# CP2 Center News

Newsletter of the California Pavement Preservation Center

No. 39 September 2016

## CP2 Center Celebrates 10-year Anniversary

By Ding Cheng and Gary Hicks, CP2 Center

The California Pavement Preservation Center (CP2 Center) held its 10th anniversary event on the campus of the CSU, Chico on August 16, 2016. During the event, participants reviewed the history and achievements of the Center and laid out the vision and plans for the next 5 to 10 years. The University President and Provost gave warm welcome speeches, and a group photo was taken at the front lawn of CSU Chico's historical administrative building, Kendall Hall (Figure 1).


Figure 1. Group Celebration of 10th Anniversary of CP2 Center at CSU, Chico

The following are some highlights of the various speakers' messages:

- **Dr. Ricardo Jacquez**, Dean of the College of Engineering, described some of the exciting things going on in the college and indicated that CSU Chico was ranked No. 3 Best Value Engineering School of the Country in 2016. The link and the basis of this ranking can be found at *http://www.bestvalueschools.com/rankings/engineering-schools-2016/*. CSU Chico was also ranked No. 8 in the "50 Colleges That Add the Most Value in the United States", according to Money magazine. The link for this rating is *http://new.time.com/money/best-colleges/rankings/colleges-that-add-the-most-value/*. Finally, the Dean discussed the importance and growth of the Center, and stressed that by looking back in the "rear view mirror" we can plan our future. He also recognized the Center's industry Patrons that have contributed to the Center's success.
- **Tom Pyle**, acting State Pavement Engineer for Caltrans, discussed some of the changes going on at Caltrans, including the use of their "PaveM" program for pavement management decisions, and the backlog of projects the state faces because of budget issues. He emphasized that if Caltrans can make pavements last even 1-3 years longer, this will help. Presently, the state has about $1 billion per year for pavements, whereas the needs are between $4-6 billion per year. He also indicated that the Center's newsletter and technical support help Caltrans promote pavement preservation within the state. The importance of the Center to Caltrans is evidenced by the fact they've provided support to the Center for 10 years.

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- Industry co-chair of the CP$^2$ Center Patrons group, **Scott Metcalf**, Vice President of Ergon Asphalt and Emulsion, discussed the role of industry as a partner with Caltrans and the Center. He said industry needs to play a role since it needs good quality students to continue to grow. Both the asphalt and concrete industries need to work together to help promote the needs for better roads. He committed additional Ergon funding to the Center and challenged other patron companies to follow this lead. He sees the need to attract younger people to the pavement world by creating scholarships and possibly having students develop computer applications and games that promote pavement preservation.
- **Dr. Ding Cheng**, Director of the CP$^2$ Center, read a congratulation letter from the National Center for Pavement Preservation, and presented the history and major accomplishments of the Center during the past 10 years. The Center has been funded about $8 million by various clients including Caltrans, CalRecycle, MTC, other agencies, and industry. He appreciated the support from agencies, industry patrons, and the University, which have made the success of the Center possible. He presented the Center's new vision and mission for the next 5 to 10 years, and also introduced the new strategic plan for the Center. One important goal of the Center is to educate more civil engineering students, providing them with engineering and research experience in the areas of pavements and pavement preservation.
- **Sri Balasubramanian**, Chief of Office of Asphalt Pavement for Caltrans, mentioned that while many roads in the state are not in good condition, the state is building new projects that will need to be preserved in a few years. So, we need to be prepared. Also, pavement maintenance and preservation projects are just not sexy enough, so you would not see state legislators or other elected officials cutting ribbons on these projects, they would prefer opening new roads. This is also a problem at the local agency level. He also mentioned the Center's role as related to Caltrans should be in the following primary areas:
  1. Education of students, agencies, the public, and state and local legislators
  2. "Pavement Guide" development
  3. Monitoring innovation pilot projects (for both state and local agencies)
  4. Forensics - understanding why some pavements fail
- **Mike Crump**, Director of Public Works for Butte County, discussed how the Center has helped his agency with several projects, including surface treatments and in-place recycling. He mentioned that it is important for the Center to continue to support local agencies. If more funding does become available, agencies will need the Center's guidance on how best to spend it.
- **Jason Lampley**, the current president of the Western Regional Association for Pavement Preservation (WRAPP) and Charles Stuart, the president of the Southwest Concrete Pavement Association (SWCPA) discussed the role of the preservation industry for both asphalt and concrete treatments. They mentioned that the Center has helped both industries grow, and through the newsletter, promote innovative and new ideas. They also stressed the importance of the following:
  1. Training and workshops
  2. Annual conferences
  3. Newsletter
  4. Innovation projects
  5. National involvement and recognition
- During the group's luncheon, **Dr. Gayle Hutchinson**, who became the 15th president of the CSU, Chico in July of 2016, and the first female president in the University's 129-year history (Figure 2), welcomed the group to campus and stressed the importance of partnerships with industry and other groups. These partnerships helped students and improved the quality of their education. She thanked all for their help in supporting the CP$^2$ Center at the university.

