits of using CIR, stating that, "The pavement life that we are getting out of our recycled roads is 15 years or even more. We keep them maintained with seal coating to make sure that we get even more years of performance." Referencing Caltrans' goals for sustainability, Mike adds, "CIR is great on these projects because we recycle our existing pavement resources and eliminate the hauling of materials to asphalt plants that

are typically 50 or more miles away. All results from CIR are very positive. The process is quicker (when compared to remove and replace methods) on the projects that we selected, and the final surface rides very smooth."



Rubber-tired roller doing secondary rolling of CIR

As is with all Caltrans projects, there was a smoothness requirement for a Mean Roughness Index (MRI) of 60 or lower using IRI measurements. The paving operation was highly efficient utilizing best paving practices and grade controls on paving equipment and the final pavement surface obtained the required smoothness, exceeding the requirement with minimal corrections needed. The project also required the use of Intelligent Compaction (IC), to achieve a longer life by achieving more uniform and better overall compaction of the CIR and RHMA. IC Rollers utilize GPS mapping, which allows the operator to view the precise location of where compaction has been completed or areas that require further rolling. This makes sure that no areas of the mat are missed during the compaction process, which ensures adequate support, stability and strength leading to a long-lasting road.

For more information contact **Michael Concannon** at: Mconcannon@pavementrecycling.com



Gilliam County Cold-Mix Paving Success

By Steve Olsen, Blue Line Products

Gilliam County is a rural and a sparsely populated dry land, wheat growing area located in north-central Oregon, east of the Cascade Mountains, approximately 150-miles east of Portland, Oregon. The Gilliam County Road Department maintains approximately 428-miles of road, of which more than 70% are unpaved. Maintenance of their gravel roads has

proven to be a challenge, but a new approach to providing a pavement surface for gravel roads has proved successful, and should be of interest to California's road agencies. According to **Dewey Kennedy**, Road Master of Gilliam County, as a result of their terrain and weather, their unpaved roads are a nightmare to maintain because of the steep grades

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and corners that consistently washboard under relatively heavy farm related traffic. Due to these issues, Dewey looked into the stabilization of the road base to hopefully mitigate these problems. Accordingly, the County experimented with several types of stabilizers all with limited success. However, about eight-years ago Dewey heard about a "local" product called Earthbind® Stabilizer and decided to test



A typical untreated Gilliam County unpaved road

its efficacy as not only a base stabilizer, but also as a dust control product.

The results were good, and Dewey states, "The Earthbind topical application worked amazingly well with both dust and washboarding. We graded the road sections and applied the diluted Earthbind to the roads and let it cure.

The public thought the roads had been paved, at first glance." At the same time, because of increasing traffic due to the booming windfarm industry, the County was also looking for an option for paving some of their more heavily traveled roads. Due to the county's location, it was evident that hot mix paving was out of the question since the distance to the closest hot mix plant was too far. Thus, it appeared that cold mix paving was an alternative worth exploring even though the county's past experience with cold mix proved to be unattractive due to cost. Dewey goes on to state, "We have our own

rock crusher and our own pug mill. In the past we made 'old school' cold mix for our projects. The cost of the cold mix oil had priced this process out of our budget, leaving us looking for other options."

Gilliam County also has available a large supply of recycled asphalt grindings, which they experimented with to upgrade some of their roads.

They laid down the grindings both wet and dry using a grader,

compacting, and covering with a chip seal. This application worked well, but the downside was that the quality of the ride that left much to be desired.



A Gilliam County road treated with Earthbind®

Due to the objectionable results from their roads constructed with the asphalt millings, Dewey reached out to **Troy Tindall**, President of Blue Line Road Products, regarding one of their engineered products known as Earthbind® EBS-RA. The intent was to find an engineered asphalt emulsion that would enable the recycled asphalt grindings to be used for cold paving. This move turned out to be a good choice.

Dewey stated, "We started running the grindings through our crusher into the pug mill adding 2½ to 3% Earthbind, and laying them with a paver. This process worked so well we paved over 14 miles of gravel roads with the recycled asphalt Earthbind blend."



Earthbind EBS-RA treated asphalt regrinds being laid down using a paver

With the success of Earthbind® for cold-mix paving using the asphalt regrinds, Dewey then decided to experiment with the same emulsion and the same process on both clean and dirty "off-spec" virgin aggregate that the county crushes from local rock sources. Again, the experiment proved to be successful.

"After the success with the recycled grindings, we produced a ½ x 10 inch clean rock with our crusher, ran this through the pug mill, adding 6% Earthbind, and laid it with a paver. The performance has been amazing and we have paved over 15 miles of gravel road with this method," said Dewey.

