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2011 is Critical Year for Pavement Preservation

This new year is a critical year for pavement preservation, because never before have so many initiatives been underway, yet never before has the funding situation been more clouded.

As you will read in these pages, a new statewide pavement preservation partnership — the Florida Pavement Preservation Council — has been launched in the Sunshine State. Under the leadership of the National Center for Pavement Preservation, it will provide Florida local government agencies with ongoing educational workshops through the NCPP, and much more.

Florida joins the growing list of regional partnerships from coast-to-coast, including the new Rocky Mountain West Pavement Preservation Partnership. This revised group represents an expansion of the existing Rocky Mountain partnership to include the states of Nevada, California, Washington, Hawaii and Montana, bringing its total membership of states to 13. In addition, regional partnership meetings are scheduled for April in Oklahoma City, October for Bismarck and Reno, with the date and place for the Northeast meeting in the works.

Also, the national Pavement Preservation Expert Task Group — which brings together some of the best minds of the industry and government, including the Federal Highway Administration — will meet this spring to continue its work on various issues relating to preservation, while the asphalt emulsion task group continues its work on emulsion specifications revises for various treatments.

Right now, building on the success of the first International Conference on Pavement Preservation held last year in Newport Beach, planners are actively developing a new national conference on pavement preservation to be held in 2012 in Nashville.

Organization, programming and logistics committees are being formed to make sure the meeting is a top-rate event. Technical sessions will be joined by demonstrations of preservation techniques in cooperation with Metro Nashville and the Tennessee DOT. Watch these pages for more information throughout 2011.

By the time you read this, the 90th annual meeting of the Transportation Research Board will have taken place in Washington, D.C. TRB’s Pavement Preservation Committee met there to discuss needs in the research area, and to keep the preservation ball rolling in 2011. TRB technical sessions addressed issues ranging from optimum timing of treatments, to the value of pavement preservation.

Professional networking also is a big part of what we call TRB. To this end, FP², Inc. manned a booth in the exhibit area, and sponsored our annual hospitality suite, where we hosted visitors from among the more than 10,000 registrants from around the world.

And there is more new for 2011. After more than a decade of working together, FP² founding member associations Asphalt Emulsion Manufacturers Association, Asphalt Recycling & Reclaiming Association, and the International Slurry Surfacing Association have launched the Pavement Preservation & Recycling Alliance. The PPRA will not be an organization, or a separate entity, and AEMA, ARRA and ISSA will continue to exist as they do today. Instead, PPRA is formal agreement to work cooperatively to represent and promote the technologies, processes and applications which were represented and promoted individually by AEMA, ARRA and ISSA, making limited dollars go farther.

All this takes place against the threat of reduced dollars for pavements at the state and federal level. The year 2011 is a critical year for long-stalled federal surface transportation legislation. The outline of the successor act to SAFETEA-LU seems to change from month to month, and the federal government will be hard pressed to provide the funds that are needed to keep pavement conditions up while coming to an agreement on its basic structure.

While we have been successful in some regions in spreading the word that reduced budgets demand pavement preservation, much still has to be done. That’s why it’s really important that FP² continues its efforts on Capitol Hill to ensure that any new legislation recognizes the need for pavement preservation. We hope you will join us and help us meet our goals with your support and contributions.

By J. Baxter Burns, II
President, FP², Inc.
Each year, an increasing number of road agencies are implementing pavement preservation programs, as awareness and understanding of the potential benefits of this approach continue to take root.

Their reasons vary and include stretching shrinking road dollars further by addressing more miles of road; achieving design life by keeping good roads good; reducing energy consumption and greenhouse gas emissions; conserving scarce road building materials; and simply economics.

The one consistent theme that underlies all of these actions is that pavement preservation is an intelligent and cost-effective use of funds. However, proponents of pavement preservation must be vigilant, keeping a watchful eye on the horizon for storms that can develop and threaten the progress that is being made.

**Constrained Budgets and Asset Management: Weathering the Storm**

By Larry Galehouse, P.E.

**ASSET MANAGEMENT**

Today, the revenues and expenditures of road agencies are coming under unprecedented scrutiny by a skeptical public which expects safe, well-maintained roads not only today and tomorrow, but in the long term. When the public perceives inefficiencies, it expects road managers to find and make improvements.

Given these conditions, road managers and administrators must be
prepared to weather the “perfect storm.”

In response, agencies are becoming familiar with pavement preservation and the practice of asset management. Asset management simply is a philosophy that assesses the needs of the roadway network as a whole, and determines where and when to allocate scarce resources to achieve the best condition and longevity.

Following sound asset management principles, it is quite possible to determine, with considerable accuracy, the extent to which current reconstruction, rehabilitation and preservation programs are contributing to network health, i.e., whether network average remaining

<table>
<thead>
<tr>
<th>Type of Activity</th>
<th>Increase Capacity</th>
<th>Increase Strength</th>
<th>Reduce Aging</th>
<th>Restore Serviceability</th>
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<tbody>
<tr>
<td>New Construction</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Reconstruction</td>
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<tr>
<td>Major (Heavy) Rehabilitation</td>
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<tr>
<td>Structural Overlay</td>
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<td>Minor (Light) Rehabilitation</td>
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<td>Preventive Maintenance</td>
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<td>Routine Maintenance</td>
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<td>Corrective (Reactive) Maintenance</td>
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<tr>
<td>Catastrophic Maintenance</td>
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Preservation techniques prolong pavement lives but don’t necessarily enhance structure or capacity.
service life (years) is growing, holding steady or declining. Unquestionably, pavement preservation provides the greatest benefit to the network condition at the lowest cost.

In 2010, the Gulf Coast and eastern seaboard states escaped the worst of the Atlantic hurricane season. Quite a few “named” storms developed, but fortunately the impacts to property in the United States have been minimal.

Depending on their intensity, land-falling hurricanes have three primary negative effects: their strong winds can severely damage or destroy coastal areas in their path, their initial surge can cause flooding in coastal and low-lying areas, and their retreat can cause damage from the receding waters. Public agencies must plan for such events and bolster their infrastructure and building codes to withstand expected impacts.

Similarly, agencies trying to establish and sustain pavement preservation programs in the face of dwindling resources must be aware of, and prepared to weather, three potential threats that are always looming on the horizon like a hurricane.

**CHANGING AGENCY CULTURE**

Like the wind, the first and foremost surge is changing the agency culture. Agencies traditionally have used the old familiar, but expensive, practice of fixing the worst pavement problems first, while the good roads continue to deteriorate until they too have major problems. These policies amount to waiting until roads are at their most expensive point to fix.

Of course agencies can continue to allocate more of their scarce tax dollars to address the “worst first” and try to spend their way out of the problem. But to be sustainable, this approach requires continuously high revenues that very few agencies enjoy. Even if this were possible, it would represent a wasteful and inefficient use of public tax funding.

Instead, successful agencies transition into good stewards of the public investment by using a portion of their resources to safeguard good roads first, keeping them from deteriorating and falling into fair or poor condition.

Preserving the system first may require a major policy change, and a commitment from top management to dedicate the funding and needed resources to collect information and measure the effectiveness of the different preservation treatments.

Training is needed at all levels of an agency to ensure success. As with any new program, a single failure can overshadow many successes.

The long established definition established by the FHWA Pavement Preservation Expert Task Group
(PPETG) states “pavement preservation is a program employing a network level, long-term strategy that enhances pavement performance by using an integrated, cost-effective set of practices that extend pavement life, improve safety and meet motorist expectations.”

The definition was further solidified in an FHWA action memorandum dated Sept. 12, 2005, by David R. Geiger, director, Office of Asset Management. The memorandum stated “… the distinctive characteristics of pavement preservation activities are that they restore the function of the existing system and extend its service life, not increase its capacity or strength.”