Figure 2. President Gayle Hutchinson and VP Ahmad Boura of CSU, Chico

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- Interim Provost Dr. Mike Ward of CSU, Chico recognized Gary Hicks and Shakir Shatnawi for starting the Center in 2006, and Ding Cheng for leading the Center during the past 6 years (Figure 3). The Center actually hires students who get experience to make them valuable to industry, agencies, and to consulting firms. Many of them also go on to graduate school and academic positions.

Figure 3. Interim Provost Dr. Mike Ward of CSU, Chico

- **Jim Moulthrop,** Executive Director of national Foundation for Pavement Preservation Inc. ($FP^2$), gave a brief update on the mission of the Foundation (Figure 4). He also discussed how the $CP^2$ Center fits into the national picture. The Foundation is mainly a lobbying group, the National Center works with AASHTO and provides educational opportunities, while the $CP^2$ Center has focused on research and some training and communication activities.

Figure 4. Jim Moulthrop, Executive Director of $FP^2$, Inc.

**Awards:** To recognize the achievements by various organizations in the field of pavement preservation, $CP^2$ Center presented awards to the following groups:

- State agencies – Caltrans (Figure 5) and CalRecycle (Figure 6)
- Local agencies – MTC (Figure 7), and LA County
- Industry – WRAPP (Figure 8)

Figure 5. Ding Cheng, Tom Pyle (Caltrans), and Dean Ricardo Jaquez (Left to Right)

Figure 6. Ding Cheng, Nate Gauff (CalRecycle), and Dean Ricardo Jaquez (Left to Right)

Figure 7. Ding Cheng, Teresa Romell (MTC), and Dean Ricardo Jaquez (Left to Right)

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Figure 8. Ding Cheng, with WRAPP Members; Scott Metcalf, Jason Lampley, Sallie Houston, Hans Ho, and Dean Ricardo Jaquez (Left to Right)

**Dr. Gary Hicks** facilitated breakout brainstorming sessions on how to move the Center forward into the coming years (Figure 9). The participants were divided into three groups. The topics and the group leaders are given in the following bullets:

- Statewide preservation needs and funding – Roger Smith and Tom Pyle
- Vision and plan for the Center – Ding Cheng and Sri Balasubramanian
- CP$^2$ products and services – Lerose Lane, Scott Metcalf, and Larry Scofield

Figure 9. Gary Hicks of the CP$^2$ Center Led the Brainstorming Session.

A group of industry and agency representatives participated in a tour of the CP$^2$ Center's materials laboratory. The laboratory, certified by Caltrans, has both asphalt and concrete testing abilities. The asphalt lab has the state-of-the-art Superpave binder and mix testing equipment. The concrete lab was remodeled recently and meets the ASTM standards. Figure 10 shows guests visiting the concrete lab.

In summary, to help the CP$^2$ Center celebrate its 10-year anniversary on the CSU, Chico campus, more than 50 people from various agencies, companies, associations, and the CSU Chico participated in this special event. The event celebrated the past successes and partnership among public agencies, industry, and the university. The event also presented the new Vision, Mission, and future plans for the Center. The anniversary celebration and meetings will continue for the rest of the year. For more information, please contact Dr. Ding Cheng at *dxcheng@csuchico.edu*.

Figure 10. Ding Cheng, Sri Balasubramanian (Caltrans)and Charles Stewart (SWCPA)

## HMA For Low Traffic Pavements (Excerpted: CalAPA *Asphalt Insider* Newsletter)

ASPHALT PAVEMENT NEWS

Prior to the implementation of "Superpave" into Caltrans specifications and its new test methods and tolerances, Hot Mix Asphalt (HMA) Type B mixes specified a lower requirement for Hveem stability, percent crushed aggregate faces and Los Angeles rattler measures of abrasion characteristics of coarse aggregate. The conventional wisdom was that Type B was perfectly adequate for rural routes and other roads that experience low traffic volumes, and it was enormously popular with city and county public works departments.

Type B also accomplished another important sustainability objective -- it allowed for the use of alluvial aggregate deposits without the requirement for additional crushing operations. With California's aggregate sources in limited

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supply, the use of HMA Type B was seen as a way to maximize existing aggregate sources to produce asphalt pavements that are more than adequate to meet the needs of less-traveled roadways in a cost-effective manner.

In recent years as Caltrans has moved to incorporate elements of "Superpave" into its specifications, HMA Type B was eliminated from the standard specification language, to the dismay of many. Since then there has been a steady drumbeat across the state calling for the return of something to replace Type B that has been vetted by Caltrans pavement engineers and industry experts even if the department does not intend to use it on the state highway system.

Hamburg Wheel Track samples, which are now called for in Caltrans "Superpave"-influenced asphalt specifications.