The more roads the Gilliam County Road Department paved using the Earthbind®, the more efficient the process proved to be. The cold-mix/Earthbind® process that the Gilliam County Road Department used to pave their roads is now called the "Ambient Mix Asphalt" (AMA) process.

"It took some trial and error and a patient roller operator to get the compaction process down, but the finished road looks as good as hot

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mix" said Dewey. In addition, Dewey considers the paving process using the Earthbind emulsion to be user friendly and adds, "Earthbind is very



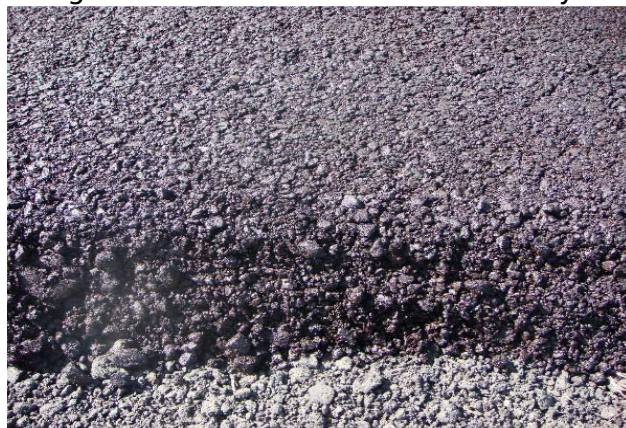
Cold Paved AMA

easy to work with - either by hand, with a blade or paver. Cleanup at the end of the day is with a water truck for any equipment used. We run water and rock through the pug mill and put the

rock back into the pile to be used the next day. The paver is just washed off and is ready to go."

In summary, the Gilliam County Road Department found a new cost-effective way to pave their roads, using their own equipment and crew, asphalt regrinds and their own virgin clean and "off-spec" aggregate, using the cold-mix AMA paving process with the Earthbind® Stabilizer product. Dewey concluded, "Performance has been

amazing. We have some mix that has been down over eight years showing no wear." Orange County (CA) Public Works has also utilized the Earthbind 100 for a dust inhibitor along a rural stretch of maintained roadway. The



A Close-up of AMA

product provided simple application methods with basic construction equipment they have. The product has held up fairly well to heavy amounts of off-road use, as well as rain events that bring in more vehicular traffic. They have applied several applications of the Earthbind® 100 to continue to stabilize the road as well as mitigate the dust concerns.

For more information contact **Steve Olsen** at mail: steve.olsen@bluelinetrans.com



Fuel Tax Dollars at Work

Dollars from Senate Bill 1 (SB1) - the gas and diesel fuel tax approved in 2017 and that all Californians are now paying at the pump - are



hitting the street in a big way, both at the state (Caltrans) level and on the local (city / county) front.

Caltrans recently announced it has been allocated \$420 million for 29 'fix it first' highway & bridge projects statewide, including \$320 million for projects funded by SB1. The Bill's funding will repair 60 bridges and 244 lane-miles of pavement. One example is in Sacramento County, where 70 lane-miles of SR-99 will be repaved to the tune of \$48M.

SB-1 will produce about \$5.4 billion per year for road and highway work. These new revenues are split equally between state and local

Roger Smith, CP2 Center

projects. At the local level, an example of putting these funds to use might be, Placer County, east of Sacramento in the Sierras. Their



SB1 funds will enable work on 12 miles of county roads at a cost of almost \$5M. This will augment their otherwise \$17 million budget for pavement maintenance. The County reports that because of the SB1 funds, Placer's roads can be resurfaced on a 10-year cycle. Without the SB1 funds, it would take them 50 to 100 years to complete their road upgrades.

Paying an extra 12 cents per gallon at the gas pump was a hard pill to swallow for many Californians, but we're now definitely seeing the positive results!

(This article contains excerpts from an article in The Auburn Journal.)



GENERAL
NEWS

Challenges and Opportunities to Quality Assurance for Preservation Treatments

By Jim Moulthrop (FP²) and Gary Hicks (CP² Center)

According to the "Glossary of Quality Assurance Terms", a good quality assurance (QA) program consists of "all those planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service" or in simple terms, making sure the quality of a product is what it should be. An overall QA program consists of three major components:

- Quality Control (QC) is performed by the contractor, must control the construction process, and involve a written a quality control plan. The QC plan must monitor production and placement and make needed adjustments where necessary. It also identifies the planned materials sampling and testing program to be performance by the contractor.
- Agency Acceptance involves inspection, sampling, and testing performed by the owner /agency or their representative. As a part of this effort the agency must inspect the product, monitor the QC testing and perform acceptance sampling and testing.
- Independent Assurance (IA) is a third party assessment of the product or process. It is an independent check of the QC and agency sampling and testing.