The accompanying chart (page 9) clarifies the intended purpose of various pavement activities, and is referenced in the Geiger memorandum. The complete document can be viewed at: www.fhwa.dot.gov/pavement/preservation/091205.cfm.

RESISTANCE TO CHANGE

An agency’s resolve to weather the tidal surge will be sorely tested as it resists the marketplace pressure exerted by certain groups which express reluctance to change the status quo.

Such groups resist any movement toward the use of cost-effective preservation treatments because of a fear of change. In an effort to guard their perceived turf, some groups will rely on political lobbying efforts to block new pavement preservation treatments from entering the market.

Tactics include distorting the established definition of pavement preservation for monetary gain. New terms, such as “structure preservation” are merely an attempt to disguise “major rehabilitation” and misconstrue the true purpose of pavement preservation.

Based on an appraisal of 42 state DOTs, nearly 66 percent of agencies stated that it had proved difficult to attract quality pavement preservation contractors. More progressive contractors are moving to fill this gap, and see new business opportunities that enable them to offer a full array of pavement services which encompass both traditional work, and innovative preservation treatments. Companies embracing the increased use of pavement preservation products will most certainly flourish and prosper in the future.

CULTIVATE PUBLIC SUPPORT

The receding tidal surge threatens to undermine an agency’s ability to gain public support. The quote “all politics is local,” often attributed to the late Thomas P. (Tip) O’Neill, Jr., former speaker of the U.S. House of Representatives, underscores the importance and value of public acceptance.

Appraisal results gained from 42 state DOTs illustrate that nearly 85 percent of the public are unaware of pavement preservation. Although people understand the importance of maintaining a car or house to prevent...
the necessity of major repairs, they may not necessarily understand why agencies might work to preserve good roads. Our road system represents a gigantic investment and represents the sum of the efforts and sacrifices made by present and earlier generations. Because our road system is so expensive and took so long to construct, it makes good business sense to preserve it in good operating condition for as long as possible, thus postponing the day for costly reconstruction or major rehabilitation. In fact, many of the projects implemented through the American Recovery and Reinvestment Act of 2009 (ARRA) used pavement preservation treatments.

In today’s world where economic and political storm clouds gather and the pace of change is very rapid, some road managers become risk averse and seem to retreat from the challenges ahead. Pavement preservation is the one tool that can arrest and reverse the deterioration of our road system when properly used.

However, the lack of proper road preservation is a concealed form of retrogression. The public and interest groups need to know that, while fuel taxes pay for the roads, a significant proportion of these resources could be used more effectively by using pavement preservation techniques. The results will be long-lasting, high-quality roads and a satisfied motoring public.

Galehouse is director, National Center for Pavement Preservation, Okemos, Mich.
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A major urban county in Florida is maximizing the value of its pavement management dollars by integrating scheduled pavement preservation.

Among the techniques the county utilizes is a form of hot in-place pavement recycling (HIR) which is topped with a virgin lift of asphalt, all in one pass.

Hillsborough County, Fla. — covering the heart of metro Tampa — is responsible for 3,250 centerline miles, with less than five miles of unpaved road. “It’s a good-sized inventory for a county of our size,” said W. Roger Cox, P.E., senior professional engineer, Engineering Division, Department of Public Works, Hillsborough County, Fla.

The county uses MicroPAVER pavement management software to inventory streets, track condition and plan maintenance. “We transitioned from a previous system, using an overall condition index on a 1 to 10 scale,” Cox said. “This took into consideration seven defects, and evaluated the ride indexes.

“MicroPAVER is different,” Cox said. “It allows us to break our system into segments, within which you perform samples. We then do an in-depth evaluation of those samples within the section. It’s a visual inspection system, with 19 defects available.”

Using its new system, Hillsborough County has achieved an audited pavement condition index (PCI) of 76. “Our goals are established by the county board of commissioners, and our goal is to be at a 55 or higher system-wide,” Cox said.

**PAVEMENT PRESERVATION PROCESS**

Hillsborough County utilizes a preventive maintenance/preservation program in which streets are identified for future work. “Our
thought is to spend money on roads that we can improve before they take that steep decline to a low PCI,” Cox said. “We want to keep our good roads in good shape, and budget for those roads we have to reconstruct.”

The county utilizes nearly the full “toolbox” of pavement preservation treatments articulated by FP2, Inc., and the Federal Highway Administration (FHWA). “We use several different types of treatments for several different kinds of roads,” Cox said. “We have our local roads, arterials and collectors, so we maintain a primary, secondary and tertiary system ranking. You can go into a lot deeper segregation of pavement types, but we’ve found that if you get too complicated, even though you are adding more calculations, you are not really addressing the specific needs on which you have to spend money.”

Therefore, the county tries to match the right treatment, with the right pavement, applied at the right time. MicroPAVER helps the county identify candidate pavements. In addition, an inspection group verifies what is indicated in the database. The program is a good tool to plan with, Cox said, but it can’t be used all by itself without field verification.

“We evaluate the road condition-wise, and then utilize the right treatment appropriate for that defect,” Cox said. “We utilize single- and double-course micro surfacing for roads that are cracked and raveled. We have a crack-seal program. And we have just started a thin-lift overlay program.”

The county’s pavement management program also tracks streets suited for resurfacing, although resurfacing of pavements is considered a capital, as opposed to a maintenance, expense. “The resurfacing budget is not contained in the transportation maintenance division, but is more of a planned expense,” Cox said. These resurfacing capital pavement projects include mill-and-fill, hot mix asphalt overlays, and repaving.

**REPAVING HILLSBOROUGH COUNTY**

As part of its capital expense budget, repaving solves Hillsborough County’s need to both spend limited funds on durable pavements, while recycling existing pavements as it develops an environmentally sustainable program. Hillsborough County DFW’s stated mission is construct and maintain essential transportation and storm water systems, while focusing on safety and environmental stewardship.

Repaving helps the county build long-lasting, smooth pavements while optimizing the county’s environment.
Hillsborough County estimates HIR saves 30 percent over comparably sized mill-and-overlay.

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Hillsborough was the first county in Florida to receive national accreditation by the American Public Works Association for delivering these services to citizens with utmost efficiency, cost effectiveness, and quality. Repaving helps the county build long-lasting, smooth pavements while optimizing the county’s environment.

“You have to have the right treatment on the right road at the right time,” Cox said. “It’s the absolute key to a cost-effective program. If you put the wrong treatment out there it will not have the survival rate that you need. Our hot in-place repaving is aimed at our arterials, for the most part.”

For its growing hot in-place recycling program, Hillsborough County uses a repaving process from Cutler Repaving, Inc., Lawrence, Kan. With Repaving, the existing pavement is heated to 300 deg F. When in the resulting softened, pliant condition, the pavement is scarified to a depth of 1 in., and in the mobile repaving unit, a recycling agent that restores the viscosity of the aged asphalt is mixed into the scarified, reclaimed asphalt.

This reclaimed material then is reapplied and distributed with a screed as a 1-inch leveling course. While that material remains at a minimum 225 deg F, a virgin hot mix asphalt overlay is placed over the recycled leveling course. Cutler’s repaving machine scarifies, applies recycling agent, places the leveling course, and applies the new overlay simultaneously in one pass. That benefits road users because there is no delay between the time the pavement is recycled and the time a riding or friction course is placed, resulting in a safer work zone for road users and for contractor personnel.

Because the hot virgin mix is placed over the heated, recycled leveling course, the process achieves a thermal bond between the recycled layer and the new layer.

“From an engineering point of view, there is no delamination between the recycled layer and the new overlay,” said Cutler vice president John Rathbun. “That’s very important in predicting life cycle performance. The same heat that’s used to take the road apart is used to put it back together, and the two layers are effectively compacted into one lift.”

