



CP2 CENTER NEWS

Newsletter of the California Pavement Preservation Center

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Interview with Jesse Bhullar, Caltrans' State Pavement Engineer

Interviewed by Dr. Ding Cheng, Director of the CP² Center

Jesse Bhullar is the State Pavement Engineer and manages the Pavement Program, California Department of Transportation (Caltrans). Jesse has worked for Caltrans for over 28 years in progressively responsible positions in the areas of Planning, Design, Construction, Traffic Safety,

Local Assistance and Maintenance. As the State Highway Safety Engineer, Jesse led the development and management of the collision reduction program, expedited the delivery of safety projects, and led the development and management of the Run-off-Road Monitoring program which received the 2005 National Roadway Safety Award. Jesse also led the development, implementation and management of California's Strategic Highway Safety Plan, which received the 2009 National Roadway Safety Award.



Jesse Bhullar

Jesse is a licensed Civil Engineer (P.E.) and Traffic Engineer (T.E.) in the State of California. He received the 2007 Karl Moskowitz Award for his significant contributions and efforts in Traffic Safety. Jesse has been an active member in national safety efforts, representing California on various National Cooperative Highway Research Program (NCHRP) panels, American Association of State Highway Transportation Officials (AASHTO) committees, AASHTO's Standing Committee on Highway Traffic Safety (SCOHTS), and other national and State efforts.

With his extensive management experience and capabilities, Jesse led the development of the Pavement Program Strategic Management Plan (PPSMP) for 2016-2021. Here are his responses to some questions posed in a recent interview.

Q1: What are the major goals and objectives of the Pavement Program Strategic Management Plan?

The major goals of the PPSMP align with the Department's goals. We not only set up our major goals, we have also developed action items, performance measures, and tracking system. We review the PPSMP often and consider it a living document. The following are the current major goals and strategic objectives of the 5-year PPSMP:

GOAL 1 - Safety and Health: Provide a safe transportation system for workers and users, and promote health through active transportation and reduced pollution in communities.

- Strategic Objective 1.1: Decrease the number of pavement work zones by extending pavement service life and improving pavement strategy performance
- Strategic Objective 1.2: Decrease the duration of pavement work zones
- Strategic Objective 1.3: Construct pavement features to support active transportation

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GOAL 2 - Stewardship and Efficiency: Money counts. Responsibly manage California's transportation assets.

- Strategic Objective 2.1: Manage the condition of pavement assets
- Strategic Objective 2.2: Maximize investments on pavement to keep it in a state of good repair
- Strategic Objective 2.3: Collaborate with external partners to develop the best practices, plans, specifications, policies and guidance
- Strategic Objective 2.4: Improve effectiveness of pavement strategies

GOAL 3 - Sustainability, Livability and Economy: Make long-lasting, smart mobility decisions that improve the environment, support a vibrant economy and build communities, not sprawl.

- Strategic Objective 3.1: Reduce environmental impacts from pavement strategies
- Strategic Objective 3.2: Implement pavement decisions to improve economy
- Strategic Objective 3.3: Assess impacts of engineering decisions
- Strategic Objective 3.4: Provide plans, specifications, policies and guidance for construction and maintenance of smooth pavement surfaces

GOAL 4 - System Performance: Utilize leadership, collaboration and strategic partnerships to develop an integrated transportation system that provides reliable and accessible mobility for travelers.

- Strategic Objective 4.1: Provide optimized strategies to the districts and MAP-21 data to partners to maintain and repair pavements
- Strategic Objective 4.2: Partner with districts and local agencies to maintain and improve the SHS and NHS
- Strategic Objective 4.3: Collaborate and improve partnerships with industry, agencies and the public to build relationships

GOAL 5 - Organizational Excellence: Be a national leader in delivering quality service through excellent employee performance, public communication and accountability.

- Strategic Objective 5.1: Ensure staff activities are aligned with Caltrans and Division of Maintenance strategic goals
- Strategic Objective 5.2: Promote a positive work environment to maximize accomplishments, encourage innovation and creativity
- Strategic Objective 5.3: Improve internal and external communications to improve service and customer satisfaction

Q2: How do you envision the steps to realize these goals in the next five years?

As provided above, each goal of the PPSMP is supported by multiple strategic objectives. Action items and performance measures (PM) are being developed to support these strategic objectives. The following is an example:

GOAL 2 - Stewardship and Efficiency: Money counts. Responsibly manage California's transportation assets.

- Strategic Objective 2.1: Manage the condition of pavement assets
 - » Action 2.1.1: Collect and validate automated pavement condition survey (APCS) data for the SHS and the National Highway System (NHS)
 - » Action 2.1.2: Load APCS data into the pavement management system (PaveM)
 - » Action 2.1.3: Publish APCS and other pavement performance reports (SOP, MAP-21, etc.)
 - » Action 2.1.4: Make PaveM data available to partners for decision making
 - » Action 2.1.5: Track pavement assets and projects using PaveM and the State Highway Operation and Protection Program (SHOPP) Tool
 - » PM 2.1.1: APCS completed, validated and published
 - » PM 2.1.2: Percent of SHS network surveyed
 - » PM 2.1.3: Reporting the good, fair and poor pavement conditions

Q3: What is the status of Caltrans pavement management system, PaveM? Will pavement preservation treatments be integrated into PaveM to allow predicting the life of each type of pavement preservation treatment?

We are using PaveM to manage the Pavement Program. The latest version of PaveM has been rolled out to the Districts and all Districts have been trained to use this system. Under Goal



4, System Performance, we provide optimized lists of potential projects to maintain and repair the pavement on the state highway system. While PaveM suggests when a pavement preservation treatment should be placed, the Districts are responsible for determining the exact strategy.

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For example, in one area a polymer modified emulsion chip seal may be the best treatment to use, while in another region a rubberized chip seal would be better. The Districts maintain that expertise to evaluate conditions and make such decisions. Also, PaveM included



Pavement Management and Performance

predictive models that are being further developed and used for running various scenarios. These predictive models project the extended life of the pavement due to the preservation treatments. These predictive models will be fine-tuned with time as performance to the treatments are monitored using pavement surveys and research.

Q4: How can the CP² Center and other universities in California support Caltrans Pavement Program?

The universities and CP² Center are vital to the collaboration of industry and government as well as the development of new technologies. The unbiased work which occurs in the universities and center is important to bring new pavement preservation and repair strategies to the public. In the era of rapidly decaying infrastructure, reduced funding, and higher expectations, it is incumbent that the public receive the highest value for their investment in roads and highways, and the Center and universities greatly assist in this. In summary, CP² Center, along with other universities, have and will continue to play a role in the Caltrans pavement preservation program. This work will include:

- Help with monitoring pilot projects
- Help with conducting forensic investigations
- Assist with the development of guidelines

Q5: With a lot of people planning to retire or change positions, how do you think this will impact the Pavement Program?

- Just like any other organization, the Pavement Program needs to be prepared to address retirements and personnel moving to other jobs. This is not unique to Caltrans, as industry has also indicated that their work force is aging and they are expecting to see retirements and movements. The Pavement Program needs to be aware of the issue and take the necessary steps to mitigate the impacts.
- Pavement Program Offices have been restructured to team up a Senior Transportation Engineer with a Transportation Engineer to work closely together in an area of expertise to share the workload, responsibilities, and to ensure that there is knowledge transfer.
- The Pavement Program is incorporating succession planning efforts (e.g., rotations and out of class assignments, documenting actions and decisions, desk manuals).

Q6: With many changes in pavement technologies, are there any training activities planned?

There are many training opportunities available at Caltrans, such as: PE Academy, PaveM training, etc. We have been working very closely with our partners in industry to provide joint training and workshops, such as the California Asphalt Pavement Association (CalAPA), California Nevada Cement Association (CNCA), Western Regional Association for Pavement Preservation (WRAPP) workshops, and smoothness specifications training. A joint training and certification program for technicians who do materials sampling and testing is under development. Training needs for new pavement technologies include: two lift concrete pavements, and concrete overlays on top of existing asphalt pavement.

Q7: What new activities are occurring in the Rock Products Committee (RPC), and what is the future role of PPTG and RPC?

The future role of the Caltrans-Industry RPC would be similar to its current role in the general sense of working closely with the industry in the development of specifications. Caltrans would be responsible for developing the specifications and getting feedback from the industry on their viability. In addition, we would be looking at prioritizing tasks, taking on fewer tasks and getting them completed. Currently, there are four Task Groups under RPC, the Asphalt Task Group, the Concrete Task Group, the Pavement Preservation Task Group (PPTG) and the

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Pavement Foundations Task Group.

Moving forward, we are looking at a more active role of the various organizations and associations representing industry that are involved in pavement materials and specifications. These establishments include the California Asphalt Pavement Association (CalAPA), California Nevada Cement Association (CNCA), the Western Regional Association for Pavement Preservation (WRAPP), and the Rocky Mountain West Pavement Preservation Partnership (RMWPPP), etc. At the RPC level, we want to come up with guidance and framework to make sure the task groups and subtask groups do an effective job.

A new development at the RPC includes the development of Operating Principles within the day-to-day activities that occur within the various committees and sub-committees. There are three areas that are being addressed: Street Ready, Performance, and Statewide Consistency. The principles are described in the following:

Street Ready

We are committed to ensuring that specifications are street ready by:

1. Providing clear guidance on scoping documents,
2. Using a partnering relationship and partnering values as described in the Caltrans field guide to partnering in the specification development process,
3. Documenting consensus on RPC decisions,
4. Effectively utilizing the pilot project process.

Performance

RPC defines satisfactory performance as successfully developing specifications that perform in the way they are designed, and ensures this by:

1. Incorporating appropriate levels of performance monitoring of pavement treatments, strategies and physical assets as they pertain to the intent of the specification into scoping documents.
2. Assessing the efficiency of the specification and investigating any issues to determine if issues are related to the specification or external factors; and by having a rapid-

response mechanism to help address project-specific problems that result from the specification.

3. Establishing a process for tracking and evaluation of associated trends.
4. Ensuring that the RPC website is current and reflects performance tracking of RPC projects.

Statewide Consistency

RPC strives to ensure statewide consistency in Standard Specification implementation across the Districts by:

1. Providing trainings and guidance documents on the intention and interpretation of specifications.
2. Enforcing uniform specification implementation through accountability, reporting and performance measures.
3. Establishing a means for ensuring that specification owners understand how the specifications are administered in the field and vice versa.

I am very excited to work with Caltrans and Industry to integrate these principles into everyday activities. Thus, after we meet and come to agreement on what these mean to us and how we could embrace them, they will affect specification development and trial projects.