QA programs need to be developed for all preservation treatments, flexible or rigid. Unfortunately, QA programs are not currently well established for preservation treatments. The AASHTO Emulsion Task Force (ETF) has been developing material specifications; design practices, and construction guides for many of these treatments. Many of these items can be found at <http://tsp2-etf.org/>.

Major QA challenges facing the completion of successful pavement preservation projects include the following:

- Identify what, where, and how to sample and test for quality control and agency acceptance
 - Sample from the production unit or from the grade
 - Finished product or components
- Identify what and when the agency should inspect and documenting any workman

ship issues

- Determine when to include 3rd party testing

The ETF is currently working on identifying the types of sampling and testing needed for



Chip Seal Operation

quality control of emulsion chip seals. These include a listing of tests needed for emulsions and aggregate, as well as what to monitor / inspect during the placement of chip seals. Some of items identified include;

- Equipment calibration
- Application rates (binder & aggregate; daily)
- Proper spread patterns for both the emulsion and aggregate
- Rolling operations (having the right equipment; number of coverages; roller speed)
- Sweeping
- Traffic control
- Additional plans are being or will be developed for other preservation treatments besides chip seals.
- Challenges for agency acceptance include:
- Inspection: having a pre-construction meeting, surface preparation, equipment calibrations, number and types of rollers, sweeping times, and application rates. Each inspector should know what is in the contract specifications, their responsibilities and empowerment to address problems, what is expected from the contractor, and to verify quantities and measurements.
- Sampling and testing (of the emulsion and aggregate): Need

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to identify where, how, frequency, and quantities.

- Documentation: Document! Document! - field observations, test results and other issues
- Communication: Communicate! Communicate! - with your team and with the contractor

IA is the responsibility of the agency. It is independent verification of the QC tests and the agency tests. Therefore, it is imperative that the IA samplers and testers are qualified and if possible certified.

Opportunities for improvement in the quality of chips seal include:

- Implementation of the new AASHTO materials specifications (MP 27-16) and design practice (PP 82-16) for chip seals and the construction guides developed as a part of NCHRP project 14-37, which can be found at http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP14-37_FR.pdf.
- The development or implementation of new test methods for QC and acceptance, including embedment depth, the sweep test (ASTM method D-7000), and the field

Vialit test that has been used by Caltrans on some pilot projects.

- Implementation of the sampling and testing methods used on the NCAT and MN Road studies for preservation treatments
- Making certain the contractor and agency personnel are certified under the NCPP certification program.

In summary, QA in highway construction is not new. It has been used in the construction of HMA and PCC for a long time. It is an effective set of tools to ensure with a high degree of certainty, the product or process meets expectations. We still have work to do to incorporate this process in specifications for all the different preservation treatments.



Field Vialit Test

For more information contact: rghicks40@outlook.com or jmoulthrop@fugro.com



WRAPP Update

By Jimmy Kendrick, WRAPP President



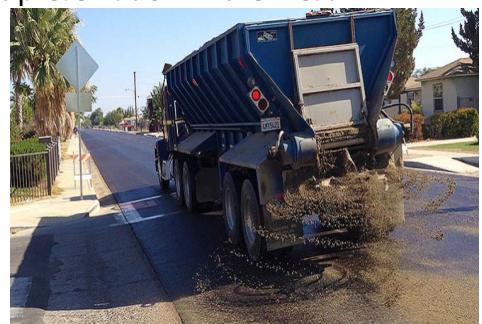
The Western Region Association for Pavement Preservation (WRAPP) 2020 Workshop is in the planning stages! Come share two fact filled days on January 29-30 at the Holiday Inn Sacramento Downtown-Arena. We are excited about returning to Sacramento. We are currently working to put together our agenda for the workshop, and secure a keynote speaker. Once we have finalized the agenda

it will be posted on our website at www.wrapp.org along with a link to register for the workshop.

As always, we strive to offer the best forum to update agency and industry on advancements and changes in the pavement preservation industry by bringing an agenda filled with experts from industry, academia and agencies. We provide some of the best technical experts in the field of pavement preservation and strive to

help agencies utilize the very best techniques to maintain cost effective, long lasting roads. WRAPP is currently partnering with Caltrans to help promote and educate contractors and agencies on the benefits of the different pavement preservation applications. WRAPP conducts quarterly meetings with Caltrans to discuss current issues, and opportunities to promote pavement preservation. Our most recent meeting was with Caltrans on Tuesday June 4th in Sacramento.

WRAPP is always looking for new members. Please check out our website at www.wrapp.org and get information on how to join our association and help promote and grow pavement preservation in the west.