“It’s an accepted methodology,” Cox said. “The thing I like about it is that the recycled mat and placement the virgin lift on top takes place simultaneously. The bond between the two lifts is homogeneous, laid flat-in. Also, the top lift is made to our asphalt spec; we know exactly what it is, so I know what my customers are driving on. And with the bond between the lifts as strong as it is, we’ve never had a delamination with that treatment. We’ve put it on roads with tremendous volumes of traffic, and we’ve not had a failure.”

**ENHANCED SPEED OF PLACEMENT**

The speed of placement is another benefit, critical on urban arterials lined with businesses that depend on vehicular traffic for profits. “I like the speed of the process,” said Robert
Swain, senior engineering specialist, Projects Management, Engineering Division, Hillsborough County DPW. “With mill-and-resurface, several nights may go by before the pavement is overlaid. We try to spec that pavement be replaced within 48 hours, but you still have cars driving on the rough surface. We avoid that with hot in-place repaving.”

And the speed of the process dictates where it might be used in the county, Cox said. “That goes into the decision into what road will be repaved,” Cox said. “It’s what defect is present, what the traffic loads are, who the customer is, where is it, and when can we do it? All that figures into the decision along with what kind of gain in longevity will the county get in the long run.”

The fact that once the repaving recycling/paving train has passed, the project is done, also bears into its use in commercial areas. “Any time we have any lane closures or resurfacing, it has a big impact on local businesses,” Swain said. “With this process, we can collapse that lane closure right behind the machine, so they get out of the way much faster, and keeps the calls down from the businesses.”

“People don’t want us on the road,” Cox said. “Our attitude is to get in, fix it, finish, and get out. With an arterial, we don’t want to be out there every seven years. Instead we want to do the best job we can, with a process that will last, so we don’t have to disrupt drivers any further.”

The process also does not use a tack coat, which can be tracked by tires and shoe soles into parking lots and businesses.

**BETTER SERVING CUSTOMERS**

In the meantime, the combination of an effective pavement management program — combined with a quality hot in-place recycling program — is providing the county what it needs to better serve its citizen customers.

“We’ve found that if you have sound engineering science that makes sense to the average citizen, you will have a successful program,” Cox said. “If you don’t, that’s when politics get involved, because people will think that’s the only way they will get what they need. They will become very focused on where they live. Most people will not complain about an arterial, but about the local street on which they live first.

“Our program has the ability to plan projects for both maintenance treatments and resurfacing forward into years,” Cox said. “If someone calls and asks ‘what are you going to be doing in my neighborhood’, we have the ability right to check the programming right on the screen using a visual tool. You can speak to him intelligently about what fiscal year you will be there, what treatment you will use, what else you have done in the area, what you did three years ago, and what you hope to do in two years. For the most part, that’s been the key to our success with our customers; being informed, and being able to speak intelligently about what’s going on, specifically about their street.”

Adapted from information provided by Cutler Repaving, Inc.
E l Cerrito, Calif., population 23,500, is located just across the bay from San Francisco, and the hilly areas of El Cerrito provide spectacular views of its famous neighbor.

In 2004, when I came to work with the City of El Cerrito as the new public works director, I learned that the condition of our streets was a concern of my predecessor. El Cerrito had just invested about $3 million in paving projects, but the funding source for this capital work was no longer available. As El Cerrito is a relatively small city with about 68 miles of street centerline, a $3 million investment was significant.

By early 2006 we were finishing our pavement management program (PMP) update. The results were discouraging: Our system pavement condition index (PCI) was 53 out of 100 (down from 63 two years earlier), and our backlog was now $21.2 million (up from $7 million). In addition, it was going to take $1.3 million per year just to keep our PCI from falling even lower. At that time, our available funding for pavement maintenance was a measly $250,000 per year. At that rate, our PCI would drop to 44 in five years with the backlog growing to $25.5 million.

This truly was a dismal picture. We took this update to the city council in July 2006. This wasn’t something that could be ignored or minimized; it would factor into all of our capital...
improvement programming for the foreseeable future.

In February 2007, staff presented the results of a statistically valid public opinion poll to the council. We revealed that the poor condition of our streets was rated by our citizens as the highest need. We also presented some options about how to fund a major street improvement program, all while keeping in mind that the other needs would soon be considered for funding, too. Staff was given clear direction at that time to develop a funding program based on a local sales tax that would require a two-thirds voter approval.

SALES TAX INCREASE

Our mission would be accomplished in two phases: first, develop a ballot measure with a realistic improvement plan; and second, if approved, implement the plan in quick fashion.

Phase 1 had already been drafted, but we had until November 2007 to fully develop a new ordinance, a complete work plan and ballot language. We also launched a public information campaign with two goals in mind: letting the community know what our intentions were, and hearing from the community about what they would want to see in a successful ballot measure and work plan. I spent my summer making presentations to various community groups including PTAs, the chamber of commerce, our local rotary club, and anyone else who would listen. We included ourselves in every community event such as the July 4th celebration and National Night Out parties.

By November, we were ready for the council to place this measure on the February 2008 primary election ballot. We expected a large turnout and were not disappointed. All of our hard work paid off when we received a 71 percent majority in favor of our ballot measure, formally named the El Cerrito Pothole Repair, Local Street Improvement and Maintenance Measure.

Now it was time to launch Phase 2, implementation. After enjoying a collaborative team during Phase 1, I suddenly realized that Phase 2 was going to be up to “me, myself and I.”

We already had been using a consulting project manager, Avila Project Management, with experience in street paving, to help develop the work plan. Avila continued playing a critical part in the implementation phase. And for over a year we had been relying heavily on StreetSaver, our PMP software developed by the Metropolitan Transportation Commission, to develop this improvement program. With the help of Nichols Consulting, experts with StreetSaver, we “sliced and diced” our street data such as PCI and geometrics many ways to figure out a plan of attack. It was now time to produce bid documents.

ESTABLISHING PLAN

We estimated that we would not have enough funding to bring all the streets up to good condition, and we predicted that we might be able to pull our average PCI up to 70 (from 53). We also promised to perform the bulk of the “catch up” work in four years.

Year 1 (2008 construction season) was to be preparatory work only (patch paving, curb ramps) in order to give the utility companies time to complete any urgent underground work before the inevitable pavement excavation moratoria would begin. Years 2, 3 and 4 would see the actual paving work.

This was a very aggressive schedule, truly a fast-track program containing several contracts each year. Year 1 included three contracts: patch paving, curb ramps (for streets that would eventually receive an overlay or reconstruction), and a full paving project on three streets utilizing a federal STP grant. We also began developing the schedule for the 2009 projects with an eye toward years 3 and 4.

My past experience with street paving projects was in small cities with very modest budgets. I had usually relied on StreetSaver to lay out the treatments with some minor modifications based on in-house knowledge of the streets. Bid documents were usually last year’s

We resurfaced 68 percent of our streets, built over 400 new curb ramps, and replaced 50 storm drain crossings.
bid package, with a new location map attached. Full blown design documents were not the norm. With the upcoming fast track program, the same was true.

But the prep work was dependent on the future treatment, so we had to have at least a preliminary treatment assigned to each street. With 44 percent of our streets in the very poor category (PCI < 25), we were facing a huge list of streets that needed reconstruction.

**Asphalt Rubber Cape Seal**

I had been considering the virtues of the asphalt rubber cape seal ever since attending a seminar a few years earlier. The claims were fantastical: You can take a street that has extreme alligator cracking and simply apply an AR cape seal, without even the need to crack-seal beforehand. Could that be true?

Further research revealed that if the underlying structure was sound and the alligatoring was due to age and weathering instead of structural failure, then the AR cape would be an appropriate treatment. We made the decision to proceed with AR cape as a treatment for many of our broken up streets, and to patch pave the failed sections in preparation. This included about a third of our city’s streets, and the cost effectiveness helped carry our program further than we had envisioned.

