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*Source: AASHTO & TRIP. 2009. Rough Roads Ahead. Fix Them Now or Pay For It Later
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Winter 2009, Vol. 3, No. 2

On the Cover: Forces of Los Angeles place rubberized slurry seal on residential street

Photo Credit: Tom Kuennen

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As Preservation Booms, FP² Sets New Goals

PAVEMENT preservation has made tremendous progress in recent years, and today with the lack of funding for highways and roads it is even more important. Only accepted preservation practices can prolong pavement life — keeping pavements usable — until the day that today’s funding crisis is resolved.

Now, many agencies have adjusted their programs to focus on pavement and bridge preservation only, and have virtually no or very little money for additional capacity or rehabilitation. In these very difficult economic times, when almost every sector has seen sharp downturns in business, pavement preservation is thriving.

From time to time, every enterprise must evaluate its goals and achievements. The Foundation for Pavement Preservation (FP²) — publisher of the magazine you hold in your hands, Pavement Preservation Journal — has gone through several such adjustments since its inception.

Each time we’ve gone through this self-examination and redirection it’s come about because long-term goals were met. Today — with the National Center for Pavement Preservation (NCPP) and California and Texas pavement preservation centers established, and the state partnerships on firm ground — we are moving on to our next big challenge.

I am very pleased to announce FP²’s latest adjustment in addressing the needs of our industry, as it adopts a new corporate structure. The Foundation for Pavement Preservation is now FP², Inc. Specifically we are changing from a 501 (c) 3 charitable organization to a 501 (c) 6 trade association.

Jim Moulthrop has accepted the position of executive director of this new association, and a new board of directors will be elected very soon.

We have a new mission statement: “Advocating national policies, promotional activities, and research programs that advance pavement preservation.” With this we have recognized that we need to concentrate on getting our message heard by the policy makers, as well as elected officials. We have commitments from our supporters that will likely more than double our annual revenue, and already have secured a Washington firm, Williams & Jensen, to represent the interests of pavement preservation in the combative Beltway arena.

To support this effort we’ve developed materials on the benefits of pavement preservation for congressional meetings, and developed language for a separate pavement preservation program that can be included in the coming surface transportation reauthorization bill, whenever it comes.

This is critical because every indication is that the next program reauthorization will be — in the words of the secretary of transportation, the House Committee on Transportation and Infrastructure, and the chairman of the Senate Committee on Environment & Public Works — a transformative or transformational bill, code words to describe a bill that will transform the federal surface transportation program to one that will vigorously support an environmentally sustainable transportation program.

Against this backdrop we have to make sure that pavement preservation is seen as a major player in building that environmentally sustainable surface transportation system.

In advance of this radical change, if it comes about at all, Congress and the administration are struggling with the long-term underfunding of surface transportation. Like the last reauthorization, which was passed after a record 12 funding extensions, extensions of the SAFETEA-LU, the current law, are under discussion. In the meantime, new revenue streams must be found to support the greatly increased funding levels that are necessary to bring our system up to par.

Regardless of how these extensions shake out, and at what time the next surface transportation bill is passed into law, FP² will be working hard on getting the proper language to support pavement preservation.

This new FP² is a membership organization. I hope everyone who is concerned with the preservation of our roads and highway will join us in supporting our efforts to increase awareness of the need to preserve our national infrastructure, especially as surface transportation reauthorization looms.
Your existing roadway is worth more today than what it cost originally—don’t you wish all of your assets behaved this way? Give us a call at Gallagher and we’ll explain how Hot-in-Place Recycling can extend your resurfacing budget by completely rejuvenating your old roadway surfaces to good-as-new condition.

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The program for the First International Conference on Pavement Preservation — to be held in Newport Beach, Calif., April 13-16, 2010 — has been released, and preservation of both flexible and rigid pavements will be featured.

The ICPP will bring together researchers and experts working in the field of pavement preservation to exchange ideas, share best practices, and discuss critical issues and concerns impacting the implementation and success of the preservation philosophy.

The conference is sponsored and co-organized by Caltrans, the Federal Highway Administration (FHWA) and the Foundation for Pavement Preservation (FP2). Other agencies participating in the planning of the conference include the California Pavement Preservation (CP²) Center, the National Center for Pavement Preservation (NCP²) and the University of California, Berkeley. Other associated conference sponsors include the Transportation Research Board (TRB), the American Public Works Association (APWA), National Association of County Engineers (NACE) and the International Road Federation (IRF).

The 2010 ICPP has been scheduled in beautiful Southern California during the same time frame as the historically-successful CP² Conference, and attendees from Caltrans and local governments are expected to attend, along with a multitude of researchers and practitioners from around the nation and the globe. If you are involved with pavement preservation anywhere on this planet, the ICPP will be the best place to be in April 2010!

Organizers are inviting bids for a location for the second international conference to be held in 2014. Proposals for this event are due by Feb. 1, 2010, and the successful bidder will be announced at the conference in April.

The main theme of the conference will be pavement preservation and sustainability. The conference will address an array of issues relevant to the pavement preservation community.

Following is a look at the preliminary program. Nearly 50 papers were received and are included in the program, which consists of peer-reviewed papers and selected invited presentations. The presentations are expected to take place on April 13-15, with field trips or demonstrations scheduled for April 16.

When available, the final program will be found on the conference web site at www.pavementpreservation.org/icpp/.

There you will find more information, including exhibition and sponsorship opportunities, and a very special program for spouses. Registration information for the conference and the hotel information also are available on the conference web site, or contact conferences@techtransfer.berkeley.edu.

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**2010 ICPP PRELIMINARY PROGRAM**

**TUESDAY, APRIL 13**
8 a.m. ............................................. Conference Registration
8 a.m. – 5 p.m. ................................. EXHIBIT HALL OPEN
9 – 10 a.m. ..................................... Spouse Program: Ice Breaker
8:30 a.m. – 12 p.m. ......................... WELCOME TO
                              THE FIRST ICPP
                                Shakir Shatnawi, conference
co-chair, and state pavements
engineer, Caltrans

**KEYNOTE LECTURES**
Randall Iwasaki, director of
Caltrans; Peter Grass, president,
The Asphalt Institute; and
others to be invited from
FHWA, ACPA, and FP.

12 – 1:30 p.m. ......................... LUNCH
1:30 – 5 p.m. ............................... 1ST PLENARY SESSION
Invited presentations on
Pavement Preservation
Solutions for Sustainability

5 – 7:30 p.m. ............................. OPENING RECEPTION

**WEDNESDAY, APRIL 14**
8 a.m. – 5 p.m. ............................. EXHIBIT HALL OPEN
8:30 a.m. – 12 p.m. ................. PARALLEL SESSIONS
SESSION 1
DECISIONS, DECISIONS,
DECISIONS
Topics will include funding
solutions for decision makers,
performance-based decision
approaches, variable condition
decision-making techniques,
surface treatment selection for
restricted budgets, pay-now or
pay-later aspects of treatment
selection and performance-
specified maintenance
contracting.

SESSION 2
FLEXIBLE PAVEMENT
PRESERVATION TOOLBOX
Topics will include bonded
surfaces, slurry seals, chip seals
over fabrics, rejuvenator basics,
crack sealing and thin overlays

12 – 1:30 p.m. ......................... LUNCH
1:30 – 5:00 p.m. ................. PARALLEL SESSIONS
SESSION 3
PAVEMENT MANAGEMENT
FOR PAVEMENT PRESERVATION
Topics include remaining
life analyses, web based
management systems, examples
of agency programs for
pavement management for
pavement preservation, whole
life analyses, life cycle cost

**SESSION 4**
RIGID PAVEMENT
PRESERVATION TOOLBOX
Topics include ride and
noise reduction benefits of
rigid pavement preservation
techniques, sustainable
preservation techniques
for cold weather pervious
concrete, and comparative
processes for assessing rigid
pavement preservation
treatments

6 – 9 p.m. .............................. CONFERENCE BANQUET

**THURSDAY, APRIL 15**
8:30 a.m. – 12 p.m. ................. PARALLEL SESSIONS
SESSION 5
SELECTING MATERIALS
FOR EXTENDING PAVEMENT LIFE
Topics will include field
performance of new materials,
environmentally-based selection
of emulsions, and influence
of crack sealants, thin surface
treatments and overlays on
pavement life.

