



CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

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Pavement Preservation: Definitions, Challenges and Opportunities

By Dr. R. Gary Hicks, P.E., CP2 Center

On July 23, 2019, I had the opportunity to deliver the 7th ASCE Monismith Lecture at the American Society of Civil Engineers (ASCE) meeting in Chicago, Illinois. Carl Monismith, a Professor of Civil Engineering at the University of California Berkeley for over 40 years, was and still is one of the leaders in the asphalt pavements world. Carl Monismith gave the first Monismith lecture followed by other distinguished professors including Robert Lytton, Marshall Thompson, Matt Witzcak, Dallas Little, and David Anderson. However, I am the first of this distinguished group to be a former student of Professor Monismith. It's a great honor to have been selected for this award and while most of the other lectures have dealt with design of hot mix asphalt, my presentation dealt with the topic of pavement preservation (P²).



Gary and wife, Joan receive ASCE award from Imad Al-Qadi, ASCE

Here are excerpts from my talk and paper. My full presentation was published in the P² Journal (Fall 2019) and can be found at: https://www.pavementpreservation-journal-digital.com/fppq/0319_fall_2019/MobilePagedArticle.action?articleId=1515822#articleId1515822

Definitions of P²

One of the early definitions is that it includes all activities to provide and maintain serviceable roadways. It includes corrective and preventive maintenance and minor rehabilitation, but does not include reactive maintenance or major rehabilitation and reconstruction. The philosophy behind the pavement preservation concept is placing the right treatment on the right road and the right time. It also has to be designed and constructed in the right way if it is to meet agency expectations.

FHWA published the first official definition of pavement preservation in 2005, which is given

in the following link (<https://www.fhwa.dot.gov/pavement/preservation/091205.cfm>). In June 27, 2017, FHWA further defined pavement preservation as, "a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations. They continue to support the concept of pavement preservation through their Every Day Counts (EDC-4) and through other programs including the FHWA Expert Task Group (ETG) for pavement preservation.

P² Treatments Commonly Used

Many treatments are now used for asphalt pavements including:

- Crack sealing
- Fog seals

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- Chip seals
- Scrub seals
- Slurry seals/microsurfacing
- Cape seals and three layered treatments
- Thin bonded wearing courses
- Thin HMA overlays
- In-place recycling (cold and hot)

All have proven to be effective when placed on the right road, at the right time and using good construction and inspection practices. However, there are too many times when the project performance does not meet agency expectations or exhibits early pavement distress. This is often due to selecting the wrong treatment or the lack of quality construction or inspection. Therefore, the industry has many challenges to overcome.

Challenges to Increased Use of P²

The industry is facing numerous challenges to increased use of P² including:

- Clearly documenting the benefits of P² treatments. An approach to do this has been developed through National Cooperative Highway Research Program (NCHRP) projects 14-33 and 14-38. This can be done using data from agencies' pavement management systems, if the data are obtained using good practices. If not, it can be a difficult task.
- Coping with the shift from treating 'worst first' to preserving good pavements... i.e., getting the agency to spend preservation dollars on good roads when others are failing. This has been done by several agencies, but still requires a clear understanding of the benefits of the treatments and an educational effort.
- Selecting the right strategy for a given pavement and using best practices. Often the wrong strategy is selected for a road and the consequences are early failures. The contractor and agency must work together to ensure success. Design practices are still an art; however, best practices for construction have improved greatly.
- Using good quality assurance (QA) practices, similar to that used for hot mix asphalt

(HMA). This area has to be improved greatly if we expect to improve the quality of the pavement preservation products. Materials specifications, design practices, and construction guide specifications that include QA are being developed in AASHTO format for several of the preservation treatments, and they include more emphasis on materials and workmanship control by the contractor with agency inspection and testing for acceptance. The first guide specifications developed as a part of NCHRP project 14-37 will be going through the AASHTO process this year. The report can be found at the following link: http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP14-37_FR.pdf

- Lack of national 'performance related' specifications. Most of the specifications currently used are 'method' specs. There is a need to develop performance based specs, which will eventually include pay incentives and disincentives. We must elevate the standards to that of HMA and portland cement concrete (PCC) pavements.
- Keeping a preservation champion. As agency people retire, it is easy to lose a champion for a treatment or the concept of pavement preservation. There is a great need for continuous education and for marketing the benefits and proper use of preservation treatment so that we have more than one champion in an agency.

Opportunities

The preservation community has to do better. We need to:

- Encourage the adoption and use of national standards for pavement preservation
- Control the factors affecting field performance
- Establish a program for certified contractors and agency inspectors
- Document treatment performance and the benefits of the various products

Recent efforts to address some of the challenges include:

- NCHRP
-NCHRP projects 14-33 and 14-38 dealing with benefits of P²

Continued, next page

- NCHRP project 14-37, which is dealing with construction guides for chip seals (emulsion and hot applied), microsurfacing, and fog seals.
- NCHRP project 9-63, which is developing performance graded (PG) asphalt emulsions
- Future NCHRP projects dealing with the development of construction guides for slurry seals, tack coats, scrub seals, and cold in-place recycling
- AASHTO TSP2 and the Emulsion Task Force
 - Established regional pavement preservation partnerships to share current practices and new technologies. These can be found at the following link <https://tsp2pavement.pavementpreservation.org/>
 - Development of materials specifications and design practices for many of the preservation treatments. The can be found at <http://tsp2-etf.org/> .
 - Development of construction guides that will be balloted by the AASHTO Committee on Materials and Pavements (COMP)
 - Develop QA guides for chip and slurry seals and microsurfacing that will be balloted by AASHTO COMP
 - Develop best practices for all emulsion preservation treatments
- FHWA
 - Expert Task Group (ETG) – Advance and improve the state of the practice of pavement preservation by working with federal, state and local agencies, industry and academia. This includes promoting the importance of preservation treatments and implementing new developments from its partners like FHWA, NCHRP, AASHTO, and Industry. Implementation of the new specifications and guides is of critical importance to moving the program forward. More information can be found at <https://www.fhwa.dot.gov/pavement/preservation/>
 - Every Day Counts (EDC) - conducting educational programs for pavement preservation on when, what and how. More details on this program can be found at https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/
- Industry
 - Developed on-line courses for the design, construction, and quality assurance of

various pavement preservation treatments through ISSA-AEMA and ARRA

- Developed a website that covers all aspects of design, construction and determining the benefits of preservation treatments, which can be viewed at www.roadresource.org

Much has been developed over the recent past, but we still need to do better. We are using older technologies or experience for the design of chip seals and slurry surfacings. We need to develop new performance based tests for all the preservation treatments. We have to elevate our work in the QA efforts for preservation treatments, including the development of new sampling and testing techniques. We need to learn from the test roads at National Center for Asphalt Technology (NCAT) and MNRoad, and make an effort to implement the FHWA Special Pavement Studies (SPS-11 and 12), which lay out detailed plans for evaluating the long term performance of preservation treatments.

