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- 6 THE PRESIDENT'S PAGE
- 8 U.S. SENATOR PORTMAN VISITS WITH
OHIO'S ASPHALT PAVEMENT INDUSTRY
- 11 CITY OF ENGLEWOOD CASE STUDY
- 16 ASPHALT OUTPERFORMS CONCRETE AT MARYLAND INTERSECTION
- 18 FPO'S 'MID-YEAR TECHNICAL SEMINAR' A HIT WITH PARTICIPANTS
- 20 COSGRAY RD./SHIER-RINGS RD. ROUNDABOUT PROJECT HONORED
- 22 FPO ASPHALT INDUSTRY SCHOLARSHIP PROGRAM
1994 LONG-RANGE PLAN MAPPED FUTURE SUCCESS
FOR INDUSTRY, STUDENTS
- 26 ACCELERATED POLISHING MACHINE FOR LABORATORY
MIX DESIGN APPLICATIONS
- 28 MARK YOUR CALENDARS/NEWS
- 30 INDEX TO ADVERTISERS

CONNECT ON  

ON THE COVER: U.S. SENATOR ROB PORTMAN, OF CINCINNATI, SPEAKS WITH MEDIA FOLLOWING A TOUR OF THE COLAS SOLUTIONS LABORATORY AND VALLEY ASPHALT PLANT IN NEWTOWN. REPRESENTATIVES OF OHIO'S ASPHALT INDUSTRY MET WITH SEN. PORTMAN TO FAMILIARIZE HIM WITH OHIO'S ASPHALT INDUSTRY AND DISCUSS HIGHWAY FUNDING. SEE PAGE 8.



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THE PRESIDENT'S PAGE



CLIFFORD URSICH, P.E.
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“If your pavements are draining your coffers and you’d prefer pavements that don’t require rebuilding, then here’s a thoughtful solution: Build a Perpetual Pavement and never have to rebuild that pavement again. If you want to hedge against future revenue shortfalls, then here’s a thoughtful solution: Set new roadway standards using Perpetual Pavement with only the future need for low-cost surface maintenance.”

What Better Time For Perpetual Pavement?

In the last issue of *Ohio Asphalt* the lead article posed this question: “Which will we choose, \$1 for 75 percent or \$5 for 92 percent?” The question sought to provoke our thinking about the extraordinarily high cost of deferring pavement maintenance and to stimulate thoughtful solutions.

Please allow me to clarify what is meant by “deferring pavement maintenance.” Deferring maintenance is the putting off of maintenance activities such as road repairs, crack sealing or resurfacing until a later time, even though pavement conditions show immediate action is needed. It’s the “do-nothing” option, which turns out to be the most expensive option of all. Thoughtful solutions need to be employed.

It is not a surprise that local roads around Ohio are in disrepair, and city fathers are scratching their heads trying to figure how to pay the repair bill. The effect of deferred pavement maintenance is being felt, and it is painful. The Ohio Municipal League (OML) on August 30th announced results of the Ohio Municipality Fiscal Assessment Survey. The survey was conducted by the cities of Upper Arlington, Westerville and Loveland, along with the Ohio Manager’s Association and the OML. The survey sought to examine how municipalities throughout Ohio have responded to the recent fiscal changes brought on by state cuts to the Local Government Fund, the elimination of Ohio’s Estate Tax and economic conditions. Survey results indicate nearly 20 percent of the responding communities raised property taxes, while 40 percent raised user fees. The analysis shows the most-frequent response to the revenue reductions involved reducing capital expenditures and service levels primarily to street and park maintenance.¹

The purpose of this article is not a call to political action, though that is something

that is needful. Nor is it my purpose to be an armchair quarterback. No doubt the prioritization process for what gets done is tough when there’s more month than money. Some of us can relate. My purpose is to engage you with an idea that if accepted and acted upon could prove to be a watershed event in ensuring there is more money than month the next time the economy hits hard times and revenues for road maintenance get scarce. Sound like a fairytale? It’s reality!

ARE YOUR PAVEMENTS MANAGEABLE?

As you mine the depths of this issue of *Ohio Asphalt* you will find a case study of sorts written about a community of 13,000 located west of Dayton; Englewood is its name. Its experience is one offered as a model to other communities and businesses with large pavement assets. Through the Great Recession, Englewood survived without sacrifice to its pavement condition. The secret to Englewood’s success? It started with pavements that were “manageable.”

There is probably no greater challenge to a pavement manager than an “unmanageable” pavement. You who maintain pavements for your livelihood know these types of pavements. They are pavements that are difficult to predict when future repairs may be needed. The repair strategies are oftentimes complicated and not very long lasting, having repaired one area you soon find that another needs fixed. Repairs are labor intensive, and the cost to equip and train your forces to do the work means lots of expense and time away from regular duties. Simply contracting the work is very costly, and the funding for such a city-wide strategy is unsustainable. “Unmanageable” pavements make planning future revenue expenditures a big challenge. Pavements that are manageable are by their

nature predictable; predictable in how they perform over time, the need and cost for maintenance, and the level of quality to which they will serve the community or business as the case may be. In bountiful times or lean times, these are the pavements of choice. They are assets to a community.

IS IT TIME TO ADOPT A STANDARD THAT ENSURES MANAGEABILITY?

Engineers have worked very hard to ensure asphalt is a “manageable” pavement, and they have largely been successful. What makes asphalt a manageable pavement is evidenced in Englewood, and communities like it, and on Ohio’s roadway network. These pavements have provided long life and predictable maintenance all at modest cost. The irony is that these pavements were designed to last 20 years; instead, they are lasting perpetually. They reflect a concept that only within the last decade has been identified as Perpetual

Pavement. With the advent of new pavement engineering “tools,” Perpetual Pavements can now be designed “on purpose,” ensuring manageability in your pavements.

I began this article with the provocation to seek thoughtful solutions given the condition of pavements and scarcity of repair dollars. Here’s a thoughtful solution if you’ve endured all the pain you can stand with attempting to manage unmanageable pavements: Build a Perpetual Pavement to limit your pavement management to preventive maintenance. If your pavements are draining your coffers and you’d prefer pavements that don’t require rebuilding, then here’s a thoughtful solution: Build a Perpetual Pavement and never have to rebuild that pavement again. If you want to hedge against future revenue shortfalls, then here’s a thoughtful solution: Set new roadway standards using Perpetual Pavement with only the future need for low-cost surface maintenance.

The journey toward manageable pavements starts with a Perpetual Pavement standard. How thick is that, you ask? A standard for a Perpetual Pavement need only be sufficiently thick to accommodate the traffic using the road, which may be far thinner than you think. It costs nothing to investigate further. FPO is willing to help you get started experiencing the advantages of “manageable” pavement.

WHAT BETTER TIME FOR PERPETUAL PAVEMENT!

¹ Ohio Municipal League Legislative Bulletin, August 30, 2013

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U.S. SENATOR PORTMAN VISITS WITH OHIO'S ASPHALT PAVEMENT INDUSTRY



In late-August, U.S. Senator Rob Portman toured the commendation-winning, mix-production plants and laboratories of Colas Solutions, Valley Asphalt and Barrett Paving Materials in Newtown in southwest Ohio. The senator was invited to visit the facilities to learn about the sustainability innovations and economic impact of the asphalt industry in Ohio, and to hear the industry's concerns regarding the need for stable funding for maintaining and improving the nation's transportation infrastructure.

The visit began with a roundtable discussion attended by owners and representatives of asphalt mix producer company members of Flexible

Pavements of Ohio, National Asphalt Pavement Association's Executive Vice President Jay Hansen and FPO Executive Director Cliff Ursich. The Senator was welcomed by Rod Russell, VP of Barrett Paving Materials Inc. and chairman of the FPO Board of Directors. John Powers of the Shelly Company reviewed the plight of local governments having insufficient revenue to adequately maintain their road systems and the challenge at all levels of government to fund road improvements that support the nation's economy. The need to find a stable, increased revenue stream to support the Federal Highway Trust Fund was stressed. Sen. Portman was presented with information regarding the \$1.8 billion total economic impact of the asphalt pavement industry on Ohio's economy; the 6,000 jobs produced; and the many innovations currently being practiced to recycle 3.86-million tons of reclaimed asphalt pavement (RAP) and the 61,000 tons of roofing shingles and scrap tires into new asphalt pavement materials.

continued on page 10





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continued from page 8



Following the roundtable discussion, Sen. Portman toured the Colas Solutions laboratory, where materials research and development is performed for all of Colas North America. Next was a tour of the adjacent Barrett Paving Materials plant, where the senator could see RAP being processed into new asphalt pavement material and the energy-saving equipment used to produce warm mix asphalt at reduced temperatures. It was then onto the Valley Asphalt plant.

At Valley Asphalt, Sen. Portman was provided a tour of the company's LEED-certified laboratory by Jim Jurgensen II. The senator was shown the electric meter of the solar-powered lab spinning backward and examples of the RAP, roofing shingles and tire rubber being incorporated into new asphalt pavement materials.

Following the plant tours, Sen. Portman conducted a press conference wherein he complimented the industry for its efforts toward sustainability by implementing technology to increase reuse and recycling of reclaimed materials, and reduce energy use and emissions into the environment. The senator acknowledged the need to adequately fund federal transportation programs to support the national economy, and in general voiced opposition to legislated mandates that interfere with the operation of the marketplace in providing the most economical products to the taxpayers.

The excellent efforts of Barrett Paving and Valley Asphalt in arranging and hosting Sen. Portman's visit with the industry are very much appreciated. Well done! Likewise, the industry appreciates Sen. Portman taking the time and making the effort to visit and learn about the asphalt pavement industry and transportation needs in Ohio.

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City of Englewood's Story: The Rewards of Building With Asphalt Pavement

Residents of Englewood, Ohio, find a lot to like about their growing, middle-class suburban city of more than 13,000 residents. With a below-average crime rate, an excellent school system and a high percentage of homeowners, the city also offers a 1,900-acre metro park along the scenic Stillwater River, with lakes and waterfalls, camping, canoeing and kayaking and abundant birding. Furthermore, residents have easy access to Interstate 70 and the amenities of the Dayton metropolitan area.

Englewood sprang up at the intersection of the National Road, which cut through the area in 1836, and a north-south turnpike constructed to bring in farm produce from the fertile plains to the northwest. Early travelers on both had to dodge tree stumps. The National Road (now U.S. Route 40) was not macadamized for more than 40 years.

The city grew slowly at first. In 1950, the population was only 678. Incorporated as a city in 1971, Englewood blossomed. Between 1970 and 1980 it grew by almost 44 percent, and by 2010 its population topped 13,000.

In a city whose very existence is owed to road traffic, Englewood's leaders pay ample attention to the condition of their streets. "The biggest investment any city has, bar none, is in their streets," says city manager Eric Smith. "And preventive maintenance is key to getting a good return on that investment. Our asphalt pavements afford us that opportunity".

Back in the 1970s, the city had two streets made of concrete pavement. Both eventually failed. After many attempts to patch them, the city finally undertook extensive prep work and repaved them with a sophisticated asphalt mix with fibers and rubber. In the '80s and '90s the city widened some streets and added lanes, using an asphalt



The City of Englewood is 100-percent asphalt, and according to officials it is now reaping the benefits of its decision.

pavement construction. Its decision to go with asphalt, now maintained with a polymer asphalt surface course, has paid back many times over in real cost savings, manageability and public good will.

"Today, Englewood is 100-percent asphalt," says Vic Roberts, the city engineer for more than 20 years and now vice president of R.B Jergens Contractors Inc. in Vandalia. "Nobody argued about it. I think I know why. Asphalt is less costly and we can maintain asphalt streets. Nobody is set up to maintain concrete streets."

All roadways deteriorate over time. The advantage of asphalt over concrete pavement is that the aging process