Another factor in our favor was the construction market and its sagging bid prices. We consistently received bids well below our engineer’s estimates. This opened to door to have our city council authorize larger-than-normal contingency funding.

This *modus operandi* proved to be exhausting yet fruitful. As we were wrapping up the 2009 projects with significant extra work included, we decided to compress the overall schedule into a three-year program instead of the promised four years. While this would deprive us of one year’s worth of revenue (approximately $600,000), we saved more than that amount in low bid prices. In addition, we had strategically added significant grant funding into the program such as a federal stimulus grant (being shovel ready) and two CalRecycle grants for the AR cape and some rubberized asphalt concrete work.

**Hard Work Pays Off**

After only three years, the street improvement program had spent $14.4 million, with bond proceeds of $10.5 million, annual revenues of $2.1 million, with grants providing $1.8 million. With that sum we resurfaced 68 percent of our streets, built over 400 new curb ramps, and replaced 50 storm drain crossings. Our fast-track program enabled us to keep our soft costs of design, inspection and administration below 20 percent.

But the big news is the resulting improvement in pavement condition. In 2010 we commissioned Nichols (through the MTC Pavement Management Technical Assistance Program) to perform another update to our PMP and ended up with a system-wide average PCI of 85, and a backlog of only $500,000.
This exceeded our wildest expectation of success. The long term benefit of this is that our annual maintenance costs will now be a modest $500,000 per year instead of the $1.3 million we faced in 2006. The new backlog of $500,000 is basically next year’s workload, and the system average PCI of 85 is about as good as it can physically be since you don’t normally treat a street until its PCI is near 70.

The take-away for other agencies from this success is that IT CAN BE DONE. Of course, it wasn’t easy, and we were lucky in a few of our steps along the way. But I believe you make your own luck.

The city’s management team had the foresight and talent to explore options and prepare recommendations to our city council, which had the courage to move forward with a ballot measure and authorize us to move quickly and flexibly in the implementation. But most of the credit goes to the citizens of El Cerrito. They weren’t afraid to impose a sales tax upon themselves in order to make a profound difference in their community. Perhaps there are other communities out there with the character to perform a similar miracle.

Bradshaw is public works director and city engineer, City of El Cerri, Calif. Adapted from copy submitted by the Bay Area Metropolitan Transportation Commission.
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Sedgwick County, Kan. — in which Kansas’ largest city, Wichita, is located — has what could be considered to be a moderately severe climate, and the climate is complicating road maintenance.

Its hottest month is July, with an average maximum temperature of 93 deg F, and the coldest month is January, with an average minimum temperature of 19 deg F. The number of days with a temperature greater than 90 deg F is 63, and the number of days in which the minimum temperature falls below freezing is 110.

Those extremes are among the reason that the roads in Sedgwick County, in south central Kansas, have a particularly high amount of thermal cycling, making them more prone to cracking and durability problems. After doing research, in 2009 Sedgwick County officials turned to a flexible micro surfacing system as the solution.

“Sedgwick County’s climate variations played a significant role in its problem with cracking, and also in the solution,” said Richard Wenthe, senior engineering specialist for Road Science LLC. “Before treatment, the roads had moderate-to-high severity transverse cracks, and some roads had structural-related cracks. The condition of the pavement, on a scale of 0-100, ranged from 48 to 85.”

In 2009, a total of eight roads were maintained using the flexible micro surfacing system, for a total of more than 330,000 sq. yd. Transverse, longitudinal, and load-associated cracking were the predominant distresses. Transverse cracking was rated between low to high severity.

Low severity cracks were less than 1/4 in. of cracking, or a sealed crack, and high severity cracks had a mean width greater than 3/4 in., or adjacent moderate severity random cracking. The roads’ surfaces were aged HMA, chip seal, or slurry seal treatment.

‘FLEXIBLE’ MICRO SURFACING

Micro surfacing is a cold mix thin surfacing process made with high quality dense-graded aggregate, polymer modified asphalt emulsion, water and mineral fillers. It is produced and applied by a continuous or truck-mount machine which accurately mixes all the components and spreads the mix on the road. It is used as a surface treatment for preventive maintenance, filling ruts and improving skid resistance on structurally sufficient asphalt or concrete pavements.

Though rutted pavements typically have not been a problem in the United States after the adoption of Superpave designs starting in the mid-1990s, filling ruts is a benefit of micro surfacing. In addition, cracking is still a common problem, as cracks from the pavement reflect through a new micro surfacing layer in a short time, even if the cracks have been sealed.

This cracking has led to agencies asking for improvements in the process. A new process, called flexible micro surfacing, is helping to solve this problem by delaying

Improved flexibility may be able to address higher-severity cracks, and has been observed to reduce the severity of the cracks that do reflect.
The first occurrence of reflective cracking and, consequently, extending the life of the treatment.

The International Slurry Surfacing Association (ISSA) has established mix design method A-143, *Recommended Performance Guidelines for Micro Surfacing*. The mix design method incorporates a rutting test and a test for excess asphalt, which aids in determining the upper emulsion content.

According to the Minnesota Department of Transportation, there has been little research in making micro surfacing less prone to cracking. MnDOT experimented with a micro surfacing system to address crack resistance. In the research, the latex-modified emulsion used a soft-base asphalt. It was graded as a PG 48-34 instead of typical PG 64-22 and had a penetration of 163 hmm, outside the typical range of 40-90 dmm.

According to the report, the gradation was an ISSA Type II, the emulsion content was 16.5 percent, and it was laid at a thickness 32 to 53 lb/SY. After six months of service, which included a northern-climate winter, 71.2 percent of the transverse cracks reflected through, with the length of cracking reduced by 16.1 percent. All cracks were rated at low severity, and it was concluded that the treatment had a moderate effect in decreasing transverse reflected cracks.

"With flexible micro surfacing projects, the asphalt emulsion is formulated for the climate in which the project is placed," Wenthe said. "A performance additive further assists in the delay of cracking by better-distributing accumulated stresses from thermal contraction and by bridging cracks in the underlying layer."

The resulting improved flexibility may be able to address higher-severity cracks, and has been observed to reduce the severity of the cracks that do reflect. "While ISSA performance tests are performed in the mix design to test for wheel abrasion and rutting," Wenthe said, "a new test called the overlay tester evaluates the cracking potential of the modified micro surfacing system."

---

Table 1 – Pavement Condition Rating of Sedgwick County Roads

<table>
<thead>
<tr>
<th>Road</th>
<th>Single or double lift</th>
<th>CEA</th>
<th>Preconstruction PCR</th>
<th>Post construction PCR</th>
<th>July 2010 PCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>61st St. N.</td>
<td>Single</td>
<td>Yes</td>
<td>67</td>
<td>89</td>
<td>80</td>
</tr>
<tr>
<td>61st St. N.</td>
<td>Single</td>
<td>No</td>
<td>72</td>
<td>76</td>
<td>72</td>
</tr>
<tr>
<td>Webb Rd.</td>
<td>Single</td>
<td>Yes</td>
<td>70</td>
<td>90</td>
<td>88</td>
</tr>
<tr>
<td>63rd St. S.</td>
<td>Single</td>
<td>Yes</td>
<td>75</td>
<td>92</td>
<td>87</td>
</tr>
<tr>
<td>29th St. N.</td>
<td>Single</td>
<td>Yes</td>
<td>80</td>
<td>91</td>
<td>88</td>
</tr>
<tr>
<td>21st St. N.</td>
<td>Double</td>
<td>Yes</td>
<td>48</td>
<td>91</td>
<td>82</td>
</tr>
<tr>
<td>City of Viola</td>
<td>Single</td>
<td>Yes</td>
<td>72</td>
<td>94</td>
<td>86</td>
</tr>
<tr>
<td>Greenwich Rd.</td>
<td>Single</td>
<td>Yes</td>
<td>85</td>
<td>94</td>
<td>86</td>
</tr>
<tr>
<td>W. 85th St. N.</td>
<td>Double</td>
<td>Yes</td>
<td>85</td>
<td>95</td>
<td>84</td>
</tr>
</tbody>
</table>

