



CP² CENTER NEWS

Newsletter of the California Pavement Preservation Center

No. 26

June 2013

CP² Center Holds Open House and Patrons Meeting

By Roger Smith, CP² Center

After seven years of operation and considerable work in the area of pavement technology and preservation, the California Pavement Preservation (CP²) Center, CSU Chico, decided it was time to invite people to see their facilities and hear, first hand, about their accomplishments and capabilities. Guests included people from Caltrans, CalRecycle, local agencies, and industry, who traveled to Chico on March 18 for the "Open House", which involved presentations about the Center and a tour of its state-of-the-art laboratory facilities.

Mike Ward, Dean of the College of Engineering, officially welcomed the group, and voiced strong support for the value of the Center to the university. He stated that much progress has been made since 2006 and that their "vision" is to continue to grow the Center. He thanked Caltrans and CalRecycle for providing the primary funding for the Center.



Dean Mike Ward

Dr. DingXin Cheng, Director of the Center, also welcomed the group, outlined the day's activities, and highlighted the Center's primary activities and capabilities, including:

- Training & education (MTAG updates and strategy selection software)
- Evaluation of innovation projects (e.g. WMA, in-place recycling, and rubber slurry seals)
- Technical assistance (fog seals, rubberized chip seals, and dowel bar retrofit)
- Promotion of preservation concepts (newsletter, website, and conferences)

He stated that the Center has played a valuable role in advancing the merits of pavement

preservation at conferences, workshops, and production of a quarterly newsletter. In addition to their major contracts with Caltrans and CalRecycle, the Center has also done contract work for FHWA, Alaska DOT&PF, Butte County, Lake County, Metropolitan Transportation Commission (MTC), Western Emulsions, and Intermountain Slurry Seal.

Caltrans was represented by Chuck Suszko, filling in for Amarjeet Benipal, State Pavement

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Engineer. Chuck emphasized the good relationship Caltrans has with the Center and some of the ways in which the Center has been a valuable asset for them, including studies of fog seals, rubberized asphalt, dowel bar

retrofit on PCC pavement, developing life cycle cost software, and in updating of their Maintenance Technical Advisory Guide (MTAG). He stated that Caltrans funding will likely see a drastic reduction in 2014, and that pavement preservation will become an even more important focus. He also reminded the group that Caltrans will change to the

Superpave mix design in 2014, and that the CP² Center laboratory facility will be a valuable resource.

The group was also treated to a tour of the state-of-the-art laboratory facilities, now up and running, in Langdon Hall. The Superpave equipment for testing asphalt binders includes the dynamic shear rheometer (DSR) and the bending beam rheometer (BBR). For HMA mix

testing, equipment includes the Superpave gyratory compactor (SGC), the Asphalt Pavement Analyzer (APA) - which is capable of performing the Hamburg wheel test and the 4-point beam fatigue tester. Special equipment for testing dowel bar bonding in PCC pavement, developed by the Center, was also displayed. Several other pieces of equipment are currently on

order including a pressure aging vessel, a vacuum degassing oven, and a core rig.

Andrew Cooper, the new owner of James Cox and Sons, Inc., travelled from the UK to present several pieces of his equipment at the Open House. His company sold the 4-point beam fatigue tester to the university; and for display, his company furnished their asphalt concrete sample rolling compactor, which he brought from the UK.



CP²C Open House and Patrons Meeting Participants



Center Patrons Co-Chair Gary Hicks



CP² Center Staff at the Patrons Meeting (left to right: Gary Hicks, Ding Cheng, Leros Lane, Roger Smith)

Students in the CSU, Chico engineering program, who work for the Center, are trained on this specialty equipment giving them valuable skills to add to their resumes. The students have earned certifications for many Caltrans laboratory tests, and the CSU, Chico, laboratory has gained accreditation through Caltrans. The Center is also planning on obtaining laboratory accreditation for AASHTO testing.

The Open House was followed by a meeting of the CP² Center's Patrons Group, which included industry partners who help support the Center. This follow-up meeting provided



Center preservation Specialist, Roger Smith

the perfect opportunity to do some brainstorming, and to get feedback as to the Center's operation and priorities for purposes of developing a future "roadmap". Some ideas for services that the Center could provide included: training for

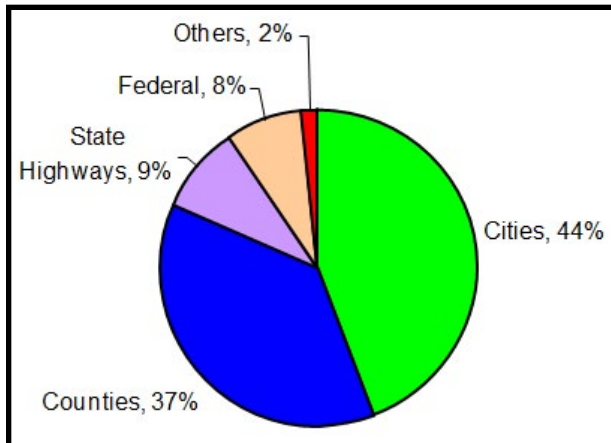
local agencies, testing of specialty materials, assistance with field trials of new products, and providing respected "third party" opinion and technical assistance. It was noted that there needs to be more promotion of the Center with local agencies, and that it should become a "go to" resource for them, possibly with the establishment of an online "Help Desk" service.

It is never too late to become a Center Patron. With State resources limited due to lean budgets, outside resources are needed to support activities (current and planned) at the Center.

California Statewide Local Streets and Roads Needs Assessment – 2012 Update

By Margot Yapp, P.E., Nichols Consulting Engineers, Chtd.

California's local street and road system continues to be in crisis. Every trip begins on a city street or county road. Whether traveling by bicycle, bus, rail, truck or family automobile, Californians need a reliable and



well-maintained local street and road system. However, these are challenging times on many levels. Funding is at risk, and there is a significant focus on climate change and building sustainable communities, and

the need for multi-modal opportunities on the local system has never been more essential. Every component of California's transportation system is critical to provide a seamless, interconnected system that supports the traveling public and economic vitality throughout the state. Sustainable communities cannot function without a well-maintained local street and road system.

The first comprehensive statewide study of California's local street and road system in 2008 provided critical analysis and information on the local transportation network's condition and funding needs. This 2012 needs assessment provides another look at this vital component of the state's transportation system and finds further deterioration and a growing funding shortfall.

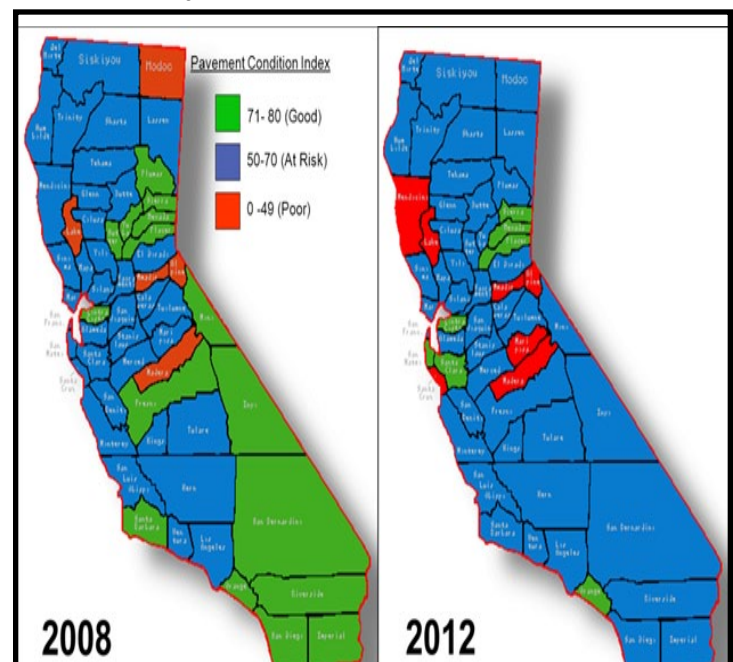
As before, the objectives were to report the condition of the local system and provide the overall funding picture for California's local street and road transportation network. Agencies needed answers to some important questions. What are the current pavement conditions of local streets and roads? What will it cost to repair all streets and roads? What are the needs for the essential components to a functioning system? How much is the funding shortfall? What are the solutions?

As owners of 81% of the state's roads, cities, and counties, the 2008 study is of critical importance for several reasons. The goal is to use the findings of this report to continue to educate policymakers at all levels of government about the infrastructure investments needed to provide California.

This update surveyed all of California's 58 counties and 482 cities in 2012. The information collected captured data from more than 98% of the state's local streets and roads! This level of participation exemplifies the interest at the local level to provide comprehensive and defensible data in hopes of tackling this growing problem.

Pavements

The results show that California's local streets and roads are moving ever closer to the edge of a cliff. On a scale of zero (failed) to 100 (excellent), the statewide average pavement condition index (PCI) has deteriorated from 68 in 2008 to 66 ("at risk" category) in 2012. If current funding remains the same, the statewide condition is projected to deteriorate to a PCI of 53 by 2022. Even more critical, the unfunded backlog will increase from \$40.4 billion to \$66 billion. The maps below illustrate the pavement deterioration that has resulted in each county since 2008.



Summary of 10 Year Needs and Shortfall for 2008 through 2012(\$ Billion)

Transportation Asset	Needs (\$B)		2012		
	2008	2010	Needs	Funding	Shortfall
Pavement	\$67.6	\$70.5	\$72.4	\$13.3	\$(59.1)
Essential Components	\$32.1	\$29.0	\$30.5	\$8.7	\$(21.8)
Bridges	N/A	\$3.3	\$4.3	\$3.0	\$(1.3)
Totals	\$99.7	\$102.8	\$107.2	\$25.1	\$(82.2)

Essential Components

The transportation network also includes essential safety and traffic components such as curb ramps, sidewalks, storm drains, streetlights and signals. These components require \$30.5 billion over the next 10 years, and an estimated shortfall of \$21.8 billion.

Bridges

Local bridges are also an integral part of the local streets and roads infrastructure. There are 11,863 local bridges, and approximately \$4.3 billion is needed to replace or rehabilitate them. There is an estimated shortfall of \$1.3 billion.

Total Funding Shortfall

The table below shows the total funding shortfall of \$82.2 billion over the next 10 years. For comparison, the 2008 and 2010 results are also included.

What are the Solutions?

To bring the state's local street and road system to a best management practice level where the taxpayer's money can be spent cost effectively; we will need approximately \$59.1 billion of additional funding for pavements

alone and a total of \$82.2 billion for a functioning transportation system over the next 10 years.

To bring the local system back into a cost-effective condition, thereby preserving the public's \$189 billion pavement investment and stopping further costly deterioration, \$8.2 billion annually in new funds are needed to stop the further decline and deterioration of the local street and road system. This is equivalent to a 56-cent per gallon gas tax increase.

The conclusions from this study are inescapable. Given existing funding levels available to cities and counties for maintaining the local system, California's local streets and roads will continue to deteriorate rapidly within the next 10 years. Unless this condition is addressed, costs to maintain the local system will only continue to grow, while the quality of California's local transportation network deteriorates.

It is imperative that cities and counties receive a stable and dedicated revenue stream for cost effective maintenance of the local system to avoid this crisis.



Asphalt Industry, Agencies Come Together for Asphalt Pavement Conference in Ontario By Russell Snyder, CalAPA Executive Director

If information is power, then the Spring Asphalt Pavement Conference held in Southern California may ultimately need a permit to connect to the state's power grid. The information-packed event was attended by more than 200 industry professionals and agency personnel and a record number of exhibitors. The lineup of speakers covered everything from state and federal transportation funding, policy, asphalt specifications, testing, new technology, and designs. And that was just before lunch.

Noted transportation champion Carl Guardino

told the packed event center in Ontario that a looming funding crisis can be averted if a broad-base of support can rally behind "responsibility, reform, and revenue." Guardino, chief executive officer of the Silicon Valley Leadership Group and currently serving as vice chairman of the California Transportation Commission, made sweeping hand gestures to emphasize the enormity of the challenges facing the State, such as reforming California's Byzantine environmental laws. Making headway, he said, will take active participation from industries and individuals

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that traditionally have not been actively engaged in the policy debate.

Regarding the California Environmental Quality Act, or CEQA, he said "we can be engaged or we can be enraged. Enraged feels good for a few minutes ... (but) engaged is good for a movement."

Guardino headlined the April 25 Conference at the Doubletree Hotel & Event Center in Ontario. Sponsored by the California Asphalt Pavement Association (CalAPA), this was the biggest event of its kind ever held in Southern California. Other speakers who delved into transportation policy and funding were Jay Hansen, executive vice president of the National Asphalt Pavement Association (NAPA), and Southern California Association of Governments Executive Director Hasan Ikhrata. All noted that there is a transportation funding crisis looming, but there is not yet consensus on how to tackle the problem.

The day was filled with impressive technical presentations, including a comprehensive "Superpave" talk by Adam Hand and an examination of Warm Mix Asphalt by Tony Limas, both of Granite Construction. James Emerson with Pavement Recycling Systems provided an in-depth look at in-place recycling, and Margot Yapp with Nichols Consulting Engineers delved

into the local needs assessment study (see page 3 of this newsletter). Erik Updyke with the Los Angeles County Department of Public Works gave an update on the "Greenbook" specifications.

Caltrans State Pavement Engineer Amarjeet Benipal outlined the department's pavement

priorities and highlighted the department's successful long-life asphalt pavement projects on the 710 Freeway in Los Angeles County, two stretches of Interstate 5 in the North State and one just getting underway on Interstate 80 in the Bay Area.



FHWA Steve Healow Spoke at the CalAPA Spring Conference



Caltrans Pavement Engineer, Amarjeet Benipal, gave a speech at the conference

The pavements are designed to last 40-years or more with minimal surface maintenance. "Long-life is no longer one pavement type," he told the audience. An in-depth feature of the department's long-life asphalt projects is featured in April issue of "California Asphalt" magazine. A link to an electronic version of the issue can be found on the calapa.net web page.

Benipal also highlighted the department's "green" initiatives, many of which involve asphalt pavements, such as Rubberized Hot Mix Asphalt (RHMA), Reclaimed Asphalt Pavements (RAP) and Warm Mix Asphalt (WMA). "Sustainability is a way of life," he said. "We are incorporating sustainability into everything we do." Benipal also reiterated the concerns about funding that had been expressed by Guardino and others earlier in the program. Referencing an eye-catching chart that depicts transportation dollars dropping precipitously, he used a ski analogy to describe the looming crisis: "We are on a double-diamond slope."

Over 35 sponsors and exhibitors made the CalAPA event possible, and also made it possible for students from Cal Poly Pomona and Cal State Long Beach to attend the conference free of charge.

The Fall Asphalt Pavement Conference will take place Oct. 24 in Sacramento. Contact CalAPA at (916) 791-5044 for more information.

North Counties Road Managers Discuss “What Works For Us”

By Roger Smith and Lerosé Lane, CP² Center

The North Counties Road Superintendents Association held their “What Works For Us” workshop on March 6th, 2013 in Maxwell, CA. Chairman Stephan Stangland (Lake County) welcomed a full house, representing the following counties: Lake, Yuba, Napa, Sacramento, Sonoma, Stanislaus, Nevada, Tehama, and Yolo.

The program for this event was arranged by IEC Distributing, purveyors of the Perma-Zyme technology for stabilizing unpaved roads. They highlighted the effectiveness of their products in stabilizing roads in North Dakota in the heart of the oil boom region, where massive increases in truck traffic have led to many problems on their un-surfaced rural roads, especially during the spring thaw season. Dennis Nelson, Highway Supervisor for Williams County in North Dakota, was the guest speaker, describing the challenges of road maintenance in an area where population and truck traffic volumes have increased dramatically in the last few years. One of their key tools for dealing with this has been the Perma-Zyme stabilization approach.

This regular gathering of road managers offers a valuable opportunity for the various counties to highlight “What works for us”. Of course, a common concern is lack of funding and understaffing, which in several cases have led to elimination of preventive maintenance/preservation programs for pavements, with only repair work and some overlays being done.

In several instances, in-house chip seal programs are being revived, but often for roads that really need more than just a surface treatment. Full-Depth Reclamation (FDR) with a Perma-Zyme stabilizer, followed by a double chip seal, is now being used by several counties, and thin Bonded Wearing Course (BWC) treatments are popular with some. Other items of discussion included snow removal practices, ice control using brine solutions, sign vandalism, and the challenges of complying with CARB truck emission regulations. The next meeting of this group is tentatively planned for June. For more information contact: Stephen Stangland at stephan.stangland@lakecountyca.gov.



Caltrans Dowel Bar Retrofit Phase II Study - Comparing High Alumina Cement to Polyester Grout

By Brian Winter and Ding Cheng (CP² Center), and Doran Glauz (Caltrans)

Introduction

Caltrans continues to study dowel bar retrofit grout material on US-50. In phase II they are working on a comparative analysis between high alumina cement grout (HAC) and the previously studied polyester polymer concrete grout (PPC). On March 28, 2013, Caltrans, the CP² Center, Fugro Consulting Inc., and the University of Minnesota visited US-50 in Rancho Cordova to conduct a visual inspection and perform non-destructive tests (NDTs) of the high alumina grout.

Background

Caltrans has had some issues with dowel bar retrofits in the past, mainly due to failure of the grout materials, particularly bonding issues. Because a more flexible material may perform better in terms of reducing the bond stresses between the portland cement concrete (PCC) slabs and the grout material, Caltrans decided to try PPC which is more flexible than typically used grouts. In 2010, a trial section was chosen on US-50 near Sacramento

and over 60,000 bars were installed using PPC. In 2012, Caltrans, CP² Center, FHWA, the University of Minnesota, and Olsen Engineering visited the site to determine the condition of the polyester grout and how it was performing. A visual inspection was conducted along with several non-destructive tests including tomography (MIRA), falling weight deflectometer (FWD), spectral analysis of a surface wave (SASW), and slab impulse response (SIR). Later the CP² Center and Caltrans returned to collect cores for laboratory testing and to verify the NDT findings.

Visually, the polyester grout was in good condition with no signs of debonding or cracking. On inspection of the cores, very few cavities were observed; they were located under the dowel bar and were not large enough to raise any concern about the integrity of the dowel bar retrofit. The bond strength was compared to a previous study of magnesium phosphate and high alumina

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Figure 1
Location of
Phase II Study
on US-50

and it was found that its strength falls in between the two materials. FWD tests determined that the load transfer efficiency (LTE) increased from 67 to 77%. The slabs themselves had some corner cracks and traverse cracks (not retrofitted) that may have lessened the effectiveness of the DBR in some locations.

Last year a section of dowel bars were installed in the wheel paths using high alumina concrete within 2 miles east of the PPC location on US-50 #2 truck lane. This provided the perfect opportunity to conduct a comparison study between the two materials.

Objective

The purpose of this phase II study is to determine the condition of the high alumina grout for the dowel bar retrofit (DBR) and to determine the performance of the DBR through visual inspection, field NDTs, and laboratory testing of cores. This project will also be used for performance comparison to the PPC from the previous study conducted in 2012.

Phase II Study

A visual inspection was conducted in March in the right wheel path of the #2 truck lane where dowel bars had been installed in 2012

(Figure 1). In addition, FWD and MIRA tests were performed to determine the load transfer efficiency and the condition of the structure of the grout (Figures 2 and 3).

-Visual Inspection

Preliminary results of the visual inspection showed that the high alumina grout is showing signs of distress in the form of shrinkage cracks. Cracks are forming at the interface between the concrete slab and the high alumina grout. In addition, traverse cracking was documented. It was observed that more distresses were present on the grouted slots where the grout had less or finer aggregates present. A few



Figure 3
MIRA transducer array

slots were given a poor rating due to the fact that they had been crack sealed.

These were backfilled slots in moderate condition prior to repairs. The portland cement concrete slabs had very few distresses and only a few slabs had minor cracking.

-FWD and the LTE

Fugro Consultants, Inc. performed the LTE tests using a Dynatest self-contained FWD trailer shown in Figure 2. Four sets of data were collected at each joint with two sets located in the right wheel path at loads of 9 and 16 kips, and the other two at mid-lane with loads of 9 and 16 kips. This was to see if there was a significant difference in the LTE between the intensities of the loads and proximity to the dowel bars.

Even with the cracking at the interface, the high alumina appears to have very high load transfer efficiency. The average LTE in the right wheel path was 89% and at midslab the LTE was 71% for both the 9 and the 16 kip loadings (even though the loadings changed, the LTEs didn't). Compared to the polyester grout, the high alumina had 11% more LTE. This is probably due to high alumina being the stiffer material or that the slabs at this location were in better condition. Further study will be needed to determine the exact reasons. The difference in the LTE between the right wheel path and mid-slab is significant and emphasizes the importance of dowel bar placement in the wheel paths where the stresses are most likely to occur.

It is expected that as time progresses and the distresses become more prominent for HAC, the LTE will decrease. Due to the flexibility of the PPC, the LTE is less, but may end up lasting longer because it is less sensitive to brittle failure.

-MIRA tomographer

A total of 36 tests were performed on each side of the slab joints for

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Figure 2 FWD in
the downward
position to take
readings

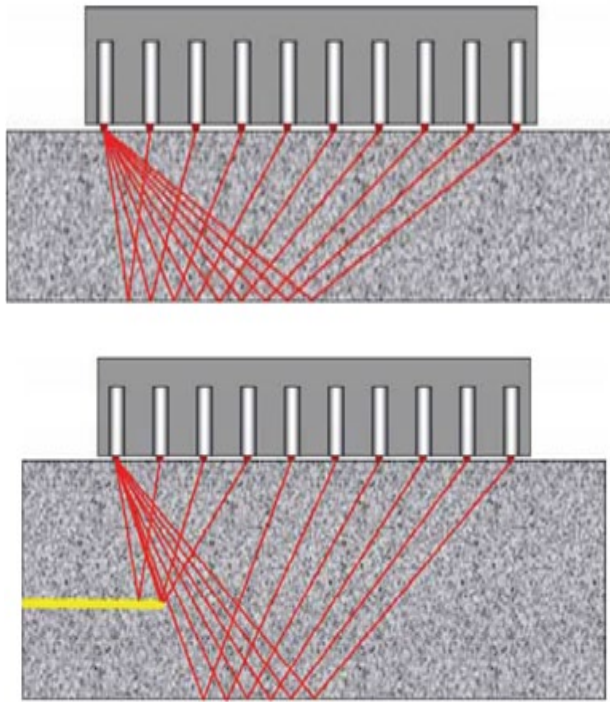


Figure 4 How the MIRA detects flaws (from GERMANN INSTRUMENTS)

a total of 72 tests per joint. This sounds like a lot, but each test only takes a few seconds. Kyle Hoegh, of the University of Minnesota, performed the MIRA tests at all 25 joints in less than three hours (that's 1800 tests).

The MIRA system is an ultrasonic tomography device which can be used to determine the properties of the PCC structure and to detect the presence of defects such as honeycombing, flaws, cracks, or foreign inclusions. A special scanning technique had to be used so that the MIRA didn't mistake the grouted slots as foreign inclusions. The scanning array shown in Figure 4 is made up of 10 channels with 4 transducers each (for a total of 40) that transmit low frequency shear waves to penetrate the concrete pavement structure. If a stress pulse is reflected off a flaw, then it will arrive at the receiver sooner illustrated in Figure 4. The amount of reflection from the scan helps determine the condition of the bonding between the grout material and the in-place concrete.

Analysis of the bond condition will be rated between level 1 to 3 with level 1 being a good bond and level 3 being a poor bond. Figure 5 shows what a scan looks like that is exhibiting a moderate level of reflection

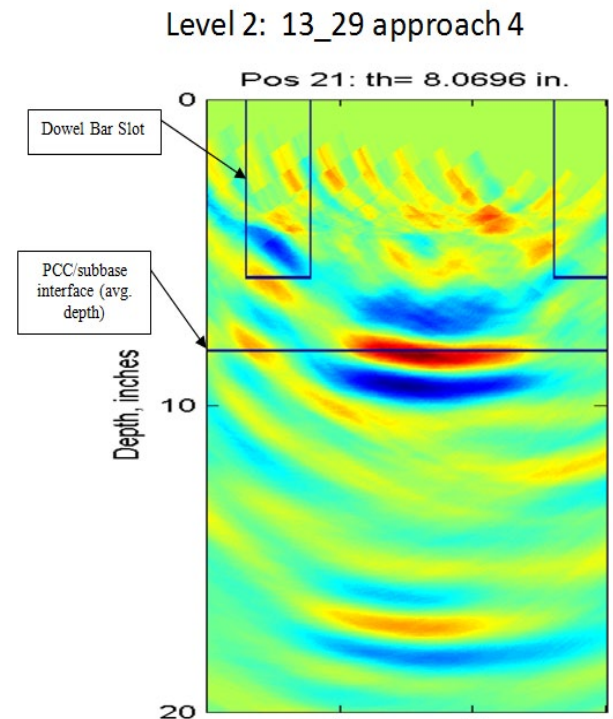


Figure 5 Example SAFT-FW location indicating level 2 bond at slots 3 and 2 on the approach side 4-inches from Joint #4 (Hoegh et al. 2012)

caused by the change in acoustic impedance between the existing PCC and polyester grout (from phase I of this study).

Plans for the Future

Caltrans is planning to obtain core samples at locations of interest based on the conditions predicted by NDTs and visual inspections. Drilling locations will be chosen so that a range of conditions of the grouted material are present. This would include some DBRs in good, fair, or poor conditions, respectively. Core samples will be subjected to visual inspections and laboratory testing. Tests will include pullout tests to determine the pullout strength of the dowel bars, shear tests to determine bond strength at the grout/concrete interface, and stress strain testing to determine moduli for both the HAC and the PPC.

In addition, long term performance of both DBR backfill materials will be monitored over the next 5 years. This will include visual inspections and automated distress surveys. It may also include additional NDT testing depending on funding.

CPR in Los Angeles County By Craig Hennings, SWCPA

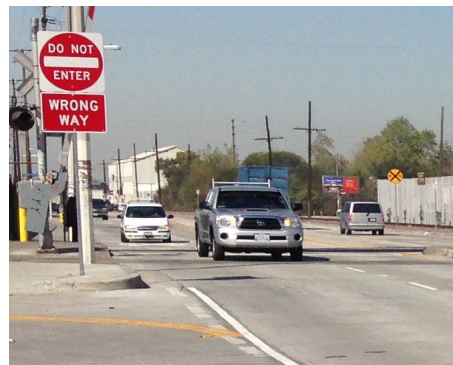
On Slauson Ave. between Compton Ave. and Alameda St., the original portland cement concrete (PCC) pavement was built in 1928. Over the last 85 years the pavement has suffered from cracks, settlement, utility trenching and other repair work. The pavement was old and a concrete pavement restoration (CPR) effort was needed.

In 2010 Craig Hennings of the Southwest Concrete Pavement Association (SWCPA) was contacted by Los Angeles County and asked to provide recommendations for repairing and revitalizing this section of Slauson Ave. Craig recommended full-depth replacement of the PCC pavement in a limited area, repairing and replacing curb and gutter in some areas, and diamond grinding the full width as the last step. The project began in the fall of 2012,



Slauson Compton to Alameda Restoring the surface with diamond grinding

and finished with the diamond grinding in 2013. The project consisted of 172,000 sq ft of diamond grinding, replacement of PCC



View looking west of the newly restored concrete pavement

driveways and sidewalks, and approximately 60,000 sq ft of new PCC pavement was placed.

"I went to the job site yesterday morning and was very impressed," said Erik Updyke, Department of Public Works, Los Angeles County.

"Our field staff was able to close one block of the street. The Harber Companies had three grinding machines on-site, a profilograph, and a fleet of tankers to collect the residue."

"I was extremely impressed with the results and with Harber," said Updyke. "There was no noticeable dust nor was there any liquid residue based on what I saw yesterday, it has a future and is a viable alternative to overlaying PCC streets with hot mix asphalt."



GENERAL NEWS

FHWA Update by Steve Healow, California Division

Mark your calendars: a one-day workshop on Warm Mix Asphalt (WMA) will be held on Thursday June 27 at the City Hall Galleria (lower level), 1110 W. Capitol Avenue in West Sacramento. The featured presenter is Dr. Ray Brown, Director Emeritus at the National Center for Asphalt Technology (NCAT) at Auburn University. You can pre-register on-line at the California Asphalt Pavement Association's on-line newsletter 'Asphalt Insider' (http://www.calapa.net/Asphalt_Insider.html). WMA encompasses a variety of technologies that allow asphalt to be produced and placed on the road at lower temperatures



Hot Mix Asphalt



Warm Mix Asphalt

than conventional hot mix asphalt. Potential benefits include cost savings and reduced greenhouse gas emissions because less fuel is required. In production and construction, WMA can potentially improve

compaction and pavement performance, reduce energy consumption, and enhance working conditions by reducing polycyclic aromatic hydrocarbons.

The AASHTO Subcommittee on Asset Management is producing a series of twelve webinars, including Asset Management and Performance Management, Asset Management and Risk Management, and Addressing Preservation and

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Maintenance in Asset Management Plans. The webinars are scheduled monthly or bi-monthly. See the schedule, plus slides and videos, or register on line for future webinars at <http://tam.transportation.org/Pages/Webinars.aspx>.

On a related topic, you are invited to join the Asset Management Book Club series of webinars by registering at <http://www.fhwa.dot.gov/asset/bookclub.cfm>. The book club meets on the last Wednesday of each month. The book club is reviewing the AASHTO "Transportation Asset Management Guide: A Focus on Implementation."

I'll bet you didn't know the National Highway System (NHS) in California grew by 7,000 centerline miles (+91%) and 3,000 bridges (+24%) with the passage of MAP-21. Essentially all of the new routes are local arterials. Our state DOT is responsible for reporting annually on the condition and performance of the NHS. Section 1203 of MAP-21 includes

the following list of proposed performance measures:

- Condition of pavements and bridges on the NHS
- Performance of the NHS
- Traffic congestion
- On-road mobile source emissions of criteria pollutants in maintenance areas and non-attainment areas (i.e. sulfur dioxide, nitrous oxide, carbon monoxide, particulate matter)
- Freight movement on the interstate system
- Fatalities and serious injuries

The rulemaking process which finalizes these performance measures will be circulated for public comments in January 2014. The final rule will be published on or about April 1, 2014.



FP² Update by Jim Moulthrop, Executive Director FP²

The Foundation For Pavement Preservation, Inc. (FP²) supports the adoption of pavement preservation at all levels of government, and works to ensure pavement preserva-

tion becomes a part of road programs from coast-to-coast.

NCAT

We continue to follow the progress of the Preservation Group Experiment at the National Center for Asphalt Technology (NCAT). As related earlier, twenty-five, 100-foot test sections of a variety of preservation treat-

ments were placed on an off-site test location on Lee County, Alabama, Road 159. The treatments were placed last August and NCAT staff continues to monitor the performance of the treatments, ranging from fog seals to thin (4.75 mm) HMA overlays.

Legislation

Since MAP-21 has a short duration of 27 months from the President's signing date of early July, 2012, indications are that efforts are already underway for the development of the next transportation bill. A fundamental area

that must be addressed is how to adequately fund the transportation needs of the country and what mechanisms to employ to accomplish this need. As transportation networks age and funding remains static, there is an ever widening gap to address.

ADA

The American with Disabilities Act contains a clause entitled "alterations". The U. S. Access Board, along with the Department of Justice, is currently considering rule-making in regards to this clause that could impact preservation project costs depending on how the clause is interpreted. For example, if a fog seal or seal coat is placed on a pavement, is this considered an alteration and, if so, it could invoke the ADA requirements for access. FP² is following the activities to determine the effects of the rule making.

2013 James B. Sorenson Award for Excellence in Pavement Preservation

Nominations are being accepted for the 2013 Sorenson Award, presented annually to an agency that has demonstrated a robust and successful pavement preservation program. In the past, both the County of Los Angeles and Caltrans have been presented with the award.

Please consider nominating an agency deserving of the award. Details and criteria can be found on the FP² website at www.fp2.org.

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Jim Moulthrop,
Director of
FP²

2015 International Conference

As a follow-up to the very successful First International Conference on Pavement Preservation held in Newport Beach, CA in 2010, FP² requested proposals for a Second International Conference. Proposals were received from China and France and the FP² Board of Directors selected the French

proposal. Plans are now underway with the European Emulsion Association and the International Slurry Surfacing Association in Paris in March, 2015. Honorary, Organizing, and Technical Committees are currently being formed and a venue has been chosen. As plans develop, we will keep you informed of progress and the schedule of events.



NHI Course on In-Place Recycling Delivered in Portland, Oregon and Hartford, Connecticut by R. Gary Hicks, CP² Center

Steve Seeds (APTech) and Gary Hicks (CP² Center) delivered the a course on in-place recycling developed by Applied Pavement Technology (APTech). The use of in-place recycling is supported by FHWA because of its cost effectiveness and it provides sustainable environmental benefits. The course was a 2 day course delivered to Oregon and Washington DOT's as well as several local agencies and consulting engineers on May 14-15, 2013. It was also delivered to Connecticut DOT on May 29-30, 2013. The course included two pre-work modules on pavement evaluation and in-place recycling techniques including hot in-place recycling (HIR), cold in-place recycling (CIR) and full depth reclamation (FDR).



Steve Seeds, APTech

- Project selection- Identification of the key factors that should be considered under different traffic levels, pavement conditions and environment
- Mix and structural design- Identifying the key steps included in the mix design process and for pavement structural design
- Project specifications-Identifying the requirements for specifications and what should be included in the specifications
- Project construction and control- Reviewing the information on quality control, inspection, and acceptance testing to ensure successful projects

The course is intended for state and local agency personnel who are responsible for selecting, designing, or constructing agency projects. Contractors, consulting engineers and others involved in asphalt in-place recycling could also benefit from the course.

All of the presentations were reinforced by short quizzes and detailed workshops in which the participants worked together in teams to ensure the lessons were learned well. The students seemed to enjoy the new approach very much. For more information on the course, please contact Steve Seeds at sseeds@appliedpavement.com.



NHI Course Participants Worked in Teams

The course made use of the newest system for delivering the materials including extensive use of participant interactivity and workshops during the course. Overall the students learned about:

- The benefits of in-place recycling including economic, environmental, and engineered performance benefits

Pacific Coast Group Meets On Asphalt Specifications

By Roger Smith, CP² Center

The committees of the Pacific Coast Conference On Asphalt Specifications (PCCAS) met in Reno on April 16 & 17. Also known as the "user-producer" group, this long standing forum provides a valuable opportunity for asphalt specialists from several states' Departments of Transportation to meet with asphalt material suppliers and discuss asphalt specifications and technologies, with the ultimate goal being more meaningful, valid specifications for asphalt products and processes -hopefully with uniformity in specifications within the Pacific coast region. The state DOT's that comprise the group are Alaska, Washington, Oregon, California, Nevada, Hawaii and FHWA Western Lands.

The PCCAS has four committees, listed below with their chairs:

- Asphalt Binder and Mix Committee - Brad Neitzke (FHWA) and Shauna TecleMariam (U.S. Oil)
- Emulsion Committee - Joe DeVol (WDOT) and Sallie Houston (VSS)

- Recycling Committee – Charlie Pan (Nevada DOT) and Steve Escobar (APART)
- Standing Committee - Bob Humer (Asphalt Institute)

Current hot issues include: Superpave mix design and asphalt binder testing, warm mix asphalt (WMA), use of reclaimed asphalt pavement (RAP) and reclaimed asphalt shingles (RAS) in HMA, testing and PG grading of rubberized asphalt binders, and sampling and testing of asphalt emulsions.

The group also frequently sponsors "round-robin" test programs for laboratories involved in the testing of asphalt binders. The CP² Center laboratory is currently participating in the round robin to evaluate a new procedure for using the dynamic shear rheometer (DSR) on asphalt-rubber binders.

The Committees will meet again on October 1-2, 2013 at UNR in Reno. The meetings are open to anyone with a serious interest in asphalt specification development. For more information visit the PCCAS website at www.pccas.org.



Improving the Quality of Pavement Management Data

by Sui Tan, MTC

To provide quality data on pavement condition ratings for local jurisdictions within the nine-county San Francisco Bay Area, the Metropolitan Transportation Commission (MTC) through the Pavement Management Technical Assistance Program (P-TAP) requires that private P-TAP contractors hired by public agencies must pass a pre-qualification test and establish a quality control plan for their pavement evaluation and rating work. On top of these requirements, the MTC Quality Data Management Plan has recently been expanded to include a quality acceptance plan.

QUALITY ACCEPTANCE PLAN

MTC has contracted with the California Pavement Preservation Center (CP²C) at California State University at Chico to administer the quality acceptance plan. The CP²C will need to communicate with the data collection contractors about issues found in the field.

If a contractor does not meet the data collection requirements (per the quality control plan) or if CP²C determines that the collected data does not meet the requirements established

in the prequalification requirements, a "stop work" order will be issued requiring corrective actions. Multiple violations could result in termination of the data collection contract.

Under the new contract, CP²C will perform the following tasks:

1) Administer the Rater Certification Program

Because a contractor company's qualification for the P-TAP does not ensure that all individual inspectors are capable of providing

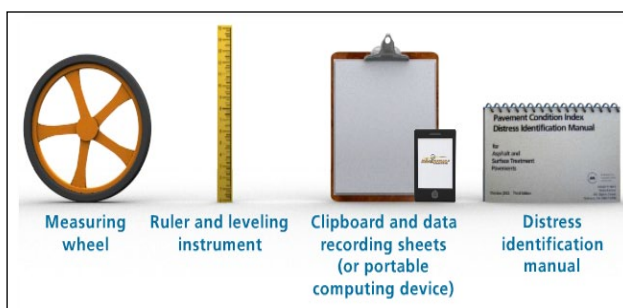
the desired level of accuracy, all inspectors employed by the qualified contractors will need to complete an inspection of the same pavement sites used in the P-TAP qualification tests, or new

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sites as directed by MTC.

The Rater Certification Program (RCP) consists of both a field pavement distress survey test for determining Pavement Condition Index (PCI) and an online written test. CP²C will fa-



cilitate both the field and online written tests for raters up to twice a year. When needed, CP²C will establish ground truths for pavement distress survey testing. CP²C's services will include administering registration, field and online tests, issuance and renewal of certification, and database tracking.

2) Conduct Audits of Contractor's Quality Control Plan

The CP²C team will verify that the Quality Control Plans (QCP) adopted by the data collection contractors are being completed prior to the project sponsor's acceptance of the inspection results.

CP²C will conduct on-site audits and will also conduct audits of the QCP results to ensure that the contractors are meeting the requirements established in their plans. The requirements of the QCP are:

- Re-inspection of "control" sections by inspection teams at least once every two weeks.
- Re-inspection of at least five (5) percent of the sections previously inspected within one month of completing inspections. The same inspection team may do the re-inspections.
- Re-inspection of at least five (5) percent of the inspected sections by a supervisor.

- Checks of collected data against prior inspection data and checks of calculated PCI values against PCI values based on prior inspection data projected to the inspection date for the same section, if no treatments have been applied since the prior inspection. All of those outside of a plus or minus 15 PCI point range should be checked by a supervisor or other person approved by MTC.

CP²C will also spot check and/or conduct full audits of the QCP from selected projects as directed by MTC.

3) Verify Data Collected by Contractors

CP²C will conduct data verification actions including at least some of the following:

- Checks of collected data against prior inspection data and checks of calculated PCI values against PCI values based on prior inspection data projected to the inspection date for the same section if no treatments have been applied since the prior inspection.
- Re-inspection of sections previously inspected by the data collection contractor.

RATER CERTIFICATION EXAM

Even if a contractor has pre-qualified, all of the firm's raters must be certified by MTC through the Rater Certification Program. As mentioned above, the Program consists of a field pavement distress survey test, and an online written test. Tests will be given up to twice a year. Upon successful completion of the tests, a certificate will be issued that is valid for two (2) years, and will be renewed upon passage of an inspection test.

Registration for the exam will be open soon at www.mtcpms.org. The 8-hour exam is scheduled for July 24 and 25, 2013. Visit <http://www.mtcpms.org/Events/RCP/2013Exam.html> for more information about the Rater Certification Program or to register for the exam.

For more information about the MTC Data Quality Management Plan or P-TAP, please contact Sui Tan, 510-400-8428.



2013 Airfield and Highway Pavement Conference

by Ding Cheng, CP² Center

The Transportation and Development Institute (T&DI) of the American Society of Civil Engineers (ASCE) held the 2013 Airfield and Highway Pavements Conference with the theme "Sustainable and Efficient Pavements" on June 10 – 12, in Los Angeles. Under the perfect weather, the conference brought more than 290 people from around the world to discuss the ever-changing challenges to airfield and highway pavement sustainability, design, advanced modeling, performance evaluation and monitoring, rehabilitation, life-cycle assessment, and emerging technologies.

During the conference, Ding Cheng presented a paper "Improving the Strategy Selection Process in the Caltrans Maintenance Technical Advisory Guide". The co-authors of the paper are Gary Hicks of the Center and Peter Vacura of Caltrans. The purpose of this paper is to

report on the recent updates made by Caltrans and CP² Center to the Chapter 3 treatment strategy selection of MTAG volume I, which includes: (1) updating the two treatment



Professor Robert L. Lytton Received Monismith Award

selection matrix tables with recent treatments and their performance; (2) adding life cycle cost analysis to the treatment selection process; and (3) utilizing the treatment selection online program developed by the CP² Center. The online strategy selection program streamlines the treatment selection process, conducts life cycle cost analysis, and generates reports as references.

To recognize the contribution to pavement engineering by Professor Carl L. Monismith's for his more than 50 years of exemplified teaching and research, the ASCE Geo-Institute has established a Lecture using his name. The C. L. Monismith Lecture is awarded annually for outstanding research contributions in Pavement Engineering. At the Conference, Professor Robert L. Lytton from Texas A&M University received the first C. L. Monismith award.



Ding Cheng, Dallas Little from Texas A&M, and Imad Al-Qadi from University of Illinois at Urbana-Champaign at the Conference



CP² Center Update by Ding Cheng, Director of the CP² Center



The purpose of the CP² Center is to provide pavement preservation services to public agencies and industry, and to integrate the research with the teaching of the Chico State civil engineering students. The following are short updates regarding the Center's activities.

Caltrans Realcost 2.5 CA Manual and Online Training Updates

CP² Center continues working with Caltrans engineers to revise its life cycle cost analysis (LCCA) manual and online training. Caltrans is working with UCPRC to upgrade the Caltrans life cycle cost analysis program Realcost from version 2.2 to version 2.5 CA. The upgrade is

almost complete. CP² Center is supporting Caltrans with the following major tasks including (a) reviewing Realcost 2.5CA beta version; (b) revising Caltrans LCCA Manual with version 2.5; (c) developing examples for typical Caltrans LCCA project scenarios; (d) upgrading the existing Caltrans online training classes on LCCA. The Center is working closely with Caltrans engineers to make the LCCA procedure easier and clearer for Caltrans' engineers.

CalRecycle Rubberized Hot Mix Asphalt Performance Models

Currently, California generates more than 40 million reuse or waste tires

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per year.

The Department of Resources Recycling and Recovery (CalRecycle) has a goal to increase the usage of processing CA waste tires into more value added tire-derived products in California. CalRecycle promotes the use of waste tires in various pavement strategies as part of their ongoing efforts to divert waste tires from landfills in California. The long-term performance modeling and development of performance curves of rubberized hot mix asphalt are needed to predict future performance and perform life cycle cost analysis.

CP² Center is working with Metropolitan Transportation Commission (MTC), and with LA County and local agencies in Southern California. It will continue to work with agencies in Central valley to develop performance models for local agencies. If local agencies want to participate in this important study, they should contact Ding Cheng at dxcheng@csuchico.edu.

The Center staff is also working with Caltrans and UCPRC to model the performance of Caltrans rubberized asphalt pavements.



The CP² Center's Laboratory is now Caltrans Certified

From left to Right: Nicanor Ceja, Michael Wiedeman, Lance Patchin, Brian Winter, Marissa Garcia, and Brandon Fraser



Recently, CP² Center decided that its laboratory should be Caltrans Certified to help expand our services and to ensure confidence in our capability as a research facility. We are now proud to announce that CSU Chico is the only current California State University which has a Caltrans certified laboratory. The process of becoming a certified lab started with a visit from Rene Robinett of Caltrans District 2 who mentored our employees on how to become a Caltrans certified laboratory and began the first round of written tests for those who were to become acceptance testers.

Laboratory certification requires that all the equipment be calibrated and documented. A notebook was compiled that includes a personnel hierarchy including resumes and training logs, equipment calibration and maintenance logs, safety procedures, and

calibration certificates. In addition, all equipment must be labeled with calibration stickers.

The second part is technician certification which includes both written and practical testing. There were seven participants that have become certified lab technicians: Ding Cheng, Brian Winter, Brandon Fraser, Michael Wiedeman, Nicanor Ceja, Marissa Garcia, and Lance Patchin. Certifications included CTM 105, 106, 125G, 201, 202, 226, 308, 309, and LP 11. In the future, the lab and its technicians will also become certified in CTM 304.

This means that the CP² Center can now serve as a third party lab for Caltrans and can perform more laboratory tests for industry.

Future Plans

With the support from Knife River Corporation, the CP² Center will be

Continued, next page

pursuing AASHTO lab certification in Superpave. This will include AASHTO certifications with the Hamburg wheel test, the Superpave gyratory compactor, dynamic shear rheometer (DSR), bending beam rheometer (BBR), and the rolling thin film oven (RTFO). The lab also plans to get certified in using the pressure aging vessel (PAV)

after we acquire the equipment and become familiar with its operation.

We would like to thank Rene Robinett of Caltrans District 2, and Tim Denlay and Mark Hayden of Knife River Corporation for their help and support in getting our lab certified and for future certifications.



Mark Your Calendar (Coming Events)

CalAPA Regional Technical Meetings

CalAPA sponsors Regional Technical Committee meetings open to anyone with a serious interest in asphalt technology. The following meetings have been scheduled:

- Los Angeles (Orange County RDMD) – June 5
- San Diego (Caltrans District 11 Office) – June 26
- Sacramento (Granite Construction-Bradshaw Road) - July 10

For more information visit calapa.net.

Warm Mix Asphalt (WMA) Workshop

The Southern California seminar will be held on Wednesday, June 26 from 8 a.m. to 5 p.m. at the new Caltrans Southern Regional Lab, 13970 Victoria St. in Fontana. For Northern

California, a one-day workshop on Warm Mix Asphalt (WMA) will be held on Thursday June 27 at the City Hall Galleria (lower level), 1110 W. Capitol Avenue in West Sacramento. The featured presenter is Dr. Ray Brown, Director



Caltrans Southern Regional Lab

Emeritus at the National Center for Asphalt Technology at Auburn University. You can pre-register on-line at the California Asphalt Pavement Association's on-line newsletter 'Asphalt Insider' http://www.calapa.net/Asphalt_Insider.html.

Northern California Bedroll Conference 2013

County Engineer Association of California Northern California will hold its 32nd Annual Bedroll Conference on July 10-12, 2013 at Lake Almanor, Camp Conery, Plumas County. For more information go to http://www.ceaccounts.org/Bedroll_2013.aspx.

The 2013 AASHTO Subcommittee on Materials Conference

The Subcommittee on Materials of AASHTO will hold its 2013 conference on August 4 - 8, 2013 at Lake Tahoe, Nevada. For registration and meeting agenda go to <http://materials.transportation.org/Pages/Meetings.aspx>.



Maintenance Superintendents Association (MSA)

The Annual Conference & Equipment Show will be held on Sept. 9-13 in Ventura. For more information go to <http://mainsupt.com/>.



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

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.

The Center works closely with the Pavement Preservation Task Group (PPTG), a statewide volunteer group consisting of members from Caltrans, Federal Highway Administration (FHWA), industry, various public agencies and academia to help promote cost-effective pavement preservation.

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