



CP2 CENTER NEWS

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Phil Demery

Interview with Phil Demery, President of NACE

Phil Demery is the Transportation and Public Works Director for Sonoma County, hired in May 2007. Prior to working for Sonoma County, Phil was the Public Works Director for Santa Barbara County, a position he held since 1994. He is a graduate of Colorado State University, receiving his B.S. and M.S. Degrees in Civil Engineering/Hydraulics. Prior to working for Santa Barbara County, Phil worked for the Bureau of Reclamation in Denver conducting physical and mathematical modeling of hydraulic systems. He has authored several professional papers and is an active member of several professional and technical organizations, including serving as the President of the County Engineers Association of California (CEAC) in 2002. Phil is a member of the National Association of Counties Transportation Steering Committee and is the President of the National Association of County Engineers (NACE).

Questions asked of Phil by Center staff included the following:

What are the priorities of NACE in 2011 and moving forward?

Following are the three priorities that we have identified at NACE for our infrastructure.

Greater investment in the infrastructure.

Our current infrastructure system received a D rating by ASCE and California is considered one of the worst states in terms of the quality of its roads and bridges.

Vehicle fuel taxes have been the primary source of transportation revenues in the USA since the 1960s. Although the USA is the largest consumer of gasoline in the world, our fuel tax remains one of the lowest. Most fuel taxes are collected on the volume of fuel sold rather than a percentage of the sale prices. Therefore, their value tends to decline with inflation unless increased regularly. The last time the Federal fuel tax was increased was in 1993 and since that time it has lost much of its purchasing power. Additionally, vehicle fuel economy has improved dramatically over the past 30 years resulting in a decline of the inflation adjusted value of fuel taxes per vehicle mile traveled.

Streamlining project delivery.

Major projects with Federal funding take an average of 13 years to deliver. During this time,

construction costs increase and environmental regulations change which also affect costs. The new bay bridge is an example starting at \$1 billion and now approaching \$10 billion and there is still a long way to go. There is significant bureaucracy and process involved in the delivery of projects which use federal dollars.

About 75% of the national road system is owned and operated by local agencies. Local projects within existing ROW and that are processed as NEPA categorical exclusions still take six months for approvals when most believe it should take just a few days. By process streamlining our local projects on the Federal-Aid system, not only would it allow more time for state/federal environmental planners to focus on major transportation projects but also to accelerate economic recovery at the local level.

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Try to prevent accidents

Set aside funding for bridge and safety programs in next Federal Transportation Bill.

There are too many deaths each year. Factors contributing to these deaths include DUI, cell phone use, speed for the geometrics, edge of road issues, driver exhaustion and more. Agencies need to

include centerline and edge rumble strips and provide safety edges.



Address our bridge problems

Bridges are falling apart. Many were constructed in the 30s, 40s and 50s that need to be replaced or upgraded. Some states are addressing these issues, but others just do not have the funding to correct these problems.

You mention that current fuel taxes are not sustainable and

this source of revenue must be changed. Can you please discuss this in more detail?

Gas tax revenue has been the backbone of transportation funding. Gas taxes are a fixed amount based upon volume of fuel sold and as such are independent of the actual cost of the fuel. Gas taxes are not indexed, have not been increased in 17 years and are decreasing as people drive less and drive vehicles with greater fuel efficiency. As mentioned above, Europe has much higher gas taxes to support their roads and public transportation. Though

they pay the same for the gas, the taxes result in a three to five times higher cost in fuel at the pump.

In 2008, the average state gas tax was about 29 cents/gal. plus 18.4 cents/gal. federal tax making the total 47 cents/gal. or 12.4 cents/liter. The graph on the left compares the total fuel price in the USA to many Euro-

pean and other industrialized countries. Therefore, gas tax revenues in the USA can no longer sustain our transportation infrastructure, given the societal

desires to reduce our dependency on fossil fuels coupled with the political resistance to raising fuel taxes.

As shown, fuel taxes are more than 70% of the total cost of fuel in Europe compared to 18% in the USA. According to the FHWA, if we were to consider our fuel tax as a roadway user charge, a 40% increase would be necessary to cover all costs associated with our roadways. Our low fuel tax greatly contributes to the degradation of our roadways. As County Engineers, we are aware of this rapid degradation of our local networks.

With the next Federal reauthorization process, increasing funding levels are critical to the conversation. Hopefully, this discussion will provide an opportunity for an open dialogue, new perspectives, and diligent economic analysis of the current problems facing our nation in transportation.

What is needed in the future to prevent our roads from continuing to fall apart?

Gas tax revenues may significantly be reduced in the future as a result of fuel economy targets placed upon car manufacturers and alternative fuel development. In California, it is estimated that the increase in gas tax must rise about 50 cents/gal to keep the system operating in good condition. Without these significant increases in gas taxes, this revenue source can no longer sustain our transportation needs.

We also need to develop alternative sources of funding for our infrastructure. California has some of the worst roads in the country and they are expected to get worse without additional funding. Without such additional investment, more and more counties throughout the country will be reverting roads to gravel.

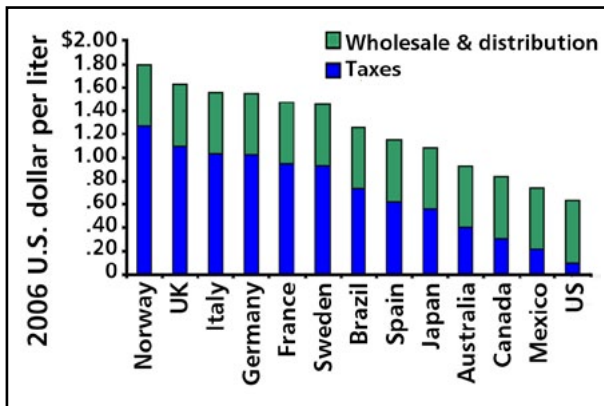


A look at our future road situation

What are the potential solutions for repairing our infrastructure in the near future?

Use our limited transportation revenues wisely by utilizing pavement preservation strategies. We should also support all efforts to streamline the delivery of transportation projects. It is important that we assist in educating our communities on the need for additional transportation investments. Finally, we need to support efforts to develop alternative, stable and sustainable revenue sources.

Comparison of fuel taxes in industrialized countries



Hot in-place recycling of polymer modified open graded HMA near Big Bar Ranger Station in Caltrans District 2

By Ding Cheng and Brandon Fraser, CP2 Center

Caltrans District 2 constructed a pilot study to expand the technical information dealing with the construction and performance of the hot in-place recycling (HIR) of an existing asphalt concrete pavement, the top two inches of which consisted of a one-inch open graded wearing course with polymer modified asphalt binder over a one-inch dense-graded asphalt. HIR of existing asphalt pavement is a surface treatment technique that is an alternative to cold milling the existing pavement and placing new asphalt mix in the milled area (commonly referred to as mill and fill). The HIR technique typically recycles the top portions of the existing pavement on site, thus eliminating the costs associated with transporting, stockpiling, handling, and inventorying reclaimed asphalt pavement (RAP). In some cases, virgin hot mix asphalt (often referred to as "admix") is required to produce the final mixture. Because only 15-30% of admix is usually required, the total transport and production costs associated with the virgin HMA are significantly reduced.

Figure 1. AR2000 hot in-place recycling train in SR 299 Big Bar area.



The HIR project was completed by the AR2000 single-pass operation train (Figure 1). This third generation equipment is manufactured in Japan, owned by the Canadian equipment contractor, Martec Recycling Corp, Inc., and operated by the Pavement Coatings Company, the prime contractor for this project.

HIR using the AR2000 train was accomplished using four unique pieces of equipment that recycled the existing pavement on site in a single pass. The first two pieces of equipment were preheating machines. The third piece was a preheater/miller machine, and the fourth piece was a postheater/mixer machine. A conventional paving machine followed this train to place the recycled mix, after which it was compacted. A truck transporting virgin admix HMA was also used in this project.

Pavements that are candidates for HIR are generally pavements that are candidates for traditional mill and fill techniques. These include pavements that have existing surface deterioration such as minor rutting, corrugations, cracking, raveling, flushing, and loss of surface friction. The HIR process typically operates at depths of one to two inches (25-50mm), but some projects have been reported to be as deep as three inches (75mm). Typical pavement widths are between 10–14.5 feet (3.05–4.42 meters). Based on the literature, HIR is not recommended for:



Figure 2. Alligator, longitudinal, and transverse cracking and raveling.