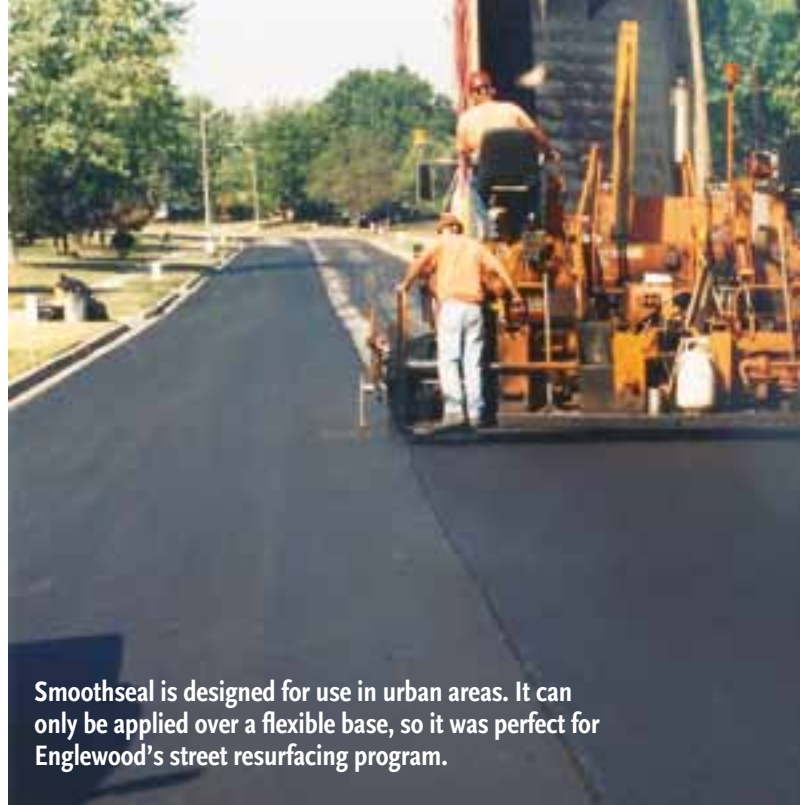
can be managed with regular surface maintenance alone. A 1983 study by Willis Giibboney of side-by-side asphalt and concrete pavements on I-71, built about the same time with the same traffic load, same specifications and same subgrade, demonstrated clearly that asphalt pavement outperformed concrete pavement over time.

Fred Frecker, former executive director of Flexible Pavements of Ohio, says he once asked a colleague at the Ohio Department of Transportation how often the department performed a lifecycle cost analysis on asphalt pavement, something always done prior to rebuilding an existing pavement. The answer? Never, because, as Frecker says, "Once asphalt pavement is in, it's in. It goes on forever."

Having chosen asphalt pavement, Englewood has needed only to fine-tune its maintenance program, which has evolved over the years. For more than two decades Roberts oversaw street maintenance using slurry seal, which had many good qualities, including low cost and quick set-up, but it just didn't last and it tended to emphasize roadway irregularities.



A 3/4- to 1-inch application of Type B Smoothseal minimizes imperfections, protects the under layers of asphalt and aggregate, and is expected to last at least a dozen years before reapplication.



Smoothseal is designed for use in urban areas. It can only be applied over a flexible base, so it was perfect for Englewood's street resurfacing program.

The most advanced surface coatings now are polymer mixes. Roberts was familiar with polymer asphalt and had used it mixed with fibers to correct rutting at intersections. It was only in the late '90s, however, that a polymer surface mix became widely available. As head of Flexible Pavements of Ohio, Frecker introduced Smoothseal at an industry conference in Cincinnati in 2001. A surface course with a velvety finish, Smoothseal is designed for use in urban areas. It can only be applied over a flexible base, so it was perfect for Englewood's street resurfacing program.

Smith says, "We started the Smoothseal program about 2002 and completed covering the whole city last year." He regards it as a huge success, lasting easily twice as long as slurry seal. So while it may initially cost more, it saves money in the long run. Englewood's experience with Smoothseal already has matched the 12-year average longevity. "We haven't reconstructed a street since we started Smoothseal," maintenance superintendent Al Butler confirms. Some Smoothseal has lasted much longer, including a stretch in Shaker Heights, Ohio, that was laid in 1973.

Then there is good will, which is worth a lot. "You'd think most people would do cartwheels that their street



is being resurfaced,” says Smith. “But not so.” He likes to tell the story of a local man who owned three old Cadillacs. Why three, he was asked? Because, he answered, at least one was always undergoing repair, and “When you’re ready to roll, you want to be ready to roll.” That’s now a byword around Englewood’s municipal building. When it comes to street maintenance, the less they hear from members of the public, the better. Long-lasting streets that require minimum regular maintenance get the public’s silent vote at city hall.

There are other surface coating mixes, but the Type B Smoothseal formula gives a superior ride quality and high skid numbers. An inch of thin-lift Smoothseal not only evens out road imperfections, as slurry seal did not, it also looks almost too smooth to be safe. Like “black

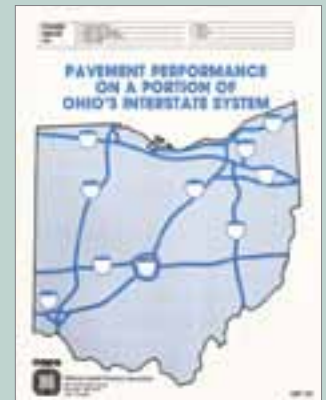
Landmark Studies Prove Asphalt’s Superiority

In 1983, Willis B. Gibboney, P.E., a former ODOT Interstate Pavements Engineer, published a study commissioned by Flexible Pavements of Ohio on a comparison of the service provided and cost over time of asphalt and concrete pavements on a portion of Interstate 71, constructed between 1957-1960 and subject to the same roadway conditions and traffic volume. What he found was asphalt pavements were less costly, needed no major rehabilitation and provided long-lasting service, while concrete pavements showed early signs of distress and began requiring extensive repairs and major rehabilitation by 1969. Asphalt maintained its road performance over time so well that Gibboney wrote, “In the foreseeable future, it is likely that only surface maintenance and not structural repair or strengthening ... will be required.”

In 1994, Gibboney revisited the comparison when some stretches of highway from the original study were more than 30 years old, and expanded it to include sections of I-75, I-275, and I-475. Once again, he concluded asphalt was both cheaper to install and cheaper to maintain over the life of the pavement.



Willis Gibboney, P.E.



Gibboney’s findings were indisputable. In the years following, new construction of Ohio’s roadways has been dominated by this high-performance material. And as the interstates on the Ohio Turnpike take up needed rehabilitation of the concrete portions of highway, Flexible Pavements of Ohio was able to argue authoritatively in a 2011 report to the Ohio Turnpike Commission that replacing these stretches with asphalt was the smarter solution because “no original flexible pavement on Ohio’s Interstate system has ever received so much as a major rehabilitation, much less had to be replaced.”

velvet,” says Roberts. But in fact, it provides great traction. “Fifty percent of the fine particles have sharp angles,” says Roberts. “It’s gritty. It allows you to stop faster.” Yet it also gives drivers better gas mileage because it maintains that smooth surface longer.

Englewood just finished applying a Smoothseal maintenance overlay to the last of the city’s streets, which have been pothole-free for years and are almost complaint-free.