SESSION 6
CASE STUDIES AND
INTERNATIONAL
PRESERVATION PROGRAMS
Topics will include the
introduction of selected
international programs in
pavement preservation as well
as successes and failures of
pavement preservation projects.

12 – 1:30 p.m. ......................... LUNCH
1:30 – 4 p.m. ............................... 2ND PLENARY SESSION
Invited presentations on
promoting benefits and
implementation

4 – 5 p.m. ............................... CLOSING CEREMONY
Conference summary, awards
and next conference

**FRIDAY, APRIL 16 (OPTIONAL)**
10 a.m. – 4 p.m. ............................... POST-CONFERENCE:
DAY TRIP TO LOCAL AGENCY PROJECTS or DAY TRIP TO DISNEYLAND
Separately ticketed; please see web site for details
Pavement Preservation Had No Greater Friend Than Jim Sorenson

Jim Sorenson, senior construction and system preservation engineer, Office of Asset Management, Federal Highway Administration — and a great champion of pavement preservation at the national level — died suddenly Saturday, June 27, at the age of 59.

The pavement preservation industry had no greater friend and it is with deep sadness that the Foundation for Pavement Preservation notes his passing.

Mr. Sorenson passed away at a rehabilitation facility in Falls Church, Va., as he recovered from a scheduled surgery earlier that month. True to form, he was moved to the rehab center and immediately began calling his staff and leveraging federal funds.

He is survived by his three daughters, Dana, Jamie and Amber, and 12 grandchildren.

He was born in Montana on July 28, 1949, and received a B.S.C.E. in 1976 from Montana State University at Bozeman, where he had worked as an engineering assistant to the city engineer following four years in the Vietnam War.

Mr. Sorenson worked in several FHWA field and headquarters offices, culminating in his position in the Office of Asset Management, where he traveled the country promoting pavement preservation to state and local road agencies, when he was not leading the effort to fund pavement preservation at the national level. There he was responsible for technical assistance, policy development and research guidance in the areas of construction and maintenance operations, transportation system preservation, asset management and FHWA’s external Quality Management Program.

Following are reminiscences of Jim Sorenson by his comrades in the pavement preservation industry.

THE JIM SORENSON I KNEW

I knew Jim since the early 80s, when he was stationed with the Federal Highway Administration in Portland, Ore., and I felt a great loss with his passing. Jim meant a great deal to me and to others in the Northwest. During his stay in Portland he literally dragged Joe Mahoney (University of Washington) and me around on a number of “show and tells” and had us help do much of his work in our spare time. His leadership style was unique and his work ethic was almost superhuman. But then, he had Joe and me to help him as support staff. He certainly knew how to get the most out of people.

There we worked on a number of projects with him that were well ahead of their time, including workshops on mechanistic-empirical pavement design and modulus testing, although it wasn’t until the late 1990s that M-E design became of interest at the national level; and participating in some early pavement preservation efforts before anybody knew the term “pavement preservation.”

Jim had a great way of bringing people together and he worked closely with agencies, universities, and with industry to promote his programs.

While at FHWA’s Pavements Division, we continued to work together on pavement design issues and on the use of asphalt rubber in pavements. He was responsible for initiating the first contract on asphalt rubber after the failed mandate.

We worked together for FP2, which he helped start, while I served on the first board of directors in 1992. FP2 was his baby and it provided the momentum he needed to market pavement preservation throughout the United States. I never saw anyone like him who showed such passion and desire to implement pavement preservation.

His vision changed the way we manage and deliver transportation programs to America. His passion and commitment have been inspirational, and his ability to get everyone together to undertake major initiatives was unequalled. The industry will miss him greatly.

– R. Gary Hicks, professor emeritus, Civil Engineering at Oregon State University, and former director of the California Pavement Preservation Center, California State University, Chico

A GOOD GUY, AND UNIQUE

Neither the Asphalt Emulsion Manufacturers Association (AEMA), the Asphalt Recycling & Reclaiming Association (ARRA), nor International Slurry Surfacing Association (ISSA) had a better friend at FHWA or in the pavement preservation community than Jim Sorenson. Even with all his, hmmm, unique characteristics and idiosyncrasies, Jim was truly one of the good guys. I will miss him professionally, and I will miss him as a friend. Godspeed, Jim, and let us know what the streets are paved with up there.

– Michael R. Krissoff, Executive Director, AEMA-ARRA-ISSA
A TIRELESS CHAMPION FOR PAVEMENT PRESERVATION

Jim Sorenson was a tireless champion for maintenance, pavement preservation and asset management, and was a great friend of local government. His forceful personality, dedication and perseverance toward excellence were unmatched. The National Association of County Engineers and its members will miss him.

– Tony Giancola, Executive Director, National Association of County Engineers

WAS CONCERNED FOR FUTURE OF INDUSTRY

Jim Sorenson was as passionate about excellence in roads and road management as any person I’ve ever met. I am especially mindful of my last conversation with him. It came in the late evening hours during the ARRA meeting in Baja California.

Jim told me he was retiring. We sat on a bench looking out at the Pacific nursing digestifs and chatting about the state of our roads and our industry.

“Where are tomorrow’s leaders for this industry going to come from?” he said, his booming voice filled with emotion. “I’m really worried about that. Guys like you and I are getting up there. And look around at these meetings … where are the young people? Where’s the next generation of leaders?”

I’m sure the next generation of leaders will take their places in the industry as positions open up for them, but will they have the dedication and passion to worry about what happens when they are gone? Jim Sorenson leaves a powerful legacy for all of us to admire and emulate.

– Kirk Landers, Editor Emeritus, Better Roads Magazine

A TRUE ROAD WARRIOR

Let me first say that Jim was a friend to many of us in the pavement preservation industry. He brought laughter from many levels and on many different latitudes. I always thought Jim as a friend first, but he was definitely a professional associate as well. He could assign tasks faster than a speeding bullet and remind you when each was due. He was a get-things-done guy and I will remember him always as a true “road warrior.”

– Myles McKemie, Vice President-Marketing, Ergon, Inc.

IF HE DIDN’T INSULT YOU, HE DIDN’T LIKE YOU

I met Jim Sorenson in 1992 at the first meeting of FHWA’s Expert Task Group (ETG) on Pavement Preventive Maintenance, as it was known then. I had been New York State’s pavement maintenance program engineer for a little over a year at that time, after having spent some time in design and inspecting hot mix asphalt paving in construction.

Jim was such a presence at that first meeting. His passion for pavement preventive maintenance was unequalled. He had a way of making people with less knowledge than he had about the subject feel welcome and included. Through him, the ETG and hard work, he helped make experts of many of us. Jim made special mention at the ETG meeting in New Orleans in May, that only four of the original ETG members were still active on the ETG; I was one of them. That acknowledgement meant a lot to me.

Jim had a way of running the ETG meetings that kept them interesting and fun, while still being a great learning experience. If Jim didn’t throw a few insults your way, you had to wonder whether he liked you or not. I certainly received my fair share of Jim’s good natured insults.

We all miss him, but I owe a great debt to Jim, as, without him, I would not be anywhere near the pavement preservation professional that I am now. Goodbye old friend.