Stepping into this void is a special committee made up of state and local agency representatives and industry experts working on something that has become known as "HMA-LV" for "Hot Mix Asphalt-Low Volume." The committee has taken regular Section 39 Hot Mix Asphalt specification and stripped out unnecessary language, and modified other standards to be inclusive of more aggregate sources in the state.

The intent is to create a modern version of "Type B" for use by local agencies and others who don't want to "over-design" for roads such as a rural route or a residential street. While the new language will not be included in the regular Caltrans standard specifications, it will be nevertheless widely available electronically so that it may be considered by local agencies. Its use will be limited to pavements subject to Traffic Index (TI) less than 8.

Tim Denlay with CalAPA-member firm Knife River is the industry co-chair of the committee developing the HMA-LV specification, and his Caltrans counterpart is Kee Foo. Local agency representatives have also participated in the effort, which began in 2014, stalled for a time, and is now gathering new momentum. The committee meets at CalAPA offices, 1550 Harbor Blvd., West Sacramento, and there is a phone-in and web option. Anyone interested in the topic is invited to participate.

This article is an excerpt from the California Asphalt Pavement Association (CalAPA) *Asphalt Insider* Newsletter. For more information contact: *rsnyder@calapa.net*

## WRAPP Update: WRAPP Partners with Caltrans on Training

### By Jason Lampley, WRAPP President

In February of this year, the California Chip Seal Association formally became the Western Regional Association for Pavement Preservation (WRAPP). Since then, WRAPP has been pursuing a strong educational program focusing on the various pavement preservation strategies – especially those included in Caltrans specifications.

In May 2016, training was done jointly by WRAPP and Caltrans on Section 37 of the 2015 Standard Specifications, which was developed jointly by Caltrans and Industry thru the Pavement Preservation Task Group (PPTG), a subcommittee of the Caltrans Rock Products Committee. "Section 37" deals with Bituminous (Asphalt) Seals for pavement preservation, including fog seals, flush coats, chip seals, slurry seals, microsurfacing and parking area seals.

Sallie Houston (VSS) Helped Instruct "Section 37" Training

Two regional training seminars were held to review and explain the new 2015 "Section 37". The first was May 20th at Caltrans District 2 in

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Redding, followed by a session on May 25th at Caltrans Southern California Regional Lab in Fontana. Over 100 attendees, representing 6 Caltrans Districts and 22 City and County agencies attended the 6 hours of informational classes and testing demos. Instruction was done jointly by Caltrans and Industry PPTG committee members, who shared information on the development process for the "Section 37" specification, field inspection, lab testing protocols and the rollout and implementation of the new "Section 37".

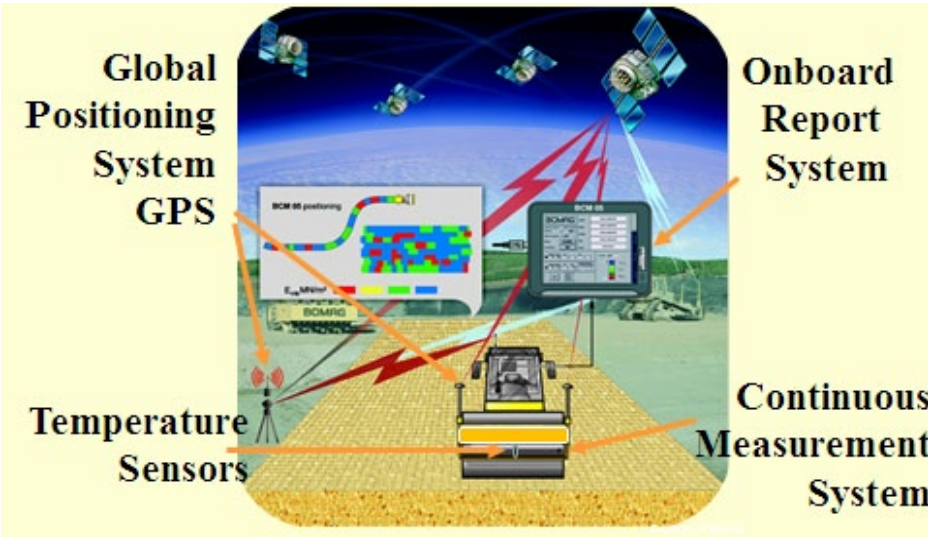
Attendees had very positive comments and recommended additional training sessions be held so that their agency/Industry associates can benefit from this important training opportunity. As a result of this initial success, WRAPP and Caltrans are planning to bring this training to additional venues in other areas of the state. For updates check the WRAPP website at: *https://wrapp.org/.*

Also don't forget to 'save the date' for the 2017 WRAPP Workshop, coming up February 1-2, at the DoubleTree Conference Center in Ontario. It'll be another great event!

