

PAVING^{the}WAY

A PUBLICATION OF THE PLANTMIX ASPHALT INDUSTRY OF KENTUCKY AND THE KENTUCKY ASPHALT PAVEMENT ALLIANCE

Asphalt gets a green light on the environment

Those living in Kentucky for any length of time have heard hot mix asphalt referred to as “blacktop.” However, “greentop” might be a more accurate description because of asphalt’s many environmental advantages.

Energy savings

The use of asphalt helps save energy from construction to fuel consumption. Asphalt pavements require about 20 percent less energy to produce and build than other pavements. Warm mix asphalt uses even less energy, saving more natural resources.

In addition to low energy consumption during the construction process, asphalt actually helps motorists conserve fuel in several ways.

An idling car gets zero miles to the gallon, and fuel efficiency in vehicles diminishes every time the brakes are hit. Because asphalt can



be laid quickly during off-peak hours and freshly paved roads can reopen nearly immediately, traffic interruption from paving is minimal. For motorists, that means less time spent in slowed or stopped traffic in construction zones. In fact, a test in Maryland showed that nearly 10 times more road was paved with asphalt than concrete, and in less time.

The smoothness of asphalt also improves fuel efficiency of vehicles because it creates less friction between the tires and roadway. Studies show a smooth roadway can increase fuel efficiency by up to 4.5 percent in trucks.

Low emissions

The production of hot mix asphalt is known to be environmentally friendly. Even though production of asphalt has increased more than 250 percent in the past 50 years, emissions from asphalt plants have been reduced by 97 percent.

Innovation

The asphalt industry is continually researching and developing new technologies to make asphalt an even better choice for communities in Kentucky and across the nation.

Warm Mix

For those looking for a smooth, durable surface that is even more environmentally friendly, warm mix asphalt is a hot topic. Warm mix asphalt allows the producers of asphalt pavement to lower the temperature at which the materials are mixed and placed on the road, with reductions of 50 to 100 degrees Fahrenheit being common. These temperature reductions cut fuel consumption by up to 30 percent and decrease greenhouse gases and emissions during the paving process. By using lower temperatures, both haul distances and the paving seasons may be extended. In addition, more reclaimed asphalt can be used in the warm mix, thus making better use of recycled asphalt.

“Another benefit of warm mix asphalt is that it is easy to work with,” said Brian E. Wood, P.E., executive director of PAIKY. “This

(continued on back)

ASPHALT LEADS THE WAY IN U.S. RECYCLING

ITEM	AMOUNT IN TONS ANNUALLY
Asphalt pavement	80.3 Million
Scrap steel	70 Million
Paper/paperboard	34.9 Million
Compost	12.1 Million
Metals	6.5 Million
Concrete pavement	3.3 Million
Glass	2.9 Million
Plastics	1.1 Million

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A smooth road means more than a comfortable ride

If cars could talk and the environment could vote, asphalt certainly would be their driving surface of choice. No roadway surface can beat the smoothness of asphalt. But a smooth road translates into much more than a comfortable ride. It also has several environmental benefits.

The smoothness of asphalt decreases the wear and tear on a vehicle. Results from an asphalt pavement test track in Nevada showed a significant reduction in engine, frame and suspension problems when pavement smoothness was improved. According to figures from The Road Information Program (TRIP) and data supplied by the U.S. Department of Transportation, driving on overly rough roads costs our nation's motorists \$23 billion a year (\$126 per year per motorist) in extra vehicle operating costs. Such

cost savings is a benefit everyone can enjoy, while fewer vehicle parts and junked cars save space in landfills.

A smooth surface protects vehicles and also promotes longer pavement life. Logically, a road with fewer bumps and joints receives less wear from the vehicles traveling on it. Some experts estimate that increasing pavement smoothness by 25 percent results in a 10-percent increase in the life of pavements. A longer road life means less construction and repair time, fewer traffic delays and considerable savings for state and local governments.

Smooth roadways have also been shown to increase fuel efficiency by nearly 5 percent in trucks, according to a pavement test track study in Nevada. Depending on the fuel efficiency of the vehicle and the current cost of gasoline, the savings could well reach hundreds of dollars each year. That saves money and

precious natural resources.

Hot mix asphalt has become the standard for smoothness in the United States. In fact, in some states (including Kentucky), asphalt is held to a higher standard than concrete when it comes to smoothness ratings. Why? Because asphalt can meet and exceed those standards when other pavement types cannot.

Of course, motorists appreciate asphalt, too. A national survey funded by the Federal Highway Administration showed that a smooth ride is the top priority for drivers.

Asphalt is a pavement that aims to please. Governments save money and time by paving with asphalt; motorists save money in vehicle repairs and fuel costs. And motorists get to drive on their environmentally friendly pavement of choice.

Pour on the water . . . porous asphalt can handle it

The first use of asphalt dates back to approximately 2500 B.C. when it was used as a water sealant between brick walls of a reservoir in what is now Pakistan. The people of that time would be amazed to see that, with new innovations, today's asphalt actually is used as a porous material, allowing water to drain through it.