– Edward J. Denehy, Transportation Maintenance Division, New York State DOT

HIS STRONG HAND GUIDED US THROUGH MAZE OF ROADBLOCKS

There may be no other person that had greater influence and impact on the pavement preservation industry than Jim Sorenson. From his place at FHWA, Jim used his unique abilities to shape a fledgling collection of contractors and suppliers, along with a few state agency engineers, into an organized coalition that now represent the preservation industry in the form of the National Center for Pavement Preservation and its various regional partners.

Jim never wavered from his original vision of a united industry and used all of his abilities as a facilitator, partner and yes, sometimes his bully pulpit, to shape the industry into its present form.

Through the years many of us felt his strong hand on our backs as he guided us through a maze of roadblocks and obstacles that only he could view as opportunities, while the rest of us saw them only as insurmountable problems.

He mentored us all, often using that wry smile and twinkling eye to break down barriers and forge partnerships between the most unlikely and uncommon partners. He was relentless in his belief that a united preservation industry was the best and brightest hope to care for what he believed was our most valuable national asset.
On a personal note, Jim became much more than a professional acquaintance. He became my friend, as I am sure he did to so many other industry professionals. I’ll never forget Jim picking me up at Washington National Airport on a Sunday evening in 1994 prior to the Transportation Research Board meeting, and transporting me to my hotel for a late dinner at which he explained the concepts and importance of preservation. He educated us all, one day, and one dinner, at a time.

While Jim is gone, his spirit remains. Let us continue his work. It’s what he would have wanted. Rest in peace, my friend.
– John Rathbun, Vice President-Sales, Cutler Repaving Inc.

**JIM TOILED TIRELESSLY FOR PAVEMENT PRESERVATION**

The preservation industry has lost a dear friend with the passing of Jim Sorenson, and a champion to the preservation movement. Jim toiled tirelessly for the greater good of the highway community, always devoting 100 percent of himself to the advancement of his principles.

A dedicated FHWA employee, Jim often labored for the agency well into the early morning hours, striving to press forward a worthwhile initiative in which he believed. He genuinely embraced the team concept and was capable of extracting more constructive output from a group than anyone imagined possible. Everyone who possessed the heart and desire to advance the preservation effort were welcome to join Jim’s team, as he believed there is always room for one more at the table.

Through the years, I had many opportunities to travel with Jim, and during those trips we would discuss limitless topics. Jim’s vast knowledge was absolutely phenomenal. He could discuss flora or fauna, materials or equipment, and countless other subjects.

Almost a decade ago we traveled overseas, and I was amazed by the number of highway officials from all over the world who enjoyed Jim’s friendship. He knew how to have fun, and every trip with Jim would quickly become an adventure. Jim’s favorite after-work activities quite often involved a Crown Royal (or two) and stories about his Montana roots, entertaining all who were fortunate enough to be included. In his eyes, everyone was family. Jim was one of a kind and is greatly missed.

In 2003, Jim was instrumental in the landmark establishment of the National Center for Pavement Preservation (NCP), prior to which there was no single academic center promoting pavement preservation. Everyone at the center forever will be indebted to him for his counsel and support. Jim was also a staunch supporter of the Foundation for Pavement Preservation and the various preservation industry associations.

Jim believed a seed must first be planted before something could grow. To this end he often encouraged young people to seek a career in highway engineering. Because Jim was a dedicated advocate of pavement preservation, he has left a lasting mark both nationally and internationally.

Jim had many friends, and I am honored to have been one.
– Larry Galehouse, P.E., P.S., director, National Center for Pavement Preservation

**Contribute to Sorenson Memorial Pavement Preservation Scholarship**

Consider perpetuating your memory of Jim Sorenson — while boosting the philosophy of pavement preservation — with a contribution to a new scholarship in his memory.

The Sorenson family and friends have established the James B. Sorenson Memorial Pavement Preservation Scholarship, to be administered by the Department of Civil and Environmental Engineering of Michigan State University (MSU), College of Engineering.

In accordance with its normal procedures, and with the following special requirements of the James B. Sorenson Memorial Pavement Preservation Scholarship:

- Recipients must be full-time undergraduate students, including incoming and transfer students, who are majoring in civil and environmental engineering studies in the College of Engineering at MSU. Preference will be given to students who have demonstrated an interest in the area of pavement preservation through out-of-classroom learning opportunities (e.g. research, internships, co-ops and preservation group affiliations).

- Scholarship recipients may have their awards renewed, provided they continue to make satisfactory academic progress towards an undergraduate degree in Engineering as determined by the College of Engineering.

Anyone who wishes to make a contribution to the James B. Sorenson Memorial Pavement Preservation Scholarship should kindly send your donation of any size to:

James B. Sorenson Memorial Pavement Preservation Scholarship
Office of Development, College of Engineering
Michigan State University
3536 Engineering Building
East Lansing, MI 48824

Please make checks out to MSU, and they should contain either James B. Sorenson or A30329 in the memo field of the check. For more information, please contact Larry Galehouse at NCPP at (517) 432-8220.
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$60.00

For more information and to order, visit www.asphaltinstitute.org or call 859.288.4960
Add Pavement Preservation to Boost Pavement Management

By DingXin Cheng, Mary Stroup-Gardiner and Sui Tan

Adding pavement preservation (PP) components to a pavement management system (PMS) can benefit both PMS and the pavement preservation program.

The potential benefits of a successful pavement preservation program are numerous, including higher customer satisfaction, increased safety, increases in cost savings and cost effectiveness, improved pavement condition, improved strategies and techniques and better-informed decisions. A pavement preservation program should be included in an agency’s pavement management system.

Some early PMSs consisted primarily of a database, a condition index and a ranking system to develop a list of projects following the “worst first” approach, but pavement preservation is a proactive approach. Instead, it’s more cost-effective when pavement preservation projects are applied at a right time and group together. Even better, a pavement management system can support systematic and effective pavement preservation treatment programming. On the other hand, a successful pavement preservation program can support a PMS on cost-benefit funding allocation and optimized project programming.

However, it is a challenging task to add the pavement preservation component to a PMS. It requires the knowledge of pavement preservation, asset management, system engineering and support from administrator.

PMS BOOSTS PRESERVATION

A PMS can be used as a tool to effectively program preservation for an agency. An effective PMS helps identify good candidates for preventive maintenance since it has the roadway distress survey and maintenance history. It also can help determine the optimum time for performing maintenance treatments. Fig. 1 illustrates the concept of finding the optimum maintenance and rehabilitation (M and R) time. Reconstruction and maintenance costs rise as a pavement ages. However, if maintenance or rehabilitation is carried out too early, the costs are prohibitively high.

There is an optimum time at which maintenance can be performed to provide the maximum cost effectiveness. If an agency’s PMS does not include a pavement preservation component, a complete history of pavement preservation activities may not be traceable as maintenance crews may not record preservation activities.

PRESERVATION BOOSTS PMS

Conversely, a pavement preservation component can help an agency using PMS allocate funding more cost effectively. It can support PMS to rank and select projects for the right
treatment, including pavement preservation.

Pavement preservation acknowledges different pavement treatments can have very different treatment lives. Treatment lives are typically defined by changes over time of the pavement condition index (PCI), which is a composite index on pavement condition.

A higher PCI value means a good service road with good roadway condition. The pavement preservation approach (Fig. 2, green line) that keeps a good road in good condition provides the best service. The rehabilitation strategy (purple line) has the intermediate serviceability, while the reconstruction approach (maroon line) has the poorest serviceability because it allows the pavement deteriorate until it needs to be replaced.

**ADDING PRESERVATION TO PMS**

Adding pavement preservation components to a PMS system can be a very demanding and challenging task. Although there are numerous benefits of the integration, it usually requires significant initial funding and other resources. Therefore, it is very important to have good communication with administration and obtain its support to set up the PMS with pavement preservation component.

Fig. 3 shows a guideline flowchart for integrating pavement preservation into PMS. Based on the funding level and available resources, three different PP and PMS integration levels can be implemented.

The network level integration requires the least effort, and integration at both network and project level requires the highest funding and most work. The integration of PP with PMS can be started from either a network or project level only. Eventually, a full integration at both network and project level with feedback loop can be developed (Fig. 3).

For example, the PMS StreetSaver program can be used to demonstrate the effectiveness of integrating pavement preservation into pavement management system. StreetSaver is the popular PMS software developed by Metropolitan Transportation Commission (MTC) in the San Francisco Bay Area.
StreetSaver provides network-level analysis with some project-level components. Rather than basing on family performance curve, its treatment needs are triggered by the individual performance curve of each management section.

Adding the pavement preservation component to PMS has many advantages, especially when more pavements need to be preserved and maintained. A PMS can support programming of pavement preservation projects, and a PMS with a pavement preservation component can demonstrate the benefits of pavement preservation program. It can clearly show the advantages of having pavement preservation over “worst first” approach.

A pavement preservation program makes a PMS more effective by providing a component within the PCI range, which is currently not used for treatment scheduling.

The integration of pavement preservation with PMS at both network level and project level is the most complicated approach. However, it can provide the most benefits for both network and project level pavement management. The network level integration or project level integration can be later upgraded to full integration of PP with PMS with feedback loop.

California Pavement Preservation Center has been developing an online pavement management class, which includes the integration of pavement preservation with pavement management system. It is one of the four pavement preservation classes for the center pavement preservation certificate program.

Cheng is senior pavement engineer in California Pavement Preservation Center, and assistant professor at California State University, Chico; Stroup-Gardiner is technical director, California Pavement Preservation Center; and Tan is program manager, MTC pavement management program.
“They paint the roads black just before an election.”
“They schedule road work according to the number of complaints or squeaky wheels.”
“The councilman gets his road resurfaced first.”
We have all heard these comments before, and depending on where you reside in the nation, they may or may not be true.

The City of Los Angeles, however, has a very different strategy. The city knows that investing in pavement preservation reduces the four-to-five times higher cost of rehabilitation. Furthermore, the city’s street managers want residents, stakeholders, and the general public to fully comprehend the simple concept of “pay less now, or pay much more later.”

By having an ongoing pavement preservation education program, the city has been able to convey the message to its communities. Neighborhoods clearly understand that the Bureau of Street Services (BSS) of the city’s Department of Public Works has been very effective at giving the taxpayers the best value for their tax dollars. In return, residents have demonstrated a strong sense of support that has been instrumental in funding the city’s pavement preservation program.

NATION’S LARGEST STREET NETWORK
Los Angeles has the nation’s largest and most congested municipal street system. It is comprised of 28,000 lane-miles, many of which were built before World War II. Decades of insufficient maintenance and rehabilitation funding, increasingly heavy traffic and thousands of utility cuts per year have all left the streets in a mess.

The city’s annual resurfacing program of 50 miles per year remained constant between World War II and 1987, despite the fact that the system grew from 2,500 to 6,500 centerline miles of paved streets. The problems were exacerbated by California’s Proposition 13, which dramatically cut tax resources used for street maintenance; and yes, the city was also guilty of some of the charges cited at the beginning of this article.

In the mid 1990’s, the BSS recognized the need to use engineering-based knowledge and technologies to address the street network challenges. The first logical step was to replace the old and subjective pavement management system (PMS) that was created in-house during the early 1980s with a state-of-the-art PMS capable of objectively determining pavement condition and
recycled hot mix. In addition, the city owns a large fleet of two municipal asphalt plants that produce both virgin and maintenance and rehabilitation work; it also owns the BSS. The city has its own trained personnel to perform support of the mayor, the city council and every employee of elected officials. The better educated the residents are about public industry leaders as well as local universities.

Neighborhoods continuously express their priorities to the elected officials to support their concerns and an issue that interests them, the better the chance will be to get the elected officials to support their concerns and demands. The fix strategy subsequently included a commitment to a sustainable level of budget allocation for pavement preservation, a toolbox of treatments and rehabilitation techniques, an aggressive recycling program and a very ambitious public education program.

This “fix” would not be possible without the continuing support of the mayor, the city council and every employee of the BSS. The city has its own trained personnel to perform both maintenance and rehabilitation work; it also owns two municipal asphalt plants that produce both virgin and recycled hot mix. In addition, the city owns a large fleet of maintenance and resurfacing equipment as well as a state-of-the-art standards lab where all materials and procedures are meticulously tested to guarantee the best quality control.

Moreover, there is a strong emphasis on developing pavement preservation products and processes that are more cost-efficient and environmentally-friendly. To this end, the city has partnered with numerous private and public industry leaders as well as local universities.

Lastly, the BSS recognizes that public buy-in is essential to continue the dedicated sustainable funding. Neighborhoods continuously express their priorities to the elected officials. The better educated the residents are about an issue that interests them, the better the chance will be to get the elected officials to support their concerns and demands.

L.A. USES MICROPAAVER

The BSS implemented MicroPAVER in 1998. MicroPAVER was originally developed by the U.S. Army Corps of Engineers for road and airfield pavement maintenance management on military bases. It uses inspection data to create a pavement condition index (PCI) rating from zero (failed) to 100 (excellent).

In addition to current pavement condition, MicroPAVER determines the type of maintenance or rehabilitation work required and the best time to perform it based on future pavement condition prediction.

The street network in Los Angeles network was broken down into 69,507 pavement segments (each one equivalent to one city block) that were inventoried and entered into a computer database. The city manually routed all segments to optimize future inspection efficiency and accuracy, and implemented a three-year survey cycle.

A state-of-the-art automated van collects pavement condition data, which is analyzed by bureau staff to determine type, severity and quantity of distresses. In addition, the van is equipped with lasers that measure rutting and roughness, digital cameras to capture pavement surface images, and a computerized work station to ensure proper storage of data.

MicroPAVER software calculates the PCI and develops life cycle curves. Using a critical PCI, the software develops an optimum preservation and rehabilitation strategy based on different budget scenarios.

Acknowledging the limitations of current budgets, the City of Los Angeles has adopted a Save the Streets strategy that emphasizes the preservation of as many fair to good condition streets as possible so they will not fall into the “failed” category, and hence, require expensive rehabilitation in the near future.

MEET ‘PROFESSOR POTHOLE’

Perhaps the city’s most innovative and effective strategy to secure funding for its pavement preservation program is the public education program. Every three years, the BSS uses the information provided by the PMS to publish a State of the Streets report, which is available to all citizens. This report clearly explains the methodology of the PMS, the current PCI ratings of the network, and the funding required to optimize the quality and costs of the city streets.

It explains why taxpayers can “pay now, or pay much more later,” illustrating the points with graphs showing the decline in PCI over time with current funding levels, and depicting exactly what the funds will provide for the neighborhoods.

The BSS has also developed the Professor Pothole training courses and presentations to educate elected officials, workers and the public on basic road structure and pavement preservation principles. The presentations explain a historical overview of “how we got in this mess,” current efforts, technologies and treatments being used, and solutions.

Several times a week, the BSS takes these presentations to evening meetings of neighborhood councils, customizing them to show an assessment of the roads in those neighborhoods. The BSS has targeted the 89 certified neighborhood councils, elected officials and their staffs, the media, and local colleges and universities to spread their message. The State of the Streets report, the training presentations and continuously updated information all is available on the city’s web site.