Conclusions and Recommendations

We have come a long way over the past 25+ years, and P² has become common practice in most states and local agencies. However, we need to continue to improve our practices and technologies to reduce the number of early failures. Until we get improved funding, we will continue to do more with less. Preservation treatments are very important where funding is limited, but even with better funding, it is still an important way to economize and improve overall network conditions.

Moving forward, my recommendations are to;

- Provide continuous education on how to design, specify, place, test and inspect successful treatments all the time.
- Continue to document the performance and cost effectiveness of preservation treatments using real life project data
- Improve the mix design and performance tests, as well as QA practices, for preservation treatments
- Be open minded and challenge our agencies to partner with industry to evaluate new products and processes which are continuously being developed.

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CalAPA Fall Conference Highlights

By Roger Smith, CP² Center

The California Asphalt Pavement Association (CalAPA) Fall Conference, Nov 6-7 in Sacramento provided a great opportunity for the 200+ attendee to get important updates on happenings in the world of asphalt pavements. As usual, the event attracted a good mix of people from both industry and road agencies. Kudos to Executive Director Russell Snyder and the Conference planning team of Brandon Milar, Sophie You and Bill Knopf for again providing a most worthwhile event.

Jordan Reed of George Reed, Inc. and CalAPA Chair for 2019, welcomed the group and expressed a thank you to CalAPA members and friends for their work towards betterment of the industry and addressing challenges and opportunities we all face.



This is an important issue since California is a major recipient of federal dollars for roads and airports, so the state need to be alert as to what's coming from D.C..

John Lane of Teichert Materials' Environmental Manager, raised awareness of the new Environmental Justice Communities (EJC) that are being set up in response to newer state legislation. These EJC's identify localized areas with disproportionate degree of pollution risk, and allow for increased monitoring and enforcement of pollution in these areas. As these EJC Areas form, they will give citizens groups increased authority, and it will be important for asphalt producers to industry to be involved.

On the technical side of things, Maged Armanuse of Caltrans METS Branch, described ongoing issues and concerns with the Hamburg Wheel-tracking Test (HWT), especially involving asphalt rubber mixes (RHMA). This is an important concern since Caltrans now uses ground tire rubber RHMA in about half of its asphalt work. Several changes to the HWT test method have been implemented including a reduced number of load repetitions for tests on RHMA.

How are the fuel tax revenues from SB1 being put to work? That question was addressed by Katrina Valentine of Transportation California (www.rebuildingca.org). The short and impressive answer is that over 7700 projects are underway involving these funds. The funds are flowing into agencies and lots of projects are coming out. But the public needs to hear more about it and know that what they're paying at the pump is actually being put to work for road improvement. Better 'PR' is needed!

'Sustainability' is a common buzzword these days, and Dr. Adam Hand (University of Nevada, Reno) brought the subject home to the asphalt industry. The basic concept being: 'How can we meet our present needs without compromising our ability to meet future needs?' He cited the fact that sustainable practices can save companies millions – for example using RAP can equate to substantial savings in asphalt mix cost. In addition to the UN setting goals for sustainable development, the 'Green Roads' program for rating projects is gaining traction. A good resource for more information is: www.storesasphaltpaving.org



Jordan Reed and Kerry Hoover at VSS Exhibit



Ann Baranov of infraTest at their exhibit

As usual, an important element of the Conference was the vendor exhibits, where companies displayed the latest products, such as asphalt additives, laboratory equipment and testing services.

A briefing on the federal funding situation was provided by special guest, Jay Hansen of the National Asphalt Pavement Association (NAPA).

With the industry moving to the use of higher RAP in HMA, research is underway for Caltrans at the UC Pavement Research Center at UC Davis. Mhamed Elkashef described this effort and the need to address questions about things like the degree of actual blending of the RAP binder that occurs, cracking resistance and moisture sensitivity. Early conclusions reinforce the policy that when 25% RAP mixes, a rejuvenator additive is needed. They've also found that the time the mix spends at high temperature (e.g. in silo) increases the blending of the RAP binder and raises the stiffness of the mix – possibly leading to increased cracking. They are also studying the use of RAP in asphalt rubber mixes (RHMA-G)

The Conference format also included concurrent 'break-out' sessions on several timely topics:

- Superpave Mix Design Overview
- Asphalt Emulsion Basics
- Troubleshooting Job Mix Formula
- Modified Asphalt Binder Overview
- Sustainability Practices.

The featured 'entertainment' speaker was McAvoy Lane portraying 'The Ghost of Mark Twain', providing a fun diversion from the otherwise technical nature of the Conference.

Watch for the big CalAPA's Spring Conference, which will take place April 16-17 at Disney's



Roger Smith, CP²C, with 'Mark Twain'

Grand Californian Hotel & Spa in Anaheim.

For more information on the Conference including the presentations, go to: (www.calapa.net).

The presentations are available electronically on the SlideShare website at: (<https://www.slideshare.net/CaliforniaAsphalt/>).



Pavement Workshops A Success

Two "Pavement Workshops", coordinated by Harris & Associates, were recently hosted by City of Benicia and the City of Roseville. Over 50 agency personnel attended each session. Harris is a leader in pavement management support for public agencies with headquarters in Concord and offices in several locations, including Sacramento.

Harris representatives, Vijay Pulijal and Marissa Baclig, presented an overview of pavement management technology with a primary focus on the "StreetSaver" program from MTC. They stressed the fact that pavements are huge assets for California agencies (482 cities and 58 counties), and that pavement management programs should be seen as a "financial tools" for agencies. Key to these programs is obtaining accurate pavement condition index (PCI) ratings by certified personnel. Tracking of accurate PCI's every 2 years on arterials and every 5-6 years on residential streets is recommended.

By Roger Smith, CP²C



Vijay Pulijal, Marissa Baclig and Cesar Lara of Harris & Associates

Cesar Lara of Harris & Associates overviewed the various pavement maintenance 'tools', ranging from simple crack sealing to surface treatments (e.g., chip, slurry, microsurfacing) to thin-bonded wearing courses. Multi-layer strategies that combine microsurfacing and chip seals were also discussed. He reminded attendees that the benefits *Continued, next page*

of microsurfacing vs. conventional slurry seal include being able to do rut-filling and to work into cooler fall weather – and possibly at night.

Jerry Dankbar, City of Roseville, presented “You Get What You Inspect”. He stressed not only the importance of a good inspector, but also the need for pre-job conferences with contractors to lay out what quality standards the City will expect. One important rule for inspectors is to “document, document, document” via diaries and photos. It’s also important for all communication with the contractor to go through the inspector.

The strategies of cold in-place recycling (CIR) and full-depth reclamation (FDR) were addressed by Dennis McElroy of Granite Rock. These are considered rehabilitation efforts, since they improve the structural value of the pavement. CIR usually deals with the top 3-6 inches and involves adding binder in the form of asphalt emulsion or foamed asphalt. After



Jerry Dankbar, City of Roseville

3-5 days, with secondary rolling and possibly under traffic, CIR is usually capped with a thin HMA overlay. It can be quite cost effective, especially if mill-and-fill repair areas exceed 25% of the project. Since the method reuses old aggregate onsite, it minimizes trucking of materials to and from the site. Simpler, shorter equipment trains can be used in urban areas. The City of San Jose has

done over 100 miles of CIR per year. FDR is the process for doing a deep stabilization, either incorporating portland cement or using a special foamed asphalt process. Hydrated lime might be called for in high clay subgrades. He advised agencies to make use of the website of the Pavement Preservation and Recycling Alliance (www.roadresource.org). Pavement interlayers in the form of high-modulus (stiffer) fiberglass reinforcement were overviewed by Dennis Rogers of the Tensar Corporation. He cited the four primary attributes of an interlayer as:

1. reinforcement,
2. moisture barrier
3. cracking resistance
4. recyclability

by conventional milling machines. The Tensar GlasPave mat products can provide these functions. In fact, based on lab tests, they can provide over 5 times the flexural strength of conventional (unreinforced) HMA. They are placed into a heavy asphalt tack coat and are available as 6.25' width - or 12.5' widths for full-lane paving. There is also a 48-inch wide GlasGrid product, which can be used for tensile reinforcement of more localized problem areas.

For more information on these speakers and topics contact: Cesar Lara at: Cesar.Lara@WeAreHarris.com



RAP In Surface Treatments?

The use of reclaimed asphalt pavement (RAP), also known as ‘millings’, is commonplace today in new hot mix asphalt (HMA) produced in California’s hot mix plants. Caltrans allows 15% RAP in any hot mix, and there are provisions for using higher percentages. Greenbook Specifications and some local agencies allow even higher amounts of RAP.



Reclaimed Asphalt Pavement (RAP)

But what about using RAP in maintenance surface treatments such as chip seals, and slurry seals?

As available aggregate becomes scarcer and more costly, these maintenance treatments can also be made more sustainable by using RAP. A recent national webinar via the Federal Highway Administration (FHWA) offered that latest findings on this strategy. Applied Pavement Technology, Inc. has a contract with FHWA to assess ‘state of the practice’ and disseminate their initial findings via webinars such as the

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recent one on October 24. A final report and an “FHWA Tech Brief” will be issued by the end of 2019.

The initial literature search and survey indicated that the use of RAP in surface treatments is not widespread, and very little has been written on the subject. Two agencies, New Mexico DOT and Los Angeles County, were invited to participate in the webinar and share their experiences.

Van Truong of Los Angeles County reported that the County, as part of their Sustainable Pavement Program, has been using 100% RAP in scrub / chip seals and slurry surfacings. Their first projects were 9 years ago, and have performed as well as those using new aggregate. They require rolling of the fresh slurry with pneumatic (rubber-tired) rollers and a modification of the slurry wet track abrasion laboratory test to account for the rolling effect. They use RAP produced from the micro-milling of about 1/8” for

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surface smoothing.

San Bernardino County has used RAP on chip seal program. Being the largest county in the US necessitates long hauls of commercial chips to many remote projects. These projects are typically done using 'in-house' county crews. RAP chip is often included as an, alternate' in bid documents and has resulted in significant cost savings.

The New Mexico DOT reports that they take ownership of RAP millings from projects, and

then contract aggregate for use in their chip seals. Because these RAP chips are coated with old asphalt, they have better retention and offer a blacker surface. Skid testing shows no difference from using new chip. Any excess fines from the RAP are simply used in earthwork.

For more information on this research project contact Greg Duncan at: gduncan@appliedpavement.com or watch the webinar at https://www.youtube.com/watch?v=idwHJNW_rFg



Thin Asphalt Overlays Find A Role

with a processor to size the

The placing of hot mix asphalt (HMA) overlays thinner than the usual 0.12' (1.5") minimum often raises eyebrows. But it's commonly being done nationwide, and many agencies are totally sold on the concept. "Thinlay" is the general term used for this strategy. It involves special small-aggregate HMA mix in thicknesses only 3/4" to 1", placed as surface treatment on structurally sound pavement. These mixes are produced in hot mix plants and placed with conventional pavers and rollers.



Thinlay in place tool in the bag of surface treatments, usually applied as preventive maintenance for pavements still in good condition.

In California, typically only open graded friction courses (OGFC) and thin bonded overlays are placed in thickness less than 1 inch. But based on national experience, thinlays might be thought of as another

In a recent webinar sponsored by the Asphalt Pavement Alliance, a panel of road managers from across the nation, including officials New Jersey, Ohio, Wisconsin, Oregon and Mississippi discussed their experiences and best practice tips for thinlay technology. Based on their experience, thinlays have lots of potential benefits and uses, including sealing, smoothing,

By Roger Smith, CP² Center

raveling repair. Smaller thinlay projects are often done 'in-house' with agency crews and equipment.

As for the mix itself, thinlay HMA mixes generally use smaller top-size aggregate (3/8" or 9.5mm max) and a harder polymer-modified asphalt binder (e.g. PG 76-22). Specifications often require 100% crushed aggregate for maximum stability – especially in hotter climates. Because of the rapid cooling of thinlays, warm mix asphalt (WMA) technology can be used to aid in proper compaction.

Thinlay best practices include:

- targeting pavements with PCI > 65
- pre-repair of localized defects
- pre-milling of rougher pavement (e.g. distortions around intersections)
- placing an asphalt tack coat
- using riser rings on manholes and other 'iron' in the street.

Thinlay HMA paving involves conventional paving equipment and is dust free with minimal traffic interruption. Life expectancies are reported to be 10+ years over old asphalt pavement and 6 to 10 years over concrete pavement.

For more information go to: www.roadresource.org or <http://store.asphaltpavement.org/index.php?productID=696>



FHWA 'Asphalt Pavement Principles' YouTube Series

By Roger Smith, CP²C

improving skid resistance, noise reduction, x-slope restoration, minor rut leveling and

The new "Asphalt Pavement Principles" online video series from the Federal Highway Administration highlights the innovation and collaboration that go into modern asphalt pavements. Developed with the cooperation of the National Asphalt Pavement Association

(NAPA), the videos feature engineers, academics, and other industry figures discussing best practices for pavement performance.

"These videos help agencies and paving contractors alike better understand how to design and build asphalt

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pavements in a way that improves pavement

performance and service life," said NAPA 2019 Chairman John Harper, Senior Vice President at Construction Partners Inc. in Dothan, Alabama. "Attention to best practices and applying innovative technologies and materials are an important part of ensuring the traveling public gets the highest level of performance that asphalt pavements can deliver."

Go to www.asphaltpavement.org



ARRA Event Draws A Crowd

By Dennis McElroy, Graniterock, dba FMG, and Ali Mostardo, ARRA

The Asphalt Recycling & Reclaiming Association (ARRA) held its 2019 Semi-Annual Meeting in Monterey, California October 21-24, with a record number of 224 registered attendees, including contractors, suppliers, and 87 government agency representatives. Attendees learned from industry leaders, viewed a live blast at a rock quarry, participated in a workshop on ARRA's disciplines, and enjoyed the breathtaking views of Monterey.

