



CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

No. 54

June 2020

Asphalt Emulsion ETF Advances Technology

By Paul Fournier (for National Center for Pavement Preservation)*



Asphalt Emulsion Spray Application

A little known volunteer group of highway technology professionals are quietly transforming the language and mechanics related to asphalt emulsions, and in the process revolutionizing the way that billions of dollars will be spent preserving the nation's roadways. The diverse collection of academics, engineers, contractors, producers and agency officials is known officially as

AASHTO Pavement Preservation Emulsion Task Force - ETF for short.

The ETF has been working for the past five years to create a set of national standards, predication on performance, for emulsion-based pavement preservation treatments. As part of this effort, the ETF is advancing changes in asphalt emulsion technology and encouraging state Departments of Transportation and local agencies to incorporate these new developments into their pavement preservation programs.

Protecting \$2.4 Trillion Investment

Emulsion-based surface treatments are employed for roadway preventive maintenance and are considered by the Federal Highway Administration (FHWA) as a major component of pavement preservation. Some agencies use the terms pavement preservation and preventive maintenance interchangeably for these treatments, which include chip seals, slurry seals, micro surfacing and fog seals, among others. The emulsion-based treatments are generally inexpensive when compared to traditional treatments using hot mix asphalt.

The FHWA notes that out of an estimated 4.1 million miles of public roads in the U.S., about 2.8 million are paved – most with asphalt. About one million miles of these are owned and operated by the states, and 1.8 million miles are owned by local governments. Of the paved state roads, more than 90 percent are asphalt with the remainder divided between concrete pavement and composite pavement.

All told, the nation's roads are estimated to be worth more than \$2.4 trillion, according to The Asphalt Pavement Alliance (APA), a coalition of the Asphalt Institute, the National Asphalt Pavement Association, and the State Asphalt Pavement Associations. Preserving this immense roadway investment requires enormous financial expenditures.

Preservation Origins

At one time FHWA allowed little or no federal funds to be spent by the states on road maintenance, but that began to change in the early 2000s thanks in part to the work of the late Jim Sorenson, considered a pioneer in the development of pavement preservation systems. A senior construction and preservation engineer for FHWA's Office of Asset Management, Sorenson spent much of his time as a

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strong advocate of pavement preservation, explaining these principles to various segments of the transportation construction industry. He partnered with state DOTs and worked closely with organizations that promoted the concepts of pavement preservation. Sorenson believed that the benefit-to-cost ratio for pavement preservation far exceeds that of reconstructing a road that has been allowed to deteriorate too long and he estimated that for every \$1 invested in preservation, there is a \$6 return in extended service life.

Today, FHWA points out that an effective pavement preservation program addresses pavements while they are still in good condition, before the onset of serious damage. By applying a cost-effective treatment at the right time, the agency believes pavement is restored almost to its original condition. The cumulative effect of aging, weather and abrasion is postponed, and the pavement can continue to provide a safe, smooth and cost-effective service to the taxpayer. This proactive and systematic preservation treatment postpones costly rehabilitation and reconstruction. For funding considerations, FHWA regards pavement preservation as having three components: preventive maintenance, minor rehabilitation (non-structural), and some routine maintenance activities.

The Emulsion Advantage

While asphalt emulsions are the key ingredient of most pavement preservation treatments, they are relatively simple products created by combining asphalt, water, and a small amount of an emulsifying agent in a colloid mill that shears the asphalt into tiny droplets. The emulsifier, usually a surface-active agent such as ordinary soap, keeps the asphalt droplets in a stable brown suspension with a thin consistency, which can be used in cold processes for road construction and maintenance. Once the emulsion is applied in the field, the asphalt begins to stick to the surrounding aggregate or other surface, and the emulsion “breaks,” with its color changing from brown to black. As the water begins to evaporate, the emulsion begins to behave like pure asphalt binder, and is described as being set.

Asphalt emulsions do not require a petroleum solvent to make them liquid, and in most cases they can be used without additional heat. Both factors contribute to energy savings and a safer work environment. Furthermore, emulsions reduce asphalt viscosity, enabling lower

temperature applications, and there are little or no hydrocarbon emissions created with their use. These features make asphalt emulsions ideal binders for pavement preservation treatments. This fact, coupled with a federal willingness to make funds available for preventive maintenance, has sparked a rising demand for the product. It is estimated that 10- to 20 percent of all asphalt produced today is used in the form of asphalt emulsions.

Loosening Strings But Not Entirely

Although the feds have been loosening the purse strings and providing more funds for pavement preservation, it took years of soul-searching on the part of FHWA to arrive at the point where significant sums were allocated for pavement preservation use. And there are serious strings still attached to the money. In 2004, pavement maintenance was made eligible for federal funding for the first time. However, the DOTs were required to have pavement maintenance programs in place to obtain those funds. In 2009, more federal funds were authorized but state spending of this money had to be linked to highway asset performance. So states would not only have to maintain their pavements but also show the resulting performance.

“Therefore, the DOTs have to use pavement preservation measures as a way to reach performance goals in a cost-effective manner,” said Larry Galehouse, Director Emeritus of the National Center for Pavement Preservation (NCP) based at Michigan State University. A professional engineer and licensed surveyor, Galehouse collaborated with Michigan State University and the Foundation for Pavement Preservation (FP²) to establish the NCP in 2003. This was America’s first formal organization to offer a national focus on pavement preservation in collaboration with industry, government, and academia. NCP works with them to advance and improve pavement preservation practices through education, training, research and outreach, and maintains a collection of preservation-related technical documents on its website.

Galehouse was Director when NCP assumed responsibility for asphalt emulsion-related research functions from an FHWA Emulsion Task Group that Jim Sorenson originated.

As public agency demand for pavement preservation funds and information rose, AASHTO developed a state-funded Transportation Systems Preservation Technical

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Services (TSP-2) center to foster cooperation among private industry, academia, consultants, and federal and state agencies. The Center was based at NCPP.

In 2015 the ETF moved under the umbrella of AASHTO's TSP-2, and NCPP is now contracted to manage ETF as well.

Lack Of Standards Hurts Progress

Galehouse said a major shortcoming of emulsion technology/treatments was the lack of formal national standards available in the AASHTO/ASTM format.

"It is well known that for a technology to be widely accepted by state and local agencies, National Standards for that technology must be developed and made available," he said.