No city street program is without challenges. Smith understands that “when times are tough, the first thing that gets cut is street maintenance, because it’s easy to do.” But slow and steady still wins the race, when contrasted with unpleasant spikes in expenditure and major inconveniences of rebuilding failed roadways. “That’s hard to budget for,” Frecker says. In both fat times and lean, asphalt pavement allows for a stable budget item and a planned maintenance program, which citizens and city councils can easily understand and track. No surprises. That’s worth a lot.

“Looking back on it,” Smith says, “the genius was in the fact that we chose to build our roads with asphalt. Now we are reaping the dividends of those decisions: low-cost preventive maintenance, smooth and reliable pavements for our citizens, public good will and manageability.” What more could a city “manager” want?

Smoothseal: The Key to Pavement Maintenance

Back in the 1970s, Englewood’s standards for residential streets and arterial roadways called for 10 inches of aggregate base covered by 3 inches of asphalt for residential streets and a foot of aggregate base covered by 5 inches of asphalt for arterial streets. By today’s standards, this is less than ideal. It was only by a meticulous attention to stabilizing the subgrade and laying over it a 9-ounce polyester geotextile that Englewood engineers reduced bottom strain and slowed the surface deterioration.

Englewood’s maintenance program therefore has adopted Type B Smoothseal polymer asphalt, ODOT item 424, which is 100-percent, crushed-coarse aggregate with a 6.4 percent polymer binder. A 3/4- to 1-inch application minimizes imperfections, protects the under layers of asphalt and aggregate, and is expected to last at least a dozen years before reapplication.

Of course, today’s standards for good street construction call for full-depth asphalt. Built correctly, and with a stable subgrade, Vic Roberts, a long-time city engineer in Englewood, says with 6 to 9 inches of asphalt base, a 1 1/2- inch intermediate layer and a high-quality finishing course – along with periodic maintenance – a street never fails.



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ASPHALT OUTPERFORMS CONCRETE AT MARYLAND INTERSECTION

Editor's Note: The Maryland Asphalt Association recently revisited the site of an asphalt vs. concrete pavement comparison trial constructed in 1994. The initial results of the trial were widely reported and appeared in the Sept. 29, 2000 edition of Ohio Hot-Mix Asphalt Current News, page 5, "The Maryland Asphalt Versus Concrete Intersection Shootout Leaves Only One Gunfighter Still Standing." This newsletter is archived on the FPO website at http://www.flexiblepavements.org/sites/www.flexiblepavements.org/files/ohio-asphalt-pdf/newsletter_12.pdf.

This reprinted article appeared in the Maryland Asphalt Association's Asphalt Pavements newsletter, Issue 16, October 2012. The article recounts the original results and updates that the original asphalt sections are still performing well after 18 years in service.

Asphalt is really the long-lived pavement.



Durability by Design – Superior Performance by Superpave

The intersection of U.S. 40 and MD 213 topped the list of “trouble spots” for the Maryland State Highway Administration (SHA) network as early as 1993. The high daily traffic count and the large percentage of truck traffic resulted in excessive pavement deformation which needed to be addressed once or twice a year at a great expense. The Asphalt Industry was challenged to come up with a solution for the eastbound travel, passing and right-turn lanes of U.S. 40 at MD 213. A team comprised of a local contractor, the Maryland Asphalt Association, National Asphalt Pavement Association (NAPA), and Asphalt Institute (AI) tackled the problem. The answer was the then-new design system known as

Superpave. A 25-mm base and a 19-mm surface featuring a PG 76-22 asphalt cement was the solution. Fifteen thousand sq. yds. of old pavement were milled down to the original Portland cement concrete (PCC) and replaced with about 5,000 tons of Superpave of varying depths up to eight inches in only eight nights with traffic through the intersection and to all businesses being maintained at all times.

Simultaneously the same challenge that was given to the asphalt industry was given to the concrete industry at the U.S. 40 and Landing Road intersection just south of the MD 213 intersection. Their project was 1,800 sq. yds. Six inches of PCC replaced the asphalt roadway. The PCC industry worked for 12 days with round-the-clock lane closures to repair the intersection. The PCC operations took twice the time to complete even though only one-eighth of the area was included in the project.

Six years later, more than 75 percent of the concrete slabs were heavily cracked and the SHA had them removed. This fractured PCC pavement was replaced with a 12.5 mm Superpave blend

featuring PG 76-22 asphalt. That operation was completed very quickly and with minimal user delays.

The U.S. 40 and MD 213 intersection is showing its age 18 years later (pictured on page 16), but the asphalt still functions well.

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FPO'S 'MID-YEAR TECHNICAL SEMINAR' A HIT WITH PARTICIPANTS

On July 18, Flexible Pavements of Ohio presented its 2013 Mid-Year Technical Seminar in Columbus. Participants were treated to a full-day of updates on the latest in asphalt pavement technology and came away with knowledge of materials, design and construction practices that they can use to improve the performance of their pavements.

After the customary welcomes and introductions, the program began with two topics related to sustainability. First was an overview of "Sustainability in Asphalt Pavements." Participants learned what elements constitute the concept of sustainability: economy, conservation of resources and technologies that increase performance and life. In general, these practices fall into the categories of reduction of use, re-use and recycling. Participants learned of practices already in use in the asphalt industry that contribute to sustainability: long-lived (perpetual) pavements that reduce the need for reconstruction, re-use of reclaimed asphalt pavement, the most-recycled product in the USA; the recycling of tires and shingles and other waste materials; and the use of warm mix technology to reduce energy use in asphalt concrete production. The sustainability presentation also covered the advantages of the perpetual pavement design concept in reducing the use of resources and reducing

the need for reconstruction. Participants also learned about the low-carbon footprint of asphalt pavements compared to concrete. Lastly, participants learned the applicability of these asphalt pavement technologies in securing recognition under the various sustainability rating systems such as LEED and Green Roads.

Next was a presentation on considerations in "Porous Asphalt Design, Construction & Maintenance" as a structural best-management practice in controlling stormwater. Participants learned how a porous asphalt pavement with infiltration and/or detention reduces stormwater runoff and pollution. Participants were given an overview of structural design and material requirements, and were directed to additional resources on the FPO website and in the ODNR Rainwater and Land Development Manual.

The seminar then moved on to presentations involving materials and construction to improve the performance of asphalt pavements. The series began with a presentation on "Best Practices for Constructing and Specifying HMA Longitudinal Joints." The presentation covered the latest findings from a Federal Highway Administration study of longitudinal joints in asphalt pavement and presented techniques for designing, specifying and constructing good-performing longitudinal joints. Participants learned about construction practices contributing to good-performing longitudinal joints, as well as how material selection can impact the issue of segregation that can impact joint performance, and most important, how to modify specifications for obtaining good-performing longitudinal joints.