Previously, the street preservation budget used to be divided among the 15 council districts, based on centerline miles in each council district. The new allocation formula factors in the pavement condition of the street, the pavement area, and the amount of bus and truck traffic. The purpose
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of this new formula is to equalize the PCI of the street network throughout the entire city.

**L.A.'s Strategic Plan**

The city has optimized its street preservation strategic plan by subdividing it into three major programs: a pavement management program (MicroPAVER), a maintenance program (pothole repairs, crack sealing, slurry sealing), and a rehabilitation program (asphalt overlays, resurfacing reconstruction, cold-in-place recycling, full-depth reclamation).

Operation Pothole hit a historical record in 2008 with over 386,000 small asphalt repairs. One hundred miles of crack sealing were completed as well, and 400 centerline miles of rubberized slurry seal were applied.

A decade ago, the city faced severe challenges with conventional slurry seal. Residents were unhappy with the invasive nature of the work — with stockpiles of sand and heavy equipment parked on streets — not to mention the strong odors and the dusty nature of the operations. The city also wanted a treatment with more reliable and consistent performance, and the BSS looked for a long-term solution.

After testing several possible options, partnering with Petrochem Manufacturing, Inc. (PMI), seemed to be a win-win situation for the BSS. The city would apply a pre-mixed rubberized slurry seal using their existing personnel while PMI would supply the plant mix consisting of latex polymer
modified asphalt emulsion, finely ground recycled tire rubber, crushed and graded aggregates, fillers and stabilizers.

The resulting rubberized emulsion aggregate slurry (REAS) product is formulated to have twice as much asphalt as conventional slurry seal, in addition to the highest amount of recycled tire rubber in any paving application. The polymer, the high asphalt content and the rubber produce a longer lasting surface treatment.

Applied with slightly altered conventional distributors, the pre-blended mix is easy and quick for the city to use, especially in demanding residential neighborhoods and busy commercial areas. Even on L.A.’s congested streets, after more than six years of service, 95 percent of the REAS surfaces are still black and performing well. And there is not one pothole in any of the REAS-treated pavements.

Approximately 25,935 waste tires are recycled for every 100 centerline miles of streets treated with REAS. Last year, the BSS applied 400 centerline miles; hence, over 100,000 tires were recycled.

To further cut costs, the city has launched an aggressive recycling program to increase the use of reclaimed asphalt pavement (RAP). Both municipal asphalt plants use an average of 20 to 25 percent of RAP in their new hot mixes.

Moreover, to address the streets in need of reconstruction, the city adopted cold-in-place recycling (CIR) technology in 2005. After three years, the BSS has determined that CIR is 25 to 35 percent more cost-effective than conventional reconstruction as well as less invasive to local neighborhoods. The city is committed to CIR and full-depth reclamation as part of a successful recycling program.

Thanks to the commitment of all involved from the mayor, to the dedicated crews working on the streets, the city is saving its pavements. In 2005, the Foundation for Pavement Preservation awarded its first ever Excellence in Pavement Preservation Award to the city of Los Angeles. This award is presented to a public agency that has implemented a successful pavement preservation program by gaining the support of elected officials and the public.

In 2002, the city’s combined crack sealing program, slurry seal program, and resurfacing program consisted of 310 center-line miles. During the 2007-2008 fiscal year, 675 centerline miles of city streets were treated or rehabilitated.

In 2008-2009, the city commenced a new and stronger commitment to pavement preservation. The new, sustainable four-year plan funds the maintenance and rehabilitation of 735 centerline miles annually, which ultimately will improve the average pavement condition index of the city-wide system for the first time since World War II.

Sauceda is assistant director, Bureau of Street Services, Department of Public Works, city of Los Angeles.
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Valued at more than $40 billion, the 40,000 miles of the San Francisco Bay Area’s local streets and roads serve as the foundation of the region’s transportation infrastructure.

The local street and road network is essential to the transportation efficiency, safety, and the social and economic health of the region. As such, properly investing in and managing this asset is essential for the long-term health of the San Francisco Bay Area’s transportation system.

The Metropolitan Transportation Commission (MTC) is the regional planning, programming and finance agency for the nine-county San Francisco Bay Area.

MTC’s pavement management software, StreetSaver, utilizes a pavement condition index (PCI) that rates the condition of roadways on a scale from zero to 100, with 100 being the best. A recent analysis conducted by MTC on the condition of the region’s streets and roads shows the Bay Area’s average local street and road network at a PCI of 64, perilously close to the steep part of the pavement life-cycle curve.

The chart depicts another recent analysis that illustrates how conditions are projected to decline over time and how the maintenance backlog is expected to increase under the existing funding scenario. Just to maintain existing conditions over the next 25 years, spending on street and road maintenance will need to increase by nearly 70 percent. To improve conditions to a reasonable target and reduce the maintenance backlog, a maintenance investment of more than double the existing spending will be required.

Given the scarcity of financial resources to address the local street and road maintenance shortfalls, it is critical that every dollar that is made available for street and road maintenance is spent cost effectively.

It costs far less to keep roads in good condition through preventive maintenance than it costs to allow the roadways to deteriorate to a point where major rehabilitation or construction is required. As with any asset—a house, car, etc.—preventive maintenance is the key to a roadway’s longevity. If regular preventive maintenance is applied to roadways in good condition, deterioration of the roadways can be managed and their serviceable life can be greatly extended.

Conversely, a “worst first” strategy prioritizes major rehabilitation or pavement reconstruction.

StreetSaver Software Key to Bay Area Asset Management, Regional Fund Distribution

By Theresa Romell and Sui Tan, MTC
and is a reactive approach to pavement maintenance. Delaying low-cost preventive treatments when pavement is still in good condition results in much greater costs when repairs are delayed until major rehabilitation or reconstruction treatments are necessary.

Dedicated revenue for the purposes of street and road maintenance coupled with an asset management approach is what is needed to begin addressing the maintenance backlog that exists and to improve the condition of the region’s local street and road network in a cost effective manner.

**STREETSAYER AND BAY AREA ROADS**

Today, all 109 Bay Area jurisdictions — and over 250 jurisdictions outside of the San Francisco Bay Area — utilize MTC’s pavement management software, StreetSaver. The software allows jurisdictions to inventory their street network, determine the maintenance needs of that network, and devise maintenance programs based on available revenues and recommendations made by the software.

The StreetSaver model develops a list of recommended treatments, classified as either preventive maintenance or rehabilitation, and prioritizes these treatments based on a weighted effectiveness ratio. Within the constraints of the input budget, the model will select the most cost-effective treatments for implementation and defer the remainder. The fact that all jurisdictions utilize a common pavement management system allows MTC to perform asset management activities for the region as a whole.

Eventually, local jurisdictions, with MTC’s help, were able to parlay their the ability to collectively track conditions on the region’s street and road network, set targets for pavement conditions, demonstrate the maintenance needs and funding shortfalls, and predict future roadway conditions based on alternative funding levels, into support for investing large amounts of the region’s discretionary funding into street and road maintenance. Success at the regional funding level made it possible for MTC to go a step further, and require that regional funds be conditioned not just on need, but on performance.

**DEFINING PREVENTIVE MAINTENANCE**

MTC has always defined preventive maintenance as any maintenance treatment applied to a roadway that has a pavement condition index of 70 or above. Research has shown that the life extension value of lower cost maintenance treatments is greatest while the pavement is still in good condition. While it can be generally said that any pavement with a PCI of 70 or above is in “good” condition and will respond well to preventive maintenance, there is a gray area for some roadways within the 60 to 70 PCI range, as to whether or not they can also garner the same life extension from lower cost treatments as those that are above 70.