- Pavements with an overall thickness less than three inches (75 mm).
- Pavements where the surface course contains aggregates larger than one inch (25mm).
- Pavements where the underlying material has low load bearing capacity.
- Pavements where surface cracks extend through the whole pavement thickness and into the underlying base material.

The existing pavement had moderate alligator cracking, moderate transverse cracking, moderate longitudinal cracking, and raveling (Figure 2). The existing pavement also was oxidized.

The project had a number of issues in the beginning, including slow production rates, obtaining the necessary paving temperatures, safety issues, and achieving compaction. Additionally, the Hveem stabilometer values of the recycled pavement were inconsistent and were likely influenced by both the amount of rejuvenating agent used and the rate of production.

After trial and refinement, the contractor was able to eliminate the fire safety issues and use the HIR process to create a uniform pavement mix while achieving proper compaction (Figure 3). The adjusted amount of rejuvenating agent, TRICOR Cyclogen-L, helped address some issues with the low stabilometer values as well.

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Figure 3. Mix coming out of paving machine after AR2000 recycling train.

The pavement that was recycled produced a good final product once all the equipment problems were worked out. Figure 4 shows the recycled pavement next to the existing pavement. The cracking and raveling apparent prior to the HIR are no longer present.



Figure 4. Finished HIR section alongside of existing old pavement.

The CP² Center recently conducted a post construction project survey after one winter rainy season. Overall the pavement had a smooth ride. There was a considerable amount of grinding within the project limits to correct intermittent pavement smoothness problems that occurred due to issues during construction. The HIR

project produced a good quality mix and there was no apparent cracking or raveling problems during this visit. Figure 5 shows a pavement photo taken in February 2011.



Figure 5. HIR pavement condition after one rainy season and some grinding for improving smoothness

This project demonstrated that hot in-place recycling is a process that can produce pavements of good quality, but it is difficult to keep results consistent if existing pavement conditions are not uniform.



Caltrans research on State Route 58 proves that diamond grinding is a quiet solution

By Craig Hennings, ACPA-Southwest

State Route 58 (SR 58) is an east-west highway in California that travels across the southern San Joaquin Valley, the Tehachapi Mountains and the Mojave Desert. The City of Mojave is located 50 miles east of Bakersfield and has a population of more than 4,000. In 2003, Caltrans constructed a new section of concrete pavement on SR 58 to bypass the City of Mojave in Kern County. The location was chosen to evaluate both concrete pavement surface textures and one bridge deck texture technique. The newly constructed four-lane concrete pavement was selected as a test bed for concrete pavement research in California.

At the time of construction, three concrete pavement surface textures were created consisting of a Caltrans standard longitudinal tined section, a burlap drag texture and a longitudinal broomed texture. For the bridge deck research, a skewed (30 degrees) transverse broomed texture was constructed to compare it against the Caltrans standard transverse tined bridge deck texture. Upon completion, it was decided to create eight additional test sections consisting of diamond ground and grooved textures. The diamond ground and grooved sections were constructed within the three original texture test areas providing a total of eleven concrete pavement test sections at the Mojave site.

To evaluate the research from the test sites, Bruce Rymer, P.E., Senior Engineer with the Division of Environmental Analysis at Caltrans, contracted with Illingworth and Rodkin, Inc. to conduct tire-pave-

Diamond grinding in progress

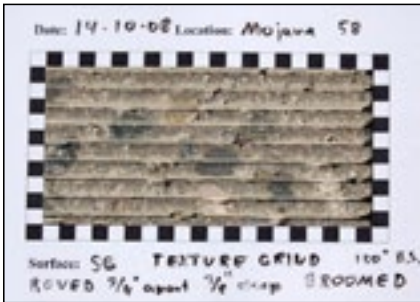


ment noise research in March 2003. Prior to opening the roadway to actual traffic, Paul Donovan of Illingworth and Rodkin, Inc. used several techniques to evaluate the sections. On Board Sound Intensity (OBSI) was used to evaluate the tire noise produced by each surface type. Additionally, way-

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Texture grind with burlap drag.



Texture grind, broomed.

side measurements were obtained by driving a reference vehicle past microphones positioned alongside the roadway. Caltrans also contracted with the Volpe Center Acoustics Facility to conduct additional pass-by testing with multiple vehicles on the originally constructed three concrete surface textures.

To date, five reports by Caltrans and Illingworth & Rodkin, Inc. have been prepared on the Mojave test site. The OBSI results found that the conventional diamond ground surface with 0.105-inch spacers resulted in noise levels lower than any of the 11 test sections. For the longitudinal grooved surfaces, the greater the cross sectional area of the groove resulted in an increase in noise. The longitudinal tined sections, representing the Caltrans standard

practice, resulted in noisier texture compared to the ground surface texture. The short segment of bridge deck evaluated in the study (skewed transverse broom texture) was determined to be approximately four to six dBA quieter than transverse tined textures that were tested.

The test results have been extremely useful to the industry as they have supplemented additional research efforts in regard to joint slap effects and acoustic longevity of concrete pavement textures. "Experiments conducted at the site have provided a fundamental understanding of surface texture acoustics and joint impulse noise. The acoustic data collected has had immediate application for quieter pavement strategies and it has provided valuable information for specifying quieter, longer lasting pavements," said Rymer. The team continues to test and monitor the site and the project also initiated a new bridge deck texturing specification.

Periodic testing, conducted by Illingworth and Rodkin, Inc. indicates the acoustic longevity of the 0.105-inch spacers diamond ground surface has changed less than 1 dBA in the five years since construction. This acoustic durability demonstrates the cost effectiveness of diamond grinding concrete pavements for improving smoothness and reducing noise.

The team members for the project included:

- Caltrans (Owner)
- Illingworth and Rodkin, Inc. (Tire pavement noise research)
- Volpe Center Acoustics Facility (Drive-by testing)
- Penhall Company (Diamond grinding contractor)

For more information on this project, please contact Craig Hennings at chennings@pavement.com.

DBR restores concrete roadways to structurally sound, smooth conditions

By Craig Hennings, ACPA-Southwest

Background

Dowel Bar Retrofit (DBR) is a Concrete Pavement Restoration (CPR) tool that restores load transfer across joints and cracks by installing dowel bars linking the adjoining slabs. By linking slabs, the traffic load is shared preventing differential vertical movement of the slabs at the joints and cracks, thereby eliminating the formation of faults or step-offs. It is these faults that cause the rough ride and wheel slap that is sensed when traveling on a concrete roadway that has lost its ability to transfer load from one panel to the next.

DBR, used in conjunction with other CPR practices such as diamond grinding, can return a concrete roadway to a structurally sound, smooth condition that can exceed the smoothness and noise values attained at the time of construction. This article is a summary of a report published by ACPA.

The benefits of DBR are many and include at least the following:

- **Long lasting:** When properly constructed, DBR lasts 15 to 20 years.
- **Environmentally friendly:** DBR is a sustainable pavement practice whereby existing concrete pavements are rehabilitated rather than reconstructed. Also, keeping the pavement light reduces the heat island effect as these pavements reflect more light, which in turn reduces roadside lighting requirements.
- **Traffic friendly:** Projects can be completed during off-peak hours with short single lane closures.
- **Flexible:** DBR only has to be applied to the lanes that show distress, whereas other treatments require the entire roadway to be treated.
- **Easy to bid:** Its simple design process allows projects to be designed and advertised in a fraction of the time required for competitive processes.
- **Safe:** Diamond grinding enhances surface friction and safety. In Wisconsin, researchers found that the overall wet weather accident rate for diamond ground surfaces was only 57 percent of the rate for non-ground surfaces.
- **Smooth:** Diamond ground roadways typically have a smoothness level equal to or better than original construction.
- **Cost-effective:** DBR is considered cost-effective since it is only applied to the faulted lane. When utilizing an asphalt overlay option, guard rails, overhead signs and bridges may need to be raised, increasing overall project costs.



The process

Before completing any work, the owner must determine that the existing pavement has the structural integrity to warrant DBR. A good DBR candidate is a roadway in which a majority of the pavement slabs exhibit a sound surface and provide significant remaining load carrying capacity. DBR placed on sound concrete will increase the potential for a successful and long-lasting installation. Roadways that have extensive spalling of the surface, with special attention paid to joint and crack locations, require further evaluation. Extensive deterioration may be an indication of larger problems within the slab not visible from the surface. Cores should be taken at these locations to determine the level of deterioration. Excessive bottom-up deterioration and spalling will inhibit bonding and may lead to premature DBR failure.

Working joints or cracks that have opened up $\frac{1}{2}$ inch or more at the surface require further investigation. Areas demonstrating bottom-up deterioration below the pavement surface should be considered as full-depth repair candidates. Areas that demonstrate heavy spalling at joints and cracks but minimal bottom-up deterioration should be repaired utilizing partial depth repairs prior to DBR installation.

Corner cracking may be an indication of voids under the slabs. Further testing with ground penetrating radar or other devices may be required to determine if undersealing should be included as a part of the project.

Cutting the slots



To begin, diamond saw blades mounted on a gang saw capable of forming a minimum of three slots at a time are used to saw-cut the perimeter of the slots. The slot dimensions should be based on the length and diameter of the bar being used, allowing enough room for the aggregate within the mix to move freely around the bar and chairs. The most common slot width is $2\frac{1}{2}$ inches when using a $1\frac{1}{2}$ inch diameter dowel bar. The slots should be placed on 1-foot centers, centered over the transverse joint or crack and parallel to the centerline with three or four slots per wheel path.

Next, the existing concrete within the dowel bar slot is removed utilizing light-weight jackhammers. The saw slurry on the sides of the slots is removed by sandblasting. Existing joints or cracks

Cutting out the concrete



are then sealed using a caulking compound prior to placement of the DBR assembly (bar, caps, core-board, and chairs) into the slot centered over the joint or crack. Prior to backfilling, all surfaces of the slot are moistened. Non-shrink patching material is placed and consolidated into the slot and cured according to manufacturer recommendations.

Diamond grinding is then used to provide a safe, smooth and quiet pavement surface followed by a joint resealing operation to prevent moisture and incompressibles from entering the repair area.

For more information on DBR and diamond grinding, as well as a complete set of industry recommended specifications, please visit www.igga.net.



Where to consider DBR:

- Pavements that exhibit load transfer below 60 percent.
- Joint and crack faulting between $\frac{1}{8}$ to $\frac{3}{4}$ inch.
- Transverse cracks that are reasonably tight with minimal spalling. If applied early, diamond grinding may be greatly reduced.
- Pavements that were constructed as non-doweled jointed pavements can have DBR applied to prevent future faulting as an effective pavement preservation treatment.

Where not to consider DBR:

- Pavements that demonstrate extreme deterioration at the joints or cracks require coring and additional investigation to determine if the pavement has the structural integrity to support the DBR process.
- Pavements that exhibit severe signs of chemical deterioration such as ASR or durability (D) cracking should be examined closely before considering DBR.
- Under-designed pavements that are cracking due to loading may require structural enhancement through the use of an overlay.
- Pavements with significant base deterioration and/or erosion should be addressed with undersealing prior to applying the DBR process.

Backfilling the slots



City of Stockton paves using terminal blend rubber with warm mix additives

By Lerosé Lane, CP2 Center

The City of Stockton, California, has implemented a major maintenance project to give the City streets new HMA surfacing in the major industrial areas. The Contractor, Knife River Construction, was very positive about using the terminal blend rubber with warm mix additives. The City's Maintenance Engineer/Resident Engineer, Vijay Sinha, was instrumental in approving the PG76-22TR terminal blend rubber, supplied and produced locally by Kent's Oil new terminal blending plant. Mr. Sinha was also instrumental in administering the construction of several test strips within the project incorporating warm mix technology. Center staff observed the construction of the project on August 27-September 1, 2010.

Altogether, the construction included a total of four different asphalt concrete mixes for five locations for this project. The five different test strips all used ¾ inch dense graded aggregate with PG76-22TR terminal blend rubber binder (see Table 1). The mixes included PG76-22TR with Sasobit, PG76-22TR with no warm mix additive (with and without liquid anti-strip), and PG76-22TR with Rediset. The different mixes appeared to behave the same during placement, with the exception that both warm mixes appeared to compact with less rolling effort. The PG76-22TR HMA mixes were not as sticky as polymer modified or asphalt rubber mixes. The PG76-22TR binder furnished by Kent's Oil for this project was developed by Ram Technologies Group. This particular binder product is said to have a solubility of 99.2% with 10% crumb rubber. The higher solubility level allows this product to be used interchangeably with the PG-polymer modified asphalt binder products.

Table 1 Summary of projects constructed

Date	Street	HMA Mix constructed with 3-inch lift thickness
August 27, 2010	Airport Way (Southbound)	PG76-22TR with Sasobit& Anti-strip (warm mix)
August 30, 2010	Airport Way (Northbound)	PG76-22TR with Anti-strip
August 31, 2010	Airport Way (Northbound)	PG76-22TR without Anti-strip
September 1, 2010	Sperry Road (Eastbound and Westbound)	PG76-22TR with Rediset (warm mix)
September 1, 2010	Manthey Road (Northbound and Southbound)	PG76-22TR with Rediset (warm mix)

The projects were placed during day-light hours and all mixes proved to provide a HMA surfacing with a uniform mat



Paving with PG76-22TR

as shown in the illustrations below. The project was



Finished mat with no warm mix additive



Finished mat with Sasobit



Finished mat with Rediset

constructed without any significant problems. Airport Way, Sperry Road, and Manthey Road had not received major maintenance in many years. All of the mixes were placed at normal paving temperatures and had minimal emissions with the PG76-22TR HMA. The high compaction that the contractor achieved with the PG76-22TR HMA made this a desirable major maintenance project for the City. The costs for this HMA were comparable to other polymer asphalt concrete mixes.

This HMA overlay maintenance project is expected to last a minimum of 10 years. As a secondary objective, this project allows the CP2 Center to study the effect that the warm mix additives have on the product and to monitor the project throughout its life. The Center plans to monitor the performance of these various test strips as a part of a CalRecycle funded project for the life of the study. This will include monitoring for raveling, flushing, rutting, reflective cracking, and stripping.

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Manthey Road:
Paving with Rediset
warm mix additive.



We appreciate the support of CalRecycle for providing the funding for this important and meaningful project. We would like to extend our gratitude to Bob Fujii and Nate Gauff of CalRecycle, who provided continuous support to this project. We also would like to extend our gratitude to the City of Stockton for their support, especially Maintenance Engineer/Resident Engineer Vijay Sinha and his staff. Neil O. Anderson and Associates, the consultant QC testing staff, were also very cooperative in furnishing the QC data, and Knife River Construction's staff furnished additional QC data to make sure that this study was a success. We also appreciate Laurence M. Sylvester, Chief Technical Officer, RAM Technologies Group, and Kent's Oil terminal blending plant staff for furnishing technical information regarding the terminal blend binder. We also want to give appreciation to Prem Naidoo with Asphalt and Wax

Innovations for his technical input on the warm mix technology.



Airport Way: Paving
with Sasobit warm
mix additive

El Cerrito street condition – a success story



By Jerry Bradshaw, Public Works
Director

When I came to work with the City of El Cerrito as the Public Works Director in 2004, I learned that the condition of our streets was a concern of my predecessor. The City had just invested about \$3 million in paving projects, but the funding source for this capital work was no longer available. El Cerrito is a small city with about 68 miles of street centerline, so a \$3 million investment was significant.

By early 2006 we were finishing our Pavement Management Program (PMP) update. The results were astonishing. 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 was a truly 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. On the day of our Council meeting, there was an article in the local paper about the sharp rise in asphalt costs. That just added salt to the wound. Although we received no direction from Council at that meeting, staff was already planning to do some public opinion surveys to determine how the community felt about the condition of the streets when compared to other major capital improvement needs such as a new police station, library or senior center — all equally dismal situations. As a public works professional, I felt the street condition crisis was most important. But as a department head I also knew that the Police Chief and Recreation Director felt just as strongly about their facilities' importance to the community.

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

Our mission would be accomplished in two phases: Develop a ballot measure with a realistic improvement plan; and, 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 back 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. Both political parties were in full swing for the presidential primary, and we expected a large turnout. We were not disappointed. All

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of our hard work paid off when we received a 71% majority in favor of our ballot measure, formally named the “El Cerrito Pot-hole Repair, Local Street Improvement and Maintenance Measure.”

For our Phase 1 success we owe much to many people. Public Works directors are not always well equipped to strategize and organize a campaign like this under

the scrutiny of public opinion. We hired two great consultants to help us, and my City Manager has an amazing talent for this sort of thing. They, along with our courageous City Council, deserve the credit for this success. The full story of how to wage a successful campaign is the subject of a different article, and I am probably not the person to write that.