Table 2 – Percent of crack length reflected

<table>
<thead>
<tr>
<th>Road</th>
<th>CEA</th>
<th>Predominant crack condition</th>
<th>Preconstruction crack length (yds)</th>
<th>% length reflected</th>
</tr>
</thead>
<tbody>
<tr>
<td>61st St. N.</td>
<td>No</td>
<td>High to moderate severity</td>
<td>59</td>
<td>81</td>
</tr>
<tr>
<td>Webb Rd.</td>
<td>Yes</td>
<td>High to moderate severity</td>
<td>24</td>
<td>100</td>
</tr>
<tr>
<td>29th St. N.</td>
<td>Yes</td>
<td>High to moderate severity</td>
<td>96</td>
<td>52</td>
</tr>
<tr>
<td>63rd St. S.</td>
<td>Yes</td>
<td>Moderate to high severity</td>
<td>52</td>
<td>31</td>
</tr>
</tbody>
</table>
MICRO SURFACING APPLICATION

Sedgwick County Engineer David Spears said the supplier, Road Science, provides technology-driven solutions. “They suggest things that have been tested,” Spears said. “We are interested in using what they bring us, because they know what extends the life of the pavement, and their recommendations on pavement maintenance procedures can save us money. We get better roads, and longer-lasting roads.”

The Sedgwick County project was constructed with a Bergkamp M1, with a special attachment to add the additive, which was added to the aggregate just before the pugmill. The mixture on most roads was placed at 20 to 25 lb/SY, and on two roads it was placed in a double lift at 45 lb/SY. The aggregate was a chat from Kansas with an ISSA Type III gradation, with 87 percent passing a No. 4 screen and a sand equivalent value of 77 percent. The asphalt emulsion was a latex-modified microsurfacing emulsion.

Pavement condition ratings (PCR) were conducted on the roads before, immediately after, and 10 months after construction, outlined in Table 1. The PCR is a qualitative rating, from 0 to 100, and was determined by experienced Road Science personnel based on cracking, rutting, patching, appearance, and ride quality.

In addition, transverse crack lengths were measured before construction and in July 2010. The predominant crack condition before construction and the percent of crack length reflected after 10 months for each road is shown in Table 2.

“Most of the cracks reflected through the non-additive section, and all the cracks reflected through on Webb Road, but the other sections containing additive had reduced cracking,” Wenthe said. “Though the results are mixed, they show the potential for the additive to slow the progression of cracking in microsurfacing mixtures.”

“Overall, the overlay tester demonstrated that the performance additive enabled the microsurfacing mixture to perform more cycles before failing,” said Todd Thomas, P.E., director of product commercialization for Road Science. “The creep compliance testing showed the CEA-modified mix had lower compliance, or lower strain, at an applied stress, indicating the ability to resist thermal deformation.”

In addition, the fracture energy test showed that the additive provided greater fracture resistance than mixtures without the additive, he said. “Pavement condition ratings and reflected crack length show the additive’s ability to reduce crack growth,” Thomas added. “However, the severity of this project’s cracks was probably greater than in a typical microsurfacing application. More comparisons should be performed on roads with lower levels of crack severity.”

Edited from material provided by Road Science LLC
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Today is an exciting and momentous time for the National Center for Pavement Preservation with many new initiatives underway, foremost among them the creation of the new Florida Pavement Preservation Council.

The FPPC is a partnership of farsighted agency, industry and academic professionals focused on the promotion of pavement preservation principles through education and training. The council’s efforts are being supported by the National Center for Pavement Preservation (NCP) at Michigan State University, which is a nonprofit group led by a team of seasoned practitioners whose mission is to advance pavement preservation through outreach, technical transfer, research and partnership building. NCPP’s Chuck Williams will help coordinate these efforts for the FPPC.

FPPC’s primary objective is to provide Florida local government agencies with ongoing educational workshops through the NCPP. The council is resolute in advocating high quality preservation treatments, properly applied by competent contractors. Furthermore, the council firmly adheres to the standard and ethics of honesty, integrity, quality, dedication, inclusiveness and highly developed competency.

Advancing these following goals is paramount for FPPC:

- Promote the implementation and benefits of pavement preservation principles through training and education throughout Florida
- Provide recommended regional specifications and guidelines for pavement preservation techniques in Florida, and
- Foster beneficial technology transfer between academia, industry, and agencies.

Since its establishment in 2003 by Michigan State University and the Foundation for Pavement Preservation, now FP², Inc., the NCP has worked closely with industry partners and pavement professionals at the federal, state and local level to promote the benefits of employing a network level, long-term pavement preservation strategy to extend pavement life. Pavement preservation is a cost-effective alternative to the traditional reactive or “worst first” approach commonly used by many agencies.

To this end the NCP has conducted training for both agency and industry personnel throughout the United States, and believes that ongoing, quality training is the cornerstone of a successful pavement preservation program, and absolutely essential for ensuring proper project selection and quality application.

Affiliation with a major accredited university allows the NCP to offer Continuing Education Units (CEUs) for Florida participants through Michigan State University, and to be an approved Continuing Education Provider recognized by the Florida Board of Professional Engineers.

Recognizing the budgetary constraints facing most local agencies, the Florida Pavement Preservation Council has proposed funding all training classes during the first year of this initiative. To achieve maximum exposure, every public road and street agency in Florida is invited to participate in planned regional workshops. Thereafter, training will be offered at very affordable prices to the agencies.

The FPPC is building momentum and generating increased support among like-minded companies and agencies committed to providing quality pavement preservation products and services. By actively promoting the benefits of pavement preservation strategies and the use of properly timed and applied treatments through quality training and outreach, agencies will be able to clearly demonstrate how their network pavement conditions and performance can be enhanced.

We hope you will agree that the FPPC initiative offers a winning combination for agencies and industry alike.

To become involved we invite you to contact ncpp@egr.msu.edu or Chuck Williams at Chuck.Williams@kisingercampo.com. For more information about the Florida Pavement Preservation Council visit http://bit.ly/floridappc.

Galehouse is director, National Center for Pavement Preservation, Okemos, Mich.
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New Resources Support Asset Management

An assortment of new resources on asset management has become available, and these new products may make agency practitioners’ jobs a little easier. Here’s an overview of these new publications.

• *Driving Asset Management Through Performance: Culture Change and Proven Results at the Missouri Department of Transportation*, by Qiang Joshua Li, University of Delaware.

This featured article in the September-October 2010 *TR News* explores how the Missouri DOT has achieved significant improvements in pavement and other assets by implementing a performance management approach which is data-driven, results-focused, accountability-based, and incorporates asset management practices. The system also offers flexibility to adapt to customer needs and to an uncertain funding environment. Read the complete article at http://onlinepubs.trb.org/onlinepubs/trnews/trnews270AssetManagement.pdf.

The article is one of many on asset management for transportation agencies contained in the September-October 2010 issue of *TR News*, the theme of which is Asset Management for a Durable Infrastructure: Practical Perspectives. In addition to the Missouri article, the issue includes:

• Asset Management at Work: Practical Perspectives on an Evolving Strategy
• Asset Management to Improve Highway Performance: Lessons from North Carolina and Tillamook County, Oregon
• Local Communities Adopting Asset Management: Initiatives, Models, and Results in Michigan and Wisconsin
• Visualization of Transportation Assets with Geobrowsers: Cost-Effective Tools for Exploration, Interaction, and Decision Making
• Research Pays Off: The Right Fix at the Right Time

Review the issue at: www.trb.org/Publications/Blurbs/TR_News_SeptemberOctober_2010_Asset_Management_for_164244.aspx


This new guide from the American Association of State Highway & Transportation Officials aims to encourage agencies to address strategic questions as they confront the task of managing the surface transportation system.

