CPR: REBUILT TO LAST

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Pavement Management Systems (PMS) improve pavement conditions and reduce costs in Kentucky

>>> CONCRETE PAVEMENT PRESERVATION & DIAMOND GRINDING

THE STATE OF KENTUCKY demonstrated five years of improved IRI through diamond grinding and saved over $1 billion using pavement management systems (PMS). PMS assisted the Kentucky Transportation Cabinet in generating data that can be used to trigger concrete pavement preservation (CPP) — and CPP has repeatedly proven successful in staving off the need for extensive and untimely pavement reconstruction.

CPP Improves Road Conditions in Kentucky

While CPP techniques include slab stabilization, full depth repair, partial depth repair, dowel bar retrofit, cross-stitching longitudinal cracks/joints, diamond grinding, and joint and crack resealing, the most common CPP technique used in Kentucky is diamond grinding. The state has been utilizing diamond grinding since the mid-1990s, but at that time they were just exploring options, not performing extensive grinding.

That changed in 2007, when the state increased its pavement preservation activities in an effort to improve the roadway system. Between 2007 and 2012, 536 interstate lane miles were diamond ground statewide, primarily in the Louisville area. During this period, IRI measurements for Kentucky's interstate concrete pavements improved from an average of 112.1 in/mile to an average of 74.5 in/mile – the longest sustained improvement in the state's IRI and their lowest recorded average IRI ever. The improvement was attributed to the 536 miles of diamond grinding that had taken place. The combined cost of the diamond grinding projects (including traffic control, patching, joint resealing, etc.) was $101 million, or $188,000 per lane mile. Reconstruction costs would have been an estimated $1.5-$2.5 million per lane mile, so CPP saved the state over $1 billion. The expected pavement life extension for ground pavement is 10 to 15 years. The average cost of diamond grinding during this five year period was $2.75 per square yard.

Prioritizing Projects using PMS

Of Kentucky's approximately 62,000 lane miles of roadway, about 1800 are concrete; 820 of their 3800 interstate lane miles are concrete. Therefore, finding an effective way to prolong concrete pavement life while improving performance is vital. The past year has seen an increasing range of CPP techniques being used in the state. When assessing its road network for needed repairs, the main indicator that Kentucky uses is pavement smoothness. Inertial profilometers are used to annually measure roughness on the interstate system and International Roughness Index (IRI) values greater than 130 in/mile will generally trigger CPP. CPP is used in situations where there is moderate to low cracking and faulting, and its use is dependent upon other contingencies, such as whether or not the road is expected to require major work such as widening within the upcoming 5-10 years.

Kentucky, having successfully balanced lessons learned from other states with the independent development of CPP solutions that fit its individual requirements, is clearly well on its way to realizing the benefits and savings resulting from the use of an effective pavement management system.

"We are getting this at the top of the curve," said Jon Wilcoxson, director, Division of Maintenance, Kentucky Transportation Cabinet, "and delivering a much improved product for the driving public."