Pavement preservation activities are the backbone of preserving our pavement infrastructure. The 5-Year Maintenance Plans distribute the preservation funding based on need and inventory. As the state works to repair more pavements and reduce the backlog of poor lane miles, the preservation strategies are going to be even more important to the state. In fact, in order to achieve our goals, every strategy will need work harder and be required to extend life and condition even a little longer than has been expected in the past. The PPTG must work closely with the Pavement Program and the CP² center to maximize our efforts as loads get heavier and expectations for performance get higher.

If you have any questions, please contact Jesse Bhullar Caltrans Pavement Program at jesse.bhullar@dot.ca.gov.





WRAPP Workshop Overview

Over 250 people signed in for the annual "Pavement Preservation Workshop" put on by Western Region Association for Pavement Preservation (WRAPP) at the Double Tree Hotel in Ontario, CA, February 1-2. WRAPP President **Jason Lampley (Intermountain)** welcomed the attendees, who included people from Caltrans, counties, cities, contractors and vendors. The event also included numerous vendor and equipment displays. The Workshop Presentations are posted on the WRAPP website at: www.wrapp.org



Figure 1. Jim Ryan of Alon Asphalt (left) and Roger

The Workshop was kicked off by Keynote Speaker **Tony Tavares, Caltrans' Chief of Maintenance**, who focused on funding and pavement conditions. California roads are currently rated 59% Good, 25% Fair and 16% Poor. On a 10-year view, Caltrans currently has a \$59 billion total shortfall, while the cities and counties are under-funded by \$70 billion. There are three funding bills currently being considered by state legislators. Caltrans finds that pavement preservation is more cost effective than reconstruction - by a factor of 8 to 1! They will continue to rely heavily on rubberized HMA overlays and chip seals to comply with their goals for using waste tires.

Charles Herbertson (City of Culver City), spoke for the California State Association of

By Roger Smith, CP² Center

Counties (CSAC). Cities and counties manage 81% of the roads in the State. According to the "Needs Assessment" report of October 2016, California roads have an average PCI of 65. To hold the 65 rating they will need \$3.5B per year, and to improve they need twice that annually. State money is distributed to counties based on population.

Scott Metcalf (Ergon) presented an update on the use of ground tire rubber (GTR) in slurry seals and microsurfacing. Various approaches have been tried including dry-add, emulsifying terminal blend rubberized asphalt, and adding GTR to aggregate feeds or to a central mixing plant. Finer rubber size (30 -80 mesh) is used. Polymer additives are also used. Rubber-tired rolling is recommended. A newer lab test is showing promise for evaluating these rubberized slurry mixes.

Chip Seal Best Practices were presented by **Doug Olson (Western Emulsions)** and **Mark Bertsch (APS)**. They provided many good tips focusing on polymer-modified emulsion and hot rubber chip seals, as well as pointers for quality control tests for chip seal binders, aggregate and spray bars. Rolling and sweeping best practices were also discussed, as well as the added value of a "flush coat" fog seal.

Howard Dashiell (Mendocino County) spoke to their success with a multilayer system involving 3 layers: microsurfacing, followed by a hot rubber chip seal, and then a slurry seal final surfacing. Mendocino County has some of the worst pavement in the state with an average PCI of 35 for their road system. Their cost for the 3-layer system is about \$1 per square foot with an expected life span of 15 years.

Roger Smith (CP² Center) spoke on preparation measures for pavement surface treatments. He focused primarily on crack sealing and patching, and suggested that these are tasks that might be done efficiently 'in house', with agency personnel. He also stressed the importance of advance communication with residents of neighborhoods where street surfacing is to be done.

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Los Angeles County's Erik Updike shared lots of good tips on the County's perspective on designing and "packaging" pavement preservation projects and contracts. For example, they try to use "seal coat only" contracts. They typically require micro-milling in advance of chip and slurry seals and they require the use of RAP aggregate in these surface treatments. Los Angeles County was also presented an Award of Appreciation from the CP² Center.

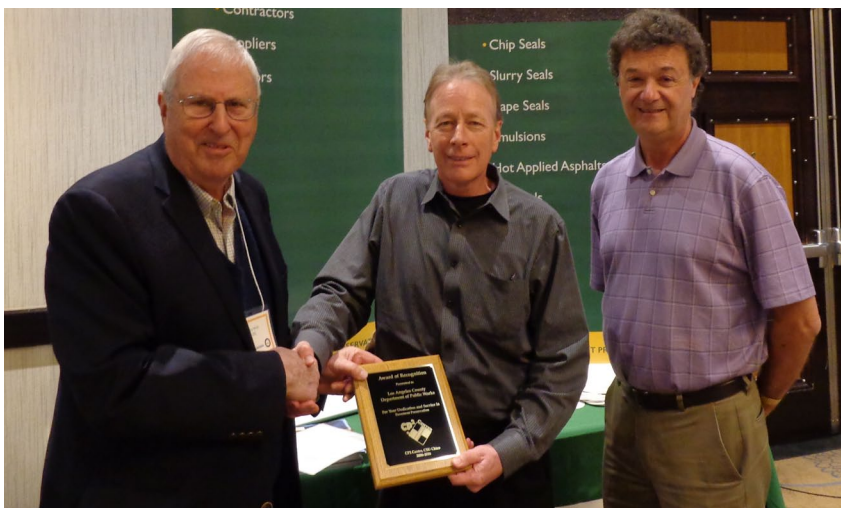


Figure 2. Gary Hicks (left) Presents a CP² Center 'Award of Appreciation' to Greg Kelley and Erik Updike of Los Angeles County

Navigating the new format of the Caltrans 2015 Standard Specifications can be a challenge. Section 37, which covers various pavement seals, is no exception. **Sri Balasubramanian (Caltrans)** and **Scott Dmytrow (Telfer)** provided insight to help. Caltrans and WRAPP have also partnered in training classes on Section 37. More of these classes are planned and will be posted on the WRAPP website.