In nature, rainwater sinks into the soil, slowly filters through it and eventually makes its way to streams, ponds, underground aquifers and lakes. The construction of towns, by contrast, unintentionally has sealed the surface with buildings, sidewalks and roads, which prevents the

natural flow of rainwater. Unfortunately, in this scenario, contaminants are washed from surfaces directly into waterways without undergoing the natural filtering and cleansing process.

However, with innovations in paving, asphalt provides a more porous material that allows water to drain from the top layer down through the lower layers, just as water does in nature. This process promotes cleaner water, as well as other water quality benefits, such as:

- Water conservation
- Runoff reduction
- Increased water infiltration
- Stormwater cleansing
- Protection for streams

Porous asphalt allows engineers to develop plans that are more harmonious with nature, while also providing an efficient, durable pavement.

Porous asphalt has been proven to last for decades, even in extreme climates. Plus, it is an economical choice as well, costing about the same as conventional asphalt. Other porous pavements are more expensive, costing about four times more than porous asphalt.

Asphalt continues to prove its versatility in myriad applications. So pour on the water; porous asphalt can handle it.

Shhh . . . I'm driving



Nearly every American driver has had the experience of driving on a rough roadway, with the annoying sounds that come with it. As they jostle through joints and cracks and hear a lot of noise, they often will come upon a smoothly paved asphalt road.

Until they experience the smooth ride of asphalt, drivers may not even realize how truly annoying all that noise can be.

However, the people who live near those loud highways probably do not need to be

reminded how bothersome traffic sounds can be as those noises waft into their backyards and living rooms. Noise pollution is an aggravation not only for drivers, but also for anyone in the vicinity of a roadway.

Because of its smoothness, asphalt is naturally quieter than other forms of pavement. In fact, a 1993 study by the World Road Association indicated that hot mix asphalt was at least 4 decibels quieter than concrete.

So what does this mean for the listener? A reduction of only 3 decibels is about the same as doubling the distance from the road to the listener, or cutting traffic volume in half.

Even though asphalt is known as the quiet pavement, the industry continually strives for improvements through quiet pavement technologies, such as open-graded surfaces, fine-graded surfaces, pavements coated in smoothseal, and two-layer, open-graded pavements. These quiet pavement technologies further reduce noise levels.

Noise pollution is the most pervasive form of pollution. It simply is everywhere. As America continues to go, go, go, the asphalt industry, which already creates the quietest and smoothest pavement, continues to look for more ways to decrease noise pollution in communities across the nation.

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What's in a sound?

With today's hectic lifestyles, there is so much noise. In fact, noise is the most pervasive form of environmental pollution. It simply is everywhere.

But what is too loud?

In 1924, a group of engineers at Bell Telephone Laboratories devised a system of measuring sound using decibels. They created a weighted scale for sounds a normal human can hear using the decibel notation. The faintest sound audible by humans begins at zero, with a normal conversation taking place between 50 and 60 decibels. Discomfort for most people starts in the 70- to 80-decibel range. (See chart.)

Unfortunately, normal highway traffic sounds weigh in at 75, which is uncomfortable for most people. Of course, distance makes a difference. The farther away a person is from the traffic sounds, the lower the noise level.

The Federal Highway Administration has determined that state and federal agencies must begin considering methods of reducing traffic noise levels when they reach 67 decibels.

NOISE POLLUTION

NOISES	SOUND LEVEL
Jet flying at 1,000 ft.	110 dBA
Gas lawn mower at 3 ft.	100 dBA
Garbage disposal at 3 ft.	80 dBA
Highway traffic	75 dBA
Vacuum cleaner at 10 ft.	70 dBA
Heavy traffic at 300 ft.	60 dBA
Normal conversation	50 dBA

Asphalt gets a green light from the environment *(continued)*

warm mix product, which saves fuel, decreases emissions, uses even more reclaimed asphalt, and provides ease of use to the paving crews, has many people in Kentucky excited.”

Rubblization

Rubblization is a construction technique that turns a worn-out concrete road into a base for a smooth, quiet, durable, hot mix asphalt pavement. With rubblization, old concrete is broken into small pieces and then overlaid with hot mix asphalt. Rubblizing the concrete before applying the overlay ensures that joints, cracks and other defects in the concrete will not show through the asphalt overlay.

“Rubblization saves resources,” said Wood. “Instead of carting off

the deteriorated concrete as waste, the concrete has value as part of the new road structure.”

Quiet pavement technologies

Because asphalt is known for its superior smoothness, the industry devotes considerable resources to finding new and better ways to make asphalt even smoother and quieter. These quiet pavement technologies, such as open-graded surfaces, fine-graded surfaces and stone matrix asphalt (SMA) pavements, make asphalt even smoother and quieter, thus reducing noise levels and road friction.

Perpetual pavement

The asphalt industry has introduced the concept of perpetual

pavement that further reduces traffic interruption. Perpetual pavement is constructed so that distress occurs on the top layer only. When maintenance is required, only the top layer is removed and overlaid with asphalt, which can be completed quickly and with little interruption to traffic flow. This rehabilitation is needed only once every 15 to 20 years, and the reclaimed asphalt is then recycled.

Kentuckians have become familiar with the comfort, durability and economy of asphalt; however, some may not realize that these same benefits translate into important environmental advantages, too.

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