## Caltrans Explores Intelligent Compaction

### By Don Mathews, -Pavement Recycling Systems (PRS)

The California State Department of Transportation (Caltrans) is working towards going "all in" on Intelligent Compaction (IC). IC is viewed as a means to improve contractor quality control on the compaction of asphalt pavements, thus leading to longer lasting pavements. In addition, as the process becomes more refined, it is hoped that it will ultimately allow for less state oversight on projects.




*Components of Intelligent Compaction*

IC can be a powerful quality control tool for a contractor who takes advantage of the real time continuous monitoring that it provides. Temperature, stiffness and number of passes along with other roller operating parameters, such as speed, frequency and amplitude, are displayed continuously on a colored display console that the roller operator can view, personalize and scroll through as well as set alerts so as to be notified if any value is outside of defined operating parameters. All roller data can then be downloaded manually via wire or USB transfer, or as is the case for most IC vendor systems, automatically uploaded to a cloud-based server. This provides the added benefit of being able to be accessed and viewed in real time by quality control managers on laptops, digital devices and desktop computers. This also allows the quality control manager to view all roller operations from an office or anywhere the server can be accessed.

Caltrans first introduced IC as a pilot program on all cold in-place recycling (CIR) projects in 2014. On some 2015 projects Caltrans required IC on not only the CIR surface, but also on the later hot mix asphalt (HMA) overlay, and also on some sole HMA projects as well. To date 14 CIR surfaces have had IC and an additional 13 are in various stages of construction. And 15 HMA surfaces have been constructed, with another 21 in various stages of construction. Indications are Caltrans may require IC on all CIR and HMA projects, and in the foreseeable future even require IC on all subgrade, subbase and base construction.

IC measures and records roller operations in real time while mapping all roller parameters via a precise global positioning system (GPS) location. A primary component of an intelligent compaction roller is the accelerometer that measures the "stiffness" response of a vibrating steel roller as it compacts a pavement surface.

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This is referred to as the intelligent compaction measurement value (ICMV). The initial goal was for the feedback of the ICMV to make automatic adjustments to the roller operating parameters so as to optimize compaction - increasing compaction where needed, while preventing over compaction.

Test strips are currently required by Caltrans, which involve extensive data collection and testing. IC test strips 500 feet long are required to be constructed on the first day of the project. Nuclear gauge testing must then be conducted in 3 random spots for each pass of the roller until the final pass where 7 additional testing locations for a total of 10 tests must be conducted. ICMV values are required to be recorded anywhere the vibrating steel roller is used during the compaction process. As many as 50 to 80 nuclear gauge compaction tests may be necessary within an IC test strip.

Caltrans specifications for the pilot projects require contractors' compaction to be within 20% of the ICMV value for HMA operations that are to be compacted to a specified density. Temperatures must be continuously mapped and recorded, and the contractor must also show that a minimum of 95% of the compacted surface area meets or exceeds the specified temperature for HMA surfaces. Finally, it must be demonstrated that at least 90% of both HMA and CIR surfaces have been compacted with at least the specified roller passes or the optimum number of roller passes determined within the test strip. Unfortunately, full analysis is currently not able to be conducted in 'real time'. The current standard is to import and analyze IC data in "VETA", a standardized software tool developed by MnDOT and FHWA.

The ability to view 100% of the compaction operations and to provide feedback during construction is what makes IC attractive. Contractors who embrace the technology will find certain aspects valuable in improving quality and minimizing potential pavement repairs or replacements. However, IC is still a relatively new and evolving technology, and with all evolving technologies, improvements can and will be made in the future. But at this point, it is evident that in California the potential value appears worth expanding its use. For more information contact Don Mathews at: *DMathews@pavementrecycling.com*

## Chip Seal Performance Modeling for Pavement Preservation on California State Highways

By Lerose Lane, CP$^2$ Center

What can be done to preserve the thousands of miles of aging asphalt pavement on highways in California? One potential strategy is to apply chip seals over these asphalt pavements. Chip seals have been used for many years, and now offer improved performance with polymer- modified emulsions and hot applied asphalt rubber binders. It is believed by both Caltrans and industry that the use of chip seals on asphalt pavements produces significant environmental and economic benefits by increasing the life of the pavement.

Unfortunately, there have been no mathematical models developed for how long the various chip seals will last, so a model is needed to predict how much longer the pavement life will be extended when various types of chip seals are applied for routine and preventive maintenance under different traffic levels and climate regions throughout California.

Besides Caltrans, the State Department of Resources Recycling and Recovery (CalRecycle) is also especially interested in asphalt rubber chip seal performance, and has contracted with the CP$^2$ Center to develop performance models to substantiate their benefits. This model will include parameters for climate, traffic, and binder types, such

Chips Being Spread over Hot Applied Binder

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as polymer modified, terminal blends, and asphalt rubber. The literature review has been completed, and the Center is presently collecting specific project data from Caltrans and various public agencies for the model development.