To be released in February 2011, and drawn from both national and international knowledge and experience, the AASHTO document provides guidance to state DOT decision makers, as well as county and municipal transportation agencies, to assist them in realizing the most from financial resources now and in the future, preserving highway assets, and providing the service expected by customers. *Part One* focuses on leadership and goal and objective setting, while *Part Two* is more technically oriented.

This document is also available in web-based, subscription format. This format offers instant access to the publication without a need to first install it on an end-user computer, plus Google-like search capability and fully integrated index, with searching many times faster than on PDFs, ability to generate comments and questions to a shared location, ability to link in and link out to supplement information and materials, such as webinars, videos, software, other web sites, or portals, single-user and multi-user access, and product distributed as an annual subscription.


• *MDSHA Guide to Pavement Preservation* by the Pavement and Geotechnical Division of the Office of Materials Technology, Maryland State Highway Administration, August 2010.

The purpose of the Maryland SHA Guide is to assist agents in the selection of pavement preservation and maintenance treatments, and is intended to be used by MDSHA pavement and geotechnical engineers and by district personnel (project development teams, maintenance and construction sections).

This guide will assist in determining “the right fix for the right road at the right time” when used in conjunction with network-level and project specific data. Step-by-step instructions on determining treatment options are provided through the use of flow charts, decision trees and treatment tables.

Any questions or comments regarding this guide may be directed to Paulo DeSousa, PE., Pavement and Geotechnical Division assistant chief, MDSHA, pdesousa@sha.state.md.us.
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Artificial Neural Networks May Help Predict Roughness

By Nima Kargah-Ostadi, Shelley M. Stoffels, and Nader Tabatabaee

Following is a summary of the peer-reviewed paper, Network-Level Pavement Roughness Prediction Model for Rehabilitation Recommendations, presented at the 89th annual meeting of the Transportation Research Board, Washington, D.C., January 2010.

Pavement performance models are key components of any pavement management system (PMS). Change in pavement surface roughness over time is one of the most important performance indicators in this regard.

Studies have been conducted regarding roughness progression trends and factors affecting them. However, the need for a simpler and more efficient empirical model to use in network-level PMS still is an ongoing pursuit of the pavement engineering community. In this study, a model for changes in the International Roughness Index (IRI) over time was developed using information from the SPS-5 asphaltic concrete rehabilitation experiment extracted from FHWA's Long-Term Pavement Performance database.

Previous studies have shown that due to the large number of variables and the complex ways in which they affect one another, use of simple statistical approaches such as linear regression does not seem to be an appropriate means to develop pavement roughness prediction models. Hence, it is recommended that other approaches including pattern recognition techniques such as Artificial Neural Networks (ANN) be undertaken.

The ANN Model testing results in this study indicated prediction of IRI with minimal errors. Moreover, predicted future roughness trends matched perfectly with the past performance. These findings indicated that the ANN model performs successfully in predicting IRI trends following each kind of treatment in SPS-5 experiment. While the model performed well for the test data set and may be applied for similar conditions, it might not perform the same way on other databases. Hence, it is recommended that data from each PMS database be used in order to train agency-specific ANN performance models before implementing them in the decision making process of that PMS.

The predicted IRI trends illustrated that thick overlays outperform thin overlays regarding roughness performance. These trends also indicated that there is not much difference between the performance of rehabilitation treatments with or without milling, as it was expected based on the results of preliminary stepwise regression. These findings agree with previous studies on the roughness progression of SPS-5 pavements.

An example illustrated the implementation of the roughness model along with Life-Cycle Cost Analysis in making future pavement rehabilitation recommendations. It was shown how an IRI model can be used in order to determine when treatments are
required and what the performance trend is going to be after each kind of rehabilitation treatment. Based on an IRI trigger value of 1.42 m/km, the number of rehabilitation treatments and the roughness trend following each scenario in the example section 0509 of Manitoba SPS-5 site has been indicated in Figure 1.

Table 1 shows that thick overlay with milling has the least life-cycle cost. It should be noted that for the purpose of simplicity, other important factors such as user costs, social factors and environmental impacts are not considered in the above analysis. Inclusion of any of those factors might change the ultimate decision dramatically. For example, alternatives with milling might impose higher user delay costs due to excessive change in traffic patterns for longer construction periods and therefore, thick overlay without milling might be recommended instead.

This example shows that the detailed model development and implementation framework provided in this study can productively assist in network-level PMS decision making.

Kargahi-Ostadi is a Ph.D. candidate, Department of Civil and Environmental Engineering, Pennsylvania State University, State College, Pa.; Stoffels is associate professor, Department of Civil and Environmental Engineering, Pennsylvania State University, University Park, Pa.; and Tabatabaee is associate professor, Department of Civil Engineering, Sharif University of Technology, Tehran.
In November, FP², Inc., presented its James B. Sorenson Award for Excellence in Pavement Preservation to the County of Rockland, N.Y.

“Rockland County has always looked to advance the concept of pavement management and preservation to reduce costs and provide quality services for the residents of our county,” said Andy Connors, county engineer.

Rockland County instituted its pavement management and preservation program in 2001. Agency staff was charged with tailoring an integrated approach using engineering and operations personnel to recommend the “right treatment to the right road at the right time.”

The county developed a program in which roads were to be resurfaced within a 7 to 10-year cycle, utilizing oil-and-chip, hot in-place recycling, cold milling for overlays, microsealing, and micro milling. The program was planned to increase the total area treated utilizing those pavement preservation applications, while decreasing the frequency, to ultimately increase the usable life of the pavement and decreasing the cost per square yard of ownership, the county said.

The results: the percentage of roads rated excellent increased from 27 percent in 2000 to 97 percent in 2008, while those rated poor (31 percent) or failed (16 percent) in 2000 declined to zero in 2008. To help ensure public buy-in the county also created a Reverse 911 recorded call system to notify residents of upcoming road work in their area. It also worked with local news media, for example, cooperating in an article on how the county saves $1 million by hot in-place recycling appropriate road surfaces.

Intended to recognize agency pavement preservation programs, the award is usually, but not always, presented to city and county agencies. Please consider submitting entries for the next Sorenson Award. The nomination should include:

- **A brief write-up** of how the agency gained acceptance and support for its pavement preservation program; how long the program has been in existence, any special or unique public awareness actions; press releases; the contact person in the agency; and the person or firm making the nomination.

- **Criteria to evaluate** candidate agencies include: process used to gain acceptance by elected officials, general public, employees, and industry (40 percent); how well the program relates to the theme of The Right Treatment, for the Right Road, at the Right Time (20 percent); tangible improvement in their system (20 percent); techniques used to keep public notified of what is being done and why (10 percent); and uniqueness of program (10 percent).

The selection committee consists of five FP², Inc. directors. Nominations are to be submitted to FP² by July 1, with evaluation and selection completed by Sept. 1 in advance of FP²’s annual meeting, where it will be presented. The award can also be re-presented at the annual convention of an appropriate association and at the appropriate National Association of County Engineers or American Public Works Association meetings if possible.

Any presentation by the recipient will be reviewed and approved by FP², Inc. prior to the annual meeting. For more information, or to submit nominations, please contact FP²’s executive director, Jim Moultthrop, at 7400 Anaqua Drive, Austin, Texas, 78750, or e-mailed at jimmoulthrop@gmail.com.
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To counteract the effects of a shrinking maintenance budget, Texas DOT organized the PEER Review Project at the Center for Transportation Research in the Austin District.