Stretching SB1 Maintenance Dollars by 'Project Bundling'

By Sui Tan, MTC

Have you checked recently? How much does it cost to build a new ADA curb ramp? If you are a city or county in the San Francisco Bay Area, you're lucky if you are paying less than \$10,000 a ramp! In fact, costs for ADA curb ramps have escalated to more than \$14,000 according to recent bids.



How about your asphalt price? Some local agencies were paying close to \$150 per ton! While we are enjoying the fruit of our success in securing dedicated SB1 funding for road maintenance, we are also suffering from a lack of qualified contractors, and that has spiked bid prices as local agencies are competing among themselves to deliver road maintenance projects. Sensing that local agencies are paying dearly for much needed maintenance work, MTC has sought technical assistance from Federal Highway Administration (FHWA) to look at 'project bundling' as a way to stretch maintenance dollars.

Project bundling, as one of the latest FHWA's Every Day Counts 5 (EDC-5) 'innovations' (<http://alturl.com/mmtao>), offers a solution to alleviate contract price spiking.

"A bundled contract could cover a single county, district, or state," explained David Unkefer, senior engineer from FHWA Resource Center. "A single contract can be awarded for several preservation, rehabilitation, or replacement projects." According to FHWA, "It streamlines design, contracting, and construction; allows agencies to capitalize on economies of scale to increase efficiency; and supports greater collaboration during project delivery and construction."

The Bay Area's Metropolitan Transportation Commission (MTC) will be working with the Solano Transportation Authority to pilot a road

project bundling contract for pavement preservation in the near future. Details on a local interagency agreement, leading agency, specifications, and procurement are just some of the items that need to be ironed out. FHWA has had great success in bundling bridge projects and will soon publish the Bridge Bundling Guidebook.

Even though FHWA has not tried bundling on road projects, it is expected that similar results will be achieved. A study by the Indiana Department of Transportation's 'Joint Transportation Research Program' concludes that, "It is reasonable to infer that road work can benefit from project bundling, when the project is bundled with similar project types."

As we embark on the road pilot project, Romeo Garcia of FHWA Office of Infrastructure, is excited that MTC is able to pursue one of the innovations in EDC-5. "We may learn as much from you, as you do from us, and that will help us help others," he added.

Here are the expected benefits of project bundling :

- Expedited Project Delivery. Project bundling delivers strategic program solutions by streamlining various project delivery requirements such as environmental agreements and standardized designs.
- Reduced Cost. Bundling projects with shared features leverages design expertise and achieves economies of scale.
- Contracting Efficiency. Using a single contract award for several similar projects streamlines design and construction and saves procurement time.

For more information on this effort contact Sui Tan at: stan@bayareametro.gov

Federal Funding Update

Congress has taken a serious look at our surface transportation infrastructure this year. House Transportation and Infrastructure Chairman **DeFazio** (D-Or) and Senate Environment and Public Works Committee Chairman **Barrasso** (R-WY) have each embarked on an aggressive schedule of hearings looking at the need and importance of three items: 1. passing an infrastructure bill this year, 2. a long-term surface transportation reauthorization bill before the current reauthorization bill, the FAST Act,

By Jim Moulthrop, Executive Director FP² expires in 2020, and 3. a way to find a sustainable funding solution to the Highway Trust Fund, which is expected to have a 30 percent shortfall beginning in 2021. Whether these three things can be accomplished this Congress is an open question, but both Democrats and Republicans in Congress, and the Administration are putting forward a serious effort to tackle these important issues. From governors and mayors across the country, the hearings have painted a broad overview of the surface transportation

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infrastructure needs our country is currently experiencing. The hearings have also highlighted - through organizations such as the United States Chamber of Commerce, Associated General Contractors, and the American Public Transportation Association - the negative impact that inadequate investment in our transportation infrastructure is having on our country's ability to compete in a competitive global economy. Underlying the needs, is always the question of how Congress can establish a sustainable funding mechanism for transportation and what form it will take.

Department of Transportation Secretary **Chao**, at a recent Senate hearing, stated, with regard to fixing the Highway Trust Fund, that, "nothing is off the table" and indicated that it will be difficult to pass an infrastructure bill and a surface transportation reauthorization in a short period of time, suggesting it may be best to focus on the surface reauthorization as a legislative vehicle to accomplish these goals.

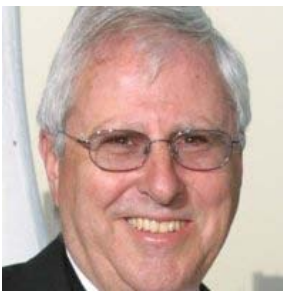
Having permanent leadership in place at the FHWA can also help accomplish legislative goals. Fortunately, early this year, the President nominated, and the Senate confirmed, **Nicole Nason** as the administrator of the FHWA. Her confirmation was approved in March by the Senate. The near unanimous vote indicates bi-partisan support for her role as the new Administrator.