Los Angeles County's An Dang and Jim Emerson (PRS) shared the County's successes with cold in-place recycling (CIR) capped with an asphalt-rubber HMA (ARHM) overlay. On two of their heavily traveled roadways they did a 3-inch CIR followed by a 1.5-inch rubberized ARHM overlay, with significant cost savings. They've used over 700,000 scrap tires since 2009. The County has also recycled a total of 640K tons of RAP in 8 years - into their bases, chip seals and slurry seals.

Brandon Milar (CalAPA) discussed the various thin lift overlay options. These are usually special treatments like open graded friction courses or thin bonded overlay systems, often placed for benefits such as smoothness, leveling, wet weather safety or noise reduction.

For conventional HMA, lift thickness should be at least 3 times the size of the large aggregate in the mix. HMA lifts as thin as 1.5 inches can be used if a smaller size aggregate mix is used. Using warm mix asphalt (WMA) can help with placing thin lifts in cooler weather or after long hauls.

Tips for a successful microsurfacing program were presented by **Frank Lujan (City of Santa Clarita)**. Santa Clarita uses the MTC's "Street Saver" pavement management program, and has managed to increase their overall PCI ratings through the use of microsurfacing and slurry seals, and some double chip seals. They've also been able to increase their street funding three-fold with the help of their PMS. He stressed the importance of public relations and good neighborhood outreach before street projects begin.

Jim Moulthrop (Foundation for Pavement Preservation, FP²) presented the national perspective on highway funding and funding for maintenance in particular. He reported that the recent National Pavement Preservation Conference in Nashville drew over 700 people. WRAPP presented FP² with a donation to help with their efforts in Washington.



Figure 3. WRAPP President, Jason Lampley of ISS (left) Presents a Check to FP² Director, Jim Moulthrop

Larry Galehouse (National Center for Pavement Preservation) spoke on the importance of workmanship and the recently introduced certification program for personnel (from agencies and industry), and for contractors constructing slurry seals, chip seals, fog seals, and crack seals. The training and testing covers six key areas: project strategy selection, materials, design, equipment, construction, and quality assurance.

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This is a newer program with only a limited number of State DOT's on board, including Nevada. The next training and testing opportunity will be in Reno. For more information go to : www.pavementpreservation.org

Nate Gauff of CalRecycle spoke of all of California's work in reusing scrap tires. The numbers are daunting. California alone generates 44.3 million tires per year. California's tire diversion program is by far the largest, and 4 million tires per year go into asphalt pavements. CalRecycle also supports research in rubber pavement technologies. For agencies wishing to use tire rubber in pavement applications, free technical support is available via CalRecycle. They also run a grant program whereby agencies can get up to \$250,000 per project. Agencies can apply up to 6 times and may receive multiple grants. A new round of grants starts in August 2017. For more information go to: www.CalRecycle.ca.gov

The 2017 project **Quality Awards** were given to:

- American Pavement Systems / Caltrans: grind + asphalt rubber chip seal (Imperial County)
- Intermountain Slurry Seal / FHWA Federal Lands: high temp desert chip seal (Mohave National Preserve)
- Telfer / City of Berkeley: cape seal / asphalt rubber chip seal (28 streets)

- VSS International / Rancho Palos Verdes: microsurfacing and asphalt rubber chip seals (various streets)

The Workshop ended with WRAPP President Jason Lampley passing the gavel to incoming President for 2017, **Sallie Houston (VSS International)**. The 2018 WRAPP Pavement Preservation Workshop will be in Concord, CA, February 5-7. See you there!

For more information on pavement preservation and the Workshop presentations, go to: www.wrapp.org.



Figure 4. WRAPP President, Jason Lampley of ISS (left) and Incoming President Sallie Houston

(Thanks to **Ray Meyers, Asphalt Interlayer Association**, for contributing to this article) 

WRAPP Update: Training & Certification Opportunity

By Jason Lampley (Intermountain), WRAPP Past President

The Western Region Association For Pavement Preservation (WRAPP) has partnered with The University of Nevada Reno (UNR), The Nevada Department of Transportation (NDOT), and The National Center for Pavement Preservation (NCP) to bring the new national training and certification program to Reno, NV. The program is aimed at both agency and contractor personnel involved in pavement preservation projects.

The pavement preservation training will be held at UNR on Tuesday, March 28th. This training is provided free of charge to agency attendees on a first come, first served basis. The room has a capacity of 70 people so please RSVP here jimmyk@bergkampinc.com. Speakers will share their experiences both locally and nationally on pavement preservation. Topics include innovative concepts, evolving specifications, and construction techniques.

This training will enhance your preservation toolbox, discuss proper specifications, and aid in ensuring quality projects.

On a national level, certification of contractor and agency personnel are gaining momentum at both the DOT and local level. In 2016, the Nevada Department of Transportation (NDOT) began the process of requiring contractors to be AASHTO TSP2 certified in order to perform work on NDOT chip seals and microsurfacing projects. This requirement is now being specified on projects for agency, contractor, and consultant personnel facilitating the projects. The certification requirement for both the agency and contractor is a step towards producing consistently high quality preservation treatments. It is the goal of WRAPP to provide this invaluable training to prepare both agency and contractor employees for the certification exam.

