CP² Center

California Pavement Preservation Center Newsletter

No. 77 **Mar 2026**

WRAPP Workshop Highlights

Panel Fielding Questions

The Western Region Association for Pavement Preservation (WRAPP) held its 2026 Workshop on February 5–6 in Friant, California, near Fresno. The event attracted more than 200 attendees, including industry representatives, city and county street and road managers, and Caltrans personnel. Numerous vendor exhibits provided valuable opportunities for participants to engage directly with material suppliers and other industry experts. In addition, the speakers delivered up-to-date insights on a wide range of pavement preservation and management topics.

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Pavement Preservation Academy Coming in April

2026 Pavement Preservation Academy

A big achievement of the CP2 Center is the development and delivery of workforce training in the form of a Pavement Preservation Academy (PPA), sponsored by the SB-1 'fuel tax' funding. The 2026 offering of this online Academy will begin April 6, which will be a self-paced online class. Since its inception, over 250 people have completed the academy. As part of the PPA, follow-up exams may be taken on each of the segments, and successful completion earns a certification.

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MTAG Update Progressing

The CP2 Center received comments from Caltrans on 14 chapters of the MTAG. Comments on Chapters 1, 2, 3, 4, 5, and 8 have been addressed, and ADA-compliant versions of these chapters have been completed. The CP2 Center is currently working on the remaining chapters and anticipates finalizing them by March 2026.

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Recycling and Stabilizing Association (RSA) Updates

The first Annual Cold Recycling Summit was successfully held in September 2025 in Sacramento. The Summit's theme, "The Road Ahead: Paved with the Urban Quarry", highlighted the growing role of pavement recycling and soil stabilization in delivering cost-effective, sustainable pavement infrastructure across California. In addition, RSA has also been working closely with Caltrans through the Pavement & Materials Partnering Committee (PMPC) to further improve specifications and streamline project development.

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Spring Pavement Maintenance

The arrival of Spring means shifting into high demand in pavement maintenance and repairs in many parts of California. The winter months and spring rains always take their toll on pavements, so it is a good time to review a few timely strategies for bringing our pavements back to life and serviceability.

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Roller Compacted Concrete in Chico

As California cities are being asked to do more with less, more resilience, more sustainability, more community benefit, the City of Chico has delivered a project that sets a new standard. The Bruce Road Reconstruction roller compacted concrete (RCC) project is far more than a road widening effort. It represents a strategic investment in public safety, fiscal responsibility, environmental stewardship, and the long-term vitality of the community. Notably, this Capital Improvement Project marks the first time the city has used RCC paving on a roadway.

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Funding for Roads – Future Directions

Future funding for roadway work is getting a lot of attention these day as fuel tax revenues decline, largely due to the growing use of electric and hybrid vehicles. In response, new user-based funding approaches are being explored, including vehicle miles traveled (VMT) fees. The issue is especially active in California, where two legislative measures are advancing. AB1421 would require study of various solutions to the problem, including mileage-based fees. ACA 12 would propose a broader Constitutional Amendment to prevent any 'double taxation'.

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CCPIC Update

On February 18, the City of Long Beach hosted a presentation by the City and County Pavement Improvement Center (CCPIC). In addition to the City of Long Beach, the 94 attendees included representatives from the Port of Long Beach, the Cities of Bell, Bellflower, Commerce, Lynwood, Maywood, Seal Beach, and Santa Fe Springs, and seven consulting firms. Topics covered included managing pavements based on distress rather than PCI, the importance of asphalt compaction and the bonding of layers, the impact of RAP on city and county asphalt mixes, and AB 2953. The session prompted numerous thoughtful questions and several individual consultations, particularly regarding tack coats.

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Greenbook Revisions Update

Agencies across California rely on the Greenbook Standard Specifications for Public Works Construction ("Greenbook") for proven guidance on building and maintaining essential public infrastructure. These standards are developed collaboratively by agency engineers and industry stakeholders, under the oversight of the Greenbook Committee and its subcommittees and task forces. The committee reviews and updates the standards every three years, with the latest revision published in 2024. Errata sheets and supplements are issued as needed between editions.

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UPCOMING EVENTS

Pavement Preservation Academy	Opens April 6	Online
California Concrete Pavement Conference (CCPC)	April 22-23	Davis

Berkeley Tech Transfer / CCPIC Pavement Classes

CCPIC Pavement Classes	Self Paced	Online

CalAPA Classes

"Asphalt Pavement 101"	Various Dates	Various Locations

Newsletter of the California Pavement Preservation Center
No. 77 Mar 2026

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Caltrans established the California Pavement Preservation (CP² Center) at CSU, Chico in July 2006, and fully funded the Center in January 2007. Dr. DingXin Cheng is the current Director of the Center. Mr. Rukesh Maharjan is the current Contract Manager of Caltrans.

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

CP² Center News is published quarterly by the CP² Center, Langdon Hall Suite 203, California State University, Chico, Chico, CA 95929-0603, Subscribe/unsubscribe our newsletter by using this link: https://ecc-ce.csuchico.edu/cp2cMailingList/.

WRAPP Workshop Highlights

by Roger Smith, CP2 Center

The **Western Region Association for Pavement Preservation (WRAPP)** held its 2026 Workshop on February 5-6 at the beautiful Table Mountain Resort in Friant, CA, near Fresno.

President, **Matt Ferguson** (VSSI) welcomed over 200 attendees – including industry representatives, a mixture of street and road managers from cities & counties, and from Caltrans. The many vendor exhibits offered a special opportunity to get up close and personal with material suppliers and other industry experts, and the full line-up of speakers offered up-to-date information on many aspects of pavement preservation and management. Here's a brief recap.

Funding Updates - Kiana Valentine (Transportation California) reminded everybody that SB-1, the special 'pay at the pump' fuel tax, is already 9 years old! But today's big challenge is finding a way for EV's – that don't pay at the pump – to pay some form of road user charge. Various scenarios have been proposed, including an assessment based on vehicle miles traveled (VMT). New legislation (AB1421) has been introduced to formally study various funding alternatives.

Advertising & Biding - The importance of being 'specific' in bid documents was addressed by **Rick Cross** (Reed Family Co's.), in order to minimize 'requests for information' (RFI's). Clearly defining traffic control and work hours is also a must. One agency, as an aid for clear bid information, actually creates a list of 'hot button' items that inspectors will be looking for. He cited the 'Caltrans-Industry Pavement Materials Partnering Committee' (PMPC) as an example of a successful joint effort for specification development.

Asphalt Refining - Scott Metcalf (Ergon) provided a simple, understandable overview of the world of refineries and how asphalt products are created from crude oils, stressing that various crude oil sources (Venezuela vs. Saudi vs. California) can have very different asphalt fractions – both in quantity and quality. He highlighted the benefits of polymer modification to improve asphalt performance in extreme climates and for the performance of emulsion-based slurry surfacing.

Emulsion Technology - Sallie Houston (Granite) presented an excellent overview of the science of asphalt emulsions, and how emulsions can be tailored to different applications, climates and traffic. She stressed the importance of knowing the three stages of an emulsion treatment like slurry surfacing – the initial 'break' (water loss), the 'set' (traffic OK) and the 'cure' (long-term hardening).

Repairs & Preparation for Surface Treatments - Roger Smith (CP2 Center) covered best practices for doing preliminary repairs that can allow using just a surface treatment instead of a HMA structural overlay. These repairs can be done 'in house' by agency crews or included in the contract for the surface treatment. He stressed avoiding wide smears and/or bumps in the crack seal material and using the right sealant for the climate. Patching best practices include using 'quick-patch' cold products for smaller potholes, and making larger digout repairs 50% thicker than what failed.

Fog/Rejuvenating Seals - According to **Wade Miller** (Mainstreet Materials) fog seals are often the best 'bang for the buck'. They're low cost, easy to apply, and provide numerous benefits. He recommends doing a fog in a new pavement's first year, as a sacrificial surface sealer. Because of the risk of a slick surface if over-applied, the 'ring test' should be used to determine the best application rate. Pavement friction testing can also be used on higher speed routes. Caltrans recently updated its Standard Specification for fog seals via the Caltrans-Industry PMPC. In addition to sealing, rejuvenating fog seals offer the added advantage of lightly penetrating the old pavement and softening the old, oxidized asphalt binder.

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Slurry Machine Calibration - Rick Cross also handled the topic of slurry machine calibration, clarifying the many steps involved. Worth noting is the general rule that calibrations are good for 60 days, as long as the materials being used don't change.

Scrub Seals - Doug Olsen (Western Emulsions) provided the latest developments in scrub seals, which involve the spreading (with brooming) of a polymer modified rejuvenating emulsion, followed by chip application. The goal of brooming is to better fill existing cracks as part of chip sealing. The 'scrub' broom assembly can be either towed by chains or directly mounted to the rear of a distributor truck. Projects with steep grades, x-slopes, or lots of starts & stops (e.g. neighborhoods) are not good candidates for this process.

Multilayer Systems - D.J. Cruz (American Pavement Systems) discussed successes with the most common 2-layer systems, asphalt rubber cape seals (slurry seal over chip seal), citing several projects involving highly alligator cracked pavements. Effective 3-layer systems can involve a micro-surfacing 'foundation' layer, followed by an asphalt rubber cape seal.

Cold In-Place Recycling (CIR) and Full-Depth Reclamation (FDR) - Mike Concannon (PRS) reviewed CIR and FDR technologies and cited the many benefits of this type of pavement rehabilitation. Cost savings of over 30% are common vs. mill and fill HMA approaches. Greenhouse gases (GHG) are also greatly reduced. With aggregate sources dwindling in California, this technology, which uses the 'urban quarry' of aggregate in existing pavements, will only grow in use.

Panel Discussion - A panel (Charles Swann – City of Bend; Ken Messina – Asphalt Paving Systems; Paul Neiswonger – City of Bend; Scott Metcalf – Ergon) discussion fielded questions from attendees, and included the following information:

- Slurry seal can be placed over a chip seal the same day, but it's best to wait 48 hours
- Rolling of slurry seal can usually be beneficial and help reduce raveling and scuffing
- The application of 'PG' grading specs to asphalt emulsions may not be realistic
- Fiber additive in slurry seal can be beneficial – for a very low added cost.

Panel Fielding Questions

Continued, next page

CP2 Center Update - Dr. DingXin Cheng, Director of the California Pavement Preservation Center (CP2 Center), provided an overview of recent Center activities involving assisting Caltrans with lab research and the field evaluation of pilot projects. These projects include:

- Rubberized chip seals
- Double chip over paving fabric
- Fiber in HMA

The Center is also leading the effort to update the Caltrans Maintenance Technical Advisory Guide (MTAG) using committees made up of experts from both Caltrans and Industry.

The Center also provides support for MTC's 'Street Saver' pavement management programs by developing performance prediction curves for various pavement treatments.

The Center's 'Pavement Preservation Academy' will be offered again in 2026.

Their popular CP2C Newsletters can be subscribed to at: CP2C Newsletters – California Pavement Preservation Center – Chico State.