A special "thank you" to the generous sponsors that made the meeting possible, including GraniteRock/FMG, ROADTEC, Inc Wirtgen Group, Caterpillar Rock Solid Stabilization & Reclamation, Inc., Western Emulsions, Pavement Recycling Systems, Inc. and Ergon Asphalt & Emulsions, Inc., Blount Construction Company, BLS Enterprises, Inc, Coughlin Company, Garrity Asphalt Reclaiming, Ingevity, Kennametal, Nouryon, Sollami Company, and Superior Tire & Rubber Corp.

The many informative presentations included:

- The Keynote Presentation by Sue Dyer, OrgMetrics, LLC on collaboration and trusted leadership
- Dr. Jon A. Epps, Texas A&M Transportation Institute, on changes in asphalt pavement technology over the last half century
- Mike Robinson of Mike Robinson, LLC gave attendees insight on the real value of value engineering.
- David Jones, University of California- Davis, shared ongoing research from the UC-Pavement Research Center (UCPRC) Test Track
- Alan Carter, Ecole de Technologie Superieure, speaking on the research done at the

LCMB-ETS on cold recycling and the interlaboratory exchange program on cold recycled materials done by the RILEM.

- Allen King, Caltrans, and Don Matthews, Pavement Recycling Systems, Inc., who worked closely together to develop a new smoothness specification for California that offers incentives for quality work.
- Jean-Martin Croteau, Colas Canada, spoke on the importance of continuous improvement and quality to not only the organization, but also for the clients.
- Nick Cosenza, Indiana Department of Transportation, and Zach Robinson, Heritage Research Group, covered the pavement design process for Indiana's State Route 101 and post-construction testing.
- Mike Voth, FHWA's Federal Lands Highway Division, presented on the use, experience, and performance of cold-in-place recycling (CIR) that has been one of their key pavement rehabilitation treatments for nearly 40 years.
- Mike Smith, Pavement Recycling Systems, Inc. talked on how building a successful safety culture is not an easy task.
- Tom Chastain, Wirtgen America, provided an overview of Wirtgen's "Performance Tracker", which is a web application that provides a compact overview of the machine status.
- Dann Rawls, Caterpillar, Inc, spoke on leveraging technology in transportation with management tools like 'eRoutes', which enables unprecedented visibility to everyone in the paving process.
- Jorge Campos, Pavement Recycling Systems, Inc., shared lab results that described how supplemental compaction may be able to be performed the same day.
- John Harvey, University of California-Davis, shared an overview of pavement Life Cycle Assessment (LCA) and

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Conventional milling vs. micro-milling exhibit

how Caltrans and other state agencies used LCA with a look forward to future developments.

- Don Greb, Griffin Soil Group, shared how FDR-c and soil stabilization for new and old pavements can be a more economical design with more predictable construction results.
- Brian Diefenderfer, Virginia Technical Resource Center, discussed recent progress on in the National Cooperative Highway Research Program (NCHRP).



Dennis McElroy, Ed Schwartz of Graniterock speak on CIR

An important part of the meeting included testimonials from two attendees on how the helpful website www.Roadresource.org by the Pavement Preservation & Recycling Alliance (PPRA) can be used daily to provide value to

agencies and the industry. Granite Rock helped organize a tour of their local quarry, and with assistance of other local ARRA members, included a workshop highlighting ARRA's various disciplines. The quarry tour included viewing a rock blast - especially interesting for those who have never seen one before. Following the blast, attendees took part at an onsite workshop where ARRA disciplines were demonstrated, including:

- Cold Central Plant Recycling (CCPR) led by Michael Concannon, Pavement Recycling Systems, Inc, with Roadtec's RT-500 CCPR Plant provided by Coughlin Company.
- Cold In-Place Recycling (CIR) led by Dennis McElroy, Anthony Silva and Ed Schwartz with Graniterock Company & FMG Co Inc, with Wirtgen's 3800 CR Machine (Single Unit Recycler).
- Full Depth Reclamation (FDR) by Don Greb, Griffin Soil Group, with Wirtgen's W240i Reclaimer & Streumaster site spreader truck
- Micromilling & Standard Asphalt Milling led by Tom Schmidt, Anrak Corporation, with Micromilling example performed by Anrak Corp, Standard Milling example performed by FMG Co Inc.

For more information contact Dennis McElroy at: dmcelroy@graniterock.com or Ali Mostardo at: alim@cmservices.com



Nevada Infrastructure Concrete Conference

By Roger Smith, CP²C

The expansion of infrastructure is big business in Nevada, and part of that work takes the form of concrete pavements. Over 200 people from Nevada and California gathered on October 29 in Reno for the 17th Annual Nevada Infrastructure Concrete Conference (NICC). Primary sponsors for the NICC 2019 event were the Nevada Department of Transportation (NDOT), the Sierra Nevada Concrete Association (SNCA), the Southwest Concrete Pavement Association (SWCPA), and the California Nevada Cement Association CCNCA), along with numerous industry co-sponsors and exhibitors. Concrete is the theme with presentations focused on materials, pavements, and bridge-related issues.

NDOT Director Kristina Swallow welcomed the group and cited the challenge of keeping up with the growth in Nevada and the increasing traffic while maintaining their lofty top 2 ranking in the nation. She highlighted several new major infrastructure projects that will demand

quality concrete materials – including the major work on Reno's infamous "spaghetti bowl" interchange, discussed below.

Jenica Keller of NDOT expanded on the Reno "spaghetti bowl" project which will rebuild the interchange of I-80 and 580 / 395 for improved traffic flow in Reno. The project will involve mostly concrete pavement and several new concrete structures, with a 20-year build-out cost approaching \$5 billion!

Stephen Gaj of the Federal Highway Administration (FHWA) explained FHWA's requirement for Asset Management Plans (AMP) from state DOT's for managing and maintaining routes on the National Highway System (e.g. US 395). In addition to having a Pavement Management Program to track pavement condition (e.g. by PCI ratings), agencies must also have a prioritized financing plan that considers the risk of delaying pavement maintenance work. NDOT's AMP has been approved by FHWA, and it emphasizes the *Continued, next page*



use of lower cost pavement maintenance strategies applied as preventive maintenance on pavements that are still in good condition.

Roundabouts are rapidly gaining popularity nationwide, at both the state highway and local road levels. Two experts from Parsons, Inc. traveled from Indiana to share their knowledge with the group. John LaBlonde and Matt Taylor address the advantages of using concrete pavements for these newer ways of designing intersections. Since roundabouts involve concentrated, sharp turning traffic, concrete offers rigidity and resistance to rutting. Also, the difficulty of invading a roundabout to do pavement maintenance also supports the use of concrete due to its minimal long-term maintenance needs. But there are some construction challenges, including laying out the optimum joint spacing and the large number of dowel bar assemblies required at sawcut weakened-plane joints. The use of macrofiber reinforcement shows promise in reducing the number of joints needed. The NCHRP 672 Report was cited as a valuable resource in planning roundabouts.