Galehouse served as NCPP Director until he retired in 2017. He was succeeded by Dr. Judy Corley-Lay. Despite being officially retired, Galehouse manages TSP.2 and is a key participant in the activities of Messaging & Implementation (M&I), the largest of seven working subcommittees of the ETF. Other subcommittees are Residue Recovery and Testing, Spray and Mix Design Group, Supplier Certification & Quality Assurance, Recycling Emulsions, Rejuvenators, and Research. There is also a Special Working Group dedicated to developing performance grading for emulsion asphalt, similar to the PG of Superpave asphalt binder.

ETF is headed by Co-Chairs Colin Franco of the Rhode Island DOT, and Chris Lubbers of Kraton Polymers USA LLC. The Task Force consists of about 80 expert representatives from all stakeholders of asphalt emulsion technology. These volunteers hail from five states, three universities, seven producers, five industry associations, AASHTO, and FHWA, among other entities.

Deliverables Progress, But Names Confuse

Making progress with deliverables, ETF recently completed materials specification and construction guides for owners or contractors on three of the most commonly used treatments – chip seals, micro surfacing and fog seals. The specifications describe:

- emulsified asphalt chip seal as the application of emulsified asphalt, followed immediately by a single layer of aggregate chips to a prepared surface
- micro surfacing as the application of a mixture containing polymer modified emulsified asphalt, mineral aggregate, mineral

filler, water, and other additives that are properly proportioned, mixed, and spread on a prepared pavement surface

- emulsified asphalt fog seal as the application of emulsified asphalt, either diluted or undiluted, to a prepared pavement surface that may be followed immediately by a light application of blotter sand.



Asphalt Emulsion Chip Seal

To illustrate the need for national standards and as an indication of the difficulty of achieving this, numerous terms have been used by agencies and contractors for chip seals, such as "seal coat," "surface treatment," "surface seal," "surface dressing," "sprayed seal." A variety of labels are also used for other treatments as well.

"The biggest challenge for the Task Force will be getting the DPW and DOT agencies to try the new specifications and construction guides we are developing," said Larry Tomkins, P.E., Chairman of ETF's M&I subcommittee, and Vice President, Sales and Marketing, for Ergon Asphalt and Emulsions Inc.

Among M&I specific tasks is creating awareness of ETF's activities to establish new emulsion standards. The subcommittee is also involved in the organization of training sessions on newly adopted ETF construction guides, and arranging pavement preservation demonstration projects using the new asphalt emulsion standards.

*Note: This article is an abridged version of an original article Mr. Fournier, reprinted with his approval. Thank you, Mr. Fournier and NCPP!

For more information on the Asphalt Emulsion ETF go to:

https://www.pavementpreservation.org/wp-content/uploads/2010/11/ETF_Membership_List_7-27-09.pdf



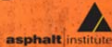
New Asphalt Manual Available

The Asphalt Institute has announced the availability of a revised Third Edition of its manual, "Construction Of Quality Asphalt Pavements" (MS-22). For 35 years this book has served as a comprehensive 'go to' manual for the industry.



Construction of Quality Asphalt Pavements

MS-22 Third Edition



The 2020 edition was updated to incorporate the latest technology, equipment, methods and standards. There are now new chapters on mix delivery / trucking and surface preparation prior to paving. Examples of newer technologies covered in this edition include specialty rollers, intelligent compaction (IC), mix performance tests, plant equipment and various quality assurance (QA) approaches.

By Roger Smith, CP² Center

The manual has 10 chapters covering all aspects of asphalt pavement construction. Including materials, (binders and aggregates) mix design methods, plant operations, hot mix delivery, preparation for paving, mix laydown / paving machines, compaction rolling and quality assurance / testing programs.

According to Peter Grass, AI President, "Our Asphalt Institute engineers spread the word about quality asphalt pavements across North America and even the world. This extensive manual encapsulates those many lessons and pointers along with decades of experience from our team."

The manual is available from the Institute at: www.asphaltinstitute.org



CalAPA Classes Go Online!

The California Asphalt Pavement Association (CalAPA) has responded to the COVID19 pandemic, by converting its popular training classes to the online 'webinar' format.

Classes currently offered are described below:

Asphalt Pavement 101

CalAPA's popular "Asphalt Pavement 101" class is a good overview of everything asphalt, touching on asphalt pavement are design, materials and construction. The half-day class is taught by Roger Smith, a pavement consultant, and former senior materials engineer with Caltrans and the Asphalt Institute, as well as a former executive director of CalAPA. Attendees receive a digital workbook and a certificate of completion.

HMA Pavement Smoothness

Two separate classes are a "deep dive" into new pavement specifications for pavement smoothness, as well as best-practices for constructing smooth pavements in the field. Both classes are taught by Mike Robinson, a paving consultant who formerly worked for Caltrans and private industry, who brings his engaging style and real-world examples to this presentation. Attendees of each class

By Roger Smith, CP² Center

will receive a handy digital reference book and certificate of completion. There will be ample time set aside for Q&A. Smoothness specifications and measurement have undergone major changes. Don't be caught unaware.

Quality HMA Paving

Back by popular demand is our training class on field paving best practices, "Quality HMA Paving," which covers all the techniques, tips and tricks for delivering a successful asphalt paving job. Our instructor, 'Skip' Brown, has decades of experience as owner of a paving company and has personally supervised the placement of more than 4 million tons of asphalt on roadways in California. All attendees of the class will receive a digital reference book and certificate of completion.

Caltrans Section 39 HMA Specifications

The influential Caltrans specifications covering Hot Mix Asphalt change several times a year. Our comprehensive Section 39 HMA Specifications class covers all the latest changes and other important guidance that contractors and those who reference Caltrans specs need to know. The instructor is Brandon Milar, P.E., Director of Technical Services for CalAPA, who has many years of experience as a materials engineer. He works closely with

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Caltrans on the joint industry-agency Pavement & Materials Partnering Committee (PMPC) that reviews and offers recommendations for changes to Caltrans specifications. All attendees of the class will receive a digital reference book and certificate of completion.

For more information on classes and dates refer to our 'Coming Events' segment or go to: www.calapa.net



Slurry Seal Webinar - Highlights

By R. Gary Hicks, CP² Center

The Pavement Preservation and Recycling Alliance (PPRA) in conjunction with FHWA, has been offering free webinars on pavement maintenance best practices. Topics have included Milling Practices, Stretching Budgets and Slurry Surfacing. Webinars are the third Thursdays of each month at 11pm PST.

The 3rd of the monthly seminars was given in April by Chuck Ingram of Slurry Pavers, and titled "Introduction to Slurry Surfacing Systems and Where They Are Best Used". Topics covered during the webinar included:

- History of these treatments
- Why we need preservation treatments?
- The different systems (slurry seals, polymer modified slurry seals, micro surfacing)
- Benefits of the treatments
- And much more

The slurry treatments, first developed in the 1930's in Europe, were a mixture of fine aggregate, asphalt emulsion and water. The process evolved over the years with better emulsifiers and equipment, and the process is now used worldwide. We now use preservation treatments as a first line of attack to defer major rehabilitation and extend pavement life, improve safety, and meet motorist expectations.

An effective preservation program addresses pavements in 'fair' to 'good' conditions, and if applied at the right time, the pavement is restored to an almost new condition. Preservation treatments have been used for preventive, corrective and reactive maintenance in order to keep pavements of all ages operational until more funding becomes available. ISSA Guideline A-105 describes the process for designing and constructing good slurry seals. ISSA Guideline A-143 provides the same type of information for microsurfacing. The major difference between the products is that microsurfacing is always polymer modified, can be used on higher volume

roads and for some types of rut filling, and are quicker drying than slurry seals. They can also be used at lower ambient temperatures (e.g. night work).

In 2020, ISSA came out with ISSA Guideline A-115 which deals with polymer modified slurry seals. These products are in between the slurry and microsurfacing. They do require 100% crushed aggregate and a CQS emulsion with a minimum of 3% polymer by weight, and micro-type machines to place the product. This product can be used where slurry seals have been used, but do provide increased durability and reduced scuffing and raveling. Nighttime work and higher volume roadways should still call for microsurfacing.

For more information on web-based training, and to download the Guidelines for slurry surfacing, check out www.slurry.org. FHWA also has pavement preservation check lists for slurry seals and micro surfacing as well as other treatments that can be downloaded from www.fhwa.dot.gov/pavement/preservation/resources.cfm

Finally, PPRA has also developed an excellent website with lots of information on a variety of asphalt preservation treatments and other upcoming webinars. These can be found at www.roadresource.org.



'Toot Your Horn' Occasionally!

Building community support for pavement work is always a challenge, especially for pavement preservation work on pavement that's still in relatively good condition. But for local agencies, it pays to 'toot your own horn' occasionally, and let the public know what you're doing. If you're lucky enough to still have a local newspaper or radio station, periodic 'news releases' can be a big ally in educating the public about the 'whys and wherefores' of your pavement program. Here's an excerpt from an article that recently appeared in the Auburn Journal touting the City of Auburn's street program. Auburn is a small City of 15,000 in the California's 'Gold Country', 30 miles east of Sacramento.

"Auburn To Catch Up On Road Resurfacing Projects; The Treatments, And What They'll Cost"

By Traci Newell.....Auburn Journal
May 26, 2020

The city of Auburn sent out contracts last week on work to resurface and extend the life of several roads. The project, which includes micro-surfacing and chip-sealing 739,000 square feet of roadway, is anticipated to begin in July. This resurfacing project aims to bring the city up to date on its 10-year road resurfacing report.

"In the past few years, we haven't necessarily been on target with the roadway report," said Mengil Deane, transit project manager for the city. "We anticipate this will catch us up. The city is eight years into its 10-year resurfacing report and has plans to update its

By Roger Smith, CP² Center

list of anticipated roadwork soon," Deane said.

Micro-surfacing and chip sealing are different than overlay, which includes scrapping 2 inches of roads and then laying down a new surface from curb to curb. The newer technologies are designed to extend the life of pavement at a lower cost and yielding greater longevity. "This project is intended to preserve roads that aren't completely deteriorated at this point," Deane said. "We are looking at the streets that we think can be saved."

This preservation of roads isn't completely foreign to Auburn. Canal Street, Oakridge Way/Auburn Glen subdivision and Shockley Way received similar treatment. The city is piggy-backing off larger Placer County projects, saving the city money by using the same contractors to obtain a more affordable rate for the work. Placer County has already executed its agreements, and the contractors intend to begin work shortly. The council approved the total project cost to not exceed \$750,000. The city has \$1.1 million allocated in its transportation budget for the year, with \$500,000 coming from the general fund. City council members directed staff to use \$600,000 in revenue from gas taxes, \$150,000 from the transportation fund and surplus money from the Nevada Street project, if there is any, on the street project before touching the general fund.

(Reprinted with permission of the "Auburn Journal", a Gold Country Media newspaper.)



PCC Pavement Supporting Williams Development

BY Clay Slocum, CNCA

The City of Williams' "2019 Pavement Repair Project No. 19-100", reconstructed portions of Vann Street and Vada Court on the developing east side town. The project sits just off Interstate 5 amidst the slough of new buildings. This up-and-coming part of Williams is progressing strategically as developers find the City to be a business-friendly partner. One newly opened business includes Grocery Outlet who benefited from the newly paved roads that serve as the entrance and exit for the store.

According to Trin Campos of Bennet Engineering, who represents Williams as the City Engineer, "The City originally faced a challenge, especially

at the cul-de-sac on Vada Court, due to high truck volumes and poor subbase conditions."

The existing pavement became a maintenance headache requiring frequent attention. Trin Campos of Bennet Engineering represents the City of Williams as the City Engineer, and he knew the first place to start was with a geotechnical investigation. Geocon Consultants, Inc. provided great support and subgrade condition analysis.

With incoming development and increased traffic expectations, the City strives to achieve the mantra "Do it once, do it right." With this in mind, Mr. Campos



approached the concrete industry to help evaluate the feasibility of building a long-life portland cement concrete (PCC) pavement that could withstand the heavy truck traffic, but would also fit their project's budget.

Clay Slocum of the California Nevada Cement Association (CNCA) helped detail considerations for concrete panel sizes, joint layout for utilities, and crack control.

The project plans were put together and the City strategically put the project out for bid with a 'base bid', as well as an additional alternative bid that included the PCC pavement alternative. This allowed the City to protect itself and its budget during bidding.



New PCC at Grocery Outlet in Williams

All-American Construction became the low bidder with pricing that fit the budget!

The PCC pavement was conventional non-reinforced 6" thick over a 6" aggregate base layer to support an expected Traffic Index (TI) of 8.0. The PCC mix was provided by Williams Ready Mix using a modified Caltrans specification being developed by CCPIC. Joint spacing was 12 feet.

Construction became a success due to extensive collaboration amongst the whole project team.

"The keys to construction included: the Contractor providing a site lead with great expertise in concrete construction, extra attention to the base and subgrade preparation below the concrete pavement, and pre-construction communication," according to Mr. Campos.

The City and Contractor held multiple meetings and carefully laid out a pour staging plan as well as a jointing and utility layout plan. There was even a contractor-provided quality control plan with a QC manager orchestrating each stage of construction.