This is especially true in the case of residential streets and low traffic
rural roadways that suffer mainly from “non-load” related distresses. For this reason, the committee recommended allowing jurisdictions preventive maintenance “credit” for treatments applied to arterial and collector roadways with a PCI of 70 or above, and residential roadways with a PCI of 60 and above.

The basic method for measuring preventive maintenance performance is to determine the ratio between the percent of total maintenance budget a jurisdiction actually spends on preventive maintenance versus the percent of total budget that is recommended to be spent on preventive maintenance via the budget needs models run on the pavement management software.

Because the recommended percent of budget comes directly from each jurisdiction’s pavement management database, it will vary depending on individual network characteristics.

Jurisdictions with very a high network PCI will have a higher percent of budget recommendation for preventive maintenance and those with a very low PCI will have a lower percent of budget recommendation. Since the recommended amount of preventive maintenance is expressed as a percentage, jurisdictions are not rewarded or penalized based on the size of their jurisdictions, the current condition of their pavements or the size of their maintenance budgets.

The recommended percent of budget for preventive maintenance figure is generated by each jurisdiction’s pavement management system once an “unconstrained budget needs” (needs are not constrained to available funds) model is run.

The final allocation model used for distributing regional funds for street and roadway maintenance includes four factors — population, road mileage, maintenance need and performance — weighted 25 percent each. The performance measure factor is weighted by each jurisdiction’s share of the other three formula factors in order to adjust for the relative size of the jurisdiction.

Regional agencies should ensure that transportation infrastructure — specifically the local street and road network — is managed to meet both current and future demands and that expenditures of existing resources are optimized.

Asset management principles can be applied to achieve more effective decision-making at all levels of government. The regional agency’s role in a successful asset management program includes supporting data collection, condition and funding needs analyses, and integrating performance measures into funding policies in order to make progress towards regional targets.

Romell is senior planner/analyst, and Tan is program manager, pavement management program, Metropolitan Transportation Commission.
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The county of Santa Barbara has developed and maintained an award-winning nationally recognized pavement preservation program that is extending the life of its pavement network through the use of pavement preservation practices, including fiscal tracking and condition surveys using asset management software.

These practices have been integrated into the county public works planning to provide powerful tools for budgeting in the face of increasingly limited funding.

**PROBLEM OR CHALLENGE?**

In 1995, the county of Santa Barbara Public Works Department maintained its pavement network by allocating funding on roadways that were in the worst condition, while neglecting those roadways that had been recently paved.

The life expectancy of a newly paved roadway was about 15 to 20 years and there was little funding left to extend the pavement life beyond that time period. This worst first strategy seemed to be dictated by the “squeaky wheel,” or how many calls came into the county related to a specific road. No real plan or vision existed for treating this system of over 1,600 lane miles.

During this time, roadways to be treated were selected by three regional road yard superintendents — and the “squeaky wheel” — while no consideration was given to gaining economies of scale by geographically grouping these projects. The county’s pavement management system (PMS) was minimal and depended on limited windshield assessments of pavement condition, without collecting data on specific distresses or work history, to track pavement performance. There was a lack of communication about budget and cost effectiveness; funding was very limited and high dollar projects treated only a minimal amount of lane miles. The county’s system continued to deteriorate.

In 1999, the county made the shift to a formal pavement preservation program. Components of the county’s pavement management program include the road maintenance annual plan, and software to leverage GIS technology, field assessments and ongoing performance measures.

The county’s corrective maintenance forces were strategically deployed to complement the preventive maintenance program. Low-cost treatments were applied by the county to extend the life of the existing “good” pavements, while using the newly realized cost savings to bring “bad” pavements into the preventive maintenance cycle. Consistent processes and communication between the three road maintenance yards was greatly improved and projects were geographically grouped to gain economies of scale.

The county also simultaneously upgraded its pavement management system (PMS) to MicroPAVER (www.cec.army.mil/paver/Index.htm), which allowed for more detailed inventory, pavement inspection data, condition ratings and work history.

Staff was able to create deterioration models, perform condition analysis and gained powerful budget, work planning and needs assessment tools. This new technology allowed the county to focus on the cost benefit and service life of all the pavement treatments available.
Individual roadway treatments were selected by the PMS based on individualized field inspections and work history while each recommended treatment was evaluated in the field by the road maintenance superintendents. This ensured the right treatment was applied at the right time, on the right road, which is the motto of pavement preservation philosophy.

Education and community outreach became the cornerstone of the county’s pavement preservation program. The public works department educated the public through community outreach efforts, video presentations produced by the department on pavement preservation on local government access television, annual workshops and neighborhood meetings. Local decision makers became part of this all inclusive process, which helped them understand the benefits of pavement preservation and to educate their constituents.

Over the next several years, the county continued to develop their pavement preservation program and strived to improve the processes. With the support of the county’s decision makers, the public works department continually sought out new technologies and partnered with industry professionals to gain an upper hand on an ever-deteriorating road network and uncertain roadway funding. New innovative technologies in road treatments included the use of rejuvenating emulsions, scrub seals and micro seals.

As education and awareness grew throughout the county of Santa Barbara on the benefits of pavement preservation, state and national interest grew as well. The county’s staff, responsible for the implementation and maintenance of this program, has traveled the state of California and nationally to educate other jurisdictions and share their experience.

**BUDGETING AND COST SAVINGS**

The county’s pavement management system is saving money. For example, for several years, Holiday Hill Road in Santa Barbara County was listed for major rehabilitation, but kept falling off the list due to funding shortfalls. As these delays continued, the associated costs to repair this roadway skyrocketed to over $350,000 for a traditional...
County’s pavement condition index (PCI) rose one point from 47 to 48. Pavement life extension practices, with the timely application of low costs oils, emulsions and other surface treatments have brought the PCI of the county from a PCI of 48 in 1999, to 69 in 2008. In fiscal year 2006/2007, the county treated a historic high of 247 lane miles of roadway at less than half the funding levels of five years prior. This success happened at a time when oil and asphalt costs were 350 percent higher that the same period five years earlier.

Through the development of a holistic pavement preservation program, the county has been able to effectively manage, plan and maintain its road infrastructure in order to maintain the right treatment to the right roads at the right time resulting in dedicated flexible funding streams for pavement preservation needs.

Donnelly is team project leader, Santa Barbara County, Calif. Photos courtesy Santa Barbara County.
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Revised Manual Provides Basics of Asphalt in Preservation

By H. Wayne Jones

In these economically challenging times, pavement specialists must get back to the fundamentals — correcting small defects before they become embarrassingly large ones, and making sure we use the right treatment at the right time to extend the life of our pavements.

Because of the need to get back to the sound fundamentals of maintenance, The Asphalt Institute has just finished updating one of its most widely used technical manuals, MS-16, *Asphalt in Pavement Preservation and Maintenance, 4th Edition*.

This new edition has been updated to include a brief overview of all of the principles of pavement management and preservation and descriptions of all of the recognized repair techniques and surface treatments.

Maintenance and rehabilitation procedures are also expanded to address the latest technologies, including current surface seal options, infrared patching, specialized patching procedures and expanded crack sealing and filling procedures.

The new MS-16 retains its field-friendly size, too, so the manual can be used on the project to reference maintenance principles and techniques to the hands-on practitioners.

This new edition is scheduled for release in early December 2009 and can be ordered from www.asphaltinstitute.org, or by calling (859) 288-4960.

UNDERSTANDING THE ‘MIX OF FIXES’

Pavement management concepts can be used to manage the maintenance and rehabilitation of a road network cost-effectively, using a mix of low-cost maintenance treatments on roads in good condition and more expensive rehabilitation treatments on roads with advanced levels of deterioration.

This “mix of fixes” results in continuing efforts to reduce the number of roads in poor condition (which are very expensive to fix) while maintaining good roads in good condition for as long as possible.

The American Association of State Highway and Transportation Officials (AASHTO) defines a Pavement Management System (PMS) as: “a set of tools or methods that assist decision-makers in finding optimum strategies for providing, evaluating and maintaining pavements in a serviceable condition over a period of time” (AASHTO 1993). A PMS uses reliable pavement inventory and condition information to help identify and prioritize pavement maintenance and rehabilitation needs within budget, or other constraints that may exist.

A PMS can be as simple as driving your pavements and rating their ride characteristics on a scale from 1-10 and then ranking them in order to determine the maintenance priority. When you plot these manual ratings on charts over time, trends will begin to develop that will help forecast the timing of maintenance procedures in the future.

Computerized PMS can be very sophisticated with the ability to manage and analyze large databases of pavement inventory. Since most computerized PMSs are able to forecast future pavement conditions, an agency can quickly evaluate the impact of today’s investment decisions on the long-term conditions of the road network.

‘WORST FIRST’ WASTES CASH

No matter how sophisticated your PMS is, you soon learn that spending the majority of your maintenance dollars fixing the “worst first” roadways in your network not only wastes money, but it allows the overall condition of your system to rapidly deteriorate while waiting for maintenance.

Before then, use preventive maintenance. Preventive maintenance is routine work that is planned and organized specifically to prevent future deterioration of a pavement. It includes crack sealing, surface treatments, thin overlays, drainage maintenance, etc.

The idea behind preventive maintenance is to expend funds and materials while the pavement is in relatively good condition in order to delay or retard future deterioration and thus prolong the life of the pavement. This type of maintenance can be done at a very reasonable cost because it is scheduled and done before any major distresses show up in the pavement.

Conducting preventive maintenance activities on a sound pavement in good condition is very effective, but conducting inappropriate repairs (in either method or timing) can accelerate the rate of pavement deterioration. In summary, preventive maintenance is completing the right maintenance activity at the right time.

Ohio-based Jones is senior regional engineer, The Asphalt Institute.
International Road Federation Hears from Lone Star State on Pavement Preservation

By Dr. Yetkin Yildirim, P.E.

As an advocate for better, safer and environmentally friendly roads, the International Road Federation (IRF) brought together public and private sector experts from around the world to examine current practices and discuss new strategies for pavement preservation in a recent seminar, Preserving our Highway Infrastructure Assets.

The seminar addressed such key issues as the role of new materials and technologies for pavement preservation, new funding strategies and contracting models to sustain pavement preservation, and the latest tools for the management of pavement networks.

The director of the Texas Pavement Preservation Center was invited to present to the IRF the recent efforts of the TPPC to raise pavement preservation awareness. He explained the various training programs in pavement preservation methods and practices offered by the TPPC to Texas DOT personnel, contractors, material producers, engineering students, and even elected officials.

The Texas Center emphasized the need for making pavement preservation information available to both highway professionals and the general public. For this reason, online courses in pavement preservation are available for free on the TPPC web site, and the TPPC partners with local high school students to help guide them through science fair projects related to pavement preservation.

For road professionals, the TPPC offers classroom courses in seal coats and micro surfacing. In the past four years, over 250 engineers and inspectors have earned Continuing Education Units through the completion of TPPC training courses.

Several presentations at the IRF Seminar highlighted the need for pavement and asset management systems. Teresa Rommel, of the Metropolitan Transportation Commission, described the benefits of the functioning pavement management system utilized in the San Francisco Bay area. Butch Wlaschin, director of the Federal Highway Administration’s Office of Asset Management, further noted that the most successful asset management programs have moved away from a “worst first” investment strategy, and instead have adopted investment principles that are based on life cycle costing. Singh Puneet also articulated the challenges posed by a highway infrastructure and the need for accountable asset management.

Environmentally responsible technologies also received significant attention at the IRF Seminar. Eric Jorda described a process used in France and throughout Europe for pavement preservation, dense cold mix asphalt emulsion. When compared to standard HMA mixes, dense cold mixes have been able to demonstrate global energy savings of over 30 percent.

Iwama Masahiko of the Nippo Corporation suggested warm mix asphalt as an environmentally friendly alternative to hot mixes. Warm mix asphalt, enhanced by the additive agent ECOFINE, can be mixed at a greatly reduced temperature of 30 to 50 deg C (86 to 122 deg F). The result is a reduction of carbon dioxide emissions at the construction site by roughly 20 percent, as the asphalt no longer needs to be heated as significantly during application.

Several presenters, including Douglas Carson, the executive director of the Rubber Pavements Association, and Cecelia Mancero, outlined the engineering benefits and opportunities made available by rubberized asphalt as an environmentally sustainable technique for the improvement of modern asphalt binder mixes.

The Texas Pavement Preservation Center was also asked to participate as a member of the IRF Road Asset Management/Pavement Preservation Task Force. As a part of this international network, representing government, private industry and academia, the TPPC looks forward to sharing knowledge of the latest techniques and newest materials for pavement preservation and learning from a wide variety of pavement management and asset management systems.

Dr. Yetkin Yildirim, P.E., is director, Texas Pavement Preservation Center, at the University of Texas-Austin. Reach him at yetkin@mail.utexas.edu or (512) 232-3084.
Iowa State Hosts Grad Course in System Asset Management

By Omar Smadi and Waddah Akili

Asset Management of civil infrastructure facilities and systems is gaining importance both in practice and academia as the public demands increased accountability in government, laws are passed requiring infrastructure asset management use, and growth and development accelerate the deterioration of already aged infrastructure.

In response, more agencies adopt and develop their asset management practices and more academic institutions and continuing education programs develop courses and programs in civil infrastructure asset management.

There are several transportation asset management courses being taught as part of undergraduate or graduate curricula or continuing education programs in the U.S. and the international community. In addition, a few institutions have succeeded in developing programs in infrastructure asset management, one being Iowa State University (ISU) at Ames.

This summary describes a graduate level class on the topic of infrastructure asset management at the Civil, Construction, and Environmental Engineering department at ISU. The class is offered mainly to civil engineering and transportation planning graduate students. Main elements of the class include:

- **Condition Assessment.** This topic covers the basic concepts of condition assessment covering items such as: system inventory, asset condition, condition segmentation, and quality assurance and quality control (QA/QC).
- **Performance Prediction.** This material covers all aspects of performance modeling dealing with assets such as pavements, bridges, pavement marking, draining systems, railroad tracks and more. Deterministic and probabilistic models are discussed, and their impact on the decision making process are explained.
- **Data Integration.** Covers the different aspects of how data integration techniques are used to address integration issues, to facilitate integration of data among different management systems (pavement, bridge, safety), and to allow decision makers to have a comprehensive look at their infrastructure needs.
- **Decision Support Tools.** Techniques ranging from prioritization, multi-year heuristics and true optimization are presented using real examples from large and medium transportation agencies. The assignment for this class covered the use of a simple linear program in order to select the lowest life cycle cost for selecting alternatives for a paving project.
- **Management Systems.** (Pavement, bridges, signs, pavement marking.) The major components of the different management are discussed, and examples are presented to cover the different aspects of these system. The interaction between pavement maintenance (preservation) and pavement management is explained. Integrated decision making covering the different assets is discussed. This provided the basis of the class project.
- **Advanced Technologies in Asset Management.** This is a brief overview of some of the advanced technologies such as: geographic information systems (GIS), global positioning systems (GPS) and database management tools. Examples utilizing data from the Iowa DOT and the Iowa Pavement Management Program are utilized to deliver the basic concepts.
- **Economic Tools, Valuation and GASB 34.** More topics are presented on the economic analysis and the important roles these models play in the infrastructure asset management area. Economic tools such as HERS-ST are presented and examples from DOT applications are discussed. GASB 34 requirements are discussed, and the depreciation and modified approaches are presented. Valuation is used in presenting the second component of the class project.