To collect initial data from Caltrans, all of the District's Maintenance Units (as well as Headquarters) were sent the following questionnaire:

1. Does your district currently use chip seals as a preservation tool for HMA pavements?
2. What pavement condition triggers a chip seal project?
3. How many chip seals are done per year by your district?
4. What types of chip seals are applied by your district?
5. When did your District begin using chip seals for a pavement preservation strategy?
6. Have you tracked the performance of these pavements since they were chip sealed?
7. What pavement management system do you use to document the performance of your chip sealed pavements, and does your District have a performance curve specifically for each type of chip seals?
8. Can you provide us with any the performance data from your PMS database that your District uses?
9. How does your District determine the preferred chip seal type?
10. Does your District use a pavement condition index (PCI) or Pavement Serviceability Rating (PSR) and does it have performance data from chip sealed pavements?
11. If you said "yes" to Question 10, could we please have a list of the roads and the Post Mile location where you have used chip seals and the PCI/PSR values?
12. Do you have a standard aggregate specification for the chips regarding gradation, and physical testing standards for the aggregate characteristics?
13. Do your specifications require a contractor warranty? If so, for how long?

**Preliminary Findings:**

All of the Caltrans Districts responded to the questionnaire, and the results are summarized below:

- Most of the Districts use chip seals. Some do not use them on high volume roads.
- Most Districts reported that the triggers for chip seals are when the existing pavement is still in good to fair condition.
- Most Districts construct less than 5 chip seal projects per year.
- Most Districts use asphalt rubber or polymer–modified emulsion chip seals. Only District 9 has reported the use of terminal blend chip seals.
- All the Districts reported that chip seals have been used for a long time.
- Most of the Districts do not have their own PMS, but track the performance. More information from the Districts on the expected lives of the various treatments will help the next steps of the project.
- The Caltrans new Pavement Management System (PMS) software (PaveM) does not yet have adequate data to track the performance.
- The preferred type of chip seal varies with Districts.
- There is no standard method used for tracking the performance of chip seals. However, the PaveM PMS system should improve tracking.
- Most Districts use a 1-year warrantee for their chip seals. None are currently using a longer warrantee period.

Five of the Districts do not quantify their chip seal performance, except for visual observation. The Districts are not presently using performance curves, but Caltrans is planning to develop performance curves to include in PaveM.

Caltrans has recently updated their PaveM PMS and are now collecting the conditions of all of the state highways within California in greater detail, using specialized equipment. It is expected that PaveM will provide improved data, but may take several years before performance curves can be developed by Caltrans. However, the $CP^2$ Center is on schedule to have performance models developed much sooner for the CalRecycle project. Perhaps, this work can be combined with the PaveM program sooner, for more benefit to all. For more information contact: *leroselane@gmail.com*

GENERAL NEWS

# 35th Annual CEAC Northern California Bedroll Conference held at Lake Almanor on August 10-12, 2016

By R. Gary Hicks, CP2 Center and Pat DeChellis, CEAC

Nearly 60 people attended the annual County Engineers Association of California (CEAC) conference organized by Mike Penrose

Figure 1. Group Photo at Camp Conery

of Sacramento County. The event brings together Public Works Directors, industry and academia from northern California to discuss new and challenging issues faced by local agencies. The program consisted of several speakers who addressed topics such as:

- Use of concrete pavers as alternatives to asphalt, Matt Machado, Stanislaus County
- Unique bridge replacement delivery systems, Rick Tippett, Trinity County
- CEAC and Legislative updates, Matt Machado and CSAC staff via video
- Making better gravel roads, David Jones, UC Davis Pavement Research Center
- Bridge preventive maintenance programs, Mark Thomas Company
- Pavement and Greenhouse gases, John Harvey, UC Davis Pavement Research Center
- Local Assistance Program Update, Ray Zhang, Caltrans
- California's Experience with High Friction Surface Treatments, Robert Peterson, Division of Local Assistance, Caltrans
- Sustainable Pavement Practices Help Local Agencies in California Improve their Road Infrastructure, Kevin Donnelly, Western Emulsions

The presentations can be found at the following link: *http://www.ceaccounties.org/resources/past-conference-presentations/*.

The meeting ended with thanking the conference sponsors, announcing future conference dates, and thanking the speakers. As usual, everyone had a great time with networking and learning new ways of doing business.


Figure 1. Mike Penrose, Conference Coordinator

# MPOs Can Be Key to Pavement Preservation Funding

By Stephen R. Mueller, P.E, Stephen Mueller Consultancy

A Metropolitan Planning Organization (MPO) is a federally required transportation planning body comprised of elected and appointed officials representing local, state and federal governments or agencies having interest or responsibility in transportation planning and programming. Each urbanized area in the United States with a population of 50,000 or more is required by the federal government to have a MPO. The MPO discusses and votes on multi-modal transportation issues of region-wide significance, and decides which local transportation projects should be implemented.