For more information contact: Clay.Slocum@cncement.org or TCampos@ben-en.com

Diamond Grinding – New Publications by IGGA

Conventional diamond grinding (CDG) is often used to create the smoothest and safest pavements available today. It is appropriate for both new construction and existing pavement and can be performed at any time during a pavement's life.

Diamond grinding:

- Provides a smooth riding surface that is often as good or better than a new pavement.
- Removes faulting at joints and cracks.
- Removes construction-related or environmental roughness.
- Does not significantly affect fatigue life. A typical concrete pavement may be ground up to three times without reducing traffic carrying capacity.
- Extends the service life of well-designed concrete pavement by decades.
- Does not affect overhead clearances underneath bridges or signs.
- May be done in isolated areas as needed and during off-peak hours.

- Costs less than most asphalt overlay treatments.
- Eliminates problems associated with bituminous overlay, like rutting and reflection cracking, while often being less than half the cost.
- Enhances texture and skid resistance, reducing wet weather accidents and the potential for hydroplaning.
- Has been shown to reduce tire/pavement noise by several decibels when compared to transversely tined pavements.

A new series of publications on pavement preservation is planned by the International Grinding and Grooving Association (IGGA). The first installment of the series is a 'fact sheet' on conventional diamond grinding.

For more information got to: https://www.igga.net/wp-content/uploads/2020/05/Conventional-Diamond-Grinding-Facts-May_2020.pdf



GENERAL NEWS

According to a recent article in the Sacramento Bee newspaper, California's 'stay-at-home' order could mean a loss of \$370 million in highway and transit funds. This information comes from a new study by the UC Davis Road Ecology Center. The study found that vehicle miles dropped by more than 75% since the COVID19 outbreak shut down California in

March. Less driving equals less fuel sales, so fuel tax revenue has plunged as well. The whopping \$5.4 billion per year additional revenue expected from the SB-1 fuel tax, enacted in 2017, will also be greatly reduced. In addition to Caltrans work, this will affect the local city and county pavement maintenance programs.



CCPIC Update

By John Harvey (UCPRC), Laura Melendy (UC Berkeley, Tech Transfer) 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 to:

- increase knowledge through **training**, peer-to-peer exchanges, tech briefs, sample specifications, and other resources,
- establish a pavement engineering and management **certificate program**, and
- serve as a **resource, research and development center**.

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 CSU San Jose are all involved with CCPIC. The following provides an update on recent accomplishments and future plans of the CCPIC.

Training

- The pavement engineering and management curriculum and certificate program was submitted and approved in August 2019. The proposed curriculum will consist of 92 hours of core classes and electives.
- Newly developed CCPIC classes held in 2019 included "Introduction to Pavement Engineering and Management" (CCA-01) with 153 in attendance in June 2019, and

"Life Cycle Cost Analysis" (CCB-01) with 130 participants in November 2019. In total for 2018 and 2019, CCPIC hosted 10 classes and trained 619 people.

- 2020 classes, all online, will include:
 - o CCB-01 Pavement Life Cycle Cost Analysis (May 26-28)
 - o CCA-02 Pavement Sustainability (July 22-23)
 - o CCC-02 Asphalt Pavement Preservation Treatments, Materials, Construction and Quality Assurance (November 16-19)
- New classes being planned include:
 - o CCB-02 Pavement Management and Preservation Strategies (fall 2020)
 - o CCC-23 Gravel Roads Engineering, Construction, and Management (spring 2021)
 - o CCC-01 Asphalt Concrete Materials and Mix Design (summer 2021)
 - o CCC-03 Pavement and Hardscape Construction Specifications and Quality Control Management (fall 2021)

Technical guidance and tools

Efforts underway will address the following topics:

- Construction specifications for HMA compaction. CSU Long Beach and Cal Poly SLO are working to develop specifications for local agencies (modeled after the Greenbook for southern California, and Caltrans specifications for northern and central California).
- Specifications for PCC mix design. CSU Chico has been working on this with industry. The final version of the specification is undergoing final review.

- Life cycle cost analysis (LCCA). The scope of the project is to build performance models for predicting crack growth due to loads and the environment, and to use the LCCA process to optimize decision trees in an agency's pavement management system. A guide will be developed to help local agencies be able to develop their own models.

Future planned efforts will:

- develop a Pavement Condition Index (PCI) Best Practices Tech Brief describing how PCI is measured, what it doesn't measure, and how similar or same PCI may have different implications for pavement preservation or rehabilitation strategies.
- develop 'Superpave Lite' specifications in Caltrans and Greenbook format for use by local agencies.
- develop Tech Topics/Pavement Technology Updates by reviewing publications from 1998 through 2011, and prioritize them for editing, updating, and posting on the CCPIC web site.
- work through LOCC/CEAC to conduct a survey of local agencies on the use of Superpave, RAP, warm mix, and other subjects.
- work on Greenbook Initiatives via an Asphalt Concrete Task Force initiating "round-robin" testing of three different Hveem mixes to develop a simplified conversion from Hveem to Superpave mix design.

Resource Centers

Three CCPIC 'Resource Centers' have formed -

for the Southern, Northern and Central California regions.

- Southern California Resource Center: Erik Updyke (formerly of LA County) has been hired to help the CCPIC. Erik will work on outreach and on specifications initially. Shadi Saadeh (CSU Long Beach) plans to meet with some APWA and ASCE sections, as well as City and County Engineering organizations.
- Northern California Resource Center: Gary Hicks (CP2C) has given webinars to APWA Northern California Chapters.
- Central California Resource Center Ashraf Rahim (Cal Poly) is continuing to look for opportunities to speak to groups in central California about CCPIC and best practices.

The CCPIC is also working to develop a contact list of people responsible for pavement in the cities and counties in the state. The list will be used to provide targeted information regarding upcoming training and other activities and gather input regarding technical information. We are looking for informal self-identification. To get on the list send an email to ccpic@ucdavis.edu with the subject "Pavement Contact Person" and provide your name and contact information, as well as a short note about what your pavement responsibilities are. The information will only be used for official CCPIC outreach activities.

For more information on the CCPIC go to: <http://www.ucprc.ucdavis.edu/ccpic/>

or email ccpic@ucdavis.edu.



WRAPP Update

Like most organizations in California, the Western Region Association For Pavement Preservation (WRAPP) has curtailed meetings and gatherings. Amidst the Covid-19 pandemic, the WRAPP/CALTRANS trainings that were scheduled for March/April have been canceled. WRAPP and CALTRANS are now working together to bring the trainings online, and are ironing out the logistics.

