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- Major New Study Proves it: Smooth Pavements Save Fuel
- IARC Issues Health Classification for Occupational Exposures During Road Paving
- Ohio Asphalt Producers Receive NAPA's Diamond Commendations

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ON THE COVER: WITH A PERPETUAL PAVEMENT DEPTH OF 16 1/4 INCHES, OHIO'S U.S. ROUTE 30 IN WAYNE COUNTY IS MORE THAN MEASURING UP – JUST LIKE THE STATE'S OTHER PERPETUAL PAVEMENT PROJECTS. FIND OUT MORE ABOUT THE ONGOING RESEARCH TO OPTIMIZE PERPETUAL PAVEMENT THICKNESSES AND HOW IT MAY BE USED FOR REHABILITATION WORK IN THE FUTURE. SEE STORY ON PAGE 14.



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“In being penny wise be careful not to be pound foolish.’ I’m sure many of you have heard the same bit of wisdom. It is apparent that the underinvestment we are seeing in transportation funding is partly due to a desire to be penny wise; however, the reality is that we are being pound foolish by failing to make the necessary investment to preserve pavement integrity and expand transportation capacity.”

BEING PENNY WISE

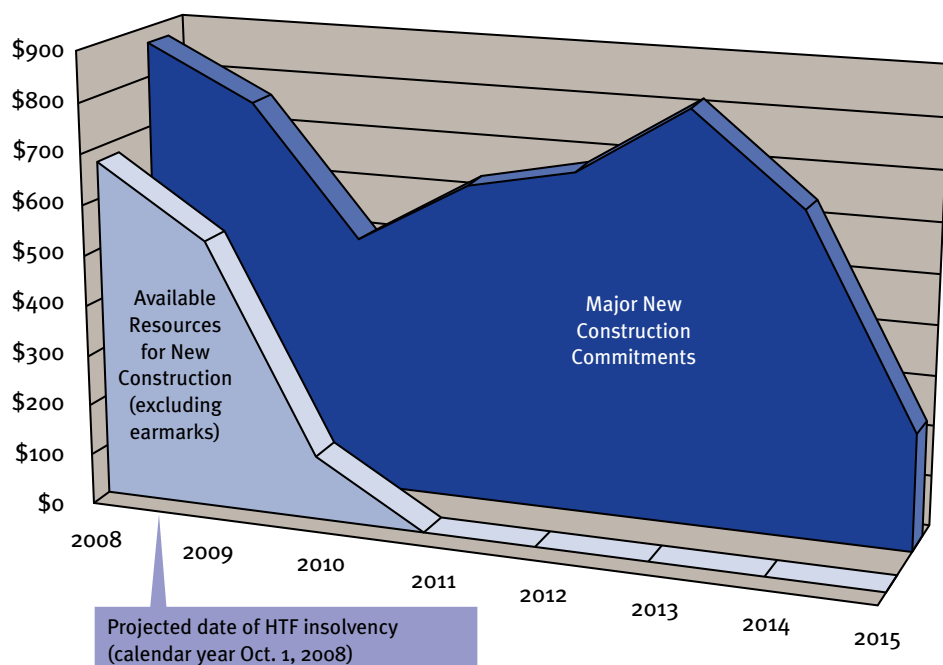
Many of us were dumbstruck recently when we read in the news of the delay in construction of road and bridge projects statewide. If your reaction was anything like mine, you couldn't believe that projects much needed for restoring pavement integrity and reducing congestion were pushed back to the 2030s. I suspect the Ohio Department of Transportation (ODOT) had a very busy day answering the plethora of inquiries when the news broke.

It's no surprise, actually, that we find ourselves in this state of affairs. Transportation funding

“watchdogs” have been saying for years that there's not enough money to both maintain the transportation network and expand it to eliminate traffic congestion and keep commerce flowing. In 2007, ODOT had already forecasted that money for such projects in Ohio would run dry by 2011. Through efficiencies, cost containment, and reducing the extent of preservation treatments, ODOT, city and county highway departments have done their part and managed to buy some time as they wait for a much needed cash infusion.

ODOT MAJOR NEW CONSTRUCTION: AVAILABLE RESOURCES VS. COMMITMENTS

May 2008 Projection



There's no doubt the Transportation Review Advisory Council (TRAC) project pushback made necessary by inadequate funding will have very negative consequences on our ability to get around our respective towns. Bad roads and congestion have the multiple effects of costing time and money. Recall that highways are for the swift conveyance of people and commerce.

As I travel around the Buckeye State evaluating the condition of asphalt pavements, it has become glaringly obvious that local governments have been hardest hit by the transportation funding shortfall. The condition of many of these pavements has deteriorated to a level where much more than preventive maintenance will be needed to suffice.

It is certainly a difficult time for a call to increase the dollar investment needed to maintain and build our highway network. Certainly, nobody wants to throw a "wet towel" on a fragile economy, nor do we want to see the value of our transportation assets degrade to nothingness. So here we find ourselves in a conundrum.

There is one thing that is an absolute certainty; ironically, underinvestment comes at a high cost. Study after study shows congested roads cost us in time, cost us in fuel, cost us in air quality and cost us in future opportunity as other countries pass us by in the global market place.

As well, the cost for not fixing our roadways is growing day by day. The Foundation for Pavement Preservation, a not-for-profit association, estimates that every \$1 invested in pavement preservation results in a savings from \$6 to \$10 or more in pavement rehabilitation or reconstruction costs. Restating that, to delay is to incur greater cost. In many cases, particularly for local roads and streets in

Ohio, we are way beyond the need for preventive maintenance. That being the case, you can see the cost of underinvestment is already taking its toll and will be even greater the longer we delay in fixing and expanding Ohio's roads to ensure free-flowing traffic and commerce.