Caltrans Updates - Steve Lee (Caltrans HQ) highlighted the manager level changes that are taking place at Caltrans, including a new Director, Dina El-Tawansy. Of particular interest is the work of the Pavement Materials Partnering Committee (PMPC), a joint effort of Caltrans and Industry aimed at providing good specifications for successful pavement work. The PMPC's Asphalt Pavement Preservation Subtask Group has a long list of action items including:

- Specifications for using 100% RAP in slurry seals and chip seals
- Updating the Standard Specifications for Crack Treatments (mastics & composites)
- Specifications for scrub seals
- Specifications for the use of microfibers

Sri Holikatti (Caltrans HQ) reported on a research for using Warm Mix Asphalt (WMA) technology with hot rubber ship seals. A pilot project was placed on Route 36 in Tehama County, and the simple Vialit Test for aggregate retention was used.

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Awards

Every year, as part of the WRAPP Workshop, various awards are given to champions in the field of Pavement Preservation. This year's awards went to:

Agency Pavement Preservation Award

Established in 2025, WRAPP will recognize and honor various agencies that have made outstanding contributions to the Pavement Preservation industry. The award is presented to agencies who have been champions in the promotion, use and success of pavement preservation applications represented by WRAPP (slurry surfacing, micro surfacing, chip seal, cape seal, full depth reclamation, cold-in-place recycling, and crack treatment). All nominations must be submitted by a WARPP member. This year's award went to the City of Bend, OR.

City of Bend, OR Reps, Chuck Swan and Paul Neiswonger with the Agency Award

Distinguished Service Award - Jeff Roberts (VSSI)

Jeff Roberts receives Distinguished Service Award from WRAPP Board

Project Awards

- Placer County / Pavement Coatings Co.
- City of Coalinga / American Pavement Systems
- Mount Ranier National Park / VSSI

WRAPP Event Coordinator, Julie Ackman, with WRAPP President, Sue Sasse

Passing of the Gavel

The new WRAP President for 2026 will be **Sue Sasse** (Asphalt Pavement Systems Inc.).

According to **Julie Ackman**, WRAPP Event Coordinator, the 2026 Workshop was a big hit and received many positive evaluations. Early planning for the 2027 Workshop, which will celebrate the 40th anniversary of the group, suggests that San Diego will be the venue.

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

Pavement Preservation Academy Coming in April

by Roger Smith, CP2 Center

A big achievement of the CP2 Center has been the development and delivery of workforce training in the form of a Pavement Preservation Academy (PPA), sponsored by the SB-1 'fuel tax' funding. The 2026 offering of this online Academy will begin April 6, which will be a self-paced online class. The registration site for the Academy is now open at the CP2 Center's website: https://www.csuchico.edu/cp2c/educational-opportunities/pp-academy.shtml.

2026 Pavement Preservation Academy

The segments of the PPA have corresponding manuals that were developed by the CP2 Center and are published on the MTI website. In addition to being used in the academy, these manuals are free to the public and downloadable using the following links:

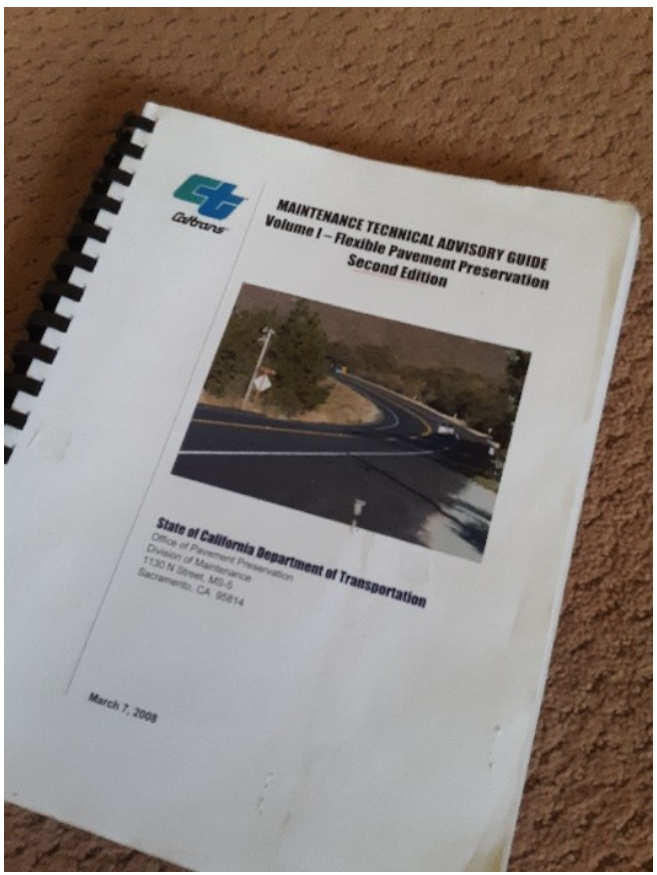
- Asphalt Pavement Repair and Resurfacing Preparation: https://scholarworks.sjsu.edu/mti_publications/414/
- Chip Seals: https://transweb.sjsu.edu/sites/default/files/1845A-Chip-Seal-Manual.pdf
- Slurry Seals and Micro-surfacing: https://transweb.sjsu.edu/sites/default/files/1845B-Cheng-Manual-Slurry-Surfacing.pdf
- Cape Seals & Multilayer Systems: https://transweb.sjsu.edu/sites/default/files/1845C-Cheng-Cape-Seal-Manual.pdf
- Thin Asphalt Overlays: https://transweb.sjsu.edu/sites/default/files/1906-RB-Cheng-Manual-Thin-Asphalt-Overlay.pdf

Since its inception, over 250 people have completed the Academy. As part of the PPA, follow-up exams may be taken on each of the segments, and successful completion earns a Certification.