Bonded concrete overlays of asphalt pavement (BCOA) are also gaining popularity - often in a mill-and-fill type application to maintain profile grade. Tom Van Dam of NCE reviewed the state of this practice, which has been used mostly in the Midwest and Eastern states. NCE is part of an NCHRP research project, NCHRP 161, to survey the history and performance of BCOA. Here's a few preliminary findings: concrete bonds well to older asphalt pavement; asphalt should be at least 3" thick after milling (with no stripping damage); 4"-6" is the best thickness range for the concrete overlay; overlays should be sawcut in a 6' x 6' pattern, which keeps any sawcut out of the wheel path; BCOA's can be beneficial in replacing distressed asphalt around heavy intersections, bus stops, etc.. Caltrans recent research is favorable and more projects are expected in California.

Repair of severely rutted concrete pavement due to chain-wear on I-80 is a continuing challenge for Caltrans. Peter Schmalzer of NDOT presented an overview of the evaluation work in the Truckee area conducted by NCE of Reno under contract with Caltrans.

Caltrans first tried thin bonded asphalt overlays, but they wore off or debonded too quickly. So a tougher solution was needed.



Rutting in PCC on I-80 near Truckee

Current practice involves grinding an inlay trough 3' wide by 0.06' ($\frac{3}{4}$ ") deep into each rutted wheel path, and installing a polyester concrete filler. Final grinding is usually done on the surface for smoothness. Projects in place since 2017 (2 winters) are performing well and lots of additional work using this method is underway by Caltrans to correct the most severe problem areas.

Some of NDOT innovations in their concrete materials practices were outlined by Darin Tedford, NDOT's Chief Materials Engineer. One example is in their bridge deck concrete, where early cracking has been experienced. Some strategies developed by Caltrans have been borrowed and employed, including the use of admixtures to reduce shrinkage, along with a mixture of micro and macro synthetic fiber reinforcement and special curing practices. They also now require a 'trial slab' 30 days before construction. Another innovation is NDOT's "Concrete Quality Initiative", which will help ensure that current specifications and best practices are complied with. This should reduce performance problems due to inferior practices or not understanding the specification requirements. One item that has proven effective is a requirement for a pre-job conference with the contractor to discuss the specifications and provide a 'heads up' on any special materials, production and paving requirements.

All attendees received a "Certificate of Award" and 0.7 CEU / 7 PDH credit.

Plans are already underway for the 2020 Conference.

For more information on the NICC event and speaker topics go to: <https://nicc2019.com/>

New Roller Compacted Concrete (RCC) Streets in Roseville

By Clay Slocum, P.E., California Nevada Cement Association (CNCA)

Located about 20 miles northeast of Sacramento, the City of Roseville is the largest city in Placer County with a population of about 150,000. Transportation has been at the heart of this community since its founding. Originally a station along the stage coach path of the early settlers, it continued its prominence being named "Roseville Junction" as the location where Central Pacific Railroad tracks crossed the California Central Railroad line. Today, Union Pacific passes through Roseville as do Interstate 80 and Highway 65.

The City maintains about 1,000 lane miles of asphalt roadway, which presents the City's challenge: In order to maintain 100 lane miles per year (a 10 year preservation cycle) the City would need to increase their annual roadway maintenance budget by about 33%. As a possible solution to this challenge, the City of Roseville is looking into using concrete pavement for new and reconstructed roadways.

Specifically, the City is looking into Roller Compacted Concrete (RCC). RCC is a revolutionary construction technique that blends asphalt-style construction equipment with a relatively 'dry' version of Portland cement concrete. The installation method keeps construction costs low and has shown to be first-cost competitive with asphalt pavement. Comparative life-cycle cost analysis shows that Roseville can save approximately \$1,000,000 by using RCC, as opposed to the traditional HMA pavement. The speed of construction is also good, as RCC is installed in a single lift (ranging from 5" to 10" thick) with no reinforcing steel.



RCC with white curing agent and colored sawcut gridlines - Washington Boulevard

Future budgetary benefits center on the expected reduced maintenance cost of concrete pavements. RCC is expected to serve 20 to 25 years without maintenance; compared to typical Roseville resurfacing practices for asphalt - every 7 to 10 years. The City's goal is to have more new roadways and their own reconstructed streets use concrete pavement. This will not only reduce the roadway maintenance structural deficit, but also increase the City's share of Gas Tax revenues.

"RCC has the potential to be a game changer in the continuous struggle to find enough resources

to maintain local roads. It allows cities and counties to benefit from the maintenance savings that concrete roads provide at a cost similar to that of asphalt streets." - Jason Shykowski, City of Roseville Public Works Director

Obstacles Overcome:

During design, the largest challenge was producing a construction staging plan for Atkinson Street that would allow the roadway to accommodate the traffic for Denio's weekly Market Plaza Events. The project team coordinated with Denio's Market to determine when the road needed to be open for their customers. Then, working with our industry partners, they were able to develop a staging plan that met the needs of the Denio's Market and the City while also being biddable and buildable.

Before construction began, the team developed a concrete mix design that was able to reach the City's specification of at least 2,500 psi unconfined compressive strength within two days, allowing the roads to be opened to traffic quickly. Businesses who had only one driveway were accommodated by placing steel plates on the RCC, providing immediate access.



Placing RCC

During construction in the summer of 2018 the ambient air temperature reached 108°F during the day. A concern was that the heat might affect the curing

of the concrete. Covered haul trucks, increased curing compound application rates, and paving at night were the key solutions implemented during construction to fight the heat's effect on the concrete.

Increased Preservation

With a 50-year pavement design life, RCC's lifecycle is more than double that of asphalt, which assumes only a 20-year typical design life. RCC's durability should reduce maintenance throughout the life of the pavement and reduce failures like rutting, especially at troubled areas like intersections. The City does not expect the first maintenance instance until approximately 20 years (2038) when there can be pavement smoothing, via diamond grinding, and individual

Continued, next page

panel replacement.

A special project video is available here: <https://www.youtube.com/watch?v=w1KtQwo7eIM>

The project was also featured in this Placer County Transportation Planning Agency blurb: <https://files.constantcontact.com/9bd71b6a001/4cd074f4-0a29-4ecc-a0a3-16f1a1fa5aab.pdf>

Increased Safety

The expected reduced maintenance with RCC ensures that road closures for maintenance will be lessened; increasing safety for drivers and road crews that no longer need to be on the roadways as often. Concrete pavement is also lighter in color, requiring less lighting to achieve the same illumination and enabling better visibility at night.

Collaborative Effort

The City and design team took every effort to reach out to all parties during the project development. The businesses and residents along the roadways were invited to public forums and their input helped frame the construction staging and timing. The City council gave full support of the project and applauded the innovative approach of the City staff tackling the funding shortfall. The local Building Industry Association (BIA) as well as the utility contractors in the area were consulted to assuage concerns and educate them on standard practice for dealing with concrete pavement. Furthermore, the City realizes their goals can be shared and enhanced if their neighboring agencies and developers begin using RCC. For this reason, the City presented their project and experience with the design community via ASCE, APWA, MTC, and public forums, as well as inviting everyone to view construction during a summer workshop! The Project Manager

for the City of Roseville was Noah Siviglia.

Construction

FBD Vanguard Construction (Vanguard) won the RCC bid for this noteworthy reconstruction. Based in Livermore, Vanguard works with Caltrans and other public agencies to provide quality concrete pavement solutions. During construction, Vanguard took extra steps to fa-



Finishing work on RCC

cilitate traffic control and provide value engineered alternatives. Cemex provided Vanguard with equipment and some foreman experience during the paving operations, involving Teichert aggregates and Cemex cement.

The RCC received varied surfacing, including diamond grinding and broom finishing, which provides pedestrians and vehicles with added traction for safety. Very thin saw blades were used to create the joints in the concrete. The brooming and the thin joints helped create a smoother surface, free of wide gaps or aggressive textures that hamper bicycle, skateboard, and stroller use.

For more information contact: Clay Slocum (CNCA) at: clay.slocum@cncement.org or Noah Siviglia (City of Roseville) at: NSiviglia@roseville.ca.us



Caltrans Updates Design Of CRCP

Under the leadership of Sergio Aceves, Caltrans' State Pavement Engineer, FHWA, and the concrete pavement industry, workshops were recently conducted to support the roll-out of new Caltrans Revised Standard Plans for continuously reinforced concrete pavement (CRCP). Over the past 9 months, Caltrans has been working closely with pavement engineers at the FHWA to update and improve their CRCP design details.

In an ongoing effort to improve CRCP designs, pavement engineers have studied CRCP performance across the U.S., and as a result are now

By Charles Stuart, SWCPA

able to simplify and improve the details for the CRCP reinforcing steel. The changes focus on eliminating the wide-flange beam details, eliminating anchor details, and increasing the cross-sectional area of reinforcing steel. These updates are expected to lead to more constructible, longer lasting pavements with lower maintenance requirements.

Two national experts, Shiraz Tayabji and Michael Plei visited California to participate in the Workshop. Mr. Tayabji has served as a principal Investigator for several FHWA and industry

Continued, next page

sponsored projects to improve performance of concrete pavements, including CRCP and precast concrete pavements. Mr. Plei is a transportation structures consultant with over 20 years of experience focused on reinforced concrete pavements and bridges. The Workshops, held on September 23 in Fontana and 25 in Sacramento, also included presentations by Chu Wei (FHWA), Dulce Rufino Feldman (Caltrans), and Charles Stuart (Southwest Concrete Pavement Association). It's also important to recognize the key support of Sam Tyson, FHWA Headquarters, and Kuo-Wei Lee, Caltrans, Chief of the Concrete Pavements Office.

These efforts have resulted in immediate implementation of the new designs on current projects under construction and projects in design. Contractors have welcomed the

simplified details, while Caltrans should benefit by receiving better performing, longer lasting pavement.

When building a pavement to last 50, 75, or even 100 years, getting things right with design and construction quality is imperative. Caltrans has identified CRCP as the preferred concrete pavement type for new construction and concrete overlays subjected to very high traffic loadings ($TI \geq 13.0$) for all climate regions except High Mountain and High Desert. Since 2008 Caltrans has delivered nearly 1000 lane miles of CRCP.

To receive invitations for future concrete pavement workshops and events, please contact Charles Stuart, Southwest Concrete Pavement Association (SWCPA) at: cstuart@swcpa.org.



CCPIC Update

By John Harvey, Laura Melendy, and Gary Hicks



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

Information on the use to city and county pavement professionals, and more details on CCPIC can be found 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 CSU San Jose are all involved with CCPIC. 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 cit-

ies 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). Meetings are held quarterly, alternating between web calls and in-person meetings. The last in-person meeting was held in San Jose State at the Mineta Transportation Institute on November 15, 2019. Visit the CCPIC web page (below) to see minutes of meetings and membership of the Governance Board, or to pose questions or suggestions for CCPIC.

The following provides an update on recent accomplishments and future plans.



CCPIC Governance Board at Meeting at CSU San Jose

Continued, next page

Training

- Pavement engineering and management curriculum and certificate plan. Laura Melendy (UC Berkeley, Tech Transfer) indicated the final version of the Certificate plan was submitted and approved in August 2019. In addition, she discussed the proposed curriculum, which consists of 92 hours of core classes and electives.
- Training given. Laura reported on the classes held since the last meeting, which included the LCCA online class, which had 130 participants, and the IDM-04 class in Santa Clarita, which reached 41 people.
- New classes being developed include:
 - CCB-02 Pavement management and Preservation Strategies (April 2020)
 - CCA-02 Pavement Sustainability (Fall 2020)
 - CCC-02 Pavement Preservation Materials and Treatments (Fall 2020)
 - CCC-23 Gravel Roads Engineering, Construction, and Management (Fall 2020)
 - CCC-01 Asphalt Materials and Mix Design (Spring 2021)
 - CCC-03 Pavement and Hardscape Construction Specifications and Quality Control Management (Spring 2021)
- Upcoming scheduled classes. The only upcoming class before our next meeting in early 2020 will be IDM-04 "Asphalt Pavement Maintenance and Rehabilitation" scheduled for December 2019 with over 40 enrolled.

Technical guidance and tools

These activities included discussions on the following tasks being undertaken by the CCPIC

- Construction specifications for asphalt concrete compaction. CSU Long Beach is working to develop specifications for local agencies modeled after the Greenbook for southern California and Caltrans specifications for northern and central California.
- Sample specifications for PCC mix design. CSU Chico has been working on this with industry. The final version of the specs is due to be completed by December 15, 2019.
- Life cycle cost analysis (LCCA). Sampat Kedarisetty of UC Davis reported on a study he is doing with the City of San Jose, County of Los Angeles, City of Berkeley, and City of Lompoc. 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 models for their own agency.

Marketing Materials

Laura Melendy provided the group with copies of the brochure, bookmarks, and the new CCPIC booth materials. A CCPIC presentation is ready for use and can be modified as needed to share with local agencies.



Laura Melendy with the new CCPIC booth

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) and he has agreed to help the CCPIC. Erik will work on outreach and on specifications initially. Shadi Saadeh of 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 reported that they have not made many contacts yet, but will focus on City and County organizations, MSA, and ASCE and APWA sections in Northern California and the Bay area.
- Central California Resource Center. Ashraf Rahim of Cal Poly reported he has met with the county of San Luis Obispo and the City of Pismo Beach. They are interested in CCPIC, but need follow-up meetings with the new brochure and slide presentation. He will also be reaching out to APWA/ASCE sections in central California as well.

For further information about the resources centers send an email to ccpic@ucdavis.edu.

CCPIC website and Peer-to-Peer Exchange

In addition to its website, CCPIC is creating 'peer-to-peer' communication capability for regional local government discussion groups. The

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exchange is not for the public, but for agencies only. Public can read, but not post. Its intent is to cover 'hot topics' facing local agencies, such as specifications, pavement engineering and materials and contract information. If interested in participating in the peer exchange group, please contact Jon Lea at: jlea@ucdavis.edu.