The intention of this project was to find more creative means to achieve optimum system performance. Goals were to provide TxDOT with an assessment of TxDOT maintenance practices, identify potential areas for improvement, and understand best practices used in other states and evaluate their applicability to Texas.

Directors of maintenance from six peer states participated in the review process. They were Steve Takigawa, Caltrans (member four-state consortium; heavy freight traffic; high traffic volumes; climatic regions; urban networks); Roy Risky, Kansas DOT (strong public involvement in establishing maintenance level of service; uses tiered goal system; excellent system management); Eric Pitts, Georgia DOT (excellent pavement system condition; tied third nationwide for pavement conditions, per Overdrive Magazine 2008); Jim Carney, Missouri DOT (strong public involvement; significant network improvement; ranked fifth nationwide in pavement conditions, per Overdrive Magazine 2008); Jennifer Brandenburg, North Carolina DOT (large highway network; uses tiered goal system; implemented Agile Assets MMS); and David Bierschbach, Washington State DOT (member four-state consortium; excellent PMS/MMS).

A three-day workshop revolved around five key focus areas, Maintenance Planning Process, Maintenance Practices at both the state and district levels, Four-Year Pavement Management Program Development, Maintenance Performance Measurement and Reporting and Funding Allocation at both the state and district levels.

Before arriving at the workshop the participants were given an information packet consisting of a one-page overview of Texas’s highway network and maintenance program, a summary of TxDOT’s maintenance funding allocation process and formulas, the TxCAP (including TxAsh, TxTAP, and PMIS), the four-year pavement management plan, and TxDOT’s maintenance contract practices. This packet was provided in hopes that the workshop would capture the expert opinions of the peer state reviewers on TxDOT’s maintenance program and practices.

On Day 1 of the workshop, director of CTR, Dr. Randy Machemehl, welcomed the peer state reviewers, and David Casteel from TxDOT highlighted the purpose of the peer review and the workshop. There were presentations on Texas Highway Network and Maintenance Program (Toribio Garza), TxAsh, TxTAP and PMIS Overview (Neal Munn, Brian Stanford and Jeff Seiders), Maintenance Funding Allocation Process and Formulas (Tammy Sims) and on Maintenance Contracts (Bob Blackwell).

Day 2 was the Road Rally, the purpose of which was to ask the peer state reviewers to rate certain road sections on several characteristics on a scale of 1 to 5, indicating if the section met expectations with reference to pavement condition, traffic operations, roadside condition and overall condition of the section. The rally was followed by a discussion on the general observations, potential areas for improvement, and recommendations, which was held at the Austin District office.

On Day 3 the peer state reviewers provided comments on several different aspects of the maintenance program. Using the initial information provided they were able to critically assess the entire process and provide comments based on their experiences at their respective state DOTs. The discussion session was followed by a facilitated consensus meeting on ratings, which asked the peer reviewers to share their answers to the prepared questionnaire booklet. The answers in the form of rating and comments were provided by the reviewers during the course of the workshop and were collected at the end of the workshop.

The comments and further discussions throughout the workshop have been compiled into a PEER Review Project Report. The report will be available at CTR’s webpage after the review process has been completed: download it at www.utexas.edu/research/ctr/.

Yildirim is director, Texas Pavement Preservation Center, Austin
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The ‘New’ Rocky Mountain West PPP

By Lloyd Neeley, P.E.

The Rocky Mountain Pavement Preservation Partnership has expanded to become the Rocky Mountain West Pavement Preservation Partnership (RMWPPP). And the change is not just a longer name, it’s a change in the geographical extent of the partnership.

At its annual meeting in Boise Oct. 19-21, the partnership added the states of Nevada, California, Washington, Hawaii and Montana, bringing the total membership of states to 13.

Besides adding states, the partnership reorganized its leadership, and refocused and expanded the work of its task forces. Three task forces are now operating within the RMWPPP, including:

• Promoting the Pavement Preservation Concept
• Terminology, Definitions, and Communication
• Standard Guidelines for Chip Seal Materials.

Attendance at the meeting in Boise was encouraging, with 11 of the 13 member state agencies participating. Not bad considering the state of the economy. But economic hard times only underscore the need for wise management of important infrastructure assets such as pavements. Thus, the need for pavement preservation programs, and for participation in the regional partnerships, is larger than ever.

Therefore we encourage all involved in pavement preservation in any way within the western states, including state highway agencies, local governments and metropolitan planning organizations (MPOs), suppliers, contractors, academia, and others, to get involved in the partnership.

We especially want to encourage wider participation from local governments and MPOs. Involvement means more than coming to the meetings, although that’s a very large part. It means helping out on task forces, vocalizing ideas, and sharing your talents and knowledge with other members of the partnership. State agency participants also need to encourage the full participation of their agency, which includes payment of the annual TSP•2 voluntary contribution to AASHTO.

The RMWPPP is planning its next meeting for Oct. 4-6, 2011, in Reno. I am hoping for a large turnout of enthusiastic pavement preservation professionals. As more details become available, they will be posted on the RMWPPP website at www.tsp2.org/rmwppp, or you can contact me at Neeley@utah.gov, or Larry Galehouse at the National Center for Pavement Preservation at galehou3@egr.msu.edu.

Come and join us, you won’t regret it!

Neeley is deputy maintenance engineer, Utah DOT, and RMWPPP chair for 2010-2011
The Silverado Trail is a scenic two-lane road that runs for 29 miles along the eastern edge of the Napa Valley in northern California. It is a high-profile road for Caltrans because some 40 wineries along the Silverado Trail attract thousands of tourists each year.

At the southern end, in the town of Napa, a 10-year-old asphalt overlay on the road was showing signs of wear over a 2.9-mile section. There was minor cracking, some raveling, and a few areas required full-depth asphalt patching. But for the most part the road was in good shape; it was structurally sound.

To preserve the road and extend its life, Caltrans turned to a process it has used often, an ultra thin bonded wearing course. Minimal milling is required. In this process, a Roadtec SP-200 paver sprays a tack coat down just in front of the spreading augers, and the screed levels off a 3/4- to 1-in.-thick layer of open-graded hot mix.

**PREVIOUS EXPERIENCE**

On State Highway 50 between Placerville and South Lake Tahoe, an ultra thin bonded wearing course lasted seven years, said Brian D. Toepfer, maintenance engineer, Caltrans. “I think it [performs] better than a mill-and-fill, and it is a lot less expensive.”

On the Silverado Trail, the Construction Division of Telfer Oil, Martinez, Calif., used the specially-equipped paver to spray down a heavily polymer modified emulsion at a rate of 0.17 to 0.20 gallon per square yard. “The emulsion is similar to a PMCRS-2H emulsion, which is a standard chip sealing emulsion,” said Karl Meyers, general manager of Telfer’s Construction Division.

The paver followed the emulsion with a 7/8-inch thick layer of open-graded hot mix made with PG 64-16 liquid asphalt that was modified with crumb rubber. The target value for binder content was 8.5 percent, and the top-size aggregate in the mix was 3/8-inch. It also contained a small amount of sand.

Static compaction with two double-drum rollers followed the paver. “You have to run two rollers because you need to hit the temperature range on compaction, which is 180 to 280 deg F,” Meyers said. “That thin lift behind the screed is cooling fast, and you want to release the road to traffic quickly. Plus, the paver is moving at 70 to 100 feet per minute, so you need to run two rollers behind.”

**ADVANTAGES TO WEARING COURSE**

The process has a number of advantages, Meyers said. “You are not getting any tack coat dragged around the city, you get an outstanding bond with the hot mix, you are forming a waterproof membrane, there is no water splash and you can release the road quickly to traffic,” he said.

“The open-graded mixture really reduces the water splash in traffic,” Meyers added. “Another advantage is that when the emulsion wicks up into the hot mix asphalt, it cools the pavement down right away. So even though our Silverado Trail project was done at night in high traffic, we were able to release intersections to the public in 15 minutes.”