Growing up, I had the privilege of living with a grandmother who immigrated to the United States as a teenager. As an immigrant, she had a tough time of it and learned the value of hard work and money earned from her labor. Her first job was as a maid in a hotel in downtown Cleveland. There she learned English through the tutoring of a caring friend. The textbook was nothing more than the Sunday newspaper comics. She later worked in the knitting mills of Cleveland and was the sole bread winner of her family as her husband had passed away at a young age. Through tough times and scant resources her wisdom was honed. A piece of wisdom she picked up and passed along to me was, "In being penny wise be careful not to be

It is likely that most of you, if not all, have heard the statistics of underinvestment in our transportation system. The recent release of the TRAC Tier 1 transportation project list brings it closer to home and provides the stark reality we face in Ohio. The question that remains is whether anything will become of it. Under the current scenario, worthy and much needed projects won't be realized until our grandchildren start driving! Imagine that; another burden for them to bear, right along with the nation's debt.

Not all that long ago our state license plate bore the motto, "The Heart of It All;" an attempt to encourage tourism and doing commerce in Ohio. Ohio, indeed, is geographically positioned to take advantage of the prosperity that transportation can bring. Many are looking to Washington for an answer to our funding woes. All indications are that the best we can expect from D.C. is status quo. If Ohio is to be "The

Heart of It All," and enjoy the prosperity from such, then there needs to be more investment than what status quo will bring. As much as folks dislike admitting it, there is a need to raise revenue and the most effective way at doing it is at the gas pump. "Pay-As-You-Go" through a user tax continues to be a fair means of securing the needed funding for transportation improvement. The penny invested at the pump reaps a dividend from which all Ohioans benefit. The question is: Will Ohio be "penny wise?"



pound foolish." I'm sure many of you have heard the same bit of wisdom. It is apparent that the underinvestment we are seeing in transportation funding is partly due to a desire to be penny wise; however, the reality is that we are being pound foolish by failing to make the necessary investment to preserve pavement integrity and expand transportation capacity.

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MAJOR NEW STUDY PROVES IT:

SMOOTH PAVEMENTS SAVE FUEL

By J. Richard Willis, Ph.D.
and Robert Jackson, Ph.D.

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Editor's note: Can improvements in pavement smoothness and texture help vehicles save fuel?

After years of debate and many studies from around the world, the answer is a clear YES. It's equally clear that pavement rigidity is a far less significant factor.

A study team at Auburn University and the National Center for Asphalt Technology reviewed and synthesized more than 20 research reports. They found that smoothness and surface texture are the key pavement properties which affect rolling resistance and fuel economy. Pavement improvements could increase fuel economy of passenger vehicles by up to 2.7 percent and of heavy trucks by up to 4.5 percent.

Using a more conservative figure of 2 percent annual fuel savings, NAPA has calculated that modest improvements in the smoothness of pavements could save up to 2.4 billion gallons of gasoline and 900 million gallons of diesel for the U.S. every year – a total of 3.3 billion gallons of fuel for the vehicles being driven on our highways. Using July 2011 prices of \$3.66 per gallon for regular gas and \$3.93 for diesel, we can see that smoothing out America's roads and highways could save around \$12.5 billion a year in fuel costs.

This article provides a summary of the Auburn University findings.



As the costs of energy resources continue to rise and citizens of the world become more environmentally conscientious, the interest in improving vehicle fuel economy has escalated. While numerous factors such as vehicle aerodynamics influence energy efficiency, one mechanism which dissipates energy efficiency is in the contact between the tire and road. This loss is often quantified by the rolling resistance.

Rolling resistance is the force required to keep an object such as a wheel or tire moving. Friction losses in the vehicle bearings and in the rolling interface do contribute to this force although deformation of the tire material also results in energy losses which contribute greatly to rolling resistance. If the tire is moving at a constant speed, then the rolling resistance force will balance with the traction force between the road and tire.

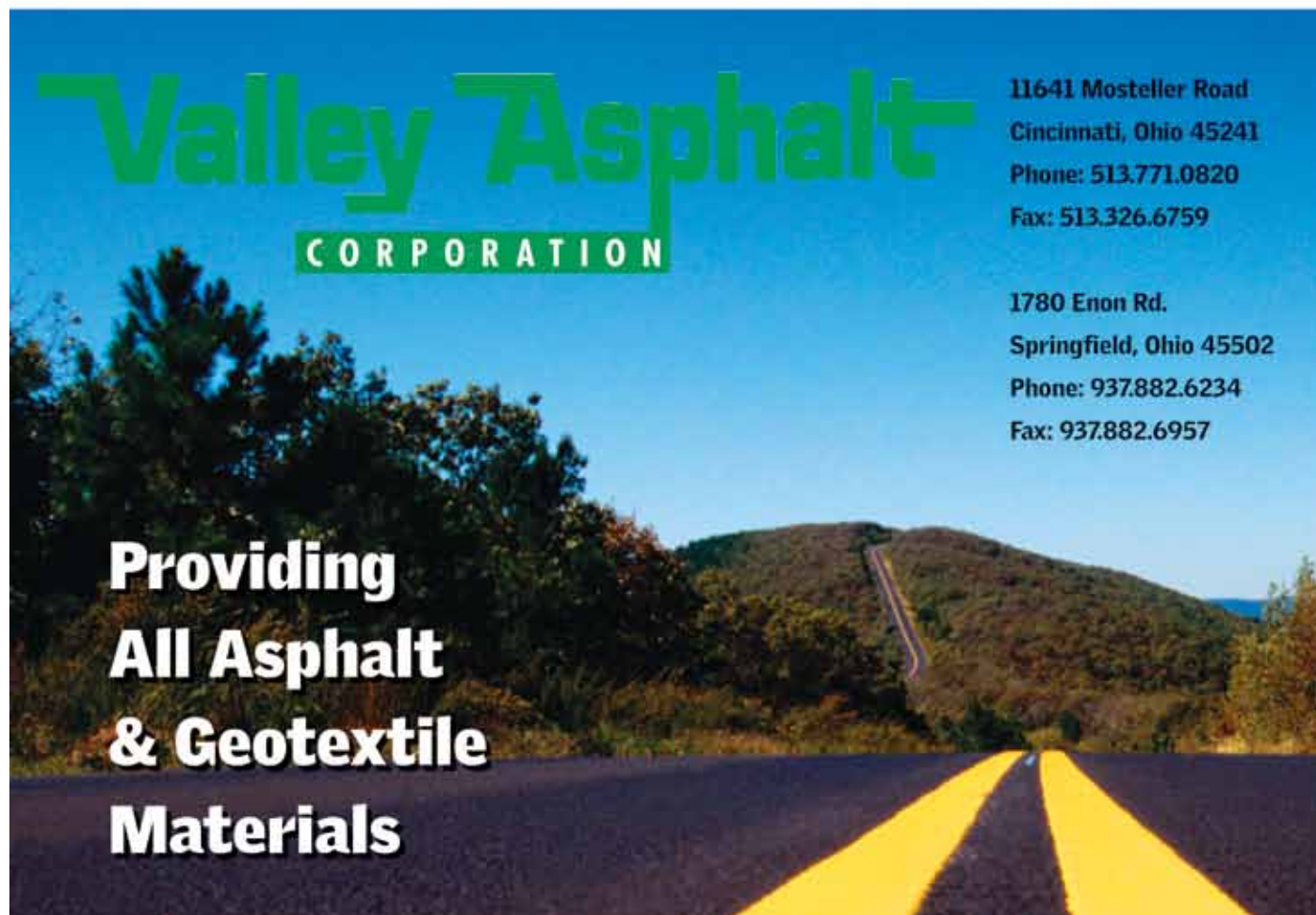
The factors that most commonly affect vehicle rolling resistance are tire material composition, tire geometry, tire pressure and operating conditions; however, recent attention has been given to the question of how much pavements affect rolling resistance and fuel economy. Do stiffer