While Covid-19 continues to effect businesses in our state, our pavement industry has been deemed essential. In the WRAPP April member meeting, we discussed and collaborated on how our individual companies were navigating Covid-19 and our challenging times. Sharing our practices and experiences helps ensure

By Cesar Lara, Talley Oil - WRAPP President

everybody stays safe during these unprecedented times, all while the state continues to repair, maintain and preserve its essential roadway infrastructure.

Watch for news of our next WRAPP Workshop - Feb. 2-4, 2021 at the Doubletree by Hilton Ontario Airport.

For more information on WRAPP got to: www.wrapp.org



BBRWG Spearheads Change

The Building Better Roads Working Group (BBRWG) has engaged industries, agencies, and associations to identify pavement preservation challenges and solutions throughout San Diego County. Over the past year, the BBRWG has organized numerous meetings and workshops to share knowledge and provide educational opportunities and leadership on a number of topics. These events included tours of local asphalt plants, presentations on cutting-edge technologies, and a workshop on tack coat application and best practices. Notable presentations included Evaluating High Reclaimed Asphalt Pavement (RAP) Mixes by the University of California Pavement Research Center, and Aggregate Sustainability for the San Diego Region, by the California Geological Survey's Fred Gius.



Fred Gius (California Geological Survey) addressed the BBRWG kezer@sdcounty.ca.gov.

By Keith Kezer, San Diego County

The San Diego area has seen BBRWG initiatives transition into action with the implementation of a specification which allows up to 25% reclaimed asphalt pavement (RAP) in resurfacing contracts. Almost half a million tons of resurfacing contracts with the 25% RAP specification are expected to be awarded in the San Diego area before the end of the year.

Guidance documents on how to implement this specification, as well as numerous other BBRWG initiatives, including RAP seals, cold-in-place recycling, and concrete overlays, are currently being developed. These documents will be available on the BBRWG website throughout the next year at: <https://www.sandiegocounty.gov/content/sdc/dpw/roads/building-better-roads.html>.

The goal of these guidance documents is to support local agencies in the implementation of these innovative pavement preservation techniques and solutions.

Looking forward, the BBRWG will remain engaged with stakeholders and will be scheduling virtual meetings and working groups to continue this essential program to identify innovative and cost-effective pavement preservation treatments for the San Diego region.

For more information, please contact Keith Kezer with the County of San Diego at keith.kezer@sdcounty.ca.gov.



Pavement Management Survival During COVID19

By Sui Tan, Metropolitan Transportation Commission (MTC)

A recent news headline read, "Stay-Home Order Could Cost California \$370 Million In Gas Tax For Road Fixes: 'A Heavy Hit'". By the time you are reading this, you probably already know that the expected SB1 funding for road maintenance has been cut more than 40%. That's because the 'stay-home order' has reduced traffic – and fuel tax revenues - substantially. It's a "heavy hit" for all cities and counties in California.

You're probably scrambling to re-prioritize your road maintenance projects to align with the dwindling funding. What are your strategies? Are you planning to defer all maintenance, letting go of all the previous preservation efforts? Or maybe just respond to a few paving projects, and kick the cans down the road?

Good times or bad times, it is crucial to continue pavement preservation.

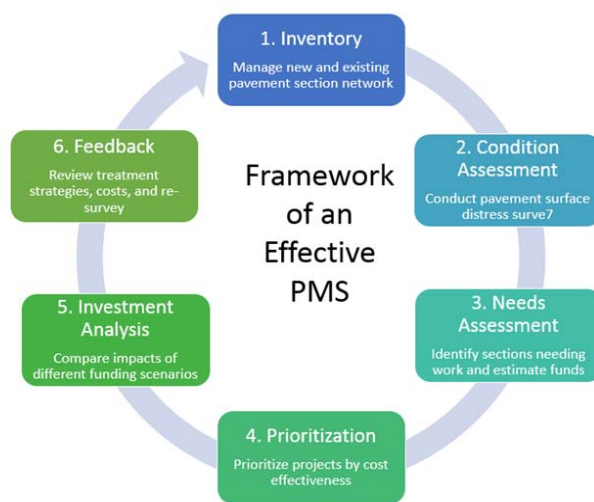
It is still the best and most cost-effective strategy during the COVID19 crisis. According to an MTC study in 2018, every 1-point drop in Pavement Condition Index (PCI) in the Bay Area will cost taxpayers \$1.5 billion at the current



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average condition of PCI 68. For an average city with 185 miles of roadway in the Bay Area, it roughly translates into a \$13.4 million cost, or an average of \$72,500 per mile per PCI point-drop.

It is my hope to instill some best management practices when it comes to rescuing your pavement management program. It does not matter whether you are just about to implement a new pavement management system (PMS) or update an existing system (e.g. MTC's "StreetSaver"), an effective PMS is designed to reduce costs, improve cost-efficiency, and promote infrastructure sustainability.



However, during crisis time, it is best to focus on Step 4. 'Prioritization' is a process to maximize benefits and minimize costs. By selecting the right projects and strategies, you will stretch your limited road maintenance dollars farthest.

Here are some tips to help stretch your limited maintenance dollars:

- Be sure your PMS has a strong emphasis on preventive maintenance
- Avoid a PMS that relies on ranking that is based on fixing 'worst-first'. Instead, focus on cost-effective pavement preservation.
- Re-examine your decision tree to make sure treatment selections and unit costs are up to date.
- Run the budget investment analysis by redirecting all the maintenance budget to pavement preservation, including preventive maintenance.
- Use the recommendation from your PMS to 'package' your preservation projects, such as slurry seals and chip seals, for economies of scale.
- Consider 'project bundling' - collaborating with your neighbouring cities and county on contracts to package projects to stretch your maintenance dollars even farther.