Nason comes to the position with considerable experience having served as the Administration. She noted during her confirmation hearing that she is particularly concerned about safety issues. In particular, safety on rural roads noting that while only 19% of the population lives in rural areas, in 2017 fatalities on rural roads represented 47 percent of the over 37,000 total fatalities. She also noted her eagerness to guide the agency through a surface transportation reauthorization and help work to find sustainable funding for the Highway Trust Fund. The last two long term highway reauthorization bills, MAP-21 and the FAST Act, have emphasized the need to preserve our existing road systems and took a close look at measuring the performance and overall quality of our roads. The next reauthorization is likely to continue this focus, while also emphasizing the need for environmentally responsible and sustainable approaches to maintaining our roads. Finding a solution to the highway trust fund shortfall will provide agencies with assurances of funding, and enabling them to take a longer-term view will likely ensure that pavement preservation remains an important tool in maintaining our roads.

For more information contact **Jim Moulthrop** of the Foundation For Pavement Preservation (FP²) at: jimmoulthrop@gmail.com

Dr. Gary Hicks Receives Monismith Award

By Roger Smith, CP² Center



Dr. Gary Hicks, currently a Project Manager for our CP² Center, is the 2018 winner of the ASCE Geo-Institute's Carl L. Monismith Award and Lecture on Pavement Engineering for his 50 years of technical and

professional contributions in pavement materials, design, evaluation, and the construction and maintenance of transportation facilities. The Monismith Lecture is awarded annually for outstanding research contributions in Pavement Engineering and honors Professor Carl L. Monismith's contributions to the field. It's an especially fitting reward for Gary since he received his BS, MS, and Ph.D. degrees from the University of California at Berkeley where his major professor was Carl Monismith. He was one of Carl Monismith's earliest Ph.D

students and is the first of Professor Monismith's students to receive this award. Other noteworthy students of Professor Monismith included John Deacon, Ken Secor, Jon Epps, Fred Finn, Ron Terrel, George Dehlen, Nick Coetzee, John Harvey, Amy Epps Martin, and many more.

Gary has held teaching positions at Georgia Tech and Oregon State University for 30 years, and in 2006 helped establish our California Pavement Preservation Center (CP²C) at CSU Chico. He has also been active with the Transportation Research Board (TRB), Association of Asphalt Paving Technologists (AAPT), Foundation for Pavement Preservation (FP²), the International Society of Asphalt Pavements (ISAP) and ASCE. He is a registered Civil Engineer in the states of California, Oregon, and Alaska and has authored more than 200 publications and one textbook, with Clark Oglesby titled "Highway Engineering", and has won numerous awards

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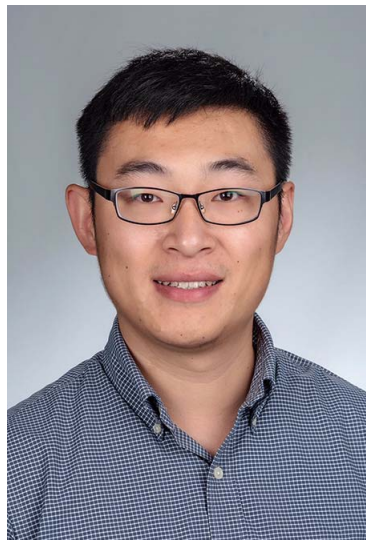
during his career. In addition to his ongoing work for the CP² Center, he is still active as a consultant to several companies and organizations in the area of pavement design,

management, maintenance, and rehabilitation. Congratulations to Gary on receiving this prestigious award!



CSU Chico Professor To Take NCAT Training

By Dr. Ding Cheng, CP² Center



Dr. Kun Zhang, Assistant Professor of Civil Engineering at California State University in Chico, has been accepted into this summer's "Professor Training" asphalt class at the National Center for Asphalt Technology (NCAT) at Auburn University. NCAT developed the educational program for college and university civil engineering faculty that provides intensive, up-to-date lecture and laboratory material for the asphalt portion of an undergraduate civil engineering materials course. The program, underwritten by the asphalt industry, is designed to help increase the pool of qualified

civil engineers and technologists knowledgeable in asphalt technology by providing faculty with appropriate educational material. The five-day course will be held June 17-21, 2019 at NCAT's main facility in Auburn, Alabama. Zhang is one of 20 participants selected from a nationwide pool of applicants.

Dr. Zhang has been with CSU Chico since August of 2018 and is the senior pavement researcher at the California Pavement Preservation Center (CP²C). Prior to joining the faculty at CSU Chico, Zhang served on the staff at Washington State University from 2012 to 2018, where in addition to serving on the faculty he was Co-Director of the Washington Center for Asphalt Technology (WCAT). He earned his Ph.D. in civil engineering from Washington State University in July of 2016, and both his Bachelor of Science and Masters of Science degrees in Civil Engineering from Shandong University in Jinan, China, where he studied between 2009 and 2012.