pavements produce less rolling resistance or are other factors such as texture and smoothness really the pavement properties which drive fuel economy?

Due to these many different parameters influencing rolling resistance it is important to take care when making comparisons between rolling resistance measurements. In ideal situations, the parameter of interest should be the only item varied when measuring rolling resistance cases that are to be compared. For example, simply increasing one's velocity from 30 to 70 mph can reduce the vehicle energy consumed by rolling resistance from 50 to 20 percent (1). Therefore, diligence must be taken to make accurate and appropriate comparisons of rolling resistance.

HOW DO PAVEMENTS AFFECT ROLLING RESISTANCE?

Numerous studies have been recently conducted which have attempted to bridge the gap between pavement properties and fuel economy. The most commonly assessed pavement properties have been stiffness, roughness and surface texture.



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Stiffness

Pavements deform and are subjected to stresses and strains as vehicles travel on highways. Therefore, some energy dissipation might also occur during this process due to the pavement-tire interaction.

ALMOST ALL RESEARCH FINDINGS HAVE SHOWN THAT PAVEMENT DEFLECTION AND STIFFNESS HAVE LITTLE TO NO EFFECT ON PAVEMENT ROLLING RESISTANCE.

It has been theorized by some that flexible pavement structures will deform more than rigid pavements, thus increasing the amount of energy necessary for vehicles to remain at a constant velocity. However, research shows that when smoothness, pavement substructure and texture are consistent, little correlation can be developed between pavement stiffness and rolling resistance.

In reality, the pavement is much stiffer and its deformation is relatively small in comparison to the tire's deformation. Therefore, the relative

stiffness of the pavement tire interaction is dominated by the stiffness of the tire, not that of the pavement.

Almost all research findings have shown that pavement deflection and stiffness have little to no effect on pavement rolling resistance. In fact, two studies have suggested that pavement deflection only accounts for about 4 percent of the energy lost in rolling resistance. If rolling resistance accounted for 30 percent energy loss, then pavement deflection only accounts for at most 1.2 percent of the energy lost (2, 3). Since rolling resistance does not have a 1:1 relationship with fuel economy, this reduces the impact of pavement deflection and stiffness on fuel economy even more drastically. The influence of pavement fuel consumption was further quantified in a 2008 review by Perriot (4). This review suggested that pavement viscoelasticity accounted for 0.005 to 0.5 percent of fuel consumption, depending on the type of vehicle. While these estimates are based on theoretical calculations, they highlight the true disconnect between pavement stiffness and rolling resistance.



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PAVEMENT TEXTURE AND SMOOTHNESS

Roughness and pavement texture are the two most commonly assessed pavement properties that influence both rolling resistance and fuel economy. These two components combined effectively, quantify the geometry of the profile of the pavement surface.

The road surface texture and smoothness affect rolling resistance by creating vibration inputs in the tire and suspension system. Therefore, making a smoother road will decrease fuel consumption by reducing these vibrations. Large-scale roughness may cause gross deformation in both the tire and shocks which causes energy losses. Small-scale roughness causes smaller deformations that will be less influential on the rolling resistance but will influence tire traction and friction. Sandberg (6) conducted a study which investigated how texture and smoothness influenced rolling resistance. In this study, Sandberg discovered that shortwave unevenness affects 10 percent of fuel consumption while macrotexture influences 5 percent of a pavement's fuel efficiency.

The International Roughness Index (IRI) is a common method of quantifying how smooth a pavement rides. Epps (1) suggested that at 50 mph, increasing the IRI of a road from 60 inches per mile to 120 inches per mile would increase the rolling resistance of a pavement by 6 percent.

Schmidt and Ullidtz (5) more accurately quantified how changing the IRI influences fuel economy. If engineers can construct roadways that are smoother, even reducing the IRI of a roadway by 0.8 percent can reduce fuel consumption by between 1.8 to 2.7 percent. Other studies have suggested that driving on smoother pavements can increase fuel economy by as much as 4 to 4.5 percent (3, 7).

MAINTAINING FUEL-EFFICIENT PAVEMENTS

As most states have smoothness requirements for asphalt and concrete pavements during the construction process, requiring a contractor to build

a smooth, fuel-efficient pavement should be a natural way of aiding in a pavement's contribution to fuel economy. Additional incentives or more stringent specifications could be developed which encourage contractors to design and build pavement structures which would increase the fuel efficiency of not only the state's fleet but passenger vehicles as well. Thus, the money paid to a contractor as incentives for smooth construction might be repaid in fuel savings.

Since states require new pavements to have a certain smoothness, the real challenge to developing a fuel-efficient pavement network would be maintaining the fuel efficiency of the pavement structures. Over time, asphalt and concrete pavements alike develop distresses throughout the entirety of the pavement structure which affect both the roughness and textural components of the surface layer; however, fully developing the concepts related to Perpetual Pavement design would aid state agencies in maintaining fuel-efficient pavements.

PERPETUAL PAVEMENTS HAVE FOUR PRIMARY DESIGN CRITERIA (8, 9):

1. Perpetual Pavements should have a wearing course life of 20 years
2. Perpetual Pavements should have a structural design life of 40 to 50 years
3. Perpetual Pavements use a mill and fill as their primary surface rehabilitation
4. Perpetual Pavements limit their distresses to the top few centimeters of the pavement surface

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Since Perpetual Pavements are designed to resist bottom-up fatigue cracking, over time the stress accumulation at the surface of the pavement leads to surface cracking. This would increase both the textural and roughness measurements of the roadway; however, after a designated period of time, this distressed pavement layer would be removed and replaced with a new, smooth surface. This surface would be placed on top of a distress-free, strong asphalt structure. In a sense, the roughness and textural numbers would return to near that of the original pavement. If this design philosophy were adopted, it would aid in the design, construction and maintenance of fuel-efficient pavements.

CONCLUSIONS AND IMPLICATIONS

After closely examining the available research literature, one concludes that pavement rigidity has negligible influence on the fuel economy of vehicles. Additionally, research clearly indicates that texture and roughness are the two most important pavement properties which affect fuel economy and rolling resistance. In the end, the smoother the pavement, the more money consumers and truckers will save at the gas pumps.

This article only highlights a few of the research studies which have been performed to relate pavement properties and fuel economy or rolling

resistance; however, while only a few articles were cited, numerous other sources also confirm and validate the findings of the previously mentioned works.

For the full, in-depth review, visit www.hotmix.org/pavement_fuel_savings.pdf. That synthesis compiles the findings of more than 20 research studies that have been conducted around the world. The findings of the much larger review support the conclusions stated in this article.

Acknowledgments

The authors of this article would like to thank Michael Arnold and Clay Palmer for their hard work and research on this project.

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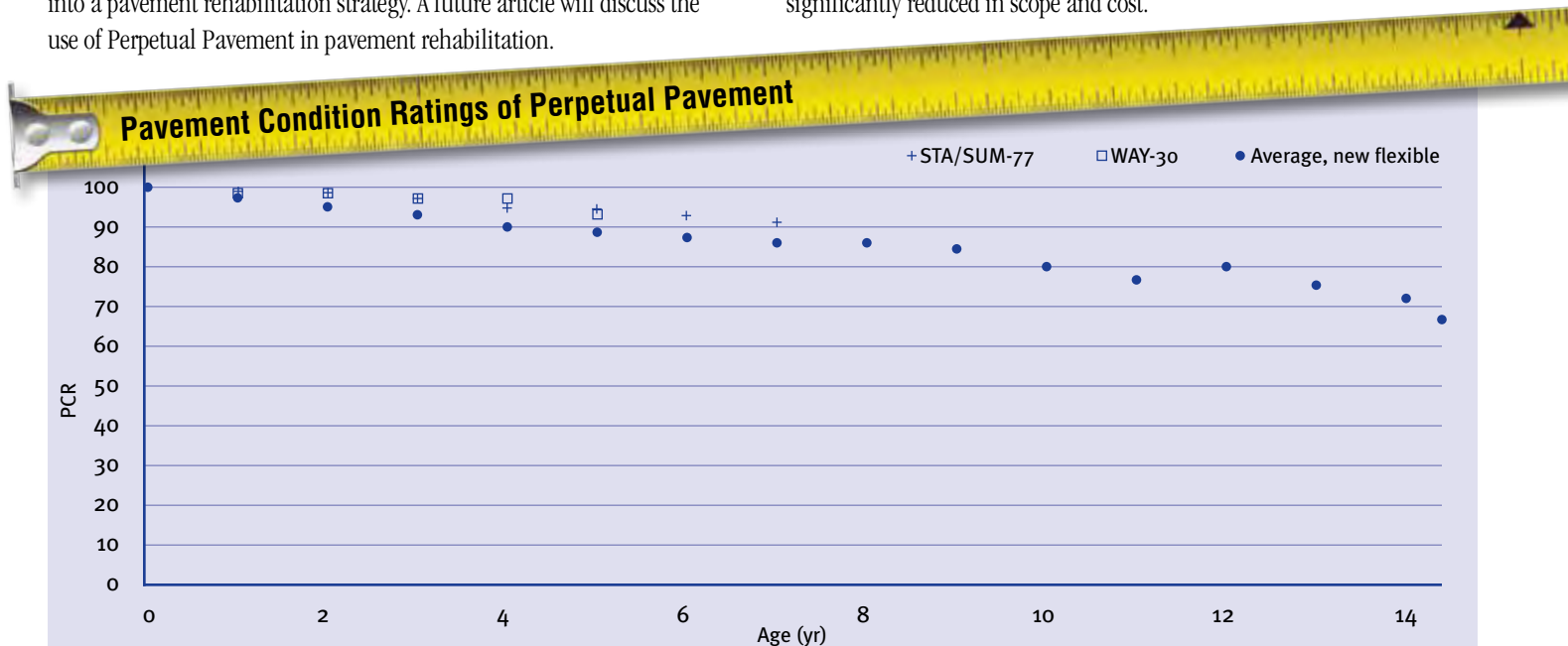


New Perpetual Pavement Research Looks to Optimize Thickness & Investigate Use for Rehab Work

*By Roger Green P.E., Shad Sargand PhD,
& Cliff Ursich, P.E.*

New Ohio Department of Transportation (ODOT) research seeks to optimize Perpetual Pavement thickness design, thereby allowing for reduction in thickness and cost. Scope of the research also includes consideration of how Perpetual Pavement principles can be incorporated into a pavement rehabilitation strategy. A future article will discuss the use of Perpetual Pavement in pavement rehabilitation.

