

PAVING^{the}WAY

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Asphalt: The Sustainable Pavement

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For constructing pavements, asphalt is the sustainable material. Asphalt is miles ahead of the competition in terms of energy and recycling; performance; water quality; and clean air and cool cities.

Energy and Recycling

According to the Asphalt Pavement Alliance (APA), in comparison to other pavements, the production and construction of asphalt pavements not only requires less energy, but also less time. Unlike other materials that take days or weeks to cure, asphalt pavement can be opened to traffic as soon as it has been compacted and cooled. This reduces traffic congestions and therefore saves fuel. This is beneficial to the environment as well as the pocketbook.

Asphalt is also America's number one recycler, as the industry recycles more than 70 million tons of its own products each year. Asphalt recycling saves taxpayers about \$1.8 billion a year.

Performance

Asphalt, the Perpetual Pavement, has an extremely long lifespan which is a vital element to sustainability. Rather than having to go through the arduous and expensive process of reconstructing a concrete pavement that has reached the end of its lifespan, the pavement can be rubblized (fractured), and used as the base for a new Perpetual Pavement. This process is faster, cheaper, and can be accomplished through temporary lane

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Asphalt Triumphs in Head-to-Head Battle

The asphalt industry has proven victorious once again in the battle between Hot Mix Asphalt (HMA) and Portland Cement Concrete (PCC).



Working late into the night, a crew replaces cracked and deteriorated concrete with asphalt at a Somerset intersection. Just nine years after installing both PCC and HMA at this busy Somerset intersection, the deteriorating PCC had to be replaced with the superior HMA.

Years of trouble with excessive pavement distress—due to high traffic volumes, high truck percentages and grade variations—across the intersection connecting US 27 and KY 80 in Somerset, Ky. led the Kentucky Transportation Cabinet to challenge the paving industries to a competition.

The contest, initiated in 1998, required both industries to use their best technologies in order to solve the problems with distress that the intersection had experienced over time. By allowing each industry to pave on either side of the busy intersection, the durability of both Hot Mix Asphalt (HMA) and Portland Cement Concrete (PCC) were tested.

The asphalt industry chose to pave the intersection with a

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Asphalt: The Sustainable Pavement *(continued)*

closures without the necessity for traffic to be detoured onto parallel routes.

Smooth asphalt pavements provide public safety in that they give vehicle tires superior contact with the road. Driving on smoother surfaces can reduce fuel consumption, as well. Asphalt is also the quiet pavement, as it reduces noise.

Airports and racetracks are punished daily by heavy loads, but asphalt stands up to them. Nearly all racetracks—for both Formula One and NASCAR racing—use asphalt.

Water Quality

Porous asphalt conserves water, allows for better use of land, reduces runoff, promotes infiltration, cleans storm water, replenishes aquifers and protects streams. Once constructed, asphalt pavements have minimal impact on the environment.

Clean Air & Cool Cities

According to the National Asphalt Pavement Association, since 1970 the asphalt industry has decreased total emissions from plants by 97 percent while increasing production by 250 percent. Emissions from asphalt plants, including greenhouse gases, are very low and well-controlled.

Many factors contribute to the urban heat island effect, or the phenomenon that makes cities 2 to 10 degrees warmer than nearby rural areas. Porous asphalt pavements have been shown to lower nighttime surface temperatures as compared to impervious pavements.

Asphalt Triumphs *(continued)*



HMA mix somewhere between a Superpave and a SMA mixture. The result was a pavement with the strength and rut-resistance of an SMA and the better performance under extreme temperatures and heavy traffic loads of a Superpave. The mix was designed in a collaborative effort between the KYTC Division of Materials and Hinkle Contracting Corporation with additional input and testing from the Asphalt Institute, PAIKY and Koch Materials Company.

Nine years after the intersection connecting US 27 with KY 80 was paved with both materials, the condition of the pavement designated a clear winner in the competition. The HMA pavement performed admirably and without maintenance, providing a smoother surface for drivers in Somerset. The PCC, on the other hand, required frequent repairs to address the extensive cracking and deterioration and was finally replaced with HMA this past May.

The rehabilitation of the intersection connecting US 27 with KY 80 and the Cumberland Parkway marks a clear victory for asphalt in a head-to-head battle with concrete. Not only is asphalt a more durable pavement than PCC, but also a less expensive material to install, repair and smoother surface on which to drive. In other words, asphalt is miles ahead of the competition.

Superpave Mixture

Superpave (SUPERior PERforming Asphalt PAVements) is a system designed to perform better under extreme temperatures and heavy traffic loads. Developed by the Strategic Highway Research Program (SHRP) in 1992, the method utilizes an asphalt binder specification, volumetric mix design and analysis system, and mix analysis tests and a prediction system that consists of computer environmental and performance models.

Source: <http://www.superpave.psu.edu/superpave/system.html>

I-64 Improvements in Shelby County on Fast Track for PGA 2008 Ryder Cup



Proving that asphalt is a more reliable and cost-efficient material, workers make minor improvements to the asphalt half of a Somerset intersection. The other half of the intersection was originally constructed with concrete and after several years had to be replaced due to extensive cracking and deterioration.

SUMMARY

- The Ky. Transportation Cabinet challenged the asphalt and concrete industries to use their best technologies to pave a Somerset intersection, and after nine years asphalt has claimed victory in durability, as well as performance.
- Not only is asphalt a more durable pavement than PCC, but also a smoother surface on which to drive and less expensive material to install and repair.
- The rehabilitation of the intersection connecting US 27 with KY 80 and the Cumberland Parkway marks a clear victory for asphalt in a head-to-head battle with concrete.

Plans for improvements along the stretch of I-64 in Shelby County were fast-tracked to be completed prior to September 2008—when Louisville hosts the PGA 2008 Ryder Cup. With the project timeline shifting gears, only the asphalt industry could meet the new deadline.

A groundbreaking ceremony was held on June 12 to mark the start of the \$57.5 million investment along I-64. The existing concrete pavement was in poor condition and required attention. Rather than simply addressing the surface problems, forward-thinking Cabinet officials decided to proceed with significant upgrades to accommodate future growth.

The interstate will be widened/extended to three lanes and rebuilt along a five-mile stretch between Hooper Station Road (KY 1790, near the weigh station) and Waddy Road (KY 395). Construction plans also include the replacement of three sets of tandem bridges on the interstate, as well as the overpasses located on KY 714 and KY 395.

Within a week of the groundbreaking ceremony, crews began the massive interstate

rebuilding project. Throughout most of the construction, the work zone will consist of two lanes of traffic maintained in each direction. Lane closures will take place only when necessary between 9 p.m. and 6 a.m.

Relieving traffic congestion/improving traffic flow and increasing safety are expected to benefit the business community, residents and tourists by allowing businesses to meet on-time delivery demands while simultaneously providing safer commuting and driving conditions for all motorists.

The interstate face-lift could not come at a better time as the greater Louisville area gears up for the 37th Annual Ryder Cup held next year at Valhalla Golf Club. Contractors for the project, HG Mays Corp., Louisville Paving Co. and Mago Construction, will aim to finish in time for tee off on September 16th. However, the department has established a fixed completion date September 1, 2008.

September 16-21 includes three days of practice and three days of competition at Valhalla that are expected to bring 30,000 visitors to Louisville.



Ground breaking ceremony on the \$57.5 million I-64 improvement project.

Atlantis Lands on Ft. Campbell Asphalt Runway



On July 2, a crowd gathered at the Fort Campbell airfield to witness a rare event. The Atlantis space shuttle, carried by a Boeing 747 jet, touched down on the asphalt runway at Fort Campbell to refuel near the KY-TN border.

Following a 14-day construction mission at the international space station, the Atlantis' ultimate goal was to return to the Kennedy Space Center, Cape Canaveral, FL., later

Monday evening—weather delayed the departure until early Tuesday morning.

While Fort Campbell recently made news as an alternate landing location for NASA space shuttles, the military base is best known for the 101st Airborne Division—a group of men and women who have played a critical role in recent military operations in Iraq and throughout the Middle East.

The runway must perform at a moments notice and stand up to severe load conditions. That is why in 2006, when military personnel faced the dilemma of how to mill and resurface the runway, hot mix asphalt was chosen for the job. Because runway pavement must meet

the most stringent specifications and minimize disruptions to airfield operations, asphalt was the only solution, due to its smoothness, speed of application, cost and durability.

Selected to produce the asphalt mixture and pave the runway was the Rogers Group, of Hopkinsville, Ky. The contractor was held to statistically-based specifications that require the highest level of production consistency and pavement quality. In all, 60,000 tons of HMA was produced—all of which met or exceeded all quality measures.

The project was completed in a mere 16 days and testing indicated that the project far exceeded specifications.

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