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**AGENCIES REACT
TO ADA GUIDANCE**

Analysis Reveals Benefits of Road Preservation Timing

By Shawn Strange, P.E.

In 1999, the Town of Avon, Ind. found itself in a difficult position. Having only been created four years earlier in 1995, the town had incorporated several neighborhoods on the outskirts of Indianapolis with streets that had not been maintained by any entity.

The town was rapidly expanding, but had little budget to pave any of its existing roadways. Fortunately, many of the roads were not yet in bad shape, but were rapidly deteriorating. If unchecked, the town would find itself in a roadway budget shortfall in a few years.

Avon began to look at alternatives. One was a process of planning maintenance activities according to the condition of the roads. It was called Maintenance Improvement Planning, and it involved rating the roads with a method that could translate to certain maintenance activities.

PASER GOES TO WORK

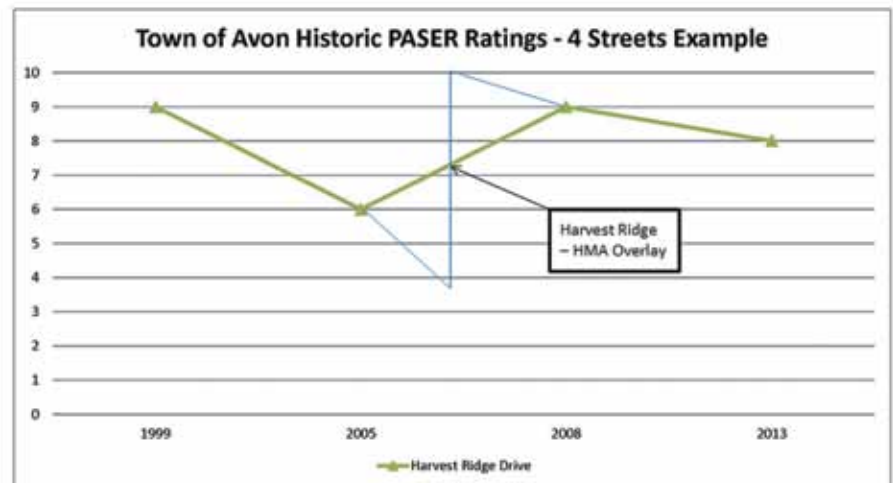
The method chosen was called PASER, an easy to use, easy to replicate, consistent pavement rating system created by the University of Wisconsin. The system did not require measuring every crack and imperfection in the roadway or using logarithmic scales and deductions to come up with a rating. It did, however, come up with a rating that could easily prioritize a network and tell users what they needed to do without bankrupting their budget and exposing employees to unneeded risks on the roadway.

After the pavement ratings were organized onto GIS maps, the data were organized into easy-to-interpret maps that indicated where problems were. The maps then were analyzed, and several maintenance activities were added with their associated costs. This information could be used to determine a yearly budget for preventive maintenance for pavement life extension. Once the town settled on a budget, the yearly maintenance activities were planned out five years in advance. Once those five years were up, the process was repeated.

In 2013, the town and its engineering consultant—which had performed this work for 14 years—began to analyze years of data to determine what benefits were being derived from the system, and determine what was working and what wasn't.

What they found exceeded their expectations. The town was using crack sealing and Reclamite rejuvenator in a simple two-part plan on roads that needed it, but had not dropped past the PASER rating of 6. Roads that had not been treated or added through incorporation had fallen in PASER rating at a fairly consistent rate. Roads that had been treated resulted in little to no loss in the PASER rating.

By field-rating all roads, the town and consultant were able to determine the correct roads to preserve at the correct time to maximize the maintenance operations effectiveness. By cataloging all ratings and maintenance activities in GIS, they were then able to track the progress. The results became apparent when they were able to compare roads that had gone through the program with



With no preservation treatment, Avon's Harvest Ridge Drive decayed from a 9 to a 6 from 1999 to 2005; it only got better when a mill-and-overlay was performed on the pavement in 2006, but immediately started to drop again and ended at an 8 in 2013

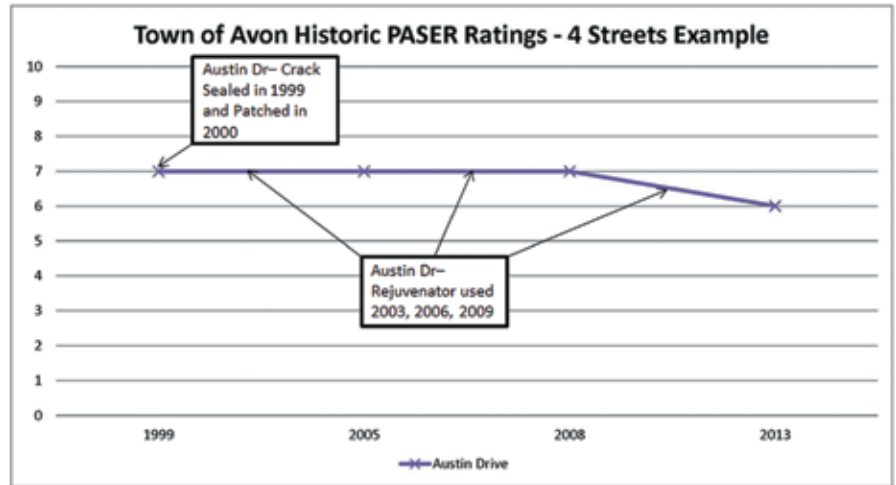
IMAGE CREDIT: FIRST GROUP ENGINEERING

ones that had not or even with roads that had only sporadically been treated.

As seen above, Harvest Ridge Drive decayed from a 9 to a 6 from 1999 to 2005. It only got better when an expensive mill-and-overlay was performed on the pavement in 2006, but it immediately started to drop again and ended at an 8 in 2013. Austin Drive was patched and crack sealed in 1999 and was given a PASER rating of 7. It was repeatedly treated with Reclamite every three to four years and never overlaid. The result: It didn't degrade one PASER rating point from 1999 to 2008, and only degraded one point from 2008 to 2013.

Other roads that had been treated once or twice showed that the effectiveness of the treatments lasted on average about five years and would then start to wear off. The PASER rating would stop degrading after the treatment, but would start degrading after about five years.

Most of the roads in Avon's roadway network initially were not



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treated regularly as the town was experimenting; therefore, many scenarios were evaluated. What Avon found was that, even with sporadic treatments every seven to eight years, it was able to gain 10 years of pavement life over the 13-year test period.

TREATMENTS PUT OFF EXPENSIVE WORK

These inexpensive treatments were putting off very expensive mill-and-overlay operations, as well as minimizing potholes. When these treatments were averaged out, the resulting graph for partial

Components of Asphalt.



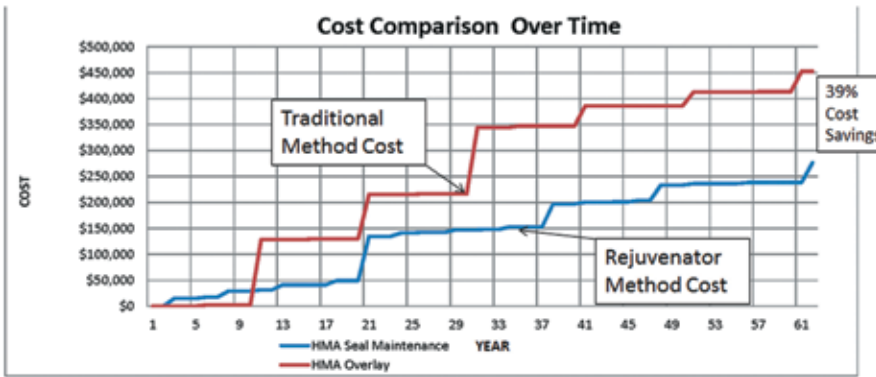


IMAGE CREDIT: FIRST GROUP ENGINEERING

When treatments were averaged out, the resulting graph for partial treatment showed doubling the life of the pavement and savings in excess of 39 percent when compared to conventional roadway mill and resurfacing

treatment showed doubling the life of the pavement and savings in excess of 39 percent when compared to conventional roadway mill-and-overlay. Now the Town of Avon is looking into how much it can save when committing to full treatments of the roadways in its network.

The town even did partial treatments of the same road by treating only one lane out of the

two and comparing them two years later. It found that when used on new roadways, Reclamite treatments actually stopped transverse cracking at the centerline, and it greatly reduced water infiltration to the lower levels of pavement and subgrade.

It found that these treatments greatly reduced oxidation, and thus reduced the likelihood of getting the first stages of pavement

aging, raveling and transverse cracking. Transverse cracking, when unchecked, eventually leads to alligator cracking and bottom-up potholes. Raveling leads to slick pavement, drainage issues, alligator cracking and top-down potholes. Raveling on some untreated roads was so bad that it appeared the surface course melted away, leaving gutters and inlets unable to drain the roadway.

By tracking and proving that preventive maintenance activities work, Avon became a leader in pavement preservation in the state of Indiana. Avon continues to prove that with the right treatments to the right roads at the right time, a road agency can do more with less.

Strange is a professional engineer and project manager at First Group Engineering, Inc., Indianapolis; he oversaw the Town of Avon's pavement management plan from 2008 to 2013 and compiled the data shown in these exhibits.

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