Perpetual pavements are designed to have inexhaustible structural life. That means these pavements are designed to withstand fatigue that comes from the pavement bending under heavy-traffic loads. By eliminating fatigue-related cracking, future maintenance of asphalt pavement is significantly reduced in scope and cost.





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Ohio saw the construction of its first Perpetual Pavement in 2005, on Summit/Stark counties, Interstate 77. The following year, a second test pavement was placed on Wayne County, U.S. Route 30. Tests conducted on the pavements in 2011, that validate these test pavements are responding as designed. They are structurally sound and reacting in a manner that indicates they will remain perpetual; that is to say, measured strain levels are within parameters necessary to ensure inexhaustible structural life. Pavement Condition Ratings (PCR) are high, also an indication the pavements are showing good structural performance. The surface on the Wayne U.S. 30 project, however, is showing wear sooner than the experiment had anticipated. I-77 surface wear, however, is low. As these pavements wear under traffic, traditional surface course treatment is expected to be the only future maintenance needed.

Ohio's earliest Perpetual Pavement method for determining pavement thickness was conservative. No national thickness design standard existed at that time, so departments of transportation around the nation were left to determine for themselves the factors needed in a thickness design method that would ensure perpetual performance. In Ohio, a convening of ODOT engineers, university scientists and industry technical staff took place to thrash out these issues.

Determining the thickness and composition of Perpetual Pavement relies upon an understanding of the engineering properties of the foundation upon which it is to be built and the materials from which it will be composed. The thickness design strategy used in Ohio's experimental Perpetual Pavements constructed on Summit/Stark counties I-77 and Wayne County U.S. 30 resulted in substantial pavement thickness; 16 ¼ inches of asphalt on U.S. 30 and 17 ¼ inches on I-77.

The conservativeness of the thickness was due in large part to the assumption that strains in the bottom layers of the pavement should in no case exceed a limiting value of 70 microstrain. As such, an assumption was made to design the pavement based on anticipated truck traffic being 20 percent overloaded. In retrospect, the assumption failed to recognize the fatigue endurance limit and healing properties of asphalt, and overestimated the likelihood of pavement damage due to overloads. Essentially, the pavement design was so stout that if every truck travelling on it were overloaded, it would be sufficient to resist all fatigue. The 70 microstrain limit was the result of research performed at the University of California in the 1960s. Research recently completed at the National Center for Asphalt Technology at Auburn University and current research at the University of Arizona (NCHRP 1-44A) show the fatigue endurance



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limit is not a fixed number, but is a function of mix composition, temperature, aging and loading rate. The current research indicates the 70 microstrain value is conservative. The original design method used for ODOT's first Perpetual Pavements was inefficient and had the needless effect of substantially increasing pavement thickness and cost.

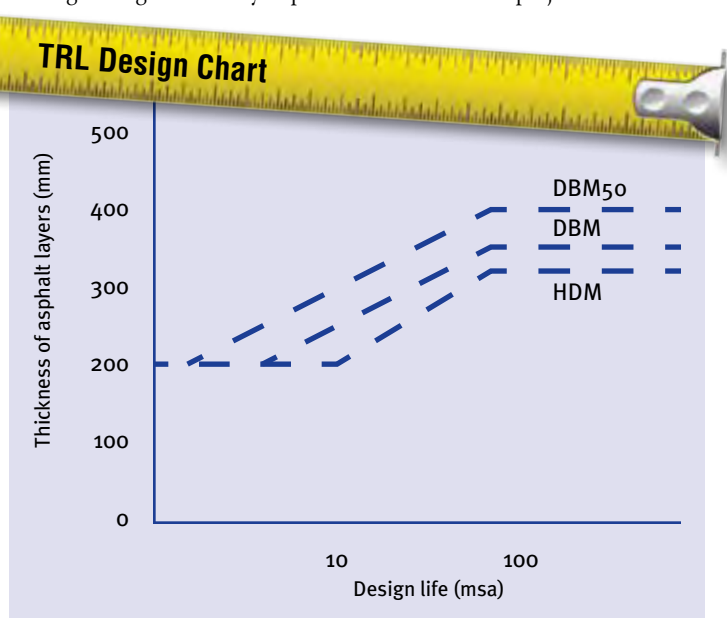
A need was seen by Fred Frecker, former FPO executive director, to address the inefficiency of using needlessly thick pavements. At his urging, a follow-up research effort was undertaken to evaluate just how thin a Perpetual Pavement can be designed. That work was conducted at the Ohio Research Institute for Transportation and the Environment (ORITE) at its accelerated load facility located at Ohio University's Lancaster campus. It found that under those laboratory conditions, the potential existed for a 3-inch thickness reduction that would still retain perpetual pavement characteristics. The new ODOT research intends to validate this finding through field study as part of a reconstruction project.

The pavement sections for this new research vary in thickness from 11 inches to 15 inches, in 2-inch increments. The 13- and 15-inch sections replicate sections evaluated at the Ohio University accelerated load facility. A thinner section (11 inch) will be placed on a low-volume test section to evaluate the effect of loading rate on pavement response and performance. The pavement will be instrumented with strain, pressure and deflection measuring gages. The 13- and 15-inch sections will be placed on the mainline (high traffic) pavement. The 11- and 13-inch sections will be placed on a ramp (low traffic) to provide data for evaluating the effect of loading rate and healing on the performance of the pavement. If the results of the experiment validate the work performed at the load facility, a substantial cost savings in asphalt pavements may be realized as ODOT moves from the traditional AASHTO thickness-design method to a mechanistic method such as Perpetual Pavement.

Research performed in the United Kingdom under the auspices of the Transport Research Laboratory (TRL) found that as thickness of asphalt pavement increases, there is a plateau at which no additional thickness is needed. The figure (left) shows the TRL Design Chart. Thickness is shown for asphalt structure above the sub-base layer. Thickness varies by mixture type, but in all cases there is a point where more thickness is not needed for higher traffic levels. A thinner structure is allowed for a heavy-duty macadam mixture, designated as HDM, than for a conventional dense-graded mixture with stiff asphalt (DBM50) or a conventional dense-graded mixture with normal asphalt (DBM). In any case, the minimum thickness of an asphalt pavement is about 8 inches (200 mm), and the thickest pavement is about 16 inches (400 mm).