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”. Of course, I wasn’t able to do this alone; I had already 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 role in the implementation phase. In addition, for over a year we had been relying heavily on StreetSaver, our PMP software developed by the Metropolitan Transportation Commission (MTC), to develop this improvement program. With the assistance of Nichols Consulting Engineers, who are 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.

First, I should summarize what was promised to the voters. Although the ordinance was written to allow many peripheral improvements such as sidewalks, traffic control facilities, and street-related storm drainage, the overt promise to voters was to tackle the pavement condition, beginning with the worst streets. 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 many of our streets were repaved and 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 layout the treatments with some minor modifications based on in-house knowledge of the streets. Bid documents were usually last year’s 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% of our streets in the “very poor” category (PCI < 25), we were facing a huge list of streets that needed reconstruction. But I was not satisfied with the prescribed treatments suggested by StreetSaver. I had been considering the virtues of 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. No need to even do crack sealing beforehand. Could that be true? Further research revealed that if the underlying structure was sound and the alligator cracking 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 engineers’ estimates.

This opened the door to have our City Council authorize larger-than-normal contingency funding. The fast-track nature of the program led us to issue bid documents with rough estimates of quantities, and we found ourselves designing specific treatments in the field with a



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can of marking paint while the contractor was mobilizing. We rationalized the large contingency funding with the promise to add more work at the favorable pricing to carry us closer to our goal.

This *modus operandi* proved to be exhaust-

ing, 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 had 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.

After only three years, the Street Improvement Program spent \$14.4 million: Bond proceeds of \$10.5 million, annual revenues of \$2.1 million and grants of \$1.8 million. We resurfaced 68% 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%.

But the big news is the resulting pavement condi-

tion. In 2010 we commissioned Nichols (through the MTC T-TAP 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 fantasies 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 be since you don't normally treat a street until its PCI is near 70.

The take-away 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. It is said that "Luck favors the Prepared Mind," and the City's collective mind was extremely prepared in this case. And that was not due to luck. The City's management team had the foresight and talent to explore options and prepare recommendations to our City Council. Our City Council had the courage to move forward with a ballot measure and authorize me 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. The trust that the City's management team had been building through years of honest, transparent, and productive work paid huge dividends in this instance. I feel privileged to be working for this community and its citizens. Perhaps there are other communities out there with the character to perform a similar miracle.



Local agencies face many challenges in operating and maintaining the local road network

By Julie Beuren, Director of Public Works, Contra Costa County and President, County Engineers Association of California

Every agency, state, county or city that is responsible for transportation infrastructure faces similar challenges in maintaining what we have and providing for the future needs with limited resources. There is not enough transportation funding to do what needs to be done and competing priorities for limited funds make our jobs more difficult.

It is important to note that most roads and bridges in the United States are under local jurisdiction, but national and state transportation funding policies do not provide the resources necessary to maintain a state of good repair, let alone meet the growing mobility needs.

Local roads are a critical component of the nation's transportation infrastructure, particularly for the critical first or last mile in the movement of people and goods. Every trip begins on a city street

or county road. Nationally, roads owned by counties and cities account for 2.9 million miles or 75% of America's highways. In California, 82% of the state's pavements are owned by cities and counties.

The users of our system, the motorists, truckers, cyclists, and pedestrians, do not care what government jurisdiction is responsible for the condition of the roads. They want their gas taxes and user fees directed to provide a safe, high quality, seamless system. Transportation policy-makers have an obligation to deliver that system.

All across the country, roads and bridges are falling further into a state of disrepair. Data available from the U.S. Department of Transportation shows that local roads have a disproportionately high amount of pavement in poor to fair condition with nearly 65% of major collector mileage in rural areas and 70% of minor arterial and collector mileage in urban areas in poor to fair condition.

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In California, when discussing funding needs for the State's transportation network, the focus has been on the Interstate system or the State Highway System with little focus on the local road network. Part of the problem has been that we did not have good data to show what the need is for the local road network. To provide that information the California State Association of Counties, County Engineers Association of California, League of California Cities, Rural Counties Task Force, and Regional Transportation Planning Agencies jointly sponsored a statewide needs assessment of the local system.

The purpose of the study was to provide information and critical analysis on the local transportation network's condition and funding needs to answer these four questions:

- What are the conditions of local streets and roads?
- How much will it cost to improve or maintain pavements in an acceptable condition?
- What are the safety, traffic and regulatory needs of the local network?
- Is there a funding shortfall, and if so, what is it?

The first comprehensive statewide study of California's local street and road system in 2008 provided critical analysis and information on the local transportation network's condition and funding needs. On a scale of zero (failed) to 100 (excellent), it showed a statewide average Pavement Condition Index (PCI) of 68 (at risk) for the local system and, based on projected funding, determined the shortfall necessary to bring the system into a state of good repair was \$71.4 billion over ten years. The 2010 update continues to report on this system and it is probably no surprise that it has gotten worse. The statewide average PCI has dropped to 66 in two short years and the ten year shortfall has grown to \$78.9 billion.

Summary of 10 year needs and shortfall for 2010 and 2008 (\$ billion)

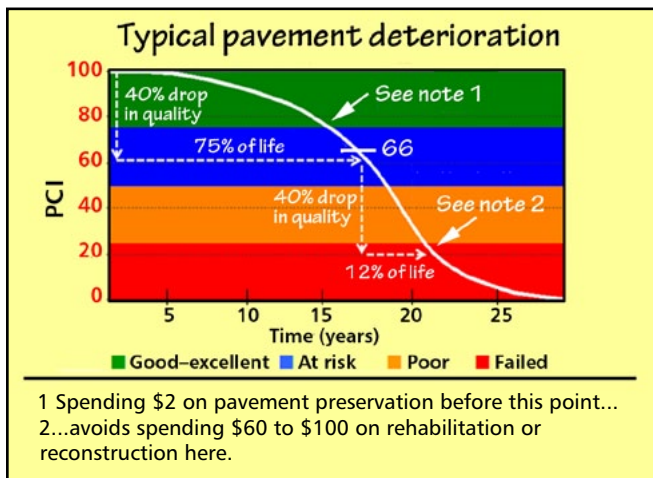
Transportation Asset	2010 Results			2008 Results		
	Needs	Funding Available	Shortfall	Needs	Funding Available	Shortfall
Pavements	\$ 70.5	\$ 14.2	\$ (56.3)	\$ 67.6	\$ 15.9	\$ (51.7)
Essential Components*	\$ 29.1	\$ 6.8	\$ (22.3)	\$ 32.1	\$ 12.4	\$ (19.7)
Bridges	\$ 3.3	\$ 3.0	\$ (0.3)	N/A	N/A	N/A
Totals	\$ 102.9	\$ 24.0	\$ (78.9)	\$ 99.7	\$ 28.3	\$ (71.4)

*The transportation network includes essential components for safety and traffic management such as signs, striping, curb ramps, sidewalks, storm drains, streetlights and signals. This does not include the costs due to NPDES regulations, which may be as much as an additional 10% of the transportation costs.

The costs developed in the needs assessment are based on achieving a pavement condition of what the industry calls Best Management Practices (BMPs). This represents improving the pavement condition to a level where roads need preventative maintenance treatments such as slurry seals, chip seals or thin overlays. These treatments are cost effective, have the least impact to traffic and are also more environmentally friendly than a major rehabilitation or reconstruction project.

As roadway pavement conditions deteriorate, the cost to repair them increases exponentially. It costs twelve times less to maintain a pavement in good condition compared to a pavement that is at the end of its service life. By bringing the roads to BMP conditions, we will be able to maintain streets and roads at the most cost effective level.

In addition, the local street and road system provides two-fold opportunity for economic recovery during the worst fiscal crisis in California in decades. The maintenance and preservation of the local transportation network provides both public and private sector jobs and thus supports economic recovery in every corner of the state. Furthermore, well maintained infrastructure is critical for economic development by attracting businesses and providing for the safe and efficient movement of both people and goods.



The chart also shows the deterioration curve of pavement with the PCI, from 0 to 100 on the vertical axis, and time in years on the horizontal axis.

If cities and counties lose any additional funding from the State, the results will be disastrous for local streets and roads. The fact that more than twice the current funding level is needed just to maintain the current conditions is alarming. Almost \$7.9 billion annually in new money is needed to bring the local system back into a cost effective condition and stop further costly deterioration of California's local street and road system. This is equivalent to about a 53 cents per gallon gas tax increase which would have the average driver paying an additional 73 cents a day for gas. (This assumes 10,000 miles per year at 20 mpg). It is imperative that cities and counties receive a stable and dedicated revenue stream for cost effective maintenance of the local system to avoid this crisis.

To illustrate what is happening, I will use my county of Contra Costa as an example. We have 660 miles of unincorporated county roads to maintain. Our average pavement condition index is 75. Our arterials are rated at 80, collectors at 74, and our residential streets are at 72. We are in pretty good shape. This is not by accident, but due to years of a proactive pavement maintenance program with regular surface treatments to preserve our pavements in good condition.

However, how well we do depends so much on how much money we have. We have seen a steady decline in our pavement condition index since about 2003/2004. When evaluating potential causes, one contributor was the amount of funding made available from the federal and state government. This illustrates how funding levels have affected the pavement condition on our county road network.

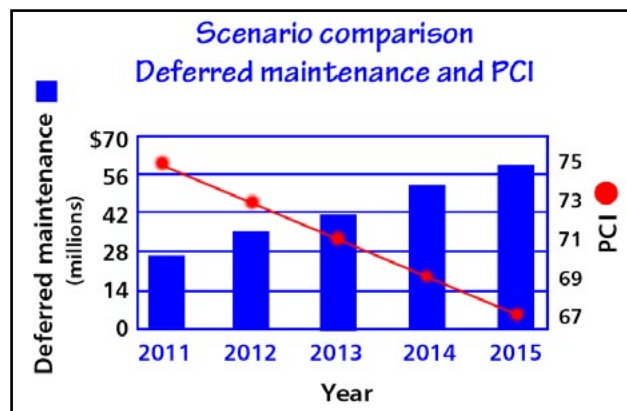
Impact of funding on PCI

	Influx of Federal funds and Prop 42 funds for local streets and roads				Budget issues: suspension of Prop 42 and deferral of gas tax				
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010
PCI	83	86	85	83	82	80	78	76	75

Our PCI rose after an influx of federal and state funds in 2000/2001 that allowed us to overlay many of our major arterials in 2002 and 2003 bringing our county average PCI up to a high of 86. Then with the suspension of Proposition 42 and deferral of gas tax a few years later, you can see that we are experiencing a steady decline in our pavement condition.

We also took a look into the future to see what our pavement condition and deferred maintenance will be if the problem of unstable and unreliable funding continues. We currently have a staggering deferred maintenance liability of almost 30 million dollars.

The following chart shows a worst case scenario of no funding for surface treatments over the next five years.



You can see that in 2015, our deferred maintenance more than doubles and our pavement condition drops from 75 to 67 putting our pavements on the "edge of the cliff."

The funding we have counted on from the State continues to be uncertain. In Contra Costa, about 90% of our maintenance and operations funds for our county road network come from the State dedicated transportation funds that are distributed to cities and counties by formula: the gas tax and Proposition 42 funds which was from sales tax on gas. Over the last few years, we have seen the state defer transportation funds to cities and counties. We have had to operate on borrowed funds and have only programmed for bare-bones maintenance, causing our pavement condition to worsen. Last year the State Legislature passed what is referred to as the Transportation Tax Swap, eliminating the state sales tax on gas for transportation, but increasing the excise tax on gas to a level that made cities and counties whole. The State also solved some bond debt issues that helped its budget problem. However, Propositions 22 and 26 passed in November basically undid the tax swap. Under Proposition 22, the State cannot use the funds for bond debt. Proposition 26 requires that the increase in the excise tax on gas be passed by a 2/3 majority vote, so the simple majority passed tax is nullified. The Governor's budget proposal includes a fix that will require the Legislature to validate the increase in the excise tax with a 2/3 majority vote.

Contra Costa is fortunate to be a self-help county and we receive a portion for our local road network. This provides about \$2 million annually, or 10% of our funding for operations and maintenance. This table shows just how reliant Contra Costa County is on state funding for road maintenance and operations.

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Dedicated funding sources	FY 09/10	FY 10/11
State – Highway Users Tax Account	\$ 14 million	\$ 14 – 21 million
State – Prop 42	\$ 7 million	\$ 0 million
Local – ½ cent sales tax	\$ 2 million	\$ 2 million
TOTAL	\$ 23 million	\$ 26–23 million

Historically, we received approximately \$14 million of the Highway Users Tax Account (excise tax on gasoline), \$7 million from Proposition 42 (State sales tax on gasoline), and \$2 million from our local ½-cent sales tax. That is what is shown in Fiscal Year 09/10. With the Transportation Tax Swap, Fiscal Year 10/11 was projected to give us the same amount of money. With Proposition 26 that is uncertain. It will either be \$14 or 21 million. Not knowing what the legislature will do makes it very difficult to plan. Seven million dollars of uncertainty represents about one-third of our road budget and it is the difference between whether or not we do a surface treatment program. Continued uncertainty, deferral, or loss of this funding will have devastating effects on our ability to maintain and operate our local road network.

Even if the tax swap is fixed, the gas tax is not keeping pace. It is not indexed to keep up with inflation and it is a tax on gallons sold, not on the price of gas. So while travel on California roads increased by 28% between the years 1991 and 2007 the revenue generated per vehicle-mile traveled has declined by more than 20% over that period.

The current state gas tax of 18 cents per gallon has been in place since 1994. The 2008 budget analysis from the State Legislative Analysis Office reported

that inflation has eroded the value of per gallon tax revenues by 28%. 18 cents in 1994 was worth 13 cents in 2008 based on the California Consumer Price Index, and worth only 11 cents based on the Producer Price Index for Highway and Street Construction.

Understanding that we are in difficult economic times and policy makers at all levels of government have to make difficult decisions on priorities, the information provided in the statewide needs assessment must be part of the process in determining where to invest our very limited transportation funds. A policy of fixing it first to bring our existing infrastructure to a state of good repair should be considered not only for the local system, but also for the State operated freeways and highways as well as for transit. Can we afford to invest in new projects, when we are not able to effectively maintain what we already have?

For more information on the California Statewide Needs Assessment, visit www.savecaliforniastreet.org/. The National Association of County Engineers (NACE) has also launched a campaign called Local Roads Matter. Visit their website for more information on this issue at the following website www.countyengineers.org/localroadsmatter/Pages/LRM.aspx.



Pavement testing and inspection — information or punishment

By Steve Marvin, LaBelle-Marvin



Worlds collide as owners, contractors and engineers debate the need, cost and value of testing and inspection. While each concludes sound judgment should drive construction practice, the reason for collecting information remains in debate. Available information is often limited to the quantities of materials used and limited data relative to the qualities of those materials. The debate seldom includes the risks and rewards of obtaining, retaining and analyzing the same data. Often the intent of testing and inspection degenerates to 'catching the cheater,' instead of enriching the database for future decisions.

In practice, we rely on tests and make judgments based on thousands of inspections each day. While driving, tests are performed on fuel levels, speed, temperature, oil levels, and so forth. Daily inspection of tire wear, condition of windows and windshields, windshield wipers, etc. is also performed. While we accept the inherent inaccuracies of the gas gauge and speedometer, few are willing to cover the instrument panel and travel without basic information.

We use the information provided and push the specified limits. Speedometer inaccuracies are known as we speed to our destination. Based on risk assessment, we might choose to travel faster than specified, either by some tolerable amount, by

keeping pace with traffic, or by choosing to travel just slower than the fastest vehicle we have observed. We combine speed information with pavement surface conditions such as dry, wet, ice or snow and adjust our 'risk' or travel speed accordingly. The surface conditions also may be combined with our most recent tire wear inspection and a final risk assessment is performed. Where our estimates are reasonably accurate, a safe journey may be the reward.

The oil dipstick provides both a high and low specification. We may tolerate running the engine one-quart low for a short time accepting some 'level' of risk. While the low oil level is no guarantee of engine failure, combining a number of variables such as heavy traffic, exceptionally high temperatures, low coolant levels, heavy loads in the vehicle, steep grades, etc. each add additional risk until the combination results in failure.

Rational thinking in the pavement industry suggests the owner includes a careful review of construction records, inspection information and testing data compared to previous performance. The owner combines the information with risk assessment progressing through alternatives such as reconstruction, conventional asphalt concrete and rubberized asphalt concrete overlay, cold in-place recycling, full depth reclamation, slurry seals,

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chip seals, cape seals and micro-seals yielding a final selection. The owner, however, also combines available data with subjective information such as recollection and rumor, desired performance level and tolerance for failure. Where the hard data is absent, decisions are based on recollection, rumor and fear of failure.