"I believe these activities can greatly benefit the teaching effectiveness and improve the teaching quality of those undergraduate courses at my own institution," Zhang said in his NCAT application. "It can also encourage our undergraduate students to have more hands-on experiences and pursue a career in the asphalt industry as pavement engineers."



CP²C Works On SB1-Funded Projects

By Gary Hicks, CP² Center



California Senate Bill 1 (SB-1) passed in April 2017 provides \$2 million per year to the California State University (CSU) system to conduct transportation research and related workforce education, training, and development. The California State University Transportation Consortium (CSUTC) led by the Mineta Transportation Institute, fosters synergies of the entire California State University system to conduct impactful transportation research and engage in workforce development initiatives that increase the mobility of people and goods and strengthen California's economy.

California Pavement Preservation Center (CP²C) at CSU Chico is part of the four CSU campuses that represent the geographical, cultural, racial, and socioeconomic diversity that makes California and the CSU system strong. The CP² Center's work effort in year one has focused on several improvements in

the area of pavement preservation, highlighted below.

Performance Model Development

To achieve improved levels of service on pavements, as demanded by SB-1, fixing only the poor roads is not enough. It is also important to understand the benefits of maintaining and preserving the better roadways. By including pavement preservation, it is possible to delay the good roads from falling below fair conditions. Due to the lack of research in the past, many local agencies in California simply do not have needed information on the life extension and economic benefits of their various pavement preservation strategies. The CP² Center has developed a methodology to quickly develop performance models for widely used pavement preservation treatments for local agencies in California. With this knowledge, local agencies can estimate pavement

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preservation life extension and economic benefits, and further select the optimal treatments to achieve low life-cycle costs and better service for the users.

Training Material Development

Currently, many local agencies also lack proper knowledge and work experience in the many pavement preservation technologies available today. Therefore, this study also includes synthesizing the most recent pavement preservation technologies and developing proper training materials for agencies and contractors. Led by Dr. Gary Hicks, Lerosé Lane, and Dr. Ding Cheng, the Center has developed technical manuals for three widely used pavement preservation technologies: chip seals, slurry surfacing, and cape seals. These manuals synthesize the most recent knowledge and best practices from Caltrans, FHWA, AASHTO, Southern California 'Greenbook', and industry partners, including the Pavement Preservation and Recycling Alliance (PPRA) and Western Region Association for Pavement Preservation (WRAPP). After the external reviews are



complete, the manuals will be posted on the CSUTC website (<https://transweb.sjsu.edu/csutc>) and CP2 Center's website (<https://www.csuchico.edu/cp2c>). The first training on these manuals is expected to begin in the winter of 2019/2020. The will be delivered through the ITS program at UC Berkeley.

Use of Recycled Concrete as Aggregate in HMA
Another project that CP2 Center is currently working on through the SB-1 funding is to develop a quality control method and guidelines for hot mix asphalt (HMA) using recycled concrete aggregate (RCA). Teaming with CSU Fresno and supported by industry, the Center, under the direction of Ding Cheng and Kun Zhang, is developing proper mix designs to maximize the benefits of using RCA in hot mix asphalt. For more information contact Ding Cheng at: dxcheng@csuchico.edu



Ernesto Lopez – Undergraduate Research Assistant

By Ding Cheng, CP² Center



Ernesto Lopez was an undergraduate student for the CP² Center. He started exploring pavement preservation in the spring of 2018 during my upper division advanced transportation engineering class. In this class, I introduced two major projects to the students. One project was for Caltrans in District 10 where rutting occurred in the wheel path of a highway section. The goal for this project was to investigate core samples and decipher the causes of the rutting. The second project was for the city of Chico and the goal of this project was to convert two old roads in a downtown neighborhood into one-way roads. As part of the class project, his group performed traffic studies of the neighborhood, leading to some troubling discoveries. Afterward, he researched and designed viable road layouts that would satisfy the demands of traffic while still preserving the neighborhood feel and aesthetics.

After completing the class, he started working with the Center on different projects and assignments and participated in various pavement preservation treatment pilot projects. Whether it was an older known treatment such as a double chip seal or a newer treatment like double chip seals with Glasspave50, Ernesto and others would visit a project site before a treatment is applied and document the condition of the pavement. After the treatment was applied and some time had passed, the CP2C team would once again visit the site to document pavement performance, including reporting any pavement distresses such as reflective cracking or with bleeding. Ernesto's more recent projects involved a literature review and development of performance models for surface treatments for local agencies in California. The treatments in the literature review and performance models include chip seals, slurry seals, microsurfacing, and cape seals. Utilizing MTC's StreetSaver program, he was able to obtain and export useful information. Using a spreadsheet with over 50,000 road inspections, *Continued, next page*

we created a series of filters that would exclude unexplainable PCI shifts. Using this technique, we set up a system to determine the behavior of a particular preventive maintenance treatment using data from that road network region. Ernesto plans to continue working in the field of pavement preservation or transportation sector after graduation. As his

knowledge and understanding grew, so did his interest and appreciation for pavement technology and the fact that the industry is large, with a lot of work that needs to be done.

Ernesto recently graduated from the Center, and now works for Bay Cities Paving and Grading, Inc. (<https://www.baycities.us/>)



AASHTO Emulsion Task Force – Update

By Colin Franco (RI DOT and Chair of the ETF), Chris Lubbers (Kraton and Co-Chair), and Gary Hicks (CP² Center)

When it comes to emulsions for pavement surface treatments, there's a lot happening nationally through the AASHTO Emulsion Task Force (ETF). The ETF was established in 2008 as part of the FHWA Pavement Preservation ETG under the leadership of the late Jim Sorenson of FHWA. As there was a dire need to bring preservation critical, emulsion technology into the 21st century. In 2015, it was placed under the umbrella of the AASHTO TSP2 program. The original scope of deliverables was as follows:

- Advance the effort to develop performance based methods and specifications for emulsions including protocols for materials, design, construction, and inspection and acceptance
- Encourage adoption of uniform national standards for the use of the products.

The deliverables of this task force have been many, and some of the recent ones (completed or underway) are summarized in this article.

ETF Deliverables 2015-2019

AASHTO materials specifications (MP), design practices (PP), and construction guides have or are being developed for the following treatments:

- Micro-surfacing (MP 28-17, PP83-17, and NCHRP project 14-37)
- Chip Seals (MP27-16, PP82-16, and NCHRP project 14-37)
- Emulsion Binder Specifications (M-140, M208, and M316) revised in 2016 and approved by AASHTO
 - M 140 – Revised to 2016 - Approved by AASHTO SOM
 - M 208 – Revised to 2016- Approved by AASHTO SOM
 - M 316 – Revised to 2016 - Approved by AASHTO SOM
- Slurry Seals (MP32-17, PP87-17). Construction guides to be developed by NCHRP.
- Fog Seals (MP 33-17, PP 88-17, and

NCHRP project 14-37)

- CIR with Emulsion (MP 31-17, PP 86-17, and construction guides under development by NCHRP 9-26 (ongoing)



- Ultra-Thin Bonded Wearing Course (Material specifications and design practice drafted and to go to ballot this fall.
- Tack Coat (MP 36-18, PP93-18, and construction guides to be developed by NCHRP.
- Scrub Seals (Material specs to go to ballot this fall, PP 91-18, and construction guides still to be developed.
- Sand Seals (MP34-18, PP90-18, and construction guide to be developed

Emulsified Asphalt Performance Graded (PG) Binder Specifications (2015-2019)

One of the ETF's original charges was to develop performance graded (PG) specifications for emulsions. This effort is still underway and includes the following;

- EAPG (Emulsified Asphalt Performance Graded) - Draft specification completed by ETF.
- NCHRP 9-63- A Calibrated and Validated National Performance- Related Specification for Emulsified Asphalt Binder. Upon completion, it will be forwarded to AASHTO COMP for vetting and acceptance as an AASHTO Materials Specification.

QA Protocols–Emulsion Treatments (2017-2019)

There are 4 parts being developed for the QA of emulsion treatments as follows:

- National Accepted AASHTO Standards - This includes the materials specs, design practices and construction guides discussed above..

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- Materials and Workmanship QA -. This includes: Agency Acceptance Plans for materials and workmanship, Contractor Quality Control (QC), Independent Assurance (IA), and Vendor Supplied Material Certifications
- Education and Training - This includes: Defining the training needs for Agency / Contactor Staff and Certification Programs for Contractor and Agency personnel

Emulsion Construction Guide Specs- AASHTO Joint Task Force

An AASHTO Joint Task Force, consisting of members from the Committee on Materials and Pavements (COMP), Committee on Maintenance (COM), and Committee on Construction (COC), was created to vet and approve construction guide specs at the request of the ETF. Larry Galehouse (NCPP), and George Connors (AASHTO Committee on Maintenance) took the lead and were instrumental in getting this initiative going and made sure that it became a reality.