Next were two presentations related to pavement preservation using thin asphalt overlays (thinlays). First, "404 LVT (Low Volume Traffic): A New 404 Specification for Your Lightly Traveled Roads" was presented, including the development of the specification and uses for which this material is appropriate. 404LVT, a type of thinlay, is another option to chip seals and microsurfacing treatments for preventive maintenance. The 404LVT specification is based on ODOT's former 404 mixes that gave good performance on low-volume roads. 404LVT's fine gradation and high asphalt binder content gives it greater resistance to the damaging forces of the environment. Since 404LVT is a thinlay it can be placed with improved economy per square yard.

This was followed by the presentation on the general topic of "Thin Asphalt Overlays for Pavement Preservation" and preventive maintenance. Covered were appropriate materials and applications for thinlays, along with considerations for their specification: what a thinlay is and where it can be used. Thinlays are cost-effective based on lifecycle analysis. The fact that of all preventive maintenance treatments, thinlays give the highest level of user satisfaction and safety since ride is improved and

road profile is corrected, not only is pavement condition improved but the functional performance of pavements are improved with thinlays.

The “Perpetual Pavements” design concept was the next topic for presentation. The history, theory and proof of the concept were presented; the fatigue limit of asphalt and design parameters was explained; and case studies of actual perpetual pavement design, construction and performance were provided. Participants learned how perpetual pavements are designed and built, and obtained an understanding of how long-lived asphalt base pavements – which need only surface preventive maintenance to keep them in good, serviceable condition – reduce the lifecycle demand for resources and improve economy.

The next presentation covered considerations for “Preventing and Correcting Deformation & Rutting at High Stress Pavement Locations.” Topics covered included making appropriate forensic studies, choosing deformation-resistant materials, both aggregates, gradations and binder grades, and appropriate layer build-ups to correct or prevent deformation. Ensuring pavements don’t rut or deform involves the careful selection of asphalt mixture composition. Identifying where high-stress pavement areas can develop is key to a strategy that resists

rutting. High angularity aggregate and stiff asphalt binders are necessary components for asphalt mixtures used in such areas, as well as mixes such as ODOT’s 442, Type A, having a binder grade 76-22M for surface and intermediate courses. Good construction practices that thoroughly compact the pavement are essential.

The seminar concluded with a presentation on “FPO Webpage Resources,” and included an overview of materials available on FPO’s website. A wealth of information on virtually every asphalt pavement topic is archived on the FPO website, which is made easier to access because of a powerful search function. FPO invites you to try it out at www.flexiblepavements.org.

Feedback from the participants indicated the day was well spent in learning the latest developments in asphalt pavement technology, and that attendees took away with them valuable information that can be readily put to use.

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Cosgray Rd./Shier-Rings Rd. Roundabout Project Honored

The City of Dublin and American Structurepoint Inc. were recently presented with the 2012 Project of the Year by the American Society of Highway Engineers (ASHE) Central Ohio Section for the design of the Cosgray Road/Shier-Rings Road Roundabout Project. This recognition serves as an example of asphalt's versatility and suitability for innovative roadway designs. The ASHE Central Ohio Section annually recognizes the outstanding work completed by its members with this award. Projects can be of any type, with the criteria they are directly related to the field of transportation and be located within a defined 50-county region in the state.

The existing conventional intersection of Cosgray Road and Shier-Rings Road presented the City of Dublin's Division of Engineering with a unique safety challenge. Speed limits of more than 45 mph, substandard lane widths and poor horizontal alignments at this intersection resulted in high-severity injury crashes at more than double the rate of comparable intersections in

the city. This intersection is also the primary access point to a popular city park, which regularly hosts events that result in irregular periods of peak traffic volumes in an otherwise low- to moderate-traffic location.

To address this challenge, the City of Dublin contracted with American Structurepoint to provide preliminary engineering and final design services for improvements to the Cosgray Road and Shier-Rings Road intersection. The project included a traffic analysis to study the feasibility of constructing a roundabout or traffic signalization, and other roadway improvements to improve traffic flow and reduce the severity and number of accidents at the intersection.

The final design recommendation consisted of the construction of a single-lane roundabout to replace the existing conventional intersection. The roundabout solution offers continuous-flow traffic to events with fluctuating attendance at the adjacent park and enhances safety features through traffic calming and the correction of both the substandard horizontal alignments and lane widths.

The City of Dublin's standard roadway specification calls for asphalt pavements, and the project team incorporated one of asphalt's most

unique performance advantages in the project design. The innovative design includes a staged construction component where the project was constructed with a single lane but with the capacity to be expanded to two lanes in the event that traffic demand grows or additional lanes are constructed on the roadways. In addition, the project design incorporated the construction of an 8-foot-wide asphalt, multi-use path for cyclists and pedestrians to access the adjacent park.

The five-month, \$1.1-million Cosgray Road/Shier-Rings Road Roundabout Project was awarded to the Trucco Construction Company and completed in November 2012.