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



FHWA Update

Pactical Workability Tests for Paving Concrete FHWA operates a state-of-the-art Mobile Concrete Technology Center (MCTC) program. The mission of the MCTC program is to transfer advance technology to FHWA partners such as state DOT's. Based on the experiences and observations from the MCTC program, FHWA has published a one-page summary titled "Practical Workability Tests for Paving Concrete", which provides insight on a new Box Test (AASHTO TP 137) and a new VKelly Test (AASHTO TP 129) for slip-formed concrete. These two new test methods are a significant improvement when compared to the 'slump' test method, and they can assess the concrete's response to vibration, which is critical to assessing workability. These test methods are included in AASHTO PP 84, "Standard Practice for Developing Performance Engineered Concrete Pavement Mixtures", and are included in the national Performance Engineered Concrete initiative. For more information visit:

By Chu Wei, FHWA – Sacramento

<https://www.fhwa.dot.gov/pavement/concrete/trailer/resources/hif20061.pdf>

Turner-Fairbank ASR Susceptibility Test (T-FAST) Alkali Silica Reactivity (ASR) is known as "Concrete Cancer" and was first discovered in 1935. According to the Federal Highway Administration (FHWA) "Alkali-Aggregate Reactivity (AAR) Facts Book", alkali-silica reaction is defined as a reaction between the alkali hydroxides in the pore solution of concrete (or mortar) and certain types of silica minerals present in some aggregates. The reaction product, an alkali-silica gel, with varying amounts of calcium, is hygroscopic - having a tendency to absorb water and swell. The swelling pressure can exceed 1,000 psi, which exceeds the tensile strength of the concrete and is more than enough to crack it. ASR gels remain a serious problem. Structures often need to be replaced at an enormous cost. So it is very important to have a standardized test method for screening aggregates for their

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susceptibility to ASR. The first test methods were devised in 1947. There have been many variations since. Almost all have been engineering tests that rely on measuring the physical expansion of concrete and mortar specimens. There are challenges with all the ASR tests. They are not very reliable and tend to either over or under estimate the ASR reactivity of aggregates. The most used tests are ASTM 1260 and ASTM1293. ASTM 1260 takes 16 days, ASTM 1293, which is more reliable, takes one year, two years if mitigation (such as the addition of fly ash) is being investigated. In addition to physical expansion tests, there have been some chemical tests such as the measurement of dissolved silica. None of the tests since 1947 have been very successful in accurately predicting aggregate ASR reactivity.

But after more than ten years of intensive research, the chemistry laboratory at FHWA's

Turner- Fairbank Highway Research Center (TFHRC) has developed a very simple and economical test method, which gives superior results to ASTM 1293 in 21 days instead of 365. It relies on purely chemical measurements on the aggregate. No concrete or mortar specimens are needed. As of now, the new test method, named Turner-Fairbank ASR Susceptibility Test (T-FAST), can be used to assess the reactivity of aggregates, and this method is more efficient than traditional accelerated ASTM standards. The test is carried out in a plastic tube containing 5 grams of aggregate, some calcium oxide and some sodium hydroxide solution. FHWA is been looking for cooperation with outside groups to expand the calibration of the test.

If you have any questions about the T-FAST method, please contact Terry Arnold at: Terry.Arnold@dot.gov



FP2 Update

If things were as we anticipated this Spring during the Transportation Construction Collation, representatives of the Foundation For Pavement Preservation (FP2) would have been in Washington, DC, to advocate for pavement preservation in either a large infrastructure package, which would have included a new surface transportation title, or a surface transportation reauthorization bill, which hopefully would have been introduced and be moving through the legislative process. While none of this has happened, FP2 has been developing pavement preservation-specific legislative language, and has engaged in the following activities:

- In early April, FP2 sent a letter to Congressional leadership advocating for pavement preservation and passage of a long-term highway reauthorization bill .
- In late April, in conjunction with PPRA, FP2 hosted a well- attended webinar for industry titled, "The Damn Roads Still Need Fixing;"
- We created new advocacy materials, which have also been posted on the FP2 website (www.fp2.org).
- On May 4th, on behalf of FP2 President Scott Bergkamp, we represented the industry on the transportation-focused "Congressional Blue Dog" conference call,

By Jim Moulthrop, FP2 Executive Director

where we were able to educate the group of conservative Democrats in Congress and their staff about the benefits of pavement preservation and the need for passing a long-term highway reauthorization bill this year.



We have also developed some detailed pavement preservation-specific legislative recommendations for the next reauthorization bill. Our goal was to develop language which would remove possible road-blocks to pavement preservation usage, raise awareness of the benefits of pavement preservation, and encourage state

and local use of pavement preservation programs without mandating it.

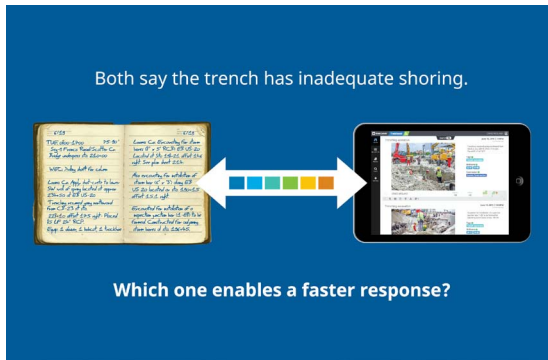
COVID-19, with its need for emergency stimulus legislation and shut-downs, has created a new reality and timeline. While COVID-19 continues to dominate the discussion in Washington, there is continued acknowledgement that Congress must also do something to reauthorize the Highway Trust Fund in advance of the September 30th expiration of the current FAST ACT.

For more information contact Jim Moulthrop (FP2) at: jimmoulthrop@gmail.com



Photo-Based Inspection Technology

By George White (Headlight) and Scott Metcalf (Ergon)



Hand Field Notes vs. Tablet Photos & Notes

Now more than ever, owners, contractors, engineering firms and materials suppliers nationwide are finding that using photo-based technology to capture, interpret and act on their transportation construction projects, without having to physically be in the office is invaluable.

Making the switch to photo-based inspection technology has provided them the potential to remain connected and confident about the progress of their inspection programs all while adhering to their local safety mandates in response to precautions surrounding Covid 19.

Construction Managers can log in from home to view project progress, approve, reject, and comment on daily inspection reports, and instantly retrieve past project data as needed. They are given a real-time window into jobsite progress and visual proof of a team's cooperation in adhering to the work requirements set to keep everyone safe.

One such technology is called HeadLight, which allows project inspectors to use software on an iPad to document progress through a simple photo and video capture process that can include on-screen annotation and typed details. Once complete, those photo-based observations are available to instantly create and submit daily reports from the field, so they don't have to visit a trailer or an office to type up their notes at the end of a shift. All of that inspection data is securely saved in the cloud and when needed is easily accessible for various uses. For example, in paving work, an Owner can make use of all the density profile information to spatially map the quality metric across their entire network of roadways for future preservation needs. Or the contractor can track the location of each truck load, where the material was delivered, and correlate that to the lay down density as to ensure quality requirements are maintained throughout the job. This not only provides a huge efficiency gain when compared to having to dig through paper files, but enables capabilities that were previously impossible in a paper-based world.

Using photo-based inspection technology provides:

- a real-time view into projects from wherever you are that day, so progress is not delayed
- reduced administrative and record keeping burden for your inspectors so they can get home safely sooner
- the ability to easily search project data from your laptop or smart device, thus eliminating the need to enter an office or storage facility
- a fast and efficient method of tracking work items, quantities, and expenditure progress that eliminates the need for end-of-month reconciliation and lengthy report reviews.