We must overcome rumor, risks and fear with information and documentation. Given the variability of the product we deliver and the products which we construct, such documentation is critical. When you run out of gas on the side of the road, the average fuel level in that tank, from beginning to end was half full. Since we do not run out of gas every time we travel, the average fuel in your tank is always over half full. Would a gauge providing average fuel level be useful, or as with so many poorly documented projects, be inaccurate and useless?

We continually construct over old alignments which have been widened and realigned, patched, cut, overlaid, sealed, and re-stripped and have been subjected to countless repeated abusive loadings from trucks, buses and automobiles. Our local roadways also serve as parade routes, playgrounds, gathering areas and other uses. Products have been applied to the roadway which range from the use of recycled glass, recycled aggregates, sound and unsound aggregates, modified binders, rubberized asphalt concrete, conforming and non-conforming asphalt concrete, effective and ineffective overlays and still we move forward placing the next greatest material over the top of what may have been somebody else's folly.

While these various products and methods have evolved, the wheel loading and traffic volumes have changed even faster. Tire pressures increase, axle loads increase and trash truck lengths increase. Small diameter cul-de-sac streets provide 'heat island' relief while presenting real operational difficulties during construction and for large service vehicles using the streets.

We utilize a variety of products with related risks and benefits ranging from major rehabilitation, overlay, fog seals, slurry seals, cape seals and micro-seals. Projects include conventional asphalt concrete overlays, rubberized asphalt concrete, latex modified binders, open graded asphalt, warm mix asphalt concrete and more. We must learn how these differing surfaces perform over time, and how they affect the use of previously cost effective resurfacing processes such as slurry and chip seal. Will the construction records exist, readily retrievable through modern technology, to evaluate the effectiveness of these products, or will our resistance to testing, our perception of testing and inspection, result in future decisions based on recollection, observed performance and rumor?

We must address the advantages of including pavement preservation treatments, which by virtue of economics become difficult to budget for comprehensive testing and inspection programs. By the very nature of the procedures, inspection is often reduced to monitoring resident notification procedures, roadway closure and opening times, etc.

Alternatives such as reconstruction provide structural improvement and include certain understood construction risks. Full depth reclamation provides structural improvement, and includes an expected asphalt concrete wearing surface. Cold in-place recycling also includes a new asphalt concrete wearing surface. Costs for each may be slightly less than complete reconstruction, while the "green," sustainable aspect of the project trumps the apparent risks of construction duration and unknown performance. Asphalt concrete and rubberized asphalt concrete overlays each present a measurable structural improvement and a finish surface consistent with public expectations.

Wearing surface replacement does not necessarily include structural improvement and as such includes greater flexibility of choice and final surface characteristics. Slurry seals provide low cost improvement with a generally acceptable final wearing surface. Chip seals are a very effective wearing surface and provide a surface widely accepted in rural environments and roadways not serving as community meeting places and play areas. Combining slurry and chip seals in a cape seal, provides the impression of a slurry seal surface acceptable in many jurisdictions.

Chip seals and cape seals are very susceptible to rumors and present the greatest challenges for testing and inspection at an acceptable percentage of total construction costs. As such, emphasis on testing and inspection often approaches 'average' conditions, pre-qualification of materials, etc. Where performance does not meet expectations, the overall product is 'blamed' and another tool in

We must overcome rumor, risks and fear with information and documentation.

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Full depth reclamation. Photo FHWA



our infrastructure toolbox is eliminated. Since no significant after-the-fact testing is possible for the plethora of pavement seals used, there is little recourse other than complete rejection of the product or procedure.

Perceptions regarding testing and inspection include "facts," such as it is not timely, it only catches cheaters, it complicates and penalizes a project and, of course, it is expensive. If we view testing and inspection as a product only valuable for catching cheaters it remains a cost and the cost is high. Where testing and inspection is reduced to a minimum, yielding average values, the value is even less, not unlike a gas gauge that provides average tank conditions over time.

Placing a value on documentation requires raising use of the information above the penalty phase and permitting understanding of the variables involved in construction. These variables include those over which we have some control, those over which we have little control and those over which we have no control. We must evaluate the risk of each variable, reducing the exposure of our products and processes to an acceptable level.

The value of documentation is to evaluate the variability of the product we provide and the variability of conditions under which we work. We must re-view the value of real and complete records. Com-

plete records provide a level of comfort to the contractor, material supplier and the owner. Where the contractor and material supplier understand the risks, costs are reduced. Where the owner understands the risks, rational decisions result. The comfort provided from the records is 'priceless.'

The image-conscious environment in which we live and work demands a higher level of product understanding. The public is interested in appearance and does not tolerate excuses. City Councils must keep the public satisfied, and the City Engineer is tasked with understanding the public, improving the streets and City infrastructure and keeping the City Council satisfied.

During the rehabilitation debate, we are not only competing project to project, but between departments, between Social Services, Fire and Safety and Public Works. During the process of Budget Evaluation and Risk Assessment, we must understand expectations and compromise. We must enter the debate with full and complete information. Judgment exercised by the owner should be based on perception, expectations and specific observations and measurements. Absent documentation, and the fact perception and expectations do not always match, the risks and rewards will be reduced to risks and rumors.



Patte Hahn and Jim Moulthrop dispense hospitality at the TRB 90th annual meeting.

FP² Inc. update

By James S. Moulthrop, P.E., Executive Director



Left to right, Roger Smith, Tom Kazmierowski, Steve Mueller and Jason Harrington enjoy the FP² hospitality.

The year 2011 is beginning with a bang for FP²! We have begun our annual drive for supporters and the response to date has been tremendous. The Transportation Research Board held its 90th Annual meeting in Washington, D.C., in late January and we hosted our annual hospitality suite. The meeting set a new attendance record of 10,900 transportation practitioners from around the world and several pavement preservation paper sessions were conducted along with the pavement preservation and pavement maintenance committee meetings. The hospitality suite was jam packed with attendees discussing preservation and other pavement related issues.

The Board of Directors met during this same time and elected officers and board members for the coming year. The following slate of officers will serve through December 2011: Baxter Burns, Ergon Asphalt and Emulsions, President; Mike Buckingham, Strawser Inc., Vice President; Bob Koleas, West-

ern Emulsions, Secretary; and Bill O'Leary, Martin Asphalt, Treasurer.

FP² Inc. selected the National Center for Pavement Preservation (NCP) as the organizer of a 2012 National Conference on Pavement Preservation at their October 2010 Board meeting. The NCP has chosen Nashville, Tenn., for the venue and scheduled the conference for the last week in August. The 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 AASHTO regional partnerships come together in a national event. Topics are expected to include:

- Pavement preservation best practices
- Pavement preservation in the asset management world
- New materials, equipment, technologies, and research
- Sustainability (financial, environmental and social)
- Pavement preservation academic and training curriculums
- AASHTO TSP 2 pavement preservation partnerships

FP² is partnering with the National Center for Pavement Preservation in organizing and delivering this

conference. For more information, check on the National Center website at www.pavementpreservation.org.

The Board also selected France as the organizer for the 2014 International Conference and a representative of the organizing committee, Jean Claude Roffe, advised the board at the January meeting of the preliminary arrangements for the meeting.

On the legislative front, the 112th Congress was sworn in and seated in January and many changes have taken place, especially in the House of Representatives. How this will impact our efforts to insert preservation language into a multi-year (we hope) transportation bill remains to be seen but our efforts continue in this regard. The President's State of the Union Address emphasized the need for the nation to address our infrastructure needs. Senator Boxer, Chair of the Senate Environment and Public Works Committee, held a hearing in late January to obtain testimony on the need for this legislation. Newly named Chairman of

the House Transportation and Infrastructure Committee, Congressman Mica, has indicated work on a bill will commence soon and, beginning February 14, he plans to conduct informational sessions at 15 locations around the country to get taxpayer input on transportation needs. Finally, word from the FHWA indicates that the Administration is working on a bill as well. It is anticipated that the Administration will include transportation in the budget to be released soon.

During TRB, several members of the FP² Inc. board held meetings with Congressional staff organized by our advocacy firm, Williams and Jensen, to acquaint the new members with the pavement preservation story and the need for legislation.

The Pavement Preservation Journal continues to be the flagship publication for FP² Inc. Currently the total distribution is 6,000 copies to 20 countries around the globe and the average pages of advertisements has increased by 49% from 2008-2010.