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So in addition to the training class, WRAPP will have NCPP representatives on site to administer the AASHTO TSP2 certification exam. The certification exam will be held Wednesday, March 29th. Individuals taking the certification exam should complete the web-based training prior to taking the exam on March 29th. To take the web-based training, please follow the registration instructions at: <http://slurry.org/wbt/issa-wbt-login-instructions/>.

Please note that the AASHTO TSP2 certification exam requires a separate registration from the WRAPP training and the web-based training.

To register for the exam online, please visit: <https://www.pavementpreservation.org/certification/upcoming-exams/> no later than Wednesday, March 22nd. The cost of each exam is \$200 for agency employees and \$325 for contractor and consultant employees. Seating for the exam is limited, so register for the exam as soon as possible. If exam seats are still available, on-site registration and payment will be available the day of the exam, beginning at 7:00 AM.

For more information go to: www.wrapp.org



HMA Specification for Local Agencies - Update

By Roger Smith, CP² Center

Prior to Caltrans' implementation of Superpave via Section 39 of their 2015 Standard Specifications, the old 2010 Section 39 included an option of 'Type B' hot mix asphalt (HMA). This Type B HMA specification imposed a less stringent criteria for Hveem stability, percent crushed aggregate faces and Los Angeles rattler. The Type B mix was intended primarily for use on lighter traffic roads, or by local agencies (cities and counties), when utilizing the Caltrans specifications. In their 2015 Standard Specifications, Caltrans has eliminated the Type B mix.

With the advent of SuperPave mix design and equipment, and the demise of Hveem method and equipment, Type A HMA via the SuperPave mix design method, is now the only option. But this mix is often 'overkill' for local agency needs, and the specification includes a host of QC and QA testing requirements that local agencies often cannot accommodate.

So, local agencies that have routinely referred to Caltrans specifications, and have used the Type B HMA specification for their lighter traf-

fic applications, are left without a 'go-to' HMA specification.

Accordingly, a task group was formed to create a special HMA specification that integrates the Superpave mix design concepts in a new, simpler HMA specification that addresses the needs of local agencies. It somewhat relaxes material quality requirements and the requirements for materials testing by both the contractor and the agency. Some construction requirements (e.g., smoothness) are also relaxed. The end product of the subtask group effort will be a new Caltrans Standard Special Provision (SSP) for HMA for low volume roads - currently termed 'HMA-LV' - designed especially for local agency use.

This new HMA-LV specification will only be for use on local routes (not Caltrans pavements) where design Traffic Index (TI) is less than 8.0. Currently a 2-Level approach is being advanced. Level 1 would be for TI of 6.0 to 8.0, and Level 2 would be for TI of 5.5 or lower. Superpave mix designs involving a laboratory gyratory compactor and Hamburg Wheel Track tests are still a requirement.

Of course agencies may opt to use the Type A specification in the 2015 Caltrans Section 39 for their more heavily trafficked roadways, but may elect to waive some elements of that 'high-end' specification. Until a new specification is available, some agencies are also opting to still use the old (2010) Caltrans 'Section 39'.

It's important that local agencies have input to the development of this new HMA-LV specification. So anyone interested in participating should contact the task group Chair, Tim Denlay, of Knife River Construction at: tim.denlay@kniferiver.com



Gyratory Compactor for HMA Mix Design



VSS Holds Workshop At Chico State

By Ding Cheng, CP² Center

VSS International, Inc. and VSS Emultech held a pavement preservation workshop at California State University, Chico, on January 20, 2017. There were about 40 participants from various local agencies in northern California, the California Pavement Preservation Center, as well as some guests.

Gary Houston started the workshop with an introduction of fundamental knowledge about road history, pavement, hot mix asphalt and emulsions (Figure 1). He then covered topics such as fog and rejuvenating seals, slurry seals, micro-surfacing, chip seals and cape seals.



Figure 1. Gary Houston of VSS gives presentation.

After lunch, Sallie Houston demonstrated mix designs for slurry seal and micro-surfacing (Figure 2).



Figure 2. Sallie Houston of VSS demonstrates mix design for slurry and micro-surfacing.

Gary Houston concluded by discussing recent development in chip seals and multi-layer treatments. It was exciting to see that some of the emerging technologies were performing well in multiple year field applications.

With the current funding constraints - especially for the local agencies - the workshop provided timely information on several suitable pavement preservation technologies. Instead of major rehabilitation or reconstruction, alternatives such as fiberized slurry/micro-surfacing, rubberized slurry seal, asphalt rubber chip seals, and multi-layer surface sealing systems should be considered.

This special event was coordinated by Kristianne Condell of VSS. More information can be found at: www.slurry.com



'Greenbook' Undergoing Major Update

By Brandon Milar, CalAPA

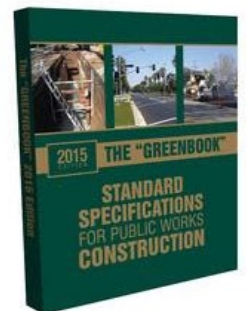
The Greenbook Asphalt Task Force has embarked on a major update to the asphalt sections of the "Greenbook" Specification. The Task Force encourages participation from contractors and agencies throughout California. Local agencies in southern California primarily use the Greenbook specifications for public works construction, while agencies in northern California primarily use Caltrans standards.