To take advantage of these topics, several special assignments and a comprehensive class project are required from the students. The assignments address basic aspects of the asset management system development, implementation and partial operation.

Real data from different state and local agencies’ applications convey the intended learning component. The assignments include:

- **Performance Modeling.** This group assignment focused on building performance models based on field data. Missing information, data that didn’t conform to the average condition and other factors were present and
Contribute Your Technical Paper to Pavement Preservation Journal

Prospective authors are invited to present articles on original research on any topic relevant to pavement preservation, such as preservation techniques, materials, construction, testing, performance, recycling and pavement management to the Pavement Preservation Journal. Papers discussing best practices for pavement preservation treatments, including asphalt overlays, scrub and fog seals, crack sealing, chip seal, hot in-place recycling, micro surfacing, and slurry seals, would be welcome as well.

Authors must prepare their manuscripts in accordance with the guidelines outlined by the Pavement Preservation Journal. All articles should be submitted as an e-mail attachment to Dr. Yetkin Yildirim, P.E., at yetkin@mail.utexas.edu.

For more information, including style guidelines, please visit the Pavement Preservation Journal’s home page at www.fp2.org.

the student groups had to deal with these issues to develop their performance prediction models. The groups presented their findings, models and key assumptions made to address data issues.

- **Decision Support Tools.** This was also another group assignment dealing with determining an optimal solution to an alternative selection problem. The students in their group had to formulate the objective function and set the constraints on the system. Funding pavement rehabilitation vs. pavement preservation was the major theme.

- **Class Project.** The class project combined several aspects of the asset management process to be addressed by each group. The data for the class project came from the Iowa Pavement Management Program database for Story County, National Bridge Inventory (NBI) data for the bridges in the county, and cost information for pavement rehabilitation and maintenance from the city of Ames, Iowa. The group assignment was to valuate the pavement and bridge assets in the county, build a pavement management system for the city of Ames utilizing the data collected on the federal-aid system in the city, and develop a trade-off analysis between funding for bridges and pavements.

Smadi is director, Center for Transportation Research and Education, and Akili is retired professor of civil engineering, Iowa State University, Ames.
Big changes are occurring at the Foundation for Pavement Preservation (FP²).

As a result of a strategic planning session held in Atlanta in October 2008, and several planning task force meetings that followed in January and March 2009, FP² has established new goals for the future of pavement preservation.

In May, the board of directors decided that the status of the foundation — a public charity — would not permit us to fulfill a new key goal of advocating for preservation policies with Congress in the highway reauthorization bill. The result was the formation of a new entity, FP², Inc., a non-profit trade organization that allows advocacy. FP², Inc. will now have the ability to deliver far more to its supporters, without the restrictions of being a charity. We have already met with great acceptance, and current commitments for 2010 are more than double the financial support than in recent years.

Our mission now is to advocate national policies, promotional activities and research programs that advance pavement preservation.

The current Foundation for Pavement Preservation has sufficient funds to continue to participate in trade shows and provide financial support to the National Center for Pavement Preservation, as it has since the beginning of the center. It’s anticipated that these funds will expire at the end of 2009 and at that time the old foundation will be dissolved. IRS rules do not permit funds from the current foundation to be transferred to the new FP², Inc.

FP², Inc., has retained a firm in Washington, D.C. to assist us in getting the preservation message to members of Congress, so that whatever legislation emerges in the form of a new transportation bill will contain the appropriate language to further our cause.

In order to accomplish these goals, the officers of the new organization chose Jim Moulthrop to be the new executive director to replace the retiring Gerry Eller, who so ably guided the Foundation for Pavement Preservation for the past several years. Gerry now will have more time to spend golfing and fishing.

Jim Moulthrop is the new executive director of the Foundation for Pavement Preservation (FP²).
Stimulus Package Boosts Preservation in Northeast

By Ed Block, P.E.

The highway infrastructure component of the American Recovery and Reinvestment Act of 2009 (ARRA) presents all states with a choice of funding capital projects, or pavement preservation. Thus many state DOT members of the Northeast Pavement Preservation Partnership (NEPPP) have benefited by being able to steer some of these funds toward pavement preservation projects.

Both agency-specific and external forces are likely to influence the project selection process for ARRA funding, yet pavement preservation presents several benefits regardless of the situation and decision process.

First, ARRA funding gives impetus to pavement preservation for those agencies that have chronically or severely underfunded programs, and have not been able to implement preservation in their jurisdiction. And for those agencies that have already implemented or decided to implement preservation, ARRA funding can accelerate the transition time to a preservation-driven pavement program.

Second, from an economic stimulus perspective, preservation projects are by their nature simpler and can benefit from a quicker engineering and approval process, so they can have a more immediate impact on the local economy.

Further, the multiplier effect of the increased road construction activity is felt far beyond the pavements. Even if an agency has decided to fund capital improvement projects, there is room to implement pavement preservation for a small part of the ARRA-funded program.

Some treatments, like crack sealing, can be developed, bid and awarded quickly, in time for ARRA obligation and construction-completion guidelines. This makes preservation an ideal vehicle to responsibly but expeditiously invest stimulus funding that remains toward the end of the program.

There are several examples of the different ways in which ARRA has contributed to the development of a stimulus construction program in the Northeast region.

The New Hampshire DOT utilized approximately $66 million of its $129 million dedicated to highway and bridge projects to fund 10 Interstate and six district preservation/resurfacing type projects. This allowed NH DOT essentially to triple its preservation program from 250 miles to 750 miles. This was a welcomed increase, as New Hampshire was losing ground due to the recent increases in asphalt cement prices.

The New York State DOT used about $45 million of ARRA funds for pavement preservation type projects on approximately 600 lane miles of eligible pavements. Types of pavement preservation projects in New York included single course hot mix asphalt overlays, cold recycling of asphalt concrete pavements, paver-placed surface treatments, micro surfacing and crack sealing.

The Rhode Island DOT is allocating $8 million for crack seals, chip seals, thin overlays, in-place reclamation and an innovative system consisting of thin overlay with a rubberized chip seal used as a stress-absorbing membrane interlayer (SAMI). At the Connecticut DOT, approximately $9 million of the $200 million dedicated to state highways has been set aside for pavement preservation projects, consisting of two mill-and-inlay projects and over 140 lane-miles of crack sealing and filling on expressways.

In addition, the municipalities in two northeast regional planning agencies have selected to engineer and build pavement preservation projects. Elsewhere throughout the region, each state highway agency has, in one form or another, incorporated some component of pavement preservation into the stimulus infrastructure program.

Even without an economic-stimulus program, pavement preservation is simply good pavement-engineering practice. But the advent of the ARRA provides a unique opportunity for agencies to demonstrate the effectiveness of pavement preservation.

Block is affiliated with the Pavement Management Unit, Connecticut DOT, and is chair, Northeast Pavement Preservation Partnership.
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Jan. 20-21 California Chip Seal Association, Seaside, Calif.
Jan. 26-29 Slurry Systems Workshop, Las Vegas
Feb. 15-18 World of Asphalt, Cincinnati
Mar. 2-6 AEMA-ARRA-ISSA Annual Meeting, Sunny Isles Beach, Fla.
April 12-16 First International Conference on Pavement Preservation, Newport Beach, Calif.
April 18-21 National Association of County Engineers, Fort Worth
July 11-15 5th International Conference on Bridge Maintenance, Safety, and Management, Philadelphia
Aug. 1-6 11th Intl. Conference on Asphalt Pavements, Nagoya, Japan
Aug. 15-18 American Public Works Association Congress & Expo, Boston
Oct. 12-14 5th World Congress on Emulsions, Lyon, France

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