If you need more information regarding the CP2 Center, please contact Dr. Ding Cheng at dxcheng@csuchico.edu or go to: https://www.csuchico.edu/cp2c/.

MTAG Update Progressing

by Roger Smith, CP2 Center



MTAG in Print Form

Since its first publication in 2003, the Caltrans Maintenance Technical Advisory Guide (MTAG) has been a go-to reference for all aspects of pavement maintenance. The 'MTAG' is often referred to as the pavement maintenance 'Bible'! But updates are needed. Its last update was in 2009. So, an updating effort is in progress, with the CP2 Center playing a major role as part of our support work for Caltrans.

The MTAG has been a 2-Volume reference - Volume 1 is for Flexible (Asphalt) Pavement Preservation, and Volume 2 addresses Rigid (PCC) Pavement Preservation. The Guides cover a lot. The full Caltrans Guides can be found at: https://dot.ca.gov/programs/maintenance/pavement/mtag.

The CP2 Center has been assigned the task, from Caltrans, of drafting initial revisions for this valuable reference, and work is progressing. Committees of Subject Matter Experts (SME) from both Caltrans and Industry, are working under the CP2 Center's lead to update each chapter.

The updating work will be limited to Volume 1, which currently has 14 Chapters, addressing topics including: Pavement Preservation Concepts, Materials, Strategy Selection, Crack Sealing, Patching, Fog Seals, Chip Seals, Slurry Seals, Micro-surfacing, Multilayer Systems, Thin Overlays, Bonded Wearing Courses, Interlayers, and In-Place Recycling. It's a very comprehensive Guide!!

RSA Updates

by Mike Concannon, P.E., President of RSA

We have a few exciting new updates from the **Recycling and Stabilizing Association of California (RSA)**, starting with the successful first annual Cold Recycling Summit hosted in September of 2025 in Sacramento.

The theme of the Summit, "The Road Ahead: Paved with the Urban Quarry", highlighted the growing role of pavement recycling and soil stabilization in delivering cost-effective, sustainable pavement infrastructure for California. The program included a diverse group of experts and recycling industry leaders from Caltrans, local cities and counties, engineering firms, industry contractors, and academia, and RSA thanks all those who participated and helped to make the Summit a success.

Highlights of the event included:

- During the local agency panel, experts provided knowledge and experience regarding what has been successful (and what has not) from both an agency and an engineering consultant perspective.
- A 'fireside chat' was held to discuss the Climate Action Plan for Transportation Infrastructure (CAPTI) initiative and green infrastructure investments in the State.
- Real-world examples of recycling implementation were provided with cost comparisons, key design considerations, and overall benefits of moving toward sustainable pavement management.

Congratulations are also in order for the **City of San Jose** as the first recipient of the RSA Excellence in Recycling Award, for their effective implementation of Cold Recycling as a foundational part of their pavement management program throughout the City over the years.

In addition to the Pavement Recycling Summit, RSA has also been working closely with **Caltrans** through the PMPC to continue the improvement of specifications and streamlining of project development. This includes the elimination of supplemental compaction for CIR-EA through a decision document, the addition of Cold Central Plant Recycling (CCPR) into the Standard Specifications and updating the engineered emulsion specifications for partial depth recycling (PDR), full depth reclamation (FDR), and CCPR - currently in progress.

Finally, it was announced late in 2025 that Dennis McElroy would be stepping down as Executive Director of RSA. Dennis was a founding member of RSA, serving as the organization's first President and then as Executive Director, and was a driving force behind many of the successes that RSA has had over the years. We are thankful for his service and contributions to the organization and the industry, and we wish him nothing but success in his future endeavors. As of January 1st, 2026, we are excited to announce that Marco Estrada with Pavement Recycling Systems (PRS) has taken over the Executive Director role for RSA. Marco has been closely involved with RSA since the inception of the organization as well, and under his leadership RSA will continue to be a strong advocate for responsible and sustainable road network management and the use of CIR, PDR, CCPR, FDR, and Soil Stabilization.

As a reminder, to further support cities, counties, and engineering firms, RSA offers a complete library of local agency specifications for Cold Recycling and soil stabilization, available for download here: https://www.rsa-california.com/resources.

If your agency or firm needs project engineering support or assistance vetting pavement designs for cold recycling or stabilization applications, RSA's technical team is ready to help. Contact RSA at (951)790-3430.

For more information on RSA go to: https://www.rsa-california.com.

Spring Pavement Maintenance

by Roger Smith, CP2 Center

In many parts of California, the arrival of Spring means shifting into high gear on pavement maintenance and repairs. The winter months and spring rains always take their toll on pavements, so it good to review a few timely strategies for bringing our pavements back to life and serviceability. These and other maintenance practices are covered in the **Manuals** developed by the CP2 Center for our **Pavement Preservation Academy**,

Find information at: https://www.csuchico.edu/cp2c/educational-opportunities/pp-academy.shtml.

Patches

The winter and spring rains have revealed weak spots in our pavement, often to the point of pothole formation. Patching potholes should be considered high-priority item since they can pose a real safety hazard to vehicles – especially the motorcycles and bicycles. Unrepaired potholes can pose a big liability for the roadway owner, so repairing them should be a very high priority.

Typical Spring Pothole

Quick-Patch Products

Quick-Patch Product

Fortunately, there are excellent 'quick patch' products for making simple and immediate repairs to hazardous potholes. They usually produce good service life and excellent 'bang for the buck'. These special cold mix products use small aggregate and proprietary asphalt binders to produce a very sticky mass that will adhere well and stay put in smaller, deeper potholes and small patches – even in the presence of water. But trying to use them as patches in larger, less confined areas will usually lead to their displacement/movement, and their rutting or shoving out of the void area. With only minimal compaction via a hand tamper or a truck tire, these product densify to form a strong cohesive mass. An optional light sanding of the surface will help them blend in for aesthetics and prevent any pick-up or tracking of the asphalt binder. Be sure to sweep up any excess sand and as it can become a slip/skid hazard – especially to motorcycles.

Various brand names of quick-patch products are available – some even at the local home stores in 40-50 lb. bags. A few bags of these special materials in the back of a maintenance pickup can make everyone a pothole patcher. The products are also available in bulk for stockpiling.

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Digout Patches

For those larger localized failed areas, it's usually necessary to remove the severely failed material and replace it with hot mix asphalt (HMA). Warm mix asphalt can also be used, but rubberized asphalt mixes (e.g. RHMA) do not lend themselves to hand work and should be avoided.

HMA Patcher Trailer

Best practices include laying out a cut line beyond the visible cracking into solid material, and making the cut with a pavement saw, a jackhammer or a small milling machine. The old pavement should be excavated deep enough to allow placement of HMA at least 50% thicker than the old HMA layer that failed. With major future repair costs being lane closures and crew time, making thicker, longer lasting patches is cost effective. The underlying material – often aggregate base (AB) - should always be re-compacted. A heavy tack coat should be applied to the vertical faces of the HMA cuts to help promote a good seal. Heated patcher vehicles (trucks or trailers) should be used to keep the HMA material hot for making multiple patches.

You should place enough loose material so that it requires 3 to 4 passes of the roller to make it flush with the old pavement. The goal is a flush patch surface and a well-compacted patch. Checking the final surface of your patch with a straightedge can help prevent a 'patch bump', especially important on higher speed roadways.

It is important to note that a steel drum roller may only be used in 'vibratory' mode if it's not touching the old (cold) surrounding pavement. This means that on smaller digout patches, only 'static' rolling should be used. A vibratory steel drum contacting cold pavement will cause cracking surrounding your new patch.

Hot Mastic Patches

Hot mastic products can also be used for patching – for potholes and for larger patches. Mastics can also be used to fill wide cracks – say wider that 2" – where conventional crack sealers aren't recommended. These proprietary products use hot thermoplastic elastomeric binders, which tend to retain flexibility to accommodate pavement movement. They contain high quality aggregate to provide a repair that stays stable under wheel loads. These hot mastic blends require special heating/melting equipment, which can be either purchased or rented.

Hot Mastic Patching

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Roughness & Raveling

The ravages of winter also can contribute to a rough-riding pavement due to raveling of the HMA surface in the wheelpaths. Often these pavements are structurally in acceptable condition and just need a surface smoothing and leveling. Short of placing a new HMA overlay, **slurry seals and micro-surfacing**, offer a lower cost way to improve smoothness – and provide a surface sealing benefit.

Micro-surfacing polymer modifiers, and also cement, that combine with high-quality aggregate to create a tougher, more stable mix that can help smooth out a rough or rutted pavement. These treatments are also enhanced by the addition of chemical additives, allowing placement in cooler air temps, or even night work.

Micro-surfacing Application

Crack Sealing

Spring and fall are the also ideal seasons to do crack sealing – mainly because air temperatures are more moderate and cracks are open enough to allow for an optimum amount of sealant to be placed in the crack. Cracks greater than ¼" can usually be effectively sealed. For wide cracks (greater than 2") use a hot mastic product (discussed above). Material manufacturers should be consulted as to the proper grade of material for your climate and traffic conditions. On higher speed routes, avoid 'over-banding' and sealant bumps, which can cause a rough ride.

So, as we head into spring, you'll need to have all your maintenance & repair operations ready to go!

These and other maintenance practices are covered in the new **Manuals** developed by the CP2 Center for our **Pavement Preservation Academy** offered online.

For more info on **CP2C** go to: www.csuchico.edu/cp2c/.

To access the **Manual** go to: https://scholarworks.sjsu.edu/mti_publications/414/.

Find information on the **Pavement Academy** at:

https://www.csuchico.edu/cp2c/educational-opportunities/pp-academy.shtml

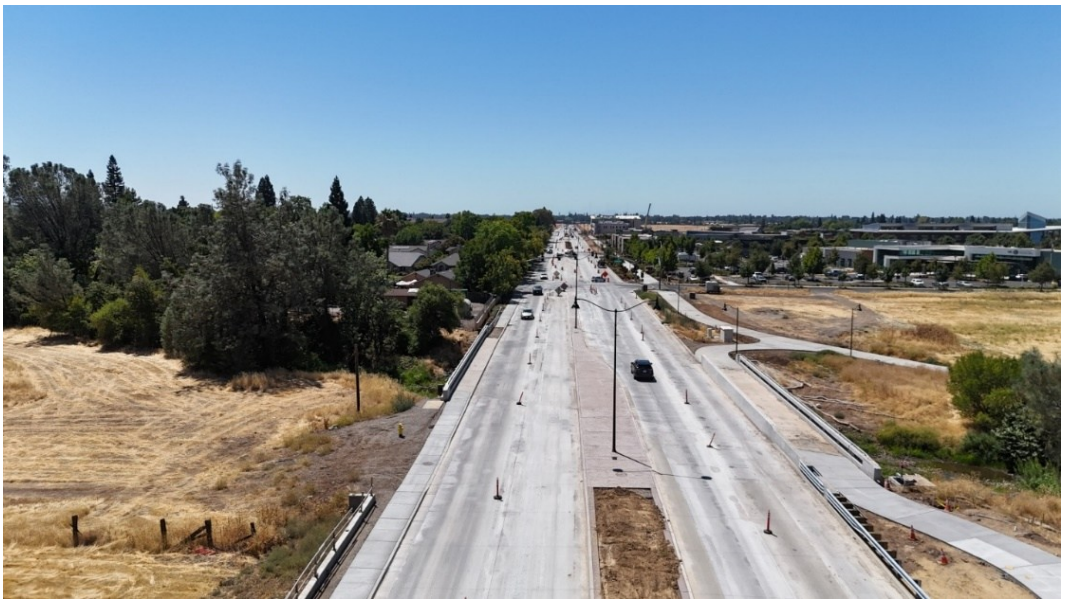
Roller Compacted Concrete in Chico

by Clay Slocum, CNCC

In a time when California cities are being asked to do more with less, more resilience, more sustainability, more community benefit, the City of Chico has stepped forward with a project that truly sets a new standard. The Bruce Road Reconstruction roller compacted concrete (RCC) project is far more than a road widening effort. It is a forward-thinking investment in public safety, fiscal responsibility, environmental stewardship, and the long-term vitality of the community.

Chico, the most populous city in Butte County, continues to grow and evolve. In recent years, wildfires have displaced residents from surrounding mountain communities, increasing the population within Chico and accelerating development particularly in the city's southeast corner. With this growth comes increased traffic, heightened safety considerations, and the need for infrastructure that can serve both today's residents and tomorrow's community.

Bruce Road is one of the city's major arterial streets. It functions not only as a critical daily transportation corridor, but also as a vital evacuation route during emergencies. Recognizing its importance, City leaders and staff understood that the time had come to expand Bruce Road into four lanes. However, rather than simply widening the roadway in the traditional manner, the city chose to rethink what a modern transportation project should look like. What emerged is a model of thoughtful planning and innovation.



Completed RCC on Bruce Road

For this Capital Improvement Project, the City of Chico implemented RCC paving marking the first time in the City's history that RCC has been used on a roadway project. Notably, this is also the first roadway project of its kind north of the Sacramento area to utilize RCC. That distinction alone reflects Chico's willingness to lead, innovate, and adopt practices that serve the public interest.

The decision to use RCC instead of traditional hot mix asphalt (HMA) demonstrates a deep commitment to long-term value and sustainability. Once complete, the reconstructed roadway is anticipated to have a 40-year design life that may extend to a full century with some long-term maintenance. That could mean little to no major maintenance for at least four decades. In an era when municipalities must carefully steward taxpayer dollars, this extended lifespan could translate directly into substantial cost savings over time.

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Major maintenance activities, such as overlays, resurfacing, and major repairs, can be disruptive and expensive. So, by choosing a pavement strategy that could reduce those future needs, the City is not only saving money, but also minimizing traffic disruptions for residents and businesses. It is a practical, fiscally responsible approach that reflects strong leadership and careful planning.

Beyond cost savings, the environmental benefits of concrete pavement played a critical role in the City's decision-making process. Concrete can offer a longer lifecycle, which reduces the frequency of reconstruction and associated emissions. Over the life of the roadway, this translates into a meaningful reduction in greenhouse gas (GHG) emissions compared to traditional paving methods.

Project Design & Construction

The project involved placing 4 lanes of RCC, 8-9 inches thick in single passes of varying widths on a prepared aggregate base (AB) layer, for a total of 15,000 cubic yards of RCC.

Compaction was achieved using 10-ton rollers making 2-3 passes immediately after placing the RCC mix. A membrane-forming curing agent was applied after rolling achieved compaction.

Transverse joints were sawed at varying times based on when the concrete was setting up – within the window where the concrete is strong enough to not ravel under the saw, but not so strong that stresses had already built up leading to unintended cracking.

Diamond grinding of the final surface is necessary for this type of RCC construction and was always expected. Placing RCC in a single lift leaves a surface that needs extensive corrective grinding, prior to a secondary and sometimes tertiary grind for smoothness and final lines/grades. This is one of the aspects that has caused the most curiosity, as the extent of grinding for RCC has been and should have been expected to be extensive.

As for the grinding equipment , there were multiple instances of grinding with multiple pieces of grinding equipment, including a new experimental machine.

The RCC mix used on Bruce Road represents cutting-edge collaboration between the city and industry partners. Developed to create the densest mix possible, the material achieved substantial reductions in GHG emissions, even compared to recently utilized sustainable concrete mixes on other Chico projects. The mix also met early strength requirements for maturity and opening, allowing construction traffic and early public traffic access without concern. This accelerated timeline demonstrates how innovation can improve both performance and efficiency.

Another remarkable aspect of the project was the use of a mobile plant operated by Pavement Recycling Systems (PRS), set up approximately half a mile from the project alignment. By producing the material so close to the job site, the team ensured exceptional quality control and significantly reduced haul time. The proximity allowed for tight response times and efficient coordination, contributing to the project's overall success.

In a departure from traditional ready-mix deliveries, the concrete arrived onsite in dump trucks, an uncommon sight for City concrete projects, which usually involve ready-mix trucks. Yet this approach proved highly effective, showcasing the adaptability and openness of Chico's engineering and construction teams. The mix was dumped directly into a conventional paving machine, and the result was a tightly controlled paving operation that delivered outstanding results.

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Haul Truck Dumping PCC Mix into Hopper of Paving Machine

While the pavement technology is impressive, what truly elevates the Bruce Road project is its community-centered design. The city did not approach this as merely a vehicular corridor expansion. Instead, planners and engineers incorporated bike lanes and dedicated paths of travel for active transportation users. Cyclists, pedestrians, and other non-motorized travelers are now integral to the roadway design.