The next meeting of the CPIC Governance Board will be a web meeting in January or February 2020, with the next in-person meeting in May 2020. This will likely take place in Sacramento.

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



Bay Area Streets Improve As Gas Tax Dollars Go To Work

By Sui Tan, MTC

Bay Area cities and counties largely improved the quality of the pavement on their local street and road networks in 2018. Recent data from the Metropolitan Transportation Commission (MTC) show the region's nearly 43,500 lane-miles of local streets and roads registered an average pavement condition index (PCI) score of 67 (out of a maximum possible 100) points last year, as calculated on a three-year moving average basis. This marks the third year in a row that the regional average has reached 67 points. With more state dollars flowing to cities' and counties' pavement programs after the November 2017 start of the Senate Bill 1 (SB1) fuel tax increases, the Bay Area's one-year average PCI score for 2018 ticked up one point to 68.

"MTC's goal is to bring all the Bay Area's transportation assets into a state of good repair," explained MTC Chair and Alameda County Supervisor Scott Haggerty. "For local streets and roads, that would mean boosting the regional average PCI score to about 85 points. So there's a lot of work ahead for cities and counties all around the Bay Area. But after just one full year of SB1 funding, the numbers are already moving in the right direction and we expect to see faster improvement over the next few years."

PCI scores of 90 or higher are considered "excellent." These are newly built or resurfaced streets that show little or no distress. Pavement with a PCI score in the 80 to 89 range is considered "very good," and shows only slight or moderate distress, requiring primarily preventive maintenance. The "good" category ranges from 70 to 79, while streets with PCI scores in the "fair" (60-69) range are becoming worn to the point where rehabilitation may be needed to prevent rapid deterioration. Because major repairs cost five to 10 times more than routine maintenance, these streets are at an especially critical stage. Roadways with PCI scores of 50 to 59 are deemed "at-risk," while those with PCI scores of 25 to 49 are considered "poor."

These roads require major rehabilitation or reconstruction. Pavement with a PCI score below 25 is considered "failed." Among the region's three largest cities, San Francisco last year climbed higher into the "good" category by raising its three-year moving average score from 70 to 72, while San Jose (65) and Oakland (54) remained in the "fair" and "at-risk" classifications, respectively.

Dublin once again topped the list of Bay Area pavement rankings for the 2016-18 period, reporting an average PCI score of 86. Other cities with three-year PCI scores in the "very good" range include Clayton and Palo Alto (84); Daly City and El Cerrito (83); Brentwood (82); Cupertino, Foster City and unincorporated Solano County (81); and Colma, San Ramon and Union City (80).

The Marin County city of Larkspur's one-year PCI score for 2018 climbed eight points to 54, ranking among the biggest year-over-year increases of any Bay Area city. Larkspur's city government has made pavement maintenance a top priority, and voters in recent years have twice approved local sales tax measures dedicated to rehabilitating the city's 65 lane-miles of local streets.

The complete 2018 Pavement Conditions Summary — including percentages of local roadways in various conditions, and a listing of average PCI scores for the arterials, collector roadways and residential streets for all Bay Area counties (9) and cities (101) — may be accessed at: https://mtc.ca.gov/sites/default/files/PCI_table_2018_data.pdf

MTC is the transportation planning, financing and coordinating agency for the nine-county San Francisco Bay Area. For more info go to: www.mtc.ca.gov



METROPOLITAN
TRANSPORTATION
COMMISSION



California's Transportation Asset Management Plan (TAMP)

By Chu Wei, FHWA - Sacramento



On October 24, 2016, the Federal Highway Administration (FHWA) published its final rule on required state-approved asset management plans and implementation process. The California Department of Transportation (Caltrans) submitted a fully compliant Transportation Asset Management Plan (TAMP) on June 20, 2019.

The California TAMP describes how the National Highway System (NHS) will be managed to achieve an effective system performance and performance measures targets for specific asset conditions, while managing the risks in a financially responsible manner, at a minimum practicable cost over the life cycle of its assets.

The FHWA California Division Office reviewed the final California TAMP and its implementation documentation and found them to be in compliance with the minimum requirements set forth in 23 CFR 515.13(b)(1). The California TAMP consistency determination was granted to Caltrans in an FHWA letter dated August 14, 2019.

<https://dot.ca.gov/-/media/dot-media/programs/asset-management/documents/20190726-am-finalcaliforniatamp-a11y.pdf>

Sustainable Pavement Systems: A Webinar Series

FHWA welcomes your participation in the FHWA Sustainability Ambassadors for the Sustainable Pavement Systems: A Webinar Series that begins on Thursday, October 17, 2019. These webinars will explore various sustainability considerations throughout the pavement life cycle. Participants can earn 1 professional development hour (PDH) per webinar. Complete 8 of the 10 webinars and you can earn a certificate of completion.

Registration on these webinars is available at: <http://surveys.appliedpavement.com/s3/SP-Webinars-Registration>

For more information contact Chu Wei at: chu.wei@dot.gov



RMWPPP Meets in Park City, Utah

By R. Gary Hicks, CP2 Center

Nearly 100 people attended the Rocky Mountain West Pavement Preservation Partnership (RMWPPP) in Park City, Utah, on October 28-30. In addition over 15 vendors participated. The meeting was opened by Kevin Robertson, the RMWPPP chair, from Arizona DOT, who introduced Kris Peterson of Utah DOT and Ivan Moreno of the FHWA Utah division.

National updates were then provided by Ben Worel of Minnesota DOT on MNRoad and by Adriana Vargas-Nordbeck of NCAT. The MN-Road presentation included discussions on pavement sealing, diamond grinding and DBR, rejuvenators with RAP, National Road Research Alliance (NRRRA) activities and the NCAT/MN Road Partnership. More information on MN-Road and the NRRRA can be found at: <https://www.google.com/search?client=firefox-b-1-d&q=mnroad>.

The NCAT presentation discussed performance of the treatments that have been placed near Auburn University and on their test track. Data is being collected, which includes the life extension of various treatments. More information

on the pavement preservation studies being monitored by NCAT can be found at <http://www.eng.auburn.edu/research/centers/ncat/testtrack/preservation/index.html>

Judy Corley-Lay of the National Center for Pavement Preservation (NCP2) then presented a summary of the Research Roadmap developed for the FHWA. Various research projects or synthesis studies have been identified in the categories of asset management, treatment selection and design, materials, construction, contracting, performance and benefits.

The presentations for the national updates, the Research Roadmap, and all the other presentations can be found on the Conference website below.

As in each annual RMWPPP meeting, reports were presented by the participating agencies which included: Alaska DOT&PF, Arizona DOT, Connecticut DOT, City of Denver, Idaho Transportation Department, Montana DOT, Nevada DOT, New Mexico DOT, Oregon DOT, City or Roseville, Utah DOT, Washington State DOT,

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Washoe County NV and Wyoming DOT. Member states not participating included California DOT, Colorado DOT, and Hawaii DOT. The presentations from each agency can be found at the meeting website below.

