

Environmentally Friendly— Smooth and Serene

Look at the road in the Lexus ad on your TV and what do you see? A winding black ribbon by a seaside cliff or a winding black line in a deep green forest.

You see a road that is environmentally appealing—smooth and serene. You see an asphalt road.

Highway engineers chose that kind of road over 98 percent of the time for Ohio road surfaces for a number of reasons. But the average motorist on an Ohio road probably doesn't consider any of them. He thinks about getting to where he is going. He also thinks about the road he is driving on, whether it's smooth and comfortable or bumpy and uncomfortable.

If it's smooth and comfortable, it's probably an asphalt road. Asphalt is smoother and quieter and offers a more comfortable ride than concrete. If you, the driver, aren't convinced of this, try this experiment: Get in your car and turn on your favorite sounds. Drive for a while on a concrete pavement. Listen. Keep the sounds on, then drive for a while on an asphalt pavement. Listen. On which pavement can you hear better?

More Evidence

If you don't trust your own ears, consider these studies conducted around the country on the subject.

- ▲ The Center for Transportation Research at the University of Texas concludes that roadside noise levels for concrete are higher than for five different asphalt pavement samples.
- ▲ The Arizona Transportation Research Center finds that concrete may be as much as 5.6 decibels louder than asphalt.

▲ A 1999 study by the Ohio Research Institute for Transportation and the Environment at Ohio University confirms that asphalt is noticeably quieter than concrete.

▲ The Transportation Research Board estimates that reducing sound barrier height by two feet will save taxpayers \$10 million per year. Quieter is cheaper.

Yes, asphalt is quieter than concrete. And smoother. The Ohio Department of Transportation (ODOT) has more stringent smoothness criteria for asphalt than for concrete pavements. In fact, ODOT pays a bonus to get concrete pavements to a level of smoothness that asphalt pavements routinely achieve without a bonus.

Not long ago, the state of Ohio switched the vast majority of their road surfaces to asphalt from concrete for several reasons. One of the reasons is driver comfort.

The smoothness advantage of asphalt pavements is so obvious that it can even be demonstrated by a fifth grade science fair project. Taylor Johnson, a fifth-grader at St. Agnes School in Charleston, West Virginia, wanted to know why some roads were bumpy and some were smooth. He performed his own tests for an award-winning Science Fair Project. Here is his story.

"My project was to study what products roads are made of and then determine what products make the smoothest roads. My hypothesis was that asphalt roads are smoother than concrete roads.

"To determine which product— asphalt or concrete—makes the smoothest road, I performed an experiment on six different streets. All six streets were in Charleston, West Virginia.

Three of them were concrete and three of them were asphalt. All of the tests were done on 100-foot-long samples.

"In the experiment I used a small red wagon, a cake pan, a glass bowl, a measuring cup, some water, and a note pad to keep the results. I placed the cake pan in the wagon and placed the glass bowl in the cake pan. I filled the bowl full of water and pulled the wagon exactly 100 feet. Then I measured in milliliters the amount of water that went from the bowl to the cake pan and wrote down the results.

"Then I compared the average amount of water lost on the asphalt roads with the amount lost on the concrete roads. The average water loss on the asphalt pavement was 84 ml. The average loss on the concrete pavement was 117 ml.

"Based on the amount of water loss for the samples I tested, I found asphalt roads had less water loss. I divided the average amount of water lost on concrete roads by the average amount of water lost on asphalt roads to show that asphalt roads are 39 percent smoother than concrete roads.

"My hypothesis that asphalt roads are smoother than concrete roads was correct, based on my experiment." ▲

This story is based on articles published in Flexible Pavements of Ohio's bimonthly newsletter.