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In 2010, there were 382 MPO's in the USA, including 52 that represented regions with populations of more than one million people. As you might imagine, most of these urbanized regions have substantial investments in roadway networks.

As an example, the Metropolitan Transportation Commission (MTC) in the San Francisco Bay Area of California represents 7.1 million people and 42,000 lane-miles of roadways, including 1,500 miles of highways. The replacement value of their transportation assets has been estimated at between $40 and $50 billion!

The MTC is also responsible for the Bay Area Rapid Transit (BART), and there are 23 transit agencies located within their region. Decades ago, the insightful leaders at the MTC realized that if the roads fall apart (thus requiring more resources to restore them) all of their transportation priorities could be placed in financial jeopardy. They devised a pavement management system (PMS), now called "StreetSaver", for use by their member agencies to track the roadway conditions and help protect their regional investment. Over time, all 109 of the local jurisdictions have adopted the use of the StreetSaver system.

The MTC has standardized data collection methods and certifies persons and companies to assure consistently good data. This together with the uniform data software package in StreetSaver helps ensure that every jurisdiction's roads are evaluated and compared on an 'apples-to-apples' basis. As a result of good data and standardized analysis, the MTC sets preservation goals for each local agency to accomplish – and they tie a portion of their funding distribution to the successful completion of those goals. The MTC has a model program that should be emulated by other MPOs across the nation.

Another large metropolitan area, Denver, has a long way to go in the area of pavement management. One of the primary goals of a newer Denver area task force is to assist our MPO – the Denver Regional Council of Governments (DRCOG) – with the implementation of asset management programs by the 54 local agencies in the Denver-metropolitan region.

As the task force reviewed the criteria being used for project selection - for Federal funding that passes through DRCOG - they discovered a written 'worst-first' selection process, whereby projects that are funded must rate lower than a "40" using a very limited pavement evaluation computer program.

Concerns were expressed with the staff at DRCOG about this 'worst-first' criteria and its impact on their Transportation Asset Management Program, since performance goals will not be satisfied without an emphasis on pavement *preservation*. Work will continue on implementing a pavement *preservation* philosophy throughout the Denver region. Part of that effort has already involved input from MTC on how they operate their MPO program for the Bay Area.

So it's important that the pavement preservation community examine the funding criteria that's used by MPO's in their area for the selection of pavement projects. Having the MPO's adopt pavement preservation concepts and funding policies can be a key to local agencies improving their management of our transportation assets.

Everyone wants a network of good roads, but areas that have a 'worst-first' funding criteria will never really have one.

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# Los Angeles County's Sustainable P2 Program

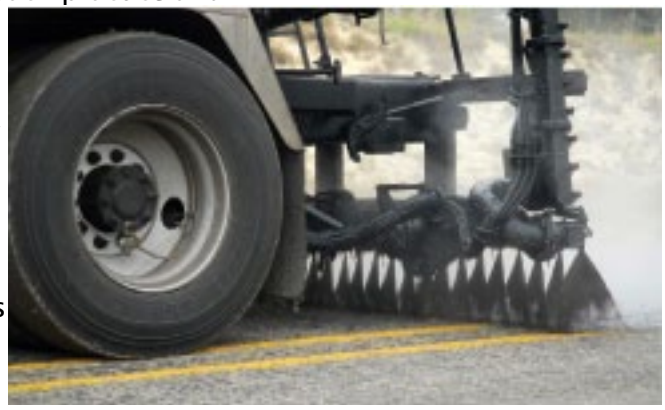
## By Greg Kelley, Los Angeles County

Counties and cities throughout California face the challenge of managing their road network on limited funding. The 2014 "California Statewide Needs Assessment" report estimated that an additional $5.6 billion is needed annually for the next 10 years "…to bring local streets and roads pavements into a state of good repair". Additionally, local agencies have been facing complying with the "California Global Warming Solutions Act of 2006" (AB 32), which requires greenhouse gas (GHG) emissions to be reduced to 1990 levels by 2020. Developing strategies to manage our road network on insufficient financial resources, as well as meet the objectives of AB 32, places challenges on local agencies throughout the State. In the face of these two challenges, several years ago the Los Angeles County DPW established a sustainable pavement maintenance approach that focuses on cost effectiveness, and reducing GHG emissions, energy usage, and impacts to our landfills.

**County Approach to improve its roads**

In 2009, DPW in collaboration with technical experts and representatives from the pavement industry piloted several sustainable projects on County pavements to evaluate their performance and cost. The successes of the treatments and associated cost savings led to development of the following '3-pronged' sustainability program, which was initiated in 2010:

- **Take care of our roads that are in good condition, first** – This "pavement preservation" approach contradicted our previous "worst first" approach practice and seemed counter-intuitive to some. A common question we were asked was, "Why would you use limited funding and resources to maintain good roads when the bad roads are the ones that need the repair the most?". Although many people understand the long-term benefits and cost savings of performing preventative maintenance activities on homes and automobiles they do not necessarily translate these principles to maintaining a road network. Painting a house every 10 years or changing the oil in your car every 5,000 miles are activities that preserve the value and improve the performance of these assets. These regularly scheduled preventative maintenance costs are far less than the ultimate replacement cost and go a long way to keeping the assets in good shape.