Here are some comments about the value of photo-based inspection:

"We had a job condition where we had a lot of rain, and the subgrade was really moving a lot, which challenges the quality that we're trying to deliver. With HeadLight, we were able to take a video of trucks going over the top of it, and watch the delineation and the grade, and we were able to share that internally, and then our project managers were able to share that with the customer, and we were able to make a decision on what needed to happen next. All of that happened within 15-17 minutes. So the cost savings that it can bring to you is hard to wrap your brain around it. It's exponential at some point." - David White, VP Operations, Superior Paving

"As an inspector I felt one of the biggest benefits was in being able to add the images and videos to our diaries every day. I guess the selling point for me was the iPad was going to be in your hands all day and you could work on your report as you go throughout the day documenting stuff. Honestly, right away we noticed that the quantity and quality of our data capture out of the gate was much greater than what we were doing before." -Lester Fletcher, Lead Inspector, LADOTD

"Once an observation was posted, everyone on the team could view the observation and make comments. The ability to visually see what is going on in the field provides our operations/technical operations staff, external partners, as well as upper management, a virtual window into the field. Investing in inspection technology made sense

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because the more inspection done on a project, the better the chance of success of a quality job being done.” Scott Metcalf, Ergon

For more information about photo-based inspection technology visit: www.headlight.com or email: info@headlight.com



New Thin Asphalt Overlay Manual

By: Leroose Lane, Ding Cheng, Gary Hicks, and Erik Updyke (all CP2 Center)



Thin asphalt overlay



Thin Asphalt Overlay with Rumble Strips

Limited infrastructure funding at the local, state and federal levels has resulted in greater emphasis on the use of pavement preservation techniques to extend life and reduce maintenance costs. Thin asphalt overlays are one of many preventative maintenance treatments. Thin asphalt overlays are placed directly on existing pavement, and can be from 5/8 inch to 1-1/2 inches in thickness. Thin asphalt overlays have proven to be an economical means for maintaining and improving the functional condition of an existing pavement since the 1960's. They can provide a "new road" appearance.

Thin asphalt overlays use conventional paving equipment and provide dust-free construction with minimal traffic delays. Life expectancies are reported to be over 10 years when placed over old, but sound, asphalt pavements.

The California Pavement Preservation (CP2) Center has recently developed a new manual for thin asphalt overlays tailored to local agencies' needs. Specifically, this new "Thin Asphalt Overlay Manual" provides guidance for engineers on where and when to use thin asphalt overlays, with information on: 1) Types and variations of thin overlays, 2) Materials and the design process, 3) Specifications, and 4) Construction, with attention to Quality Assurance, and Troubleshooting. Both the Design and Construction sections address the Greenbook and Caltrans (2018 plus 2020 revisions) specifications and their differences. Table 1 shows the different types of hot asphalt mixes that are currently used for thin asphalt overlays in California.

Table 1. Thin Asphalt Overlay Mixes Used in California

Binder Types				
	PG-Graded	Polymer Modified	Asphalt Rubber (AR)	Notes
Aggregate Types				
1/2-Inch Dense Graded	X	X		Not used for AR
3/8-Inch Dense Graded	X	X		Not recommended for AR
Open Graded	X	X	X	1/2-Inch or 3/8-Inch max. typical
Gap Graded	X	X	X	1/2-Inch or 3/8-Inch Max
Ultra-Thin Bonded Wearing Course or Bonded Wearing Course	X	X		0.375- to 0.75-in. thick Gap Graded HMA placed over a polymer modified emulsified asphalt membrane

Caltrans Section 39

The current Caltrans specifications have very rigorous testing standards for Superpave mixes that may not fit a local agency's needs. So the Center's manual outlines a simplified testing plan for thin asphalt overlays, and suggests that many of the specified tests required in the Caltrans specifications may be eliminated for local agencies. For example, the Caltrans specifications, currently have many tests related to stripping of asphalt from aggregates, and require both AASHTO T 283 (freeze/thaw) and the modified Hamburg Wheel Tracking (HWT) test (California Test 389) for both Job Mix Formula (JMF) and construction testing. The Center's recommendations include eliminating these tests for local agencies, and only require that liquid antistripping be added to hot mix asphalt mixes.

In Section 39 of the 2018 Caltrans specifications, each type of HMA mix has a separate subsection with similar testing requirements, which are subject to the 2020 revisions as well as future revisions. Table 2, and Table 3 below shows tests and frequencies recommended by the CP2 Center for thin asphalt overlay mixes. These suggestions would require modifications to the Caltrans specifications through the project's Special Provisions, if the agency decides to use them.

Table 2. Aggregate Production Testing Frequencies

Quality characteristic	Test method	Minimum testing frequency
Gradation	AASHTO T 27	1 per 750 tons and any remaining part
Sand equivalent	AASHTO T 176	
Moisture content	AASHTO T 255	

Caltrans' Reclaimed Asphalt Pavement (RAP), Section 39-2.02A(4)(b)(iii) states that during Type A HMA production, sample RAP twice daily and perform QC testing for:

1. aggregate gradation at least once a day under California Test 384, and
2. moisture content at least once a day

Table 3. HMA Production Testing Frequencies

Quality characteristic	Test method	Minimum testing frequency
Asphalt binder content	AASHTO T 308, Method A	1 per 750 tons and any remaining part
HMA moisture content	AASHTO T 329	1 per 2,500 tons but not less than 1 per paving day
Nuclear gauge in-place density ¹	California Test 375	3 per 250 tons or 3 per paving day, whichever is greater

Notes:

1. If nuclear gauge densities are used by both the agency and the contractor, then the gauge readings need to be calibrated between the two gauges. Method compaction in the Caltrans Standard Specifications does not have a minimum compaction specified. This specification would be an addition and included in the project's special provisions.

2. Agency may vary testing frequency if approved by the engineer. Greenbook

The Greenbook specifications already allow for thin lifts of asphalt concrete, with appropriate mixes specified in Table 302-5.5.

Subsection 203-6.3, of the Greenbook specifications is currently tailored for use by local agencies, and uses Hveem mix design instead of Superpave mix design. The Greenbook is currently being revised, and a new edition will soon be published. Hveem mix designs must result in mixes that conform to specific requirements stated in the Asphalt Institute's publications (e.g. MS-2)

Important excerpts from the 2018 Greenbook are as follows:

1) "The Contractor shall submit ... a JMF that summarizes each asphalt concrete mix design for each class and grade of asphalt concrete required to construct the Work."