Pavement preservation conferences

CCSA meeting



Steve Takigawa of Caltrans makes a point at the CCSA meeting.

The California Chip Seal Association held its annual pavement preservation conference on Feb 2-3, 2011 in Ontario, Calif. More than 275 participants attended the conference with good representation from industry and agencies. A total of 24 Industry, Academia and FHWA exhibitors were also present to show off their wares, and share technical information. All breaks took place in the exhibit areas so there was plenty of time for networking.

Steve Takigawa "kicked off" the meeting with the theme that change is coming to Caltrans. He clearly stated that change is needed to become more credible and accountable. Those accountable for pavements in Caltrans include Takigawa, Tony Tavares, and Amarjeet Benipal. Some points Takigawa addressed included:

- The PPTG needs to address issues quickly. This will improve perception and credibility.
- Funding will be more difficult in the future. Pavements have competition for funding and you must "get in line if you want to get funded."
- He wants to introduce proposals for better value and not for lowest bid.
- He wants to change the culture. This will include partnerships and moving forward together. The partnerships must be "credible and accountable."
- "If you are credible and accountable, funds will flow to you."

Pavement preservation is important to Steve Takigawa and other leaders in Caltrans. This was evidenced by the fact that he and Tony Tavares stayed for the entire conference.

Other presentations during the first day included:

- Surface preparation, by Mike Fain (Windsor Fuel)
- Training tools, by Jim Ryan (Paramount Petroleum)
- Rock basics, by Ben Licari (Granite Rock)
- Basic on emulsions, by Gary Houston (VSS Emultech)
- Eco-friendly chip seals and slurry surfacings, by Arlis Kadrmaz (BASF)
- Emulsion chip seals, by Joe Platt (Western Emulsions)
- Hot applied chip seals, by John Fox (Caltrans)
- Slurry surfacings, by Imelda Diaz (LA County Public Works)
- Contractor viewpoint on chip seals and slurry surfacings, by Marc Bertsch (Intermountain)

At the conclusion of the first day, a lifetime achievement award was presented to Bob McCrea of Western Emulsions for his contributions to the Association and Industry. Bob has been instrumental in promoting chip seal and other maintenance strategies in the state of California and elsewhere. He has over 36 years of experience in the asphalt industry and is a past president of the CCSA.

The second day began with a presentation by Julie Bueren, Director of Public Works at Contra Costa County titled "Funding in Tuff Economical Times." She discussed the importance of local roads and how they continue to fall into disrepair due to the lack of funding. She reported on the needs assessment done by Nichols Consulting Engineers (NCE) which reports large deficits between agency needs and funding. She also mentioned that other things competed for funding. The areas competing for general funds include:

- Safety
- Emergency response
- Congestion
- Livable communities

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She reported there are funding challenges at the local, state and federal levels. Right now most of the funding for the county comes from the state. For more information on some of the issues facing counties nationally or in California, please check out the following websites:

NACE: www.countyengineers.org

CEAC: www.ceaccounties.org

Other topics covered during the second day included:

- Multi layer maintenance seals, by Jack Van Kirk (Basic Resources)
- Fog and rejuvenating seals, by Jim Brownridge (TRICOR Refining)
- Inspection and testing, by Steve Marvin (LaBelle-Marvin)

At the end of the second day, quality awards were presented to the following agencies and contractors:

- Western Emulsions and Caltrans District 8
- International Surfacing Systems and Sonoma County/Paramount Petroleum, Roy Allan Slurry Seal and the City of Thousand Oaks
- Intermountain Slurry Seal and City of Porterville
- Valley Slurry Seal and Caltrans District 8



Bob McCrae receiving an award from the CCSA board, from left to right Andy Clayton, Bent Towns, Rick Best, Mike Heath, Bob McCrae, Scott Dmytrow, Ken Talley, and Jim Ryan.

All of the presentations and more on the awards can be found on the association website at www.chipseal.org.

RPA annual meeting

The Rubber Pavements Association convened its 2011 Annual Membership meeting in an unseasonably cold San Antonio, Texas, on Feb. 8, 2011. The well attended event included a Board of Directors' meeting where issues of policy and finances were addressed. The annual gathering also hosted a luncheon with John D'Angelo presenting details on the effort to modify performance grading protocols to include binders with particulates. An associates' forum in the afternoon allowed various associate members to present items of interest to all. An Awards Dinner in the evening included a presentation by Dr. Gary Hicks on progress with the updates to the Life Cycle Cost Analysis work at the CP² Center at Chico State.

Dr. Barry Takallou, immediate past President of the RPA, was honored for his accomplishments during



Jeff Smith, RPA's new president

his term including the institution of the RPA Ambassador Program. The Bureau of Indian Affairs and the Navajo Nation were recognized with an award for the large spray applied project they successfully completed in north-east Arizona and northwest New Mexico. Brett Barstow of Golden By-Products was awarded an honorary title for his diligent efforts in researching the asphalt rubber industry as someone new to the technology. Finally, Donna Carlson was given an RPA "Lifetime Achievement Award" for her many contributions over the years to a grateful asphalt rubber industry (see photo on page 20).

The second day included presentations on:

- Pavement preservation strategies
- Advantages of using recycled tire rubber in asphalt
- Texas DOT materials and specifications
- Case histories of asphalt rubber chip seals and thin HMA overlays
- Asphalt rubber research and development
- Durability and safety advantages of asphalt rubber pavements
- Best practices for placement of asphalt rubber pavements
- AR/PMAR pavement preservation strategies

All of the presentations can be found on the RPA website at www.rubberpavements.org.

APWA meeting

A workshop on strategies for pavement preservation was held in Ventura, Calif., on Feb. 23, 2011. The meeting was hosted by Chris Hooke of Ventura County. Gary Hicks, of the CP² Center led off the meeting by discussing pavement preservation techniques for flexible pavements. Other topics covered during the workshop included:

- Warm mix asphalt
- Rubberized asphalt
- Cost effectiveness and strategies for pavement maintenance
- Local pavement preservation programs

The presentations were followed by a panel discussion.

More than 60 people attended the meeting and were pleased with the presentations. All presentations can be found on the CP² Center website at www.cp2info.org/center.



Chris Hooke



Gary Hicks

Continued, next page

Joint AEMA-ARRA, ISSA meeting

The annual meeting of AEMA-ARRA-ISSA was held in Tucson, Ariz., on Feb. 21–25, 2011. The theme of the conference was “Bailing out Main Street or Preservation and Rehabilitation 2011.” The program featured the following:

- Board meetings for each of the associations.
- Welcomes by each of the association presidents during the Opening General Session on Wednesday which was followed by comments from the Mayor of Tucson, the Administrator of the Federal Highway Administration, the Director of Transportation for Arizona DOT, and a motivational presentation by Clayton Clark.
- Update on FHWA activities in preservation.
- Update on the FP² Inc. and the Washington outlook.

The presentations are on the association websites www.aema.org, www.arra.org, and www.slurry.org.

90th Transportation Research Board

The 90th Transportation Research Board annual meeting was successfully held in Washington, D.C., from Jan. 23 – 27, 2011. The TRB meeting attracted more

than 10,000 transportation professionals from all over the world. Although the number of participants from State DOTs dropped, the participants increased from others sections, such as policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. The meeting covered all the areas in transportation with 4000 presentations and 600 sessions or workshops. The theme of the 2011 TRB meeting was Transportation, Livability, and Economic Development in a Changing World.

It was an excellent opportunity to promote pavement preservation knowledge as well as the CP² Center. Dr. Ding Cheng, CP² Center Director, attended the meeting and made three presentations for the CP² Center: (1) Assessment of Warm Mix Technologies for Use with Asphalt Rubber Paving Applications, (2) Pavement Preservation – Protecting Our Investment on the Road, and (3) Innovation Process and Database for Pavement Preservation Treatments Used in California. He also attended the AHD18 pavement preservation committee meeting, the AHD20 pavement maintenance committee, and the AFD10 pavement management system committee meeting.



George Way (Rubber Pavements Association) and Ding Cheng at the TRB meeting poster session.



The CP² Center moved into a new office space in Jan., 2011. It is now located at 35 Main Street, Suite 205, in Chico. The phone numbers and email addresses remain the same.

Center News

By Ding Cheng, CP² Center Director

The Center remains very active despite a reduction in funding from Caltrans. The following include some of the efforts underway at the Center.