Included in this approach are projects where pavement preservation treatments are used as a stop-gap measure for roads that are in poorer condition. By "catching" roads before they fall into a more severe condition we provide an improved roadway and extend the pavements service life. Because pavement preservation treatments that preserve the good roads and act as a stop-gap measure for roads in poor condition cost substantially less than replacing roads, it enables the County to preserve and maintain 4 to 10 times more streets for the same amount of money compared with rehabilitating or reconstructing the bad roads.

Another question asked is, "Why are pavement preservation treatments sustainable?" One component of being sustainable is to use existing material and use less energy to perform the specific treatment. Pavement preservation treatments are treatments that are applied directly to the existing pavement surface and use emulsions (with a lower temperature range - between 100-150 degrees Fahrenheit) that use far less energy than repairs for the heavily distressed roads. By contrast, for roads that are in poor condition, the top layer(s) of the road are typically removed and hauled to a landfill and new hot mix paving material (temperature 275-300 degrees Fahrenheit) is needed to fix the road. The energy utilized and GHG emissions expended during the operations of removing

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and hauling the distressed pavement waste to a landfill, importing new pavement and using hot mix paving material all add up to a larger energy use and GHG impact to the environment when compared to pavement preservation treatments.

- **Use recycled materials in treatment selections** – Repurposing and recycling materials that typically would go to the landfill is another approach used that is both economical and increases sustainability. DPW has been a long-time recycler (over 20 years) of automobile tires into our asphalt pavements. For each lane-mile of roadway that incorporates ground tire particles into the hot mix asphalt, 2,000 tires are repurposed and directed away from landfills.

Chip Seal with 100% Reclaimed Asphalt Pavement

In addition to reducing the amount of tires going into landfills, using 'asphalt rubber' has also resulted in significantly improving the performance of our roads - and driver/passenger comfort. DPW has learned that adding tire particles to our pavement mix resulted in: significant reduction in pavement cracking; roads lasted 40 to 60 percent longer than conventional asphalt; less pavement/tire noise than other pavement treatments; and less color fading of the black roadway surface. In addition to asphalt rubber, DPW is now recycling asphalt millings called Reclaimed Asphalt Pavement (RAP) into our pavement treatments. This led to a commitment in 2012 by DPW to use 100 percent RAP aggregate for all pavement preservation projects. In 2013 we expanded our use of RAP into 50% of all base pavements. This practice will enable us to recycle these millings into our pavement treatments rather than hauling them to a landfill.

- **Reutilize existing materials in-place** – Of all the pavement treatment types, reconstruction projects impact the environment the most and are the most costly. The conventional approach included removing the existing asphalt and the layers of base material below the pavement, and replacing them with new materials. The truck trips to haul the material away from the project site, generally to a landfill, and to haul virgin pavement material imported to replace what was removed results in significant fossil fuels expended and further add to the GHG's in the atmosphere. Processes such as "Cold-In-place Recycling" and "Cold Central Plant Recycling" refurbish the existing asphalt in-place. Treating the soil beneath the pavement by adding cement, lime or asphalt emulsion provides another in-place treatment opportunity resulting in significant environmental benefits. Minimizing the truck traffic on the project also helps reduce the impact to motorists and greatly expedites the project completion. Reutilizing the existing materials in-place also has the added benefit of saving significant project costs.

**Summary**

In 2010 the County decided to change the way they approached treating their roads. The "worst first" approach of waiting for the distresses to appear before treating the road was replaced with the 3-pronged sustainable approach that focused on environmental sustainability and cost effectiveness. After 6 years of implementing the pavement program, DPW has made strides in successfully addressing environmental and economic challenges. The net benefits of implementing sustainable pavement treatments compared to "worst first" treatment strategies have been substantial. Energy Usage was reduced by 76%; Greenhouse Gas Emissions reduced by 82%; Landfill Reduction of 275,000 cubic yards - and almost one million waste tires were incorporated into our roads. In addition, approximately $30 million was saved within a 6-year period, which was reinvested back into the road program.

For more information contact Greg Kelley at: *gkelley@dpw.lacounty.gov*.

# FHWA Update

By Steve Healow, FHWA, Sacramento

**Congress** has been on summer recess since July 16, but they are back in session. That's the good news. The bad news is they only have until September 30 to pass an appropriations bill to avoid a government shutdown. Possible outcomes include a short-term continuing resolution or a full fiscal year 2017 funding bill or something in between.

Remember the "**Every Day Counts** (EDC)" campaign? It's the FHWA initiative devoted to identify and rapidly deploy proven but under-utilized innovations, with the goal of expediting the project delivery process to preserve infrastructure. Now in its sixth year we are into Phase 4 (EDC4). The EDC4 webpage includes a series of webinars and background information on the nine EDC4 initiatives, including e-construction, hydraulic modeling for design, high performance concrete connections and pavement preservation. The latter initiative is entitled "Pavement Preservation: When, Where and How". Visit the EDC4 web page at: *http://www.fhwa.dot.gov/innovation/everydaycounts/* . Also note that you can register for the EDC4 orientation webinars at: *http://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/summit.cfm#webinar* .

United States Capitol Building

AASHTO's Transportation Curriculum Coordination Council (TC3) is a technical service program which offers **on-line technical training** for the transportation workforce. The curriculum is designed for industry personnel serving local, state and federal transportation agencies, although anyone interested in TC3 training may enroll. The categories include materials, construction, maintenance and pavement preservation. Featured this month are two series of eleven modules each entitled "Maintenance Training" and "Flexible Pavement Preservation Treatments". Both are available at no cost. Visit the TC3 web page at *https://training.transportation.org* . See the curriculum at: *http://tc3.transportation.org/* .

In a recent L.A. Times article the **Los Angeles** City Street Services Bureau was both praised and chastised for pavement preservation efforts. Overall the condition of city streets improved over the previous three years, although in some neighborhoods the pavement condition remained poor. With 28,000 lane-miles, the City of Los Angeles has the largest municipal system in the country. L.A. voters will see a proposed half-cent sales tax on their ballots in November to help pay for more road improvements. You can see the L.A. Times article at : *http://www.latimes.com/local/lanow/la-me-ln-street-repairs-20160814-snap-story.html* .

If you need more information regarding the **sustainability** of your pavement preservation strategies, consult this new FHWA TechBrief entitled "Strategies for Improving the Sustainability of Asphalt Pavements" at *http://www.fhwa.dot.gov/pavement/pub_details.cfm?id=986*. Also be sure to visit the National Asphalt Pavement Association (NAPA) web site to see their series on implementing sustainability. The ten part series includes steps to take from the asphalt plant through construction. Go to *http://www.asphaltpavement.org/* and search for key word 'sustainability'.

**The Road Information Project (TRIP)** report for California was released August 17 and can be viewed at: *http://www.tripnet.org/index.php* . The report includes condition reports on bridges, congestion, traffic fatalities, transportation funding, economic growth, and pavement condition. According to the report, 37% of major highways and roads have pavement surfaces in poor condition, 42% are fair to medium and 21% are good. For more information on road condition and funding outlook visit the Fix Our Roads Coalition web page at: *http://fixcaroads.com/*.

For more information contact Steve Healow at: *steve.healow@dot.gov*

# Mark Your Calendar (Coming Events)

**National Pavement Preservation Conference, October 11-14 (Nashville, TN)**

This second national conference promises to give attendees all the latest information on pavement preservation, for local, state and national perspectives, including informative sessions on the basics of pavement preservation and the environmental issues. In addition to the various opportunities for technology transfer, field demonstrations of pavement preservation technologies will also be included. For more information go to: *http://nationalpavement2016.org/*

**Cal APA Fall Conference and Equipment Expo, October 26-27 (Sacramento)**

The California Asphalt Pavement Association (CalAPA) with hold another of it excellent conferences on all things asphalt. Speakers from agencies, and industry will discuss various hot topics affecting asphalt pavements and attendees will have an opportunity to interact with vendors of equipment and services related to asphalt pavement materials, construction, testing and pavement maintenance and preservation technologies. Outdoor displays of large equipment will also be included. For more information go to: *www.calapa.net*

**Northwest Pavement Management Association (NWPMA) October 25-28 (Portland, OR)**

The annual NWPMA Conference goals are to foster relationships among members and with other allied agencies, institutions, organizations, and business firms, to improve the ability of members to manage their pavement preservation and restoration programs, to promote pavement management technology transfer, research, and education, and to provide a common forum for the open exchange of ideas related to pavement systems. A full agenda of is planned.
For more information go to: *http://www.nwpma-online.org/*

**"Asphalt Pavement Maintenance for Local Agencies" (U.C. Berkeley / ITS Class) December 1, 2016 Rancho Cordova, CA**

This popular half-day class, taught by Roger Smith of the CP$^2$ Center, provides a solid working knowledge of the most common pavement maintenance and preservation practices. Transportation agencies at the city and county level can maximize the value of their huge investment in streets and roads by using proper pavement maintenance strategies. Topics include pavement management systems, pavement distress types, asphalt materials, maintenance vs. rehabilitation concepts, repair options and common pavement maintenance / preservation strategies.

For more information go to: *https://registration.techtransfer.berkeley.edu/CourseStatus.awp?&course=162IDM041201*



Caltrans established the California Pavement Preservation (CP$^2$ 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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