Research Initiatives

The ETF has also been responsible for initiating or supporting several research efforts for emulsion surface treatments. These include the following:

- NCHRP – Research projects submitted by ETF
 - 14-37 Construction guide specs for Chip seal, Microsurfacing and Fog seal. - Completed
 - 20-50(18)CIR, FDR and CCPR reclamat-

ion specifications and test methods. - Ongoing

-9-63 Performance Grade Specification for Emulsion Binders. -Ongoing

- New research proposals submitted to NCHRP
 - Rejuvenating Sealers in Emulsions
 - Construction Guide Specs for tack coat and slurry seals (accepted) NCHRP 9-44
 - Construction Guide Specs for CIR (accepted) NCHRP 9-43
- FHWA Research Proposal
 - Proposal for implementation of emulsion treatments using new AASHTO standards, forwarded for consideration by FHWA Implementation and Innovation programs.
- EAPG- Limited Validation Testing
 - Asphalt Emulsion testing is being conducted by several Emulsion Labs to Calibrate/validate certain tenets of the EAPG specification. This effort is being coordinated by the Asphalt Institute and funded by Husky Asphalt of Canada.

So there's a lot to keep up with on the national front concerning asphalt emulsions and surface treatments for pavement maintenance. For more information on the ETF efforts, please check out their website at: <http://tsp2-etf.org/>



COMING EVENTS: Mark Your Calendar!

By Roger Smith, CP² Center

"Introduction to Pavement Engineering and Management" (IDM-31) June 17-20 (Online)

This 'live' online class has four two-hour sessions on four consecutive days - June 17-20. The class provides an introduction to the different functional requirements of pavement for different purposes, including streets, roads, highways, and bicycle/pedestrian paths. The class provides a basic understanding of how pavement materials, structural design, construction, and asset management interact to affect pavement performance.

For more information go to:

<https://registration.techtransfer.berkeley.edu/CourseStatus.awp?&course=194IDM310617>

ASCE International Airfield & Highway Pavements Conference July 21-24 (Chicago)

This national event will feature Dr. Gary Hicks of our CP² Center. Gary is the 2018 winner of the ASCE Geo-Institute's Carl L. Monismith Award and Lecture on Pavement Engineering. The conference will provide an unrivaled chance to interact and exchange information with worldwide leaders in the fields of highway and airport pavements, as well as airport safety technologies.

For more information go to:

<https://www.pavementsconference.org/>



Petersen Asphalt Research Conference (PARC) 2019 July 14-17 (Laramie, WY)

The 56th annual PARC is coming up in July. The mission of PARC is to bring together researchers and practitioners, highway officials, producers, suppliers and users, academia, and others who are working to advance the understanding, characterization, specification, design, usage and performance of asphalt materials. For over 50 years, research presented and discussed at the PARC has led to designing innovative asphalt materials and safer, longer-lasting and more cost-effective highways.

For more information go to: <http://www.petersenasphaltconference.org/>

Airport Pavement Technical Workshop November 5-7 (Newport Beach)

This Asphalt Institute workshop provides the most up-to-date information for those design-

ing, constructing and managing asphalt airport pavements. Focus is on current FAA and other applicable industry standards, including speci-

cations, advisory circulars, criteria and policy. Topics covered include pavement design and evaluation, materials, mix design, construction, preservation and rehabilitation practices, along with innovative pavement technologies for airports.

For more information go to: <http://www.asphaltinstitute.org/training/seminars/>

"Pavement Maintenance For Local Agencies" (IDM-04) December 3 (Sacramento, CA)

This popular class from the Tech Transfer

Program at U.C. Berkeley, provides a solid working knowledge of the most common pavement maintenance and preservation practices. Topics include pavement management system concepts, pavement distress types and causes, asphalt materials, maintenance vs. rehabilitation concepts, repair options and common pavement maintenance and preservation strategies.

For more information or to enroll, go to: <https://registration.techtransfer.berkeley.edu/wconnect/CourseStatus.awp?&course=142IDM041203>

"Asphalt Pavement 101" Class

This popular half-day class from CalAPA offers an overview of the basics of asphalt pavement including asphalt materials and HMA pavement construction. It is available by request to companies or road agencies - or watch for scheduled 'public' offerings.

For more information go to: www.calapa.net

"Road Crew Asphalt Pavement Maintenance" (IDM-05)



Berkeley
UNIVERSITY OF CALIFORNIA

Coming soon will be this new class from the Tech Transfer Program at U.C. Berkeley. It will be offered periodically or on-request by an agency. The 1-day class will provide asphalt pavement basics and a working knowledge of the most common pavement repair and maintenance practices, focused on what road maintenance crews need to know.

For information go to: <https://registration.techtransfer.berkeley.edu/>



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Caltrans established the California Pavement Preservation (CP² Center) at CSU, Chico in July 2006, and fully funded the Center in January 2007. Dr. DingXin Cheng is the current Director of the Center. Mr. Hector Romero is the current contract manager of Caltrans.

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

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