Applying Curing Compound After Saw-Cutting of Joints

Importantly, the benefits of RCC extend beyond durability and emissions reductions. Observations during construction highlighted a noticeable temperature difference between concrete pavement and asphalt pavement. This has important implications for the urban heat island effect, a growing concern in California communities. By selecting concrete, the city is contributing to cooler surface temperatures and a more comfortable environment for residents. It is a subtle but meaningful improvement that aligns with broader sustainability goals.

The Roller and 'Whirlybird' Used to Compact and Shape the Initial Lines and Grades Prior to Any Diamond Grinding

This holistic approach reflects Chico's identity as a community that values accessibility, health, and quality of life. By integrating active transportation infrastructure into a major arterial expansion, the city is promoting safer multimodal travel and encouraging alternatives to single-occupancy vehicle trips. That forward-looking vision ensures the roadway will serve a diverse range of users for decades to come.

The Bruce Road Reconstruction project also stands as a testament to the professionalism and expertise of Chico's public works and engineering staff. Successfully implementing a first-of-its-kind RCC project required careful research, coordination, and confidence in new methodologies. City staff demonstrated both technical competence and thoughtful leadership in bringing this innovation to life.

Moreover, the city has made clear that this is not a one-time experiment.

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"With the success of RCC on Bruce Road, Chico intends to use this paving method on upcoming projects wherever possible. This commitment signals a broader transformation in how the city approaches infrastructure, prioritizing durability, sustainability, and fiscal responsibility," says Brendan Ottoboni, City Engineer. "As Chico continues to expand, investments like this ensure that growth is supported by infrastructure built to last. The expanded four-lane roadway should carry residents safely through their daily routines, serve as a reliable evacuation route in times of crisis, and stand resilient for at least the next 40 years."

The Bruce Road Reconstruction project is more than concrete and pavement. It is a reflection of a city planning intelligently for its future. Through thoughtful design, innovative materials, environmental awareness, and a steadfast commitment to the community, the City of Chico has delivered a project that will serve as a point of pride for generations.

A video link for the project is included below.

For more information contact:

Clay Slocum, California Nevada Cement Council (CNCC) clay.slocum@cncement.org.

Brendan Ottoboni, City of Chico brendanottoboni@chicoca.gov.

Video link: https://www.youtube.com/watch?v=FoIGAENjyc4&list=PLjuvocJg4Axo3sEiLVl-dELpolWqkM8-F.

Funding for Roads – Future Directions

by Roger Smith, CP2 Center

The subject of future funding for roadway work is getting a lot of attention these day as pay-at-the-pump taxes dwindle - primarily due to electric vehicle (EV) and hybrid use. New forms of user-pay financing are being explored, including charges based on vehicle miles traveled (VMT).

It's a hot topic in California, and at the political level two pieces of legislation are moving forward. AB1421 would require study of various solutions to the problem, including mileage-based fees. ACA 12 would propose a broader Constitutional Amendment to prevent any 'double taxation'.

As California studies the problem, Oregon & Hawaii are moving toward solutions.

In Hawaii, EV drivers can pay $8 per 1000 miles driven, or an annual fee of $50. In 2028, all EV drivers will be expected to enroll in the pay-per-mile program, with odometers read at annual inspections. By 2033, all light-duty vehicles will be included in the program.

Oregon's transportation budget faces a projected $300 million shortfall due to inflation, rising costs, and declining fuel tax revenues as more efficient and zero-emission vehicles take to the road. ODOT has already sent layoff notices to almost 500 workers. Under a new proposal, starting in 2027, EV drivers would pay 2.3 cents per VMT, with hybrid EV's phased in in 2028. They could alternately choose an annual flat fee of $340.

In California, the near future approach may likely involve a mixed 'fee' system - that combines a proven fuel tax system with a road user charge (RUC) for alternative fuel (electric) vehicles.

A good source of information on this timely topic is *Transportation California*, a non-partisan, non-profit coalition advocating for solutions to improve our infrastructure, grow the economy, and enhance our quality of life. For more information go to https://transportationca.com/.

CCPIC Update

by Erik Updyke, P.E., CCPIC

The City of Long Beach hosted a presentation by the City and County Pavement Improvement Center (CCPIC) on February 18. In addition to the City of Long Beach, the 94 attendees included those from the Port of Long Beach, the Cities of Bell, Bellflower, Commerce, Lynwood, Maywood, Seal Beach, Santa Fe Springs, and seven consulting firms. Presentation topics include managing pavements by distress, not PCI, the importance of asphalt compaction and the bonding of layers, the effect of RAP on city and county asphalt mixes, and AB 2953. The presentation generated numerous relevant questions and several individual consultations, in particular on tack coats.

The CCPIC continues to invite interested cities and counties to host an in-person technical presentation. Presentations are delivered by John Harvey, P.E., PhD, Executive Director, assisted by Erik Updyke, P.E., Technical Engineer, and staff from the University of California Pavement Research Center. Presentations are offered for free. Host agencies are asked to make the arrangements and invite attendance from neighboring agencies.

Enrollment for both online and self-paced (taken at the convenience of the enrollee) courses in the Pavement Engineering and Management (PEM) continues to be strong. Six self-paced classes are currently available. Pavement preservation related self-paced classes include CCI-04, Pavement Preservation Construction Inspection with instructor Lance Brown and CCI-06, Construction Inspection of Asphalt Rubber Pavement Materials with instructor Mike Robinson. Two additional self-paced classes, CCC-22, Cold Recycling of Asphalt Pavements and CCC-23, Unpaved Roads Engineering, Construction and Management, both with instructor David Jones, are expected to become available in early Spring 2026. Enrollment is now open for live, on-line Spring 2026 classes, CCC-01 Asphalt Concrete Materials & Mix Design, and CCA-02, Pavement Sustainability.