One session was devoted to the topic of building a 'pavement preservation culture' within an agency. Speakers included Kevin Robertson from Arizona DOT, Scott Gibson from Washoe County, and Jerry Dankbar from the City of Roseville, CA. Some of the 'take-aways' included;

- Ensure pavement preservation is a priority
- Have a system to pass along knowledge
- Plan for the future
- Document the benefits of preservation treatments
- Encourage collaboration between engineering and maintenance departments

Judy Corley-Lay (NCP) and Kim Alexander (WSDOT) then made a presentation on how to develop an agency "champion" and what champions must do.



Judy Corley-Lay speaking, with panel members, Jeff Mann (NMDOT), Kevin Robertson (AZDOT), Kim Alexander (WSDOT), John Coplantz (ODOT, and Jared Dustrup (UDOT)

One of the highlights of the meeting was the presentation of the James Sorenson Excellence Award for Pavement Preservation to the Town Of Moraga, CA, for having the best pavement preservation program in the United States. Edric Kwan of Moraga accepted the award. The work he did for the Town

has been described in the September 2019 edition of the CP2 Centers newsletter. Prior winners from the state of California include the City of Los Angeles (twice) and Caltrans. If you are interested in submitting your agency for this award, please check out the FP2 website at <https://fp2.org/>. The deadline for the next award is July 1, 2020.



Edric Kwan, Town of Moraga, recipient of the Sorenson Award

Industry presentations included the following topics

- Use of RAP in preservation treatments James Emerson of Pavement Recycling gave an enlightening presentation on the benefits of using RASP in preservation treatments including chip seals, slurry surfacings, and cape seals. He discussed the cost effectiveness of these treatments as well as those of CIR and CCPR. He included case studies from the City of Corona, CA and the County of Los Angeles.



James Emerson, Pavement Recycling Systems

- Micro Milling Andrea Latham of Keystone in Chicago discuss the types of milling heads (standard, fine and micro) including the different configurations for the milling heads (Triple vs Quad wrapped) used in milling operations. She also discussed the use of flat tooth drums for pavement markings
- Asphalt Rubber Chip Seals Kevin Robertson of Arizona DOT discussed the Arizona experience. In Arizona, they experienced some early failures with emulsion chip seals and replaced them with AR chip seals. To address the problems with the emulsion chip seals, they formed a working group and developed new best practices which included;
 - Chip seal design and the use of a test strip
 - Preconstruction meetings to identify all potential key issues

The process worked, and as a result ADOT was able to bring back emulsion chip seals.

Larry Galehouse developed a presentation on the AASHTO Emulsion Task Group (ETG) activities. This presentation was given by Gary Hicks and included the development of new materials specifications and design practices for many preservation treatments, construction guides for some of the treatments, and new NCHRP research projects initiated by the ETG.

Continued, next page

Larry Scofield followed with a presentation on a "Peer Exchange" program that he and Larry Galehouse had undertaken for the NCPP. The purpose of the Peer Exchange was to share knowledge on select asphalt and concrete treatments. The approach consisted of 4 regional workshops followed by 10 Peer Exchanges. The results of this effort and that of the ETF can be found at the conference website below.

- Safety elements and pavement preservation
- On-line training for concrete pavement presentation

The Industry vendors are also an important part of the annual meeting in that they share new technologies related to pavement preservation. They suggested that for future meetings the Agencies provide a list of 5 'hot topics' facing them, so that Industry might provide input on these issues.

RMWPPP Task Groups formed include ones on Training, Research, Case Histories and Marketing- Information Sharing, and Hot Topics. Each group meets periodically during the year and to share their work at the next annual meeting.

The 2020 meeting will be in New Mexico. The time and location is still to be determined.

Other topics covered, but without presentations, included

More information can be found on the RMWPPP website at: <https://tsp-2pavement.pavementpreservation.org/rocky-mountain-west-rmwppp/annual-meetings/2019-rmwppp-park-city-ut/> .

- Use of State and Federal funding for pavement preservation projects



COMING EVENTS - Mark Your Calendar!

By Roger Smith, CP2C

"Asphalt Pavement 101" Class January 14 (San Diego)

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.

For more information go to: www.calapa.net

than 1,500 exhibiting companies and 60,000 registered industry professionals in more than 700,000 net square feet of exhibit space. At World of Concrete, find all the products, resources and valuable information necessary to strengthen your business. This is the commercial construction industry's first, largest and most important annual international event for concrete and masonry professionals across the globe! For more information go to: www.worldofconcrete.com



WRAPP 2020 Workshop January 29-30 (Sacramento)

The Western Region Association for Pavement Preservation (WRAPP) annual Workshop, a premier west coast training function, will again offer an outstanding lineup of pavement technical experts focusing on the topic of pavement preservation. A good mix of Agency, Industry and Academic speakers will make up the program.

For more information go to; www.wrapp.org



AEMA-ARRA-ISSA Annual Meeting February 17-21 (San Antonio, TX)

Three associations, the (AEMA), (ARRA) and (ISSA) will again come together for a joint annual meeting featuring the latest information on pavement maintenance technology. In addition to general sessions on industry-wide topics, there will be break-out sessions and committee meetings for the individual associations. For more information go to: <https://www.aema.org/mpage/2020AnnMtg#Registration>

Asphalt Mix Design Certification April 14-17 (Sacramento)

The Asphalt Institute's "Mix Design Technology
Continued, next page



WORLD OF CONCRETE 2020
EXHIBITS: FEBRUARY 4-7; EDUCATION: 3-7
LAS VEGAS CONVENTION CENTER

World of Concrete 2020 February 4-7 (Las Vegas)

WOC was introduced to the commercial construction industry in 1975, and boasts more



Certification (MDT) Course” provides advanced technicians, designers, and engineers responsible for mix designs with a thorough understanding of the properties of the materials that compose asphalt mixtures, as well as the physical and mathematical processes involved in producing a successful asphalt mixture design. Students will receive training over the entire range of activities related to the design of asphalt mixtures, including aggregate and binder selection, material properties, development of trial blends, batching, volumetric calculations and analysis, Superpave mix criteria, mix performance tests and criteria, use of RAP in asphalt mix designs, plus an overview of SMA and open-graded mixtures.



State and local transportation agencies, consultants and contractors who are involved in HMA materials and mix design will benefit from this course. For more information go to: <http://www.asphaltinstitute.org/training/seminars/>

CalAPA Spring Conference
April 16-17, (Anaheim)



The CalAPA Spring Conference will be held at a special location - the Disney Grand Hotel in Anaheim. The Conference will feature prominent speakers from industry, government agencies and academia, as well as breakout technical sessions and vendor exhibits. 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 half-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. Safety issues will also be discussed.

For information go to: <https://registration.techtransfer.berkeley.edu/wconnect/ShowSchedule.awp?&Mode=GROUP&Group=:FULL&Title=Complete+Listing>



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.

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