In 2010, Telfer Oil alone placed upwards from 3 million square yards of ultra thin bonded wearing course in states throughout the west. In 2009, the figure was 5.6 million square yards. “In 2011, we think that we will hit 5 million square yards again, and we have half that in our backlog already,” Meyers said. “We see it growing exponentially.”

Ultra Thin Wearing Course Serves California’s Silverado Trail

By Daniel C. Brown
Why? Meyers said Telfer has been placing these wearing courses since 2001. He said Caltrans has analyzed how well the product is working, and that the state is getting the same life expectancies — or more — with the ultra thin bonded process as with conventional overlays, while consuming a lot less material.

The rubberized hot mix for the 2.9-mile project on Silverado Trail cost $295,000 and the emulsion membrane cost $22,000, for a total of $317,000, said Danilo Patenia, Caltrans resident engineer. By contrast, a 2-in. mill-and-fill would cost $296,000 per mile, for a total of roughly $888,000, so the ultra thin wearing course represents a savings of about $197,000 per mile.

Also, the process saved the time and traffic disruption that mill-and-fill would have required. “It was through the town of Napa, so there were a lot of intersections and driveways and curbs and gutters,” Patenia said. “So we would have had to grind it first before we could give it a 2-in. overlay. Compared to grind-and-pave, this is faster. You eliminate the grinding of both lanes.”

USE SUITABLE PAVER

Using the right equipment is important with the bonded wearing course. And while the Roadtec SP-200 paver is good for a slower-moving urban project like the Silverado Trail, it is also built for high-production work with the bonded wearing course.

The machine holds 2,100 gallons of emulsion, and it can pave at more than 100 feet per minute. “Under the right conditions we can average 350 tons per hour, and that is really excellent productivity,” Meyers said. “To achieve that tonnage the paver has to really move because the bonded wearing course is typically placed at just 3/4 to 7/8 of an inch thick.”

The spray bar on the Roadtec paver is specially designed by BearCat Manufacturing Co., which specializes in such systems. The emulsion pump speed and rate of application are automatically controlled by a computer that gauges ground speed of the paver and width of application.

Eric Baker, Roadtec marketing manager, said the paver has two spray bars that overlap to cover various paving widths up to 20 ft. wide. Each bar can cover 10 ft., so when paving 10 ft. wide, only one bar comes on. When paving 20 ft. wide both bars come on. For widths between 10 and 20 ft., one bar only has some nozzles on.

Achieving good density is also important with the bonded wearing course, because it cools so quickly. On the Silverado Trail and other projects, Telfer Oil uses a Roadtec SB2500 Shuttle Buggy to receive hot mix from the trucks, remix it, and load the paver. The remixing function helps assure that the material reaches the paver at a uniform temperature, Meyers said. “You eliminate the cold spots, the cold corners from the truck, and any cold skin that you get on top of the load. That really helps with your density and compaction.”

Caltrans’ Toepfer said he likes the ultra thin bonded wearing course because you can open it to traffic quickly. “It is hard, it seals the pavement itself so that you don’t get water seeping into the base, and you don’t get roadway pumping,” he said.

Daniel C. Brown is the owner of TechniComm, a communications business based in Des Plaines, Ill.
rent Burwell, executive director of the Oklahoma/Arkansas Chapter of the American Concrete Pavement Association, was recognized with the International Grooving & Grinding Association’s highest honor, the Concrete Pavement Restoration Promoter of the Year Award.

Each year, the award recognizes an individual or company for exemplary efforts towards promoting diamond grooving, grinding and CPR, and Burwell’s was awarded for the year 2010.

Burwell was honored at IGGA’s annual awards banquet, held in Bonita Springs, Fla. on Nov. 29. The program honored individuals and companies or organizations for their lasting contributions made to the grooving, grinding and concrete pavement preservation/restoration industry.

OKLAHOMA/ARKANSAS CHAPTER

Since 1989, the ACPA Oklahoma/Arkansas Chapter’s main focus has been on developing markets for new pavements and pavement rehabilitation. The state of Oklahoma, especially, has a long history of CPR work. According to Burwell, the Oklahoma/Arkansas Chapter embraced dowel bar retrofit technology early on and has had a lot of success.

“This award is a reflection of the industry,” said Burwell. “It takes good contractors, engineers and suppliers, along with the willingness of the DOTs to support the technology and put these jobs out there.”

According to IGGA executive director John Roberts, since 2002, 34 projects have been let in Oklahoma that have been a combination of CPR, DBR and diamond grinding. To date, of the 5.5 million retrofits recorded, 867,841 of them have been through the Oklahoma DOT.

The Operator of the Year (Iron Man) Award was presented to Frank Davidsson, of Vag & Trafikarbeten SVT AB of Sweden. This award recognizes the men and women who work in the field for their leadership, with special emphasis on his/her dedication to quality and getting the job done right.

Davidsson started his working life in a quarry as a boy of 14. In 1970, Davidsson was one of two men that started Vag & Trafikarbeten, and their main focus was concrete and asphalt repair. In 1981, he helped develop a grooving machine that is in use today.

Also, the Minnesota DOT was selected as the Government Official of the Year, for its efforts in implementing the first Next Generation Concrete Surface (NGCS), which was installed on a stretch of I-35 in Minnesota.

The NGCS is innovative because it is different from a typical grooved surface. It contains diamond saw-cut surfaces that are designed to provide a consistent profile absent of positive or upward texture; it’s a uniform land profile design with basically all negative texture. These textures can be used for both new construction and rehabilitation of existing surfaces.

NEW OFFICERS, DIRECTORS

Separately, IGGA announced its new board members and the slate of officers for the 2011 year.

The IGGA president is Pete Lewis of Penhall Company, Rogers, Minn. With more than 30 years of experience in the highway and concrete paving and concrete pavement restoration industry, Lewis has expertise in concrete pavement, dowel bar retrofit, joint sealing and CPR. Following the acquisition of his own company by Penhall, he has been the regional manager at Penhall and is responsible for all national contracts with preservation groups.

New IGGA vice president is Alex Ugalde, Hilti North America, Tulsa. Secretary is Tom Bonness, Jr., of CPR, Inc., Elkhorn, Wis.; treasurer is Scott L. Eilken of Quality Saw & Seal, Bridgeview, Ill.; immediate past president is Jenne Imholte-Decker, Simplex Construction Supplies, Minneapolis; new director is Jerry Voigt of ACPA, Rosemont, Ill.; and international director is Charley Grady, Crafco, Inc., Chandler, Ariz.

The International Grooving & Grinding Association (IGGA) is a non-profit organization dedicated to serving as the leading promotional and technical resource for acceptance of diamond grinding and grooving, as well as pavement preservation and restoration markets.
Plan now to attend the National Conference on Pavement Preservation in Nashville in August 2012. Following on the success of the First International Conference on Pavement Preservation in 2010, the 2012 conference aims to bring together pavement practitioners and technical experts in pavement preservation to discuss critical issues, concerns and exchange ideas. It will also be the first time all four AASHTO regional pavement preservation partnerships will come together in one national event.

Main focus areas will include:

- Pavement Preservation Best Practices
- Pavement Preservation in an Asset Management World
- New Materials, Equipment, Technologies and Research
- Sustainability (Financial, Environmental and Social)
- Pavement Preservation Academic and Training Curricula
- AASHTO TSP•2 Pavement Preservation Partnerships, and
- Field demonstrations of pavement preservation treatments.

FP2, Inc., is partnering with the National Center for Pavement Preservation (NCPP) to organize and deliver this conference. More information, including final dates, will be forthcoming soon at www.pavementpreservation.org/2012nationalppconference.

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**Calendar of Events**

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