Representatives from throughout the state are meeting to develop a new asphalt mix design methodology that uses the gyratory compactor in lieu of the Hveem compactor. The group has reviewed several data sets from agencies and contractors throughout California that included existing Greenbook Hveem mixes compacted with the gyratory compactor. The group will

begin additional mix evaluations to determine the design gyration parameters.

At the recent Task Force meeting in Santa Ana, the group embarked on an update of Section 302-5, "Asphalt Concrete Paving." The group will review and update portions related to Prime Coat, Tack Coat, paving equipment, paving process, lift thicknesses and temperatures. The group requests that agency and paving contractors throughout the State consider sharing their experience and expertise with the group.

For information contact CalAPA's, Brandon Milar, at [\(916\) 995-0086](tel:9169950086).





NRRA Concrete Pavement Research Planned

By Ben Worel (MnDOT) and Larry Scofield (IGGA)

The National Road Research Alliance (NRRA) has only been in existence since July 1, 2016, and thanks to the many motivated participants, a lot has been accomplished in the first six months. The Technical Teams have been working on the experimental designs for the \$2.5 million Phase 3 MnROAD reconstruction, which will occur this summer in Albertville, Minnesota.



Currently NRRA is a six-state, pooled fund effort comprised of: Minnesota (the lead state), California, Illinois, Michigan, Missouri, Wisconsin, Minnesota Local Road Research Board, and twenty-four industry associate members, and is expected to grow in the future.

Figure 1. NRRA Organizational Structure

Caltrans NRRA members include: Ken Darby and Joe Holland on the Executive Committee, Mehdi Parvini on the Rigid Group, and Doug Mason and Linus Motumah on the Preventive Maintenance Group.

Figure 1 indicates the NRRA organizational structure. The Executive Committee, comprised only of pooled fund members, approves the work plans and study efforts.

The five technical committees, comprised of both associates and state representatives, help

select topics and develop plans for both the construction and research efforts. Each team has been active since the beginning of summer 2016 to develop and prioritize ideas that fall into each of these categories to meet local, state, regional and national research needs. They currently have developed final designs and special provisions recommendations to MnDOT so a construction contract for the test sections (cells) can be let in March 2017. These test cells, built at the MnROAD facility, will be used to support the 12 long-term research needs developed by NRRA members using the available \$1.35 million funding.

Figure 2 indicates the projects developed for concrete pavements under the NRRA umbrella. Note that the projects to be constructed are from both the Preventive Maintenance and Rigid Technical Groups. These test sections include fiber-reinforced concrete, diamond grinding when questionable aggregates have been used, effects of early opening strength on pavement performance, optimized PCC cement content, compacted concrete pavements, and partial depth repairs. These sections are currently planned for summer 2017 construction.

In addition to identifying long-term research studies, the technical teams have identified technology transfer goals expected to be accomplished in the short term. These short term needs focus on topics that have had enough research done, but need to be summarized and

NRRA Rigid Team Studies*	MnDOT Funds	NRRA Funding (Next two years)			Total Investment
	Construction Estimate	Sensor Costs	Construction & Performance Monitoring	Long Term Research Contracts Estimate**	
PCC Partial Depth Repair	\$ 25,000	\$ -	\$ 13,139	\$ 113,333	\$ 151,472
Fiber-reinforced Concrete Pavement	\$ 275,000	\$ 58,513	\$ 15,395	\$ 113,333	\$ 462,241
Fiber Reinforced Concrete for City Streets	\$ 100,000	\$ 19,798	\$ 8,596	\$ 113,333	\$ 241,728
PCC Diamond Grinding	\$ 30,000	\$ -	\$ 13,239	\$ 113,333	\$ 156,572
Evaluation of Long-Term Impacts of Early Opening of Concrete Pavements	\$ 200,000	\$ 12,054	\$ 10,596	\$ 113,333	\$ 335,984
Reduced Cementitious Material in Optimized Concrete Mixtures	\$ 200,000	\$ 25,173	\$ 10,596	\$ 113,333	\$ 349,103
LRRB Idea - Compacted Concrete Pavement	\$ 100,000	\$ 19,318	\$ 8,596	\$ 113,333	\$ 241,248
* See NRRA website for more details on other team activities other than PCC					
** Long Term Research is being developed - equal distribution is shown but will change depending on study needs					

Figure 2. NRRA Concrete Pavement Study Plan for 2017

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discussed as to how they might be implemented in a consistent manner. The NRRRA 'Rigid' technical team will focus on their top two needs: 1.) design and performance of concrete unbound overlays and 2.) repair of joint-associated distresses. NRRRA will make a financial commitment of \$850,000 to fund technology transfer efforts to benefit NRRRA members.

NRRRA will be hosting a workshop with demon-

strations at MnROAD, and a one-day formal pavement conference in St Paul, Minnesota, May 23-24, 2017, to highlight the successes so far. Both days are open to the public.

For more information on this project or to join NRRRA please contact Ben Worel (ben.worel@state.mn.us) or any of the California representatives. Details on NRRRA can be found at: <http://dot.state.mn.us/mnroad/nrra/index.html>



JTCP Ramps Up

By Roger Smith, CP² Center

Caltrans is moving forward with a Joint Training and Certification Program (JTCP) for material testers working on Caltrans projects. Al Ochoa, Materials Engineer for Caltrans District 11 in San Diego, has led this huge effort.

This "joint" program will offer standardized training and certification jointly for both Caltrans and Industry technicians involved in the field sampling and testing of soils and aggregates, hot mix asphalt (HMA) and Portland cement concrete (PCC) with the objectives of:

- providing highly skilled, knowledgeable materials sampling and testing technicians
- promoting uniformity and consistency in testing
- providing quality improvement
- creating a harmonious working atmosphere between public and private employees based upon trust, open communication, and equality of certification



For Phase 1 of the program, an interagency agreement was set up with California State University, Long Beach (CSULB), to develop the training curriculum for the HMA I, HMA II, soils and aggregate modules. For concrete, the existing program of the American Concrete Institute (ACI) will be used. Work on Phase I is under the leadership of Associate Professor Shadi Saadeh, Ph.D.

At a Workshop on January 25-27 at CSU, Sacramento, the training handbooks for the HMA modules - for both students and instructors - were presented and reviewed. These materials were developed by subcontractors, Dr. Peter Sebaaly and Dr. Adam Hand of the University of Nevada, Reno.

After the training curriculum is fully developed, Phase 2 will handle the implementation and execution of the program, involving training classes, written exams and hands-on proficiency testing of all technicians.

It's expected that about 1000 certifications will be issued per year through the program. Certifications will be good for 3 years. Two training and testing sites will be established - one in Southern California (CSU, Long Beach) and one in Northern California (CSU, San Jose). The training and testing will likely require about a 4-day time commitment of a technician.



The JTCP program will require field testers to participate in training classes, take a written test and perform the 'hands on' lab tests in the presence of Caltrans Independent Assurance representative. The new program will also

be open to technicians from local agency labs.



FHWA Update

By Steve Healow, FHWA - Sacramento

Every four years the American Society of Civil Engineers (ASCE) issues a report card for the nation's infrastructure. The 2017 report card will be posted March 9th at the ASCE web page: <http://www.asce.org/infrastructure/>. This summary report discusses the physical condition and performance of our infrastructure and investments needed for improvement. The previous report card was issued in 2013 and included grades on sixteen different sectors of our infrastructure, e.g. roads, bridges, rail, ports, water supply, etc. See the 2013 report card here <http://www.infrastructurereportcard.org/>.



Have you noticed an up-tick in traffic volume? 2016 traffic data shows continued steady growth in vehicle-miles traveled (VMT) over the past five years, especially in thirteen western states. Nationally we are now at an unprecedented 3.2 trillion miles. California's VMT is consistent with the national trend and in 2016 reached an all-time high of 195.2 billion miles.

If you're new to the asphalt pavement community, you are encouraged to visit the National Asphalt Pavement Association (NAPA) website; specifically note the series of 'Back To Basics' webinars. There are 13 webinars planned throughout the year on a variety of asphalt topics. The webinars are typically 1.5 hours each. Registration is free for employees of government transportation agencies. For the list of topics, schedule, and a brief synopsis of each webinar visit the NAPA website at: http://www.asphalt-pavement.org/index.php?option=com_content&view=article&id=1113&Itemid=1385.



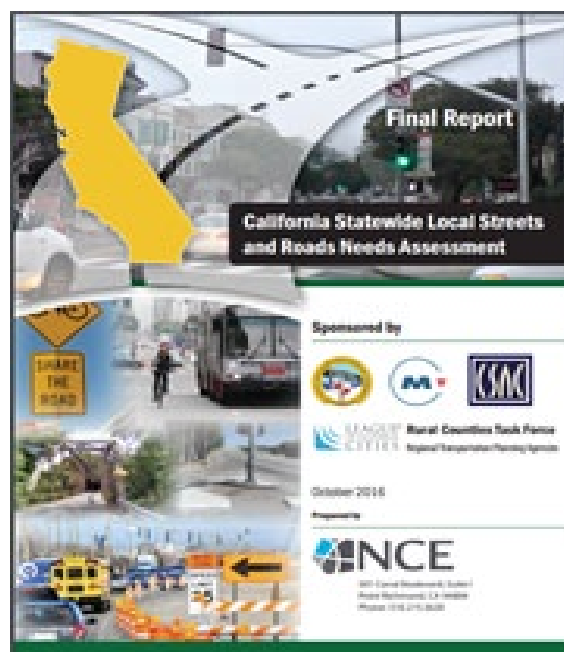
If there is concrete pavement in your inventory, you may be interested in the upcoming calendar of events at the Concrete Pavement TechnologyCenter. See the calendar at: <http://www.cptechcenter.org/events/upcoming-events/>.

Also see a summary of concrete pavement rehabilitation and preservation treatments in this TechBrief at: <https://www.fhwa.dot.gov/pavement/pccp/pubs/06005/06005.pdf>.

Remember Transportation Curriculum Coordination Council (TCCC)? It's a technical service program under the auspices of AASHTO devoted to training the transportation work force. For the month of March, TCCC is offering two online courses free of charge: "Maintaining Pavement Drainage" and "Earthwork: Excavation". See <https://tc3.transportation.org/> for more information.



The biennial update to the "Statewide Local Streets and Roads Needs Assessment" report has been completed and posted as of October 2016. You can download the current document from the 'Save California Streets' website: <http://www.savecaliforniastreet.org/read-the-report/>. The document includes a summary of inventory and conditions, needs assessment and funding analysis for local roads and bridges. If you work for a Metropolitan Planning Organization (MPO) or a county or city with roads on the National Highway System (NHS), your attention is called to Section 2.6, "NHS Proposed Requirements", on page 30.