2) "When greater than 25 percent RAP is to be included in a mixture, a mix design shall be submitted."

3) "... the asphalt binder content shall be defined as the total bituminous material present in the mix consisting of the blend of virgin paving asphalt, residual paving asphalt from RAP, and recycling agent."

Both Caltrans and the Greenbook have detailed requirements for Job Mix Formula (JMF) submittals. Agencies must choose which specifications best meet their needs early in the design process and to take care to not mix Greenbook and Caltrans specifications.

The new Thin Asphalt Overlay Manual developed by the CP2 Center will soon be available online. The Center's other pavement preservation manuals include: Chip Seal Manual, Slurry Surfacing Manual, and Cape Seal Manual. They are currently available online at the following websites:

<https://transweb.sjsu.edu/sites/default/files/1845A-Chip-Seal-Manual.pdf>

<https://transweb.sjsu.edu/sites/default/files/1845B-Cheng-Manual-Slurry-Surfacing.pdf>

<https://transweb.sjsu.edu/sites/default/files/1845C-Cheng-Cape-Seal-Manual.pdf>

Long-term plans also include the development of training classes to go with these manuals.

For more information contact Leros Lane at: leroslane@gmail.com

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COMING EVENTS - Mark Your Calendar!

By Roger Smith, CP2C



PPRA and FHWA Webinar Series for 2020 (Online)

The Pavement Preservation and Recycling Alliance (PPRA) in conjunction with FHWA, has been offering free webinars on pavement maintenance best practices. Topics have included Milling Practices, Stretching Budgets and Slurry Surfacing. Other topics are planned. Upcoming webinars are:

Hot in-Place Recycling (HIR)June 18
Tack Coats & Fog SealsJuly 16
Chip Seals..... August 20
Cold In-Place Recycling (CIR)September 17

For more information go to: www.roadresource.org or <https://collaboration.fhwa.dot.gov/dot/fhwa/WC/Lists/Seminars/DispForm.aspx?ID=2422>

"Asphalt Pavement 101" Classes (Online)June 24-25, July 22-23, August 12-13

This popular 4-hour class from CalAPA offers an overview of the basics of asphalt pavement including asphalt materials and HMA pavement construction. In addition to scheduled 'public' online sessions, it is available by request to companies or road agencies. The class has been divided into two 2-hour segments on consecutive days. This and other CalAPA classes are now being offered only as webinars.

For more information go to: www.calapa.net

CCPIC Training Classes (Online)

The City County Pavement Improvement Center will be offering the following webinars:

Pavement Sustainability (CCA-02) (see below).....July 22-23

Asphalt Pavement Preservation Treatments, Materials, Construction and Quality Assurance (CCC-02).....November 16

Pavement Management and Preservation Strategies (CCB-02)Fall 2020

For more information go to: <http://www.ucprc.ucdavis.edu/ccpic/>



"Pavement Sustainability" (CCA-02) July 22-23

The Tech Transfer Center at U.C. Berkeley will offer this online class in partnership with the City and County Pavement Improvement Center, hosted by the University of California Pavement Research Center, and funded by California Senate Bill 1, the Road Repair and Accountability Act of 2017. Reduced registration fees are available to employees of California's city, county, regional, and other public agencies so they can better repair and maintain California roadways. The course will introduce definitions and metrics for assessing and improving the sustainability of pavements across the life cycle using the concept of life cycle thinking. For more information go to:

<https://mail.google.com/mail/u/0/?tab=rm&ogbl#search/tech+transfer/WhctKJVqstbkvMlnhCDvWNNsBVnQqsBBSms-jTBRjqmzkXmHrWFFNKQcrJWKjHQzHbjkCJLq>



PCC Pavement Preservation Treatments: A 5-Course Series (Online)

Pavement preservation is a proactive approach to protecting and maintaining existing pavements. The National Highway Institute (NHI) offers this five-course series that focuses on different pavement preservation techniques that may be performed on Portland Cement Concrete (PCC) pavements. Enrolling in this series gives you access to courses on the following courses preservation techniques: Full-Depth Repairs, Partial-Depth Repairs, Diamond Grinding, Dowel Bar Retrofit (DBR) and Cross-Stitching, and Joint Sealing. For more information go to: https://www.nhi.fhwa.dot.gov/course-search?tab=0&key=134207&sf=0&course_no=134207&utm_source=GovDelivery&utm_medium=email&utm_campaign=coursepromo



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Building for the next 100 years

Asphalt Institute Classes (Online)

Now that all in-person training is on hold, The Asphalt Institute is working hard to provide you with some excellent virtual training tools. Our June webinars listed below are live sessions with a team present to answer your questions as they come in.

Constructing Longitudinal Joints	June 2
Understanding Pavement Distress ID	June 4
Tack Coats	June 9&11
Delta Tc	June 17
Segregation Causes & Cures	June 18

For more information go to: http://www.asphaltinstitute.org/training/webinars/?_cldee=cmRzbWl0aDIwMDIAZ21haWwuY29t&-recipientid=contact-180126fc2f43e81180d002bfc0a80172-5ae3d8a30f4a448ebffae852a0b25b1f&esid=e3a0be08-659c-ea11-80e8-000d3a0ee828



Concrete Pavement Preservation Webinars (Online)

The CP Tech Center, with support from the International Grinding and Grooving Association (IGGA), will offer a free webinar on concrete pavement preservation. The webinars will cover:

Achieving Smoothness in Concrete Pavement Construction July 21

Concrete Pavement Joint Design, Layout and Construction..... August 18

For more information go to: <https://go.acpa.org/cp-tech-center-2020>

or contact: kristin.dispenza@aoeteam.com



RMWPPP Annual Meeting

(Canceled Due to Covid19)

September 28-30

Albuquerque, NM

The Rocky Mountain West Pavement Preservation Partnership (RMWPPP) is a 12-state forum of pavement professionals from State and Local Agencies, Contractors, Suppliers and Academia. It provides a forum to share research, specifications, and construction practices to promote the benefits of pavement preservation. Membership is not required to attend the annual meeting. For more information on RMWPPP go to: <https://tsp2pavement.pavementpreservation.org/rocky-mountain-west-rmwppp/>



Disclaimer: Caltrans does not endorse any industry products or services, and the contents of newsletter articles reflect the views of the authors and do not necessarily reflect the official views or policies of Caltrans, the CP² Center, or the State of California.

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.

CP² Center News is published quarterly by the CP² Center, Langdon Hall Suite 203, California State University, Chico, Chico, CA 95929-0603, Subscriptions by e-mail: contact CP2C@csuchico.edu to add your name to the distribution list.