Traffic in the UK is dissimilar to the United States, as the mix of traffic tends toward a higher number of single-axle trucks. This axle configuration creates the greatest amount of damage to a roadway. The finding of ODOT's current research will help the agency discern the maximum asphalt thickness needed for perpetual performance under Ohio conditions. As previously stated, this could result in a significant cost savings as asphalt pavement thickness is optimized.

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IARC Issues Health Classification For Occupational Exposures during Road Paving

*By Margaret Cervarich
Vice President for Communications and Public
Affairs National Asphalt Pavement Association*

The International Agency for Research on Cancer (IARC), based in Lyon, France, has assigned occupational exposures to the same health classification it gives to cell phones and coffee.

Jim Melius, DrPH, MD, the top occupational physician at the Laborers International Union of North America (LIUNA), commented, "People working in the asphalt paving industry should not be concerned about this new IARC classification. The two key animal studies on paving asphalt did not show any evidence of cancer risk, and the major IARC cancer study of people working in the paving industry in Europe did not show any increased risk for cancer."

The ruling applies to straight-run asphalt cement and its emissions during road paving. IARC put these into its Group 2B ("possibly carcinogenic to humans") classification, the same category as numerous exposures.

NAPA President Mike Acott responded to the IARC announcement saying, "The asphalt paving industry has always taken questions about workers' health and safety seriously. That's why we appreciate IARC's commitment to creating the healthiest possible workplace through its scientific review process."

Acott added, "We were pleased to note that IARC took into account the following areas of research: human mortality, animal inhalation and animal skin painting. All three areas

of research on asphalt paving fumes have been completed, and all show no relation between asphalt paving fumes and cancer," Acott continued.

"IARC's own eight-country study showed no link between exposure to asphalt paving fumes and cancer in paving workers. An animal inhalation study in Europe found no link between asphalt paving fumes and cancer. Similarly, an animal skin painting study in the U.S. found no link between asphalt paving fumes and cancer.

"For more than 20 years, we have partnered on research with government agencies, academic institutions and unions. Our goals have been, first and foremost, to protect the workers by reducing their exposure; and while we are doing that, to cooperate in research that will fill the gaps in the science. We will continue this collaborative approach, which has led to technology advances such as warm-mix asphalt that are improving the work environment even further," Acott concluded.

More about IARC

IARC brings together international panels of scientists. Its assessments go to national health agencies for possible guidance. IARC has reviewed more than 900 chemicals and other agents since its founding in 1971. IARC categorizes chemicals, agents, mixtures and exposures into five groups:

- **Group 1:** carcinogenic to humans (includes alcoholic beverages, solar radiation and wood dust)
- **Group 2A:** probably carcinogenic to humans (includes high-temperature frying, household wood fires and hairdressing/barber occupational exposures)
- **Group 2B:** possibly carcinogenic to humans (includes coffee and cell phones)
- **Group 3:** not classifiable as to carcinogenicity in humans (includes tea)
- **Group 4:** probably not carcinogenic to humans (Only one substance, caprolactam, has been placed by IARC in Group 4.)

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MODIFIED ASPHALT TOUGHENS UP BRIDGE DECKS

(Editor's note: This article, which originally appeared in the winter 2012 issue of Wisconsin Asphalt News, is being reprinted with permission of the Wisconsin Asphalt Pavement Association [WAPA].)



The protective asphalt overlay is going strong on Milwaukee's High-Rise Bridge. (Image courtesy of Chase Construction Products)

Two notable motorways in Milwaukee, the I-94/I-43 High-Rise Bridge and the Milwaukee Mile racetrack, share something in common (and no, it's not traffic speeds approaching 150 mph).

Both have enjoyed longer life and improved performance thanks to a modified asphalt overlay. Applied as a wearing course, the polymer-modified asphalt layer is both waterproof and provides resistance to rutting and shoving.

Butch Benish with Construction Resources Management provides the back story: "It started with the Milwaukee Mile. Our company had paved the new racetrack surface to specifications, but it just couldn't withstand the destructive forces of racing vehicles. We tried again using this extra-tough polymer overlay back in 1996, and it did the trick."

The same material makes perfect sense for sealing bridge decks. "We were involved with the polymer asphalt overlay of Milwaukee's High-Rise Bridge just a few years later," Benish says. "At the time it was the largest

undertaking of its kind in Wisconsin, and it was a huge success."

These are just a couple of examples among many in the state, thanks to the efforts of WisDOT, which has used polymer asphalt deck overlays for years to help get maximum life out of its bridges. (It's good business sense, too — these overlays appear among approved items for which federal funds may be used for preventive maintenance of structures, as listed in WisDOT's Facilities Development Manual.)

WisDOT Project Manager Jan Bennett talked about the agency's enthusiasm for this treatment. "We see polymer-modified asphaltic concrete overlays as a high-performance product," Bennett says. "Our Bureau of Structures expects these polymer overlays to last up to 20 years — and some people think they'll last even longer."

Results like those seen on the High-Rise Bridge led to several other WisDOT bridge overlay projects, including the I-94 Tomah Interchange Bridge, the I-41 bridge in Green Bay and the I-39 Saunders Creek bridge in Dane County. (The Saunders Creek bridge project involved milling out a concrete overlay and replacing it with asphalt.) In addition, the polymer asphalt overlay treatment has also been applied to many of the bridges and culverts along I-94 between Madison and Milwaukee as part of the recent Interstate highway reconstruction.

What's next? WisDOT's Bennett tells us that the state is considering using asphalt overlay as a possible preventive treatment for the bridges along Madison's Beltline Highway. "We are still in the planning stages," Bennett says, "and we're also considering an epoxy treatment. But the modified asphalt could go beyond sealing cracks and weatherproofing, and also help smooth out an uneven ride."

And that's not the only advantage of asphalt. "Anyone who has driven the Beltline knows that traffic and construction delays are a concern," Bennett says. "We have to fit in rehabilitation work around rush hour and downtown events, and asphalt doesn't have the same curing time requirements as epoxy overlays. It's another factor we're taking into consideration."

One thing is clear enough to WAPA: The story on modified asphalt overlays isn't over. In fact, based on how well they protect bridge decks and how long they last, the story is just beginning.

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An article on PublicWorks.com provides details about the project and the paving material used – Rosphalt 50:

... Rosphalt 50 saved the state of Wisconsin thousands of hours in repair time [and] hundreds of thousands of dollars in costs. [WisDOT]

used Rosphalt 50 for waterproofing the entire deck of I-94 and I-43's heavily traveled eight-lane, mile-long High-Rise Bridge in downtown Milwaukee. The work was completed in just 48 hours as opposed to a more customary nine-week repair schedule with other asphalt products ...

NEW INDUSTRIAL STORM WATER GENERAL PERMIT



*By R. Curtis Spence, PPE, CPESC
Spence Environmental Consulting Inc.*

The Ohio EPA published the fifth-generation Statewide NPDES Industrial Storm Water General Permit (General Permit No. OHR000005) on Dec. 15, 2011, with an effective date of Jan. 1, 2012. Asphalt plants that discharge storm water from their properties should submit a notice of intent (NOI) to obtain coverage under the new general permit by March 30, 2012, and fully implement the requirements of the new permit by June 28, 2012. The new general permit, NOI form and application instructions are available on the Ohio EPA website at www.epa.state.oh.us/dsw/permits/GP_IndustrialStormWater.aspx.

The NOI form has been modified for the fifth-generation general permit, and requires the geographic coordinates (latitude and longitude) for the center of the facility and at each storm water outfall (discharge point) from the site. Asphalt plants are standard industrial classification (SIC) No. 2951 and industrial subsector D1.

The new general permit is based on the U.S. EPA Industrial Multi-Sector General Permit and contains a number of new requirements including:

- New requirements for Storm Water Pollution Prevention Plans (SWPPPs)
- Quarterly storm water visual assessments
- Storm water monitoring and reporting for total suspended solids (TSS)

As indicated above, storm water runoff from asphalt plant sites will need to be periodically sampled for TSS, and the collected data must be reported to the Ohio EPA electronically via the electronic discharge monitoring

report (eDMR) system. The Ohio EPA has established a benchmark concentration for TSS at asphalt plants of 100 milligrams per liter, which equals 100 parts per million. The benchmark concentration is not an effluent limitation and the exceeding of this concentration is not a permit violation. However, site modifications will be required if the benchmark concentration is exceeded.

The benchmark concentration is also not applicable until year four of the general permit (2016). During the first 12 quarters of the permit (years one through three), storm water samples must be collected for TSS analysis from four of the 12 quarterly monitoring periods. Over the first three-year period, one benchmark sampling event needs to be collected during each quarterly monitoring period (January 1 to March 31; April 1 to June 30; July 1 to September 30; and October 1 to January 31). However, sampling will not be required during the winter quarter if your plant is inactive and unstaffed. During year four of this permit, you may average your four monitoring values and compare to the benchmark concentration.

If you have questions or would like additional information regarding the new Statewide NPDES Industrial Storm Water General Permit (General Permit No. OHR000005), contact Flexible Pavements of Ohio, at www.flexiblepavements.org, or Curt Spence, P.E. with Spence Environmental Consulting Inc. at (614) 837-4750.

'CONSTRUCTION REFORM' RULES FINALIZED BY DAS



By Donald W.
Gregory, Esq.
Kegler, Brown, Hill
& Ritter Co., LPA

The Ohio Department of Administrative Services (DAS) is finishing its legislative mandate to enact rules governing design-build, construction manager (CM) at-risk and general contracting so that these new contracting methods can be implemented in early 2012.

Those new rules can be summarized as follows:

2. Contract forms – The state is adopting contract forms aligned closely with the current language in other prime contracts. Political subdivisions like counties and townships are able to utilize trade association forms, including ConsensusDOCS, AIA, DBIA or EJCDC.

1. Surety bonds – After meeting much resistance to the original prospect of permitting less than 100 percent performance and payment bonds on larger projects, DAS has relented and mandated 100 percent performance and payment bonds be posted by the design-builder or CM at-risk on all projects, regardless of size.

3. Subcontract forms – Design-builders and CM at-risk contractors are to utilize a standard subcontract form, which, among other things, mandates:

- Prompt Pay no later than 10 days upon receipt
- Retainage shall be at the rate retained by the owner on the contractor
- Lien rights cannot be waived

4. Prequalification – Design-builders and CM at-risk contractors are to adopt prequalification criteria for subcontractors that are subject to the approval of the public authority.

5. Best value – Design-builders and CM at-risk contractors are to be selected in a subjective two-step proposal process (qualification phase followed by proposals from the three short-listed firms). The award is to be based upon “best value” – a combination of pricing and performance considerations – to determine the offer deemed most advantageous and of the greatest value to the public authority.

As these rules will soon become effective, we will now see how well they work in the real world.

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Ohio Asphalt Producers Receive NAPA's Diamond Commendations

The National Asphalt Pavement Association (NAPA) annually recognizes excellence in asphalt production and paving operation through the Diamond Achievement Commendation Program. This program encourages and recognizes excellence and continuous quality improvement by bestowing commendations in the following categories:



The Diamond Achievement Commendation covers operations both in the manufacturing plant and around the plant's site. This commendation includes a review of appearance, operations, environmental practices, safety, permitting and regulatory compliance and community relations.



The Diamond Paving Commendation recognizes excellence in paving crew operations. The areas evaluated include training, use of best practices in paving and compliance.



The Diamond Quality Commendation recognizes the quality of the asphalt material produced by a plant. This commendation includes a review of quality management practices, raw material handling and storage, drying and mixing, air quality, truck scales, silos and control rooms.

Seven companies and 56 plants from across Ohio were recognized in 2011 by this program. The following is a listing of the Ohio companies and their respective plants and divisions receiving these prestigious awards:

Barrett Paving Materials Inc.

Diamond Achievement Commendation

- Camden Asphalt Plant 1161
- Fairborn Plant
- Middletown Asphalt Plant 10057
- Moraine Asphalt Plant 10055
- River Road Plant 10058
- South Lebanon Hot Mix Plant
- Spring Valley Plant 10052
- W. Carrollton Plant 10050

Diamond Achievement Commendation (10+)

- Carthage Plant 1051
- Newtown Drum Plant 1011

Diamond Achievement and Diamond Quality Commendations

- Cleves Plant 1001
- Fairfield Plant 1121
- Reading Plant

Kokosing Construction Co. Inc.

Diamond Achievement Commendation

- Columbus Plant
- Cleveland Plant
- East Claridon Plant
- Fredericktown Plant
- Garfield Heights Plant
- Mansfield Plant

Mar – Zane Inc., Division of Shelly & Sands Inc.

Diamond Achievement Commendation

- Plants 6, 13 & 27

Diamond Achievement Commendation (10+)

- Plants 2 & 21

Scioto Materials LLC

Diamond Achievement Commendation

- Scioto Materials Plant 50096

The Shelly Company, an Oldcastle Materials Co.

Diamond Achievement Commendation

- Allied Corp. Bedford Heights 71
- Allied Corp. Plants 5, & 77
- Allied Corp. Kent Plant 75

- Shelly Materials Plants 25, 61, 66, & 85

- Stoneco Plant 118

Diamond Achievement Commendation (10+)

- Allied Corp. Downtown Plant 76

Diamond Achievement and Diamond Quality Commendations

- Allied Corp. Streetsboro 72
- Allied Corp. Plant 79
- Shelly Materials Plants 2, 24, 63, 80, 90, 94 & 99
- Stoneco Plant 110

Diamond Quality Commendation

- Shelly Materials Plants 62
- Stoneco Materials Plants 114 & 117

Diamond Paving Commendation

- Northeast Division
- Northwest Division
- Southern Division

Terry Asphalt Materials Inc.

Diamond Achievement Commendation

- Terry Asphalt Plant

Valley Asphalt Corp.

Diamond Achievement Commendation

- Plant 17 Kilby Road
- Plant 19 Mehring Way
- Plant 5 Morrow

Diamond Achievement Commendation (10+)

- Plant 14 Newtown
- Plant 23 Sharonville
- Plant 25 Troy
- Plant 6 Dryden Road



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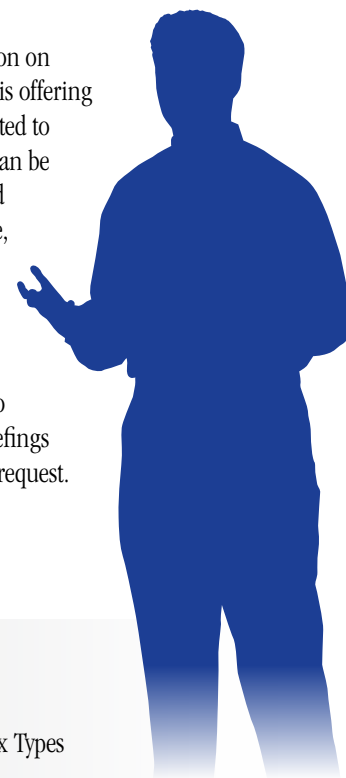
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FPO OFFERS NO-COST TECHNICAL BRIEFINGS



In an effort to provide the hottest information on asphalt, Flexible Pavements of Ohio (FPO) is offering technical briefings on a range of topics related to asphalt pavement technology. "Briefings" can be presented at your location upon request and mutual agreement. Presented free of charge, these Briefings can be accompanied by an opportunity for Q&A on the presentation or other topics related to asphalt pavement technology. Each Briefing topic is intended to last approximately 45 minutes in order to fit within a limited timeframe. Multiple briefings may be combined to fill a longer period if desired. FPO can award certificates for professional development hours (PDHs) by request.



The host agency will be responsible for providing a suitable location for the presentation, inviting participants and taking an attendance record for awarding PDHs.

Briefings on the following topics are available:

- Performance Advantages of Asphalt Pavements
- Importance of Smoothness on Pavement Performance
- Mitigating Cost Increases in Asphalt Pavement Construction
- Overview of Sustainability in Asphalt Pavements
- Porous Asphalt Pavements for Stormwater Management
- Design, Materials, Construction and Maintenance of Porous Asphalt Pavements
- The Perpetual Pavement Concept
- Asphalt Pavement Structural Design
- Selecting the Proper Asphalt Concrete Mix Types
- Asphalt Pavement Construction Basics
- Asphalt Pavement Construction Quality Control, Quality Assurance and Inspection
- Asphalt Pavement Maintenance and Rehabilitation
- Correction and Prevention of Deformation in Asphalt Pavements

For more information on the Briefings, visit the FPO website at www.flexiblepavements.org.

To arrange a technical briefing, contact FPO by e-mail at info@flexiblepavements.org, or by telephone at 614-791-3600.



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NEW MEMBERS

Flexible Pavements of Ohio would like to welcome six companies as associate members of the association. Please join us in recognizing these new members:

Frankfort Testing Laboratory is an AASHTO-accredited construction materials testing lab headquartered in Kentucky and specializes in asphalt and aggregate testing.

JC Equipment Sales & Leasing Inc. is a provider of lasers, machine-control, GPS-guidance systems and supplies located in Cincinnati.

MOBA Corporation manufactures the Pave-IR™ device for monitoring paving temperatures and road construction positioning systems.

QPR® Quality Pavement Repair is a provider of cold patch asphalt repair materials throughout the United States and Canada.

SealMaster® provides sealcoat materials, pavement maintenance products and related equipment throughout North America and in more than 60 countries.

TesTech Inc. is a full-service geotechnical engineering, materials testing, construction inspection and surveying company with offices located in Ohio, Kentucky, Indiana, Michigan and Missouri.



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