Patrons Program Update

By R. Gary Hicks, CP² Center and Scott Metcalf, Ergon Asphalt and Emulsions

The CP² Center's Patrons Program gives our partners from industry and other pavement oriented groups a way to provide more general sustaining support for the Center, and to help direct and even participate in the Center's activities.

The Center was established in 2006 at CSU, Chico, to provide assistance with the development and use of appropriate pavement preservation strategies, and it celebrated its 10th anniversary in August, 2016. The Center was originally funded by Caltrans and continues to work closely with them, as well as other agencies. We maintain a very experienced staff of pavement experts and a state-of-the-art laboratory facility which continues to improve each year.

But the Center is funded only by its contracts with agencies such as Caltrans, CalRecycle, Metropolitan Transportation Commission (MTC) as well as industry clients. In all cases, work under those contracts is narrowly defined, so that funding may only be used for specific contract tasks. The Center, therefore, has no contingency funding to sustain "overhead" activities, such as maintaining lab equipment, preparing contract proposals, participation in events to promote pavement preservation, organizing

meetings and conferences, and delivering training classes. This funding must come from non-contract sources such as our Patrons Program. Donation of used lab equipment is another way Patrons have supported the Center.

Co-Chairs for the Patrons group are currently Dr. Gary Hicks, CP²C, and Scott Metcalf, Ergon Asphalt and Emulsions. The next Patrons meeting is being planned for May, 2017, at a location to be determined. The newest member of the patrons group is N.R. 'Skip' Brown, Asphalt Consulting Services, LLC. We're looking to other Patrons to provide help as well.

For more information on joining our Patrons Program, please contact Co-Chairs, Dr. Gary Hicks at rg Hicks@csuchico.edu and/or Scott Metcalf scott.metcalf@ergon.com. More information can also be found on the Center's website at www.cp2info.org/Center.



Skip Brown of Asphalt Consulting Services, LLC



Mark Your Calendar (Coming Events)

By Roger Smith, CP² Center

WRAPP Classes on Section 37 Specification April 11 (San Diego) and May 4 (Fresno)

The Western Region Association For Pavement Preservation (WRAPP) will partner with Caltrans to offer classes on Section 37 of the 2015 Caltrans Standard Specifications. Section 37 deals with surface treatments, including fog seals, chip seals, slurry seals, microsurfacing and parking area seals.

For more information go to: <https://wrapp.org/>



CalAPA Spring Asphalt Conference & Equipment Show.... April 12-13 (Ontario)



Hear from top policy-makers and respected experts from across the country on topics that will directly impact your business or your agency now and in the future.

Topics will include: best practices in Hot Mix Asphalt design; specifications; testing; paving; future trends; research projects. Updates on legislation and funding for road construction and maintenance will also be included. In conjunction with the Conference, the popular class, "Asphalt Pavement 101", will also be offered.

For more information go to:

www.calapa.net

Continued, next page

"In-Place Asphalt Recycling and Stabilization Strategies" Class... June 8 (Emeryville)



This class, presented by the Tech Transfer Center at U.C. Berkeley, will explore the most common pavement recycling methods, and selecting the most appropriate method and stabilization strategy based on a project's and site's specific characteristics. The soil stabilization portion of the course will expand on the Caltrans Highway Design Manual Chapter 614 by providing guidelines on the selection of an appropriate stabilization method, design of stabilized subgrade, and construction considerations. This is an important course for local pavement managers who are looking for a more cost-effective alternative to traditional pavement rehabilitation or reconstruction. For more information go to: <https://registration.techtransfer.berkeley.edu/wconnect/CourseStatus.awp?&course=174IDM260608>

***AAPT Annual Meeting
March 19-22 (Newport Beach)***

The annual business meeting and technical sessions of the Association of Asphalt Paving Technologists (AAPT) will be March 19-22 in Newport Beach. The annual meeting, being held at the Island Hotel, includes asphalt-relat-

ed technical sessions comprised of peer-reviewed papers, and invited pre-

sentations on specific topics. Details and registration information can be found at: <http://asphalttechnology.org/annual-meeting.html>



***Asphalt Institute Class
March 30 (Phoenix)***

The Asphalt Institute will present its one-day MS-22 seminar "Principles of Constructing Quality Asphalt Pavements". The workshop has been designed for engineers, inspectors, technicians, and contractor personnel responsible for quality control of paving materials, mix designs, and the inspection and operations of asphalt plants, and paving operations. The workshop is geared for the technician level and as a basic refresher course for the practicing engineer. For more detailed information and registration, go to: www.asphaltinstitute.org

***CalAPA "Asphalt Pavement 101" Classes
April 11 (San Diego) and April 12 (Ontario)***

Two sessions of CalAPA's popular "Asphalt Pavement 101" class will be offered in southern California in April. This 4-hour class provides an overview of asphalt pavement design, materials, equipment, construction, and inspection basics. It's great introductory training for new hires and provides a solid refresher and update for more experienced personnel. For more information go to: www.calapa.net

***Nevada Transportation Conference
May 2-3 (Reno)***

The annual Nevada Transportation Conference is a 1-stop event to hear about the latest transportation topics affecting our neighbor state. In addition to topics such as funding, planning, materials, and safety, you hear about the latest big transportation projects happening across Nevada, including the SE Connector around Reno and the Boulder City Bypass. For more information go to: www.nevadatransportation-conference.com



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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