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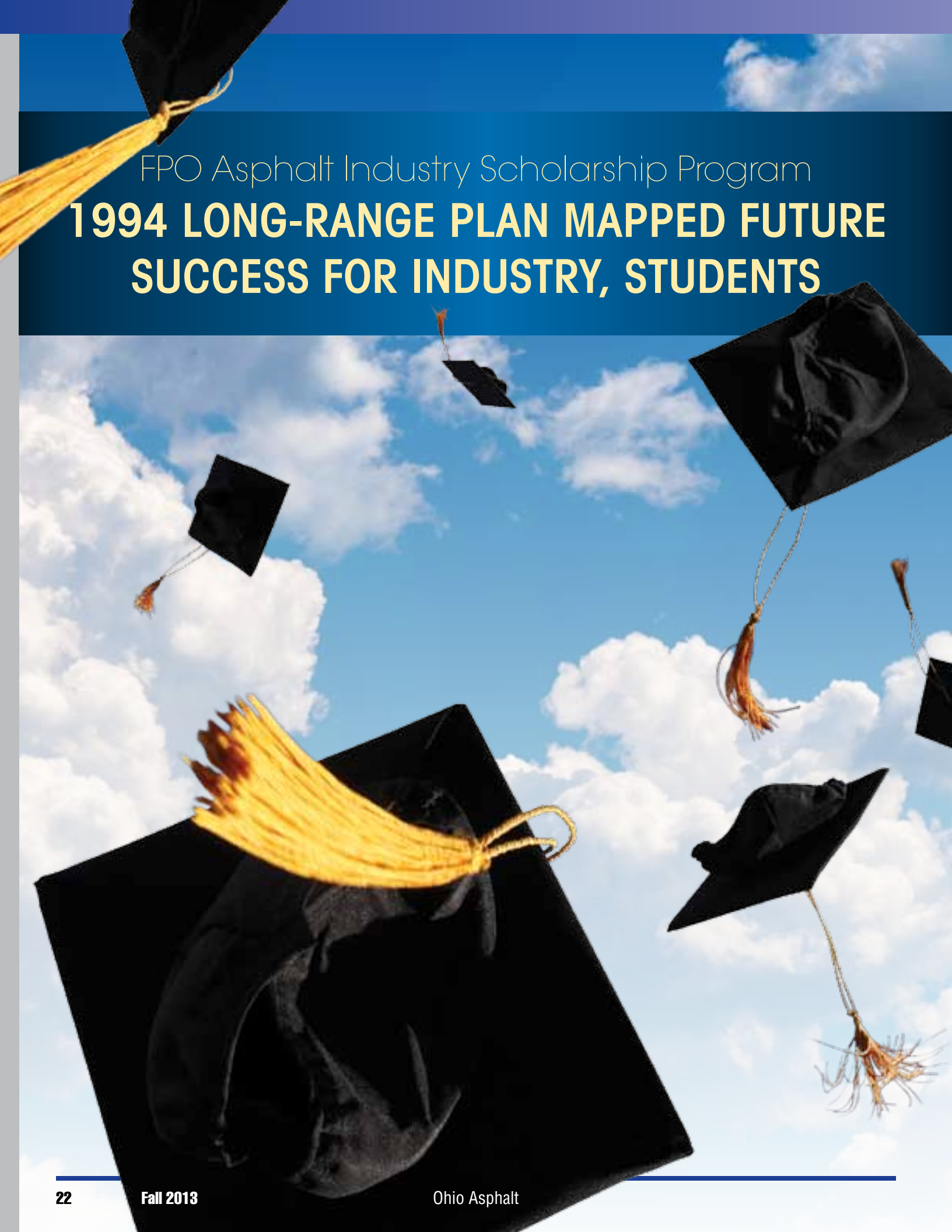
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FPO Asphalt Industry Scholarship Program

1994 LONG-RANGE PLAN MAPPED FUTURE SUCCESS FOR INDUSTRY, STUDENTS

Getting from here to there is the goal, whether you're using MapQuest or trying to reach any other achievement or destination in life. Getting from here to there was the basis for the inception of the Flexible Pavements of Ohio's Asphalt Pavement Industry Scholarship Program in 1994 – two years before MapQuest hit the Internet.

In 1994, FPO's Long-Range Strategic Plan included the formation of a scholarship program, which in its first 18 years has assisted the academic pursuits of college students by awarding 372 scholarships totaling \$466,099. In the 2013-2014 academic year, FPO Asphalt Pavement Industry Scholarships total \$34,000 and are assisting 16 undergraduate students and one graduate student from five Ohio universities.

However, while the development of a scholarship program was an important part of that 1994 Long-Range Plan, FPO leaders were also looking at ways to get asphalt from here to there in terms of better recognition and use. With that in mind, the 1994 Long-Range Plan also promoted the following objectives:

- Provide an incentive for students to gain knowledge in asphalt pavement technology by requiring scholarship recipients to take at least one asphalt pavement course
- Provide an incentive for colleges/universities to offer asphalt pavement coursework
- Establish a relationship between the asphalt industry and universities to raise awareness of asphalt pavement in the academic community and foster asphalt pavement-related research
- Provide a workforce trained in asphalt pavement technology

While FPO's 1994 Long-Range Plan objectives are ongoing, there is measurable achievement that Ohio's asphalt pavement industry has gotten from here to there when you consider that prior to the mid-1990s, Ohio universities offering degrees in Civil Engineering and Construction Management generally didn't offer courses in asphalt pavement technology; since the inception of FPO's Long-Range Plan, 10 Ohio universities

have offered coursework in asphalt pavement technology. Also, today, 98 percent of Ohio's roads are asphalt paved, which makes getting from here to there an even smoother ride.

Here is a look at the 2013-14 FPO Asphalt Pavement Industry Scholarship recipients:

2013-2014 FPO Asphalt Pavement Industry Scholarship Recipients

Barrett Paving Materials Inc.



Matthew Menche
U. of Cincinnati

**Wayne & Debbie Brassell
Asphalt Pavement Industry
Scholarship**



Jayson Gray
Ohio U.

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Nathaniel Gussler
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Christopher Volzer
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Shelly & Sands Inc.



Anthony Colella*
U. of Akron

*Repeat Scholarship Recipient

The 2013-14 scholarship recipients were recognized and honored earlier this year during the Ohio Asphalt Expo in March.

For the first time, the graduate scholarship – which is awarded to a post-graduate student whose major field of study is related to asphalt pavement technology and has been recommended by his/her faculty advisor – is being recognized as the Wayne & Debbie Brassell Asphalt Pavement Industry Scholarship. A 2012 recipient of FPO's Industry Service Award, Wayne Brassell served as the vice president of Operations for Kokosing Construction Co. Inc. and served as the association's 2011 co-chair.

FPO Asphalt Pavement Industry Scholarship Fund Contributors

The following companies and individuals have contributed to endow the Ohio Asphalt Pavement Industry Scholarship Fund through the National Asphalt Pavement Association Research & Education Foundation (NAPAREF):

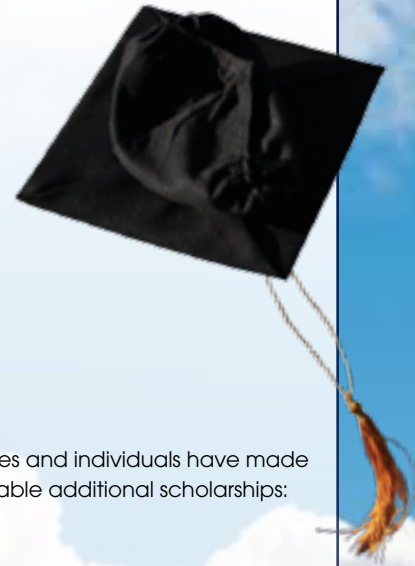
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In addition, the following companies and individuals have made a supplemental contribution to enable additional scholarships:

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ACCELERATED POLISHING MACHINE FOR LABORATORY MIX DESIGN APPLICATIONS

By ROBERT LIANG, UNIVERSITY OF AKRON, & DAVID POWERS, OHIO DEPARTMENT OF TRANSPORTATION

INTRODUCTION

The majority of weather-related crashes on highways occur on wet pavement and during rainfall. Studies have shown that correlations exist between pavement friction and crashes in wet driving conditions. Therefore, maintaining adequate friction at the tire-pavement interface is an important task for highway agencies.

The Ohio Department of Transportation (ODOT) routinely monitors skid resistance on Ohio's interstate highways. While the practice of monitoring and re-surfacing pavement sections with low-skid resistance is important, it is a passive and reactive approach to the problem. A more proactive approach would involve the design of hot mix asphalt (HMA) with high-polishing resistance and high-friction properties during the initial laboratory mix design stage.

"The Polisher"

ODOT has sponsored a research project (Liang, 2013) to develop a laboratory-scale, accelerated polishing machine for testing friction-degradation behavior of hot mix asphalt concrete samples due to tire abrasion and polishing actions. The requirements for this polishing machine include: (i) ability to test gyratory compaction samples or field-cored specimens, (ii) a relatively short test duration, (iii) a test procedure with test specimen preparation and friction measurement techniques that are relatively simple and easily replicable, (iv) a test procedure that requires minimum labor efforts and (v) test results that provide realistic screening ability for determining a suitable hot mix design.

The machine developed from this ODOT research is a fairly sturdy, easy-to-use machine that has been nicknamed "The Polisher." The Polisher essentially presses a rotating rubber disc with 290 pounds (1.29 kN) of vertical force at approximately 30 rpm. Water flow of 3.38 ounces (100 ml) per minute is introduced to the surface of asphalt samples to prevent overheating during polishing. The polishing rubber disc is made of 90 Durometer styrene-butadiene rubber. The machine can accommodate gyratory compactor samples in two sizes: samples that are 6 inches

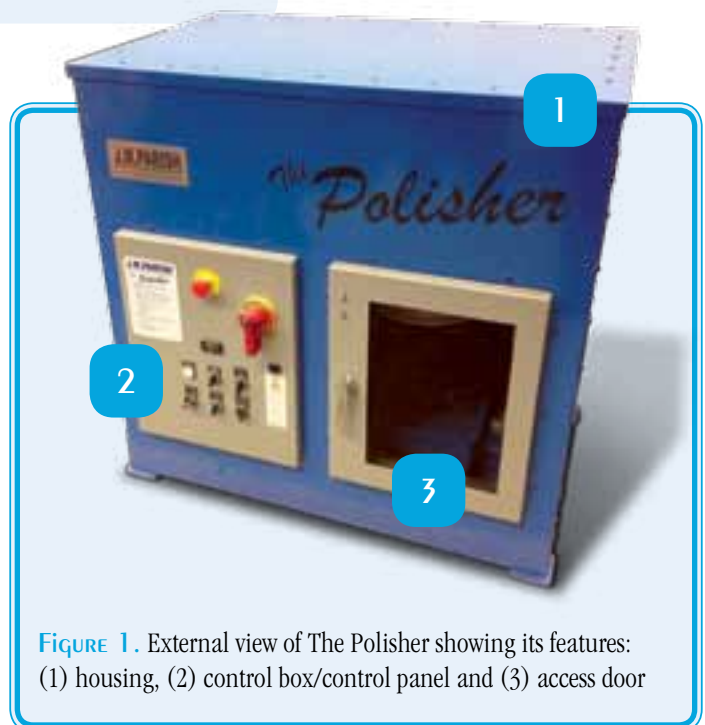


FIGURE 1. External view of The Polisher showing its features: (1) housing, (2) control box/control panel and (3) access door

(15.24 cm) in diameter by 6 inches (15.24 cm) in height, or samples that are 6 inches in (15.24 cm) diameter by 4 inches (10.16 cm) in height. Figure 1 shows the external view of The Polisher.

Applications

ODOT is in the process of developing a supplemental specification for the application of The Polisher. The specification, tentatively titled "Polishing and Determining Friction Number of Gyratory Compacted Specimens," specifies the procedures for using The Polisher to correctly determine the following:

1. Friction degradation curve for an asphalt mixture
2. Suitability of an asphalt mixture for meeting pavement skid-resistance requirements
3. Prediction of actual friction for an installed pavement over its expected service life

The supplemental specifications provide a laboratory test procedure for determining the friction degradation curve for an asphalt mixture. The friction degradation curve is a graph that relates the British Pendulum Number (BPN) values, which are measured by British Pendulum Tester in accordance with ASTM E-303-93, versus polishing time at one-hour intervals until reaching the 8-hour duration. Example friction degradation curves are presented in Figure 2.

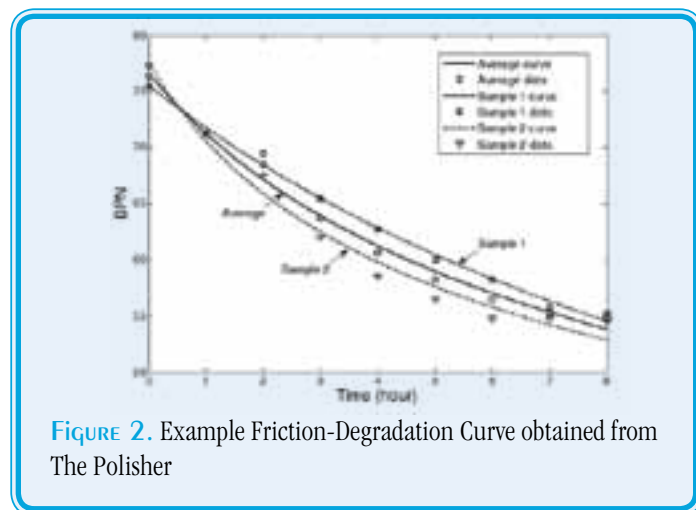


FIGURE 2. Example Friction-Degradation Curve obtained from The Polisher

The Polisher can be used to determine the “Final Friction Number” of a mix design. Since the sample size is limited to a 6-inch diameter specimen, only the British Pendulum Tester can be used to measure friction values. Consequently, the BPN value measured from the British Pendulum Tester is converted to an equivalent skid number (SN) value.

Finally, the supplemental specifications provide the procedure for predicting actual pavement friction at different stages of the expected service life. The predictors for SN (64)R (the skid number measured at 64 km/hr speed using a ribbed tire) included the friction-degradation curve of the mix obtained from the polishing machine, parameters for characterizing the aggregate-gradation curve and traffic data (ADT). The

predictors for the International Friction Index (IFI), represented by $F(60)$, were the same as those for SN(64)R, but they include one additional predictor: the mean texture depth (MTD).

Concluding Remarks

Many factors affect safety under wet-pavement conditions, other than SN value of pavement surface. Vehicle speed, road geometry, traffic flow, vehicle type and driver skills may also play a significant role in causing wet-pavement accidents. However, The Polisher provides an accelerated means for highway agencies to design mixes holistically, giving consideration not only to the structural performance of a pavement, but for its surface-friction performance as well. The existing Superpave mix design procedure lacks standards and universally accepted accelerated polishing machine(s) to address the aspect of surface friction characteristics. The accelerated polishing machine called The Polisher fills this gap by adding to the existing testing protocols and array of equipment for hot mix asphalt design, specifically for ensuring adequate friction properties of a mixture over the expected service life of the pavement.

OA



Robert Liang is a Distinguished Professor of Civil Engineering at the University of Akron.



David Powers is the Asphalt Materials Engineer for the ODOT Office of Materials Management.

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FPO is organizing an Asphalt Technology session on Tuesday, October 22. Visit the OTEC website at www.dot.state.oh.us/engineering/OTEC/Pages/default.aspx for up-to-date registration and conference information as well as archived material from previous conferences. Please stop by booth 200 in the main exhibit hall during the conference and meet the FPO staff.



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For more information as it becomes available, visit FPO's website at www.flexiblepavements.org.

FPO Wins National Website Award

In mid-July, the National Asphalt Pavement Association (NAPA) honored Flexible Pavements of Ohio as the winner of the 2012 Outstanding Website Award in the State Asphalt Pavement Association category. The award recognizes website designs that promote the use of asphalt and the asphalt pavement industry.

FPO created the new website to demonstrate the value and performance advantages of asphalt while providing greater accessibility to the informational resources maintained by the association on an updated technical platform. "We utilize it as our primary vehicle for providing information in terms of our reference and resource materials," said FPO President/Executive Director



Brent Gerken (right) of Gerken Paving Inc., a member of FPO's Board of Directors, accepts NAPA's Outstanding Website Award on behalf of the association.

Cliff Ursich. "FPO's members and staff are honored to receive this recognition."

Visit www.flexiblepavements.org to view FPO's award-winning webpage.



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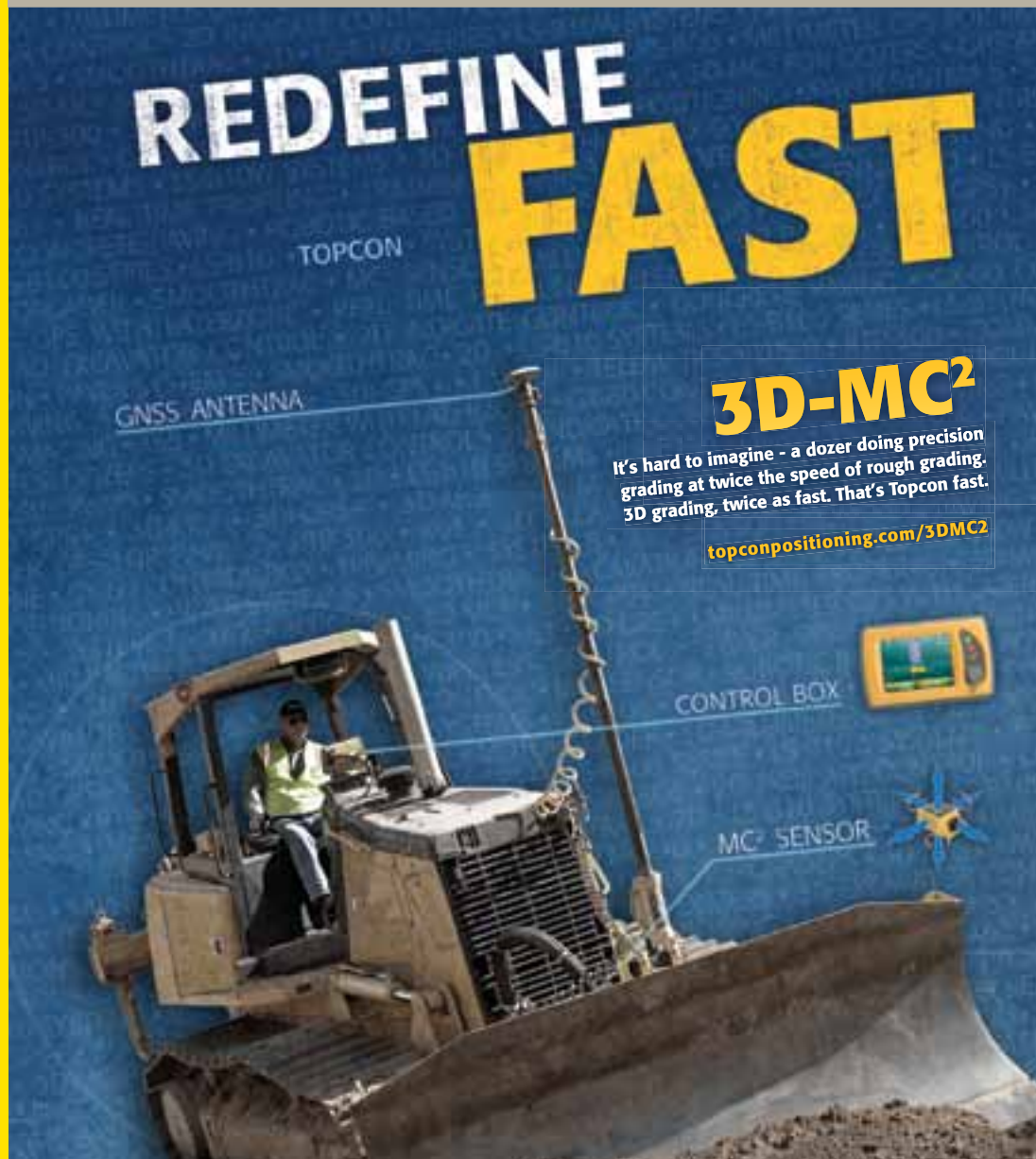
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