Warm mix project with CalRecycle

We continue to monitor projects that use warm mix additives with asphalt rubber or terminal blends (modified binders). These projects include chip seals and thin hot mix overlays. We will be looking for other projects to monitor in the construction season of 2011. If you have projects, that you would like the Center to monitor, please let us know by contacting Dr. Gary Hicks at rg Hicks@csuchico.edu or 530-898-3685.

LCCA project with CalRecycle

We are currently surveying a number of agencies in California to identify the cost and expected life for both chip seals and thin HMA products containing asphalt rubber, rubber modified binders, and polymer modified binders. The purpose of this study is to determine the cost effectiveness of the various modified binders compared with conventional binders. For more information on this study, please contact Dr. Ding Cheng at dxcheng@csuchico.edu or 530-898-5981.

LCCA work with Caltrans

As a part of an ongoing training effort, the Center is updating the Caltrans online LCCA software training

module used by Caltrans. Both Dr. Ding Cheng and Le-rose Lane are working on this effort.

Alaska pavement preservation project

The Center is working with Alaska DOT & PF, the University of Alaska at Fairbanks and Anchorage on a project to establish a pavement preservation program for the state. The first step includes the development of a Roadmap for Alaska to develop and implement a pavement preservation program. This is being accomplished by the Center. Concurrent activity includes a review of literature and a survey of other cold region areas on preservation treatments used in these locations. These efforts are being accomplished by the Universities in Alaska. Preservation treatments used in Alaska have generally included thin HMA overlays, chip seals, and surface recycling. Their existing projects are being incorporated into a pavement preservation database which has been developed by the Center. For more information on this project, please contact Dr. Gary Hicks at rg Hicks@csuchico.edu.

Lab update

The Center is in the process of purchasing binder equipment including the Performance Grade test equipment for use in characterizing the binders we work with. We hope to have the equipment set up in time for monitoring projects during the summer of 2011. We are still working on the construction of a modern materials lab that would house not only our existing labs (soils, aggregates, concrete) but also an asphalt binder and mix laboratory.

PPTG update

By Peter Vacura, Hans Ho and Craig Hennings, Co-Chairs, PPTG

The PPTG is still evolving as we move into 2011. At a meeting in October 2010, Bill Farnbach (Caltrans interim PPTG co-chair) reported that the PPTG was being streamlined in part because of resource issues on the part of Caltrans. The latest org chart is shown to the right, which basically compressed the number of subgroups from 22 to 8.

A meeting will be scheduled for April, 2011 in Sacramento, Calif., to discuss the new organization, the expectations from the new sub-groups, and the various work plans that were developed in 2010. It is important that we clearly define the transition from the old to the new organizations so that the important work in the old task groups is completed. There are still a number of outstanding issues including the following:

- Development of the SSP for modified binders.
- Updating the SSP for asphalt rubber.
- Completing the fog and rejuvenating seal study so that specification and guidelines for their use can be issued.
- Updating various chapters in the flexible and rigid MTAGs.

At the proposed meeting, the frequency of the general meetings and the new subtask groups will be discussed. We look forward to restarting this important organization after a period of inactivity.

Pavement Preservation Task Group	
Caltrans Co-Chair	Industry Co-Chairs
Peter Vacura	Hans Ho/Craig Hennings
Outreach/Training CT Co-Chair, Hector Romero Ind. Co-Chairs Brandon Milar Craig Hennings	Surface Seals CT Co-Chair, Doug Mason Ind. Co-Chair, Jim Ryan Section 37 MTAG Vol. I Chapters 6, 7, 8, 9, 12
Local Agency Issues Chaired by local agencies Erik Updyke Greg Kelley Nina Buelna TBA	Thin Lifts/BWC and Asphalt Repair CT Co-Chair, Sri Holikatti Ind. Co-Chair, Wally Smith MTAG Vol. 1, Chapters 4, 5, 10, 11
Strategy Selection CT Co-Chairs, Rob Marsh and Ron Jones Ind. Co-chair, John Roberts MTAG Vol. I, II, Chapter 3	Surface Recycling CT Co-Chair, Hamid Moussavi Ind. Co-Chair Don Matthews MTAG Vol. I, Chapter 13
Innovation CT Co-Chairs, Leo Mahserelli and Brian Weber Ind. Co-Chair, Scott Metcalf New Products New Applications	Concrete Repairs CT Co-Chair, Larry Rouen Ind. Co-Chair, Vincent Perez Slab Replacement, Joint seal DBR, Spall Repair Diamond grinding MTAG Vol. II, Chapters 4,5,6,7,8



Upcoming pavement-related events

March 2011

22–26 — CONEXPO. Las Vegas, Nev. www.conexpoconagg.com

27–30 — AAPT Annual Meeting. Tampa, Fla. <http://www.asphalttechnology.org>

April 2011

15–23 — National Association of County Engineers Annual Conference, Minneapolis, Minn. www.nace.org

July 2011

24–27 — Tech International Conference on Low-Volume Roads, Orlando, Fla. email: TRBMeetings@NAS.edu

September 2011

18–20 — APWA Show. Colorado Conference Center, Denver, Colo. www.apwa.net

October 2011

11–13 — Second International Conference on Warm Mix Asphalt, St. Louis, Mo. www.hotmix.org/warmmix/

November 2011

15–19 — Eighth International Conference on Managing Pavement Assets, Santiago, Chile. www.icmpa2011.cl or email: icmpa2011@uc.cl

Roger Smith joins Center staff

Roger Smith has joined the CP² Center as a part time pavement preservation specialist. He will work on projects including updating the MTAG's chapters and monitoring various field projects. Roger has a long history of working in the pavement preservation arena. He has worked for Caltrans, the Asphalt Institute, the Northern California Asphalt Pavement Association, and as a private consultant. He also teaches pavement technology classes for the Tech Transfer Centers in California and Nevada, and for the California Asphalt Pavement Association.



Roger Smith "at home" in his new office at the CP² Center

We are pleased to have Roger join our staff and look forward to working with him in the future.

Ding Cheng wins 2011 Outstanding Project Director award

Dr. Ding Cheng was elected as one of three outstanding project directors of the CSU, Chico on Feb. 10, 2011. Dr. Cheng, from the Department of Civil Engineering of the College of Engineering, Computer Science and Construction Management, became the interim director of the California Pavement Preservation Center (CP² Center) in January 2010 and later was appointed as the director for the Center in December 2010. He is currently managing more than \$2 million in contracts for the next two years. The funding sources include California Department of Transportation, California Department of Resources Recycling and Recovery and



CSU Chico President Paul Zingg presented Ding Cheng 2011 Outstanding Project Director Award.

the Alaska University Transportation Center.

He is an active member of the National Pavement Preservation expert task group of the Federal Highway Administration, the Transportation Research Board, and the Caltrans Pavement Preservation Task Group. During the past year, he published one paper in the Geoshanghai International Conference in Shanghai and one in the International Conference on Asphalt Pavements in Nagoya, Japan, as well as three papers in the 90th annual Transportation

Research Board meeting in Washington, D.C. The publications demonstrate the pavement research achievements by the CP² Center.

He works closely with other key members of the Center, Dr. Gary Hicks and Lerosé Lane, and collaborates with faculty from civil engineering and construction management on research. He enjoys working with students on a variety of research projects and has brought his research findings into the classroom.

Terrie Bressette retires from Caltrans

After over 30 years, Terrie Bressette retired from Caltrans on December 17, 2010. A dinner was held to honor Terrie's time and dedication on December 9 at Cattleman's in Sacramento. The event was attended by more than 110 Caltrans, industry and family representatives. Her supervisor, Phil Stolarski, acted as Master of Ceremonies for the evening's events. Some of the assembled folks had some funny stories to tell, and many had very kind words for her many accomplishments over the years. She was recognized for some of her most recent involvement with the development and implementation of the QC/QA specifications, the re-write of Section 39, the revision and implementation of the Certificate of Compliance program for asphalt binders and other key activities during her tenure at Translab. Terrie's most recent assignment was the Office Chief of Roadway Materials Testing at Translab. During her retirement she expects to do some extensive traveling. We wish her the best in her years of retirement!



Terrie Bressette says goodbye to a large crowd of well-wishers.



Donna Carlson is congratulated by Dr. Barry Takallou, past president of RPA, for her Lifetime Achievement Award at the RPA meeting in February, 2011.

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CP² Center, 35 Main Street, Suite 205, California State University – Chico, Chico, California 95929

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