For a complete list of classes available for enrollment, go to https://registration.techtransfer.berkeley.edu/wconnect/.

Further information about both the self-paced and online classes and enrollment is available on the Berkeley Tech Transfer website, https://www.techtransfer.berkeley.edu/home.

Further information about the CCPIC and the PEM Certificate Program, along with technical references and resources, are available on the newly updated CCPIC website, https:/ccpic.ucdavis.edu.

If you have any questions or wish to schedule a presentation, please contact me, eupdyke@ucdavis.edu.

Greenbook Revisions Update

by Brandon Milar, CalAPA

Agencies throughout California rely upon the Greenbook Standard Specifications for Public Works Construction (aka the "Greenbook") to provide the public works professional with the proven strategies to build and maintain the infrastructure that communities use to thrive. These Standards are created through the collaboration of the agency engineers and the industry stakeholders. The Greenbook Committee oversees the work of these collaborators through the various subcommittees and task force. Every three years the committee reviews and revises the Standard. The last revision was published in 2024. The committee will publish errata sheets and a supplement as necessary between formal book publishing.

Greenbook asphalt stakeholders are working on finalizing revisions for the 2027 standards.

The sections of the Greenbook devoted to asphalt pavements are reviewed and revised by the Asphalt Concrete Task Force (ACTF). The ACTF has worked diligently to prepare the current proposed revisions to the Greenbook which are summarized below.

- Approved Changes:
  - Emulsion Quality Testing: This revision updated the testing requirements from ASTM to AASHTO. This aligns test methodology and requirements to unify emulsion requirements throughout the State. Also, testing changes were made to significantly reduce testing that requires the use of TCE; a harmful solvent used in asphalt extractions.
  - Asphalt Rubber Specification Edits for Consistency: These changes revised the layout and references in the section to align with the layout for asphalt concrete construction.

- Under Final Review:
  - Warm Mix Asphalt (WMA) – Contractor Option: This change would align the Greenbook with Caltrans and other State DOTs across the US to allow the contractor to determine whether or not to include a WMA technology in the asphalt concrete. Currently the Greenbook only allows WMA if the specifying agency allows it in their project special provisions.
  - Aggregate Crushed Count Testing Clarification: Currently the Greenbook specifies a crushed particle requirement for the use in asphalt concrete but does not mention a test procedure. The revisions include the procedure also referenced in the Caltrans Standard Specifications, and the requirements reflect the crush count requirements used by Caltrans for Hveem designed asphalt mixes.
  - Aramid Fiber Modified Asphalt Concrete: This new specification will provide agencies that wish to use aramid fibers a standard that was developed in collaboration between agencies and the suppliers of aramid fibers. This outlines the necessary requirements for the fibers and the methods to determine the quantity of fibers in the mix.

It is the intention of the ACTF to have these revisions completed, reviewed and approved by the Greenbook Committee for inclusion in the 2027 Greenbook.

For those of you that are stakeholders (agency and industry) in the construction and maintenance of the asphalt pavement infrastructure, we welcome you to participate in the ACTF and share your knowledge and expertise to improve the asphalt pavement standards.

Please feel free to contact **Brandon Milar, ACTF Industry Co-Chair**, at BMilar@calapa.net.

Coming Events

by Roger Smith, CP2 Center

Here's a summary of pavement conferences, training opportunities and other events coming up…

Pavement Preservation Academy **Opens April 6 (Online)**

A big achievement of the CP2 Center has been the development and delivery of workforce training in the form of a Pavement Preservation Academy (PPA), sponsored by the SB-1 'fuel tax' funding. In 2026, this will be a self-paced online offering covering common strategies for asphalt pavement preservation, including crack sealing & patching repairs, surface treatments/seals and thin overlays. The 2026 offering of the Academy will begin April 6. The registration site for the Academy is now open at: https://www.csuchico.edu/cp2c/educational-opportunities/pp-academy.shtml.

California Concrete Pavement Conference (CCPC) **April 22-23 (Davis)**

The 2026 CCPC will bring the concrete pavement community together to hear about best practices and innovations in planning, design and execution. This public event is designed for engineers, material suppliers, contractors, equipment manufacturers and researchers, and will include timely technical sessions, practical insights and opportunities for valuable peer-to-peer discussions.

For more information go to: https://www.theccpc.com/.

CCPIC Pavement Classes / UC Berkeley Tech Transfer **(Various Dates)**

Several training classes have been developed in partnership with the City and County Pavement Improvement Center (CCPIC), funded by California Senate Bill 1, The Road Repair and Accountability Act of 2017.

Class delivery is supported by the Caltrans Division of Local Assistance, which offers reduced registration fees to employees of California's city, county, regional, and other public agencies.

For a complete list of classes available for enrollment, go to https://registration.techtransfer.berkeley.edu/wconnect/.

Further information about both the self-paced and online classes and enrollment is available on the Berkeley Tech Transfer website, https://www.techtransfer.berkeley.edu/home.

Further information about the CCPIC and the PEM Certificate Program, along with technical references and resources, are available on the newly updated CCPIC website, https:/ccpic.ucdavis.edu.

"Asphalt Pavement 101" **(Various Dates & Locations)**

This popular CalAPA class is a good review of the basics of asphalt pavement technology, including materials, design, construction and acceptance testing. It's an ideal class for new employees, or for updating experienced ones. In addition to frequent 'in person' training sessions, it is also available by special request.

For more information on this class and other CalAPA events go to: www.calapa.net.