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concrete pavement preservation (CPP): built to last

Oklahoma Turnpike CPP: A Smooth, Safe, Affordable Option

CPP vs. Reconstruction: 7 Times the Length of Roadway Repaired for Every Dollar Spent

IN ADDITION TO ITS INTERSTATE HIGHWAYS, OKLAHOMA HAS A NETWORK OF TURNPIKES that are maintained by the Oklahoma Turnpike Authority (OTA). Although the state's first two turnpikes were constructed using asphalt, the OTA switched to concrete in 1964, opening a total of four four-lane divided highways constructed of plain jointed concrete pavement (PJCP) between 1965 and 1975.

Over the years, the concrete highways needed only isolated panel replacement where subgrade failures had occurred, along with some short reconstruction projects, according to Joe Echelle, Assistant Executive Director, OTA. By comparison, more than 130 repair projects were conducted on each of the two asphalt roadways during the same time frame.

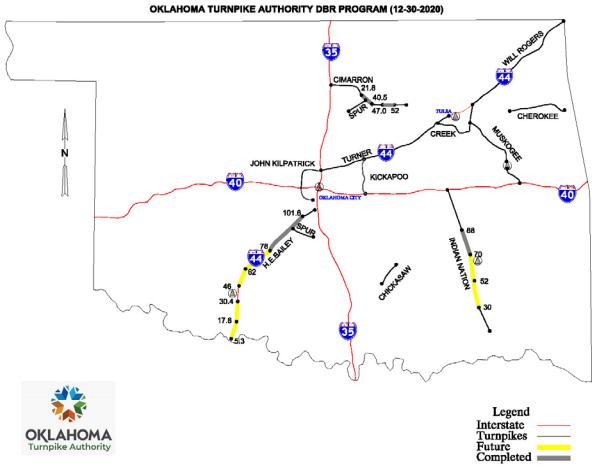
In 2020, Oklahoma's concrete pavements were due to begin a maintenance cycle, and by the end of that year, concrete pavement preservation (CPP) consisting of selected panel replacements, dowel bar retrofit (DBR) and diamond grinding had been completed on portions of the Cimarron, Bailey and Indian Nation Turnpikes. The Cimarron Turnpike had several severely cracked panels, and where cracks occupied the middle portion of the panel, the OTA performed cross-stitching. Where there were larger cracks or faulting, the OTA chose panel replacement. The cost for Cimarron Turnpike CPP was $14 million, which included 19 miles of selected panel replacements, patching, dowel bar retrofit (DBR) and diamond grinding of an area covering approximately 500,000 square yards.

Like the Cimarron Turnpike, the Bailey Turnpike required panel replacements on selected cracked panels, DBR and 500,000 square yards of diamond grinding. Cost for Baily Turnpike CPP was $13.7 million for an 18-mile repair area. The Indian Nation Turnpike, which was one of the roughest pavements at the outset of the project, received similar repairs. Cost for panel replacement, DBR and diamond grinding of 500,000 square yards was $12 million for an 18-mile repair area.

» CPP TAKES A FRACTION OF THE TIME AT A FRACTION OF THE COST

The OTA estimates the cost of pavement reconstruction to be approximately $4 million per mile of four-lane highway. CPP, however, costs less than $600,000 per mile (based on Oklahoma's 2020 contract prices)—**that's 15 percent of the cost of reconstruction.** Furthermore, reconstruction projects in Oklahoma can stretch over several years because of winter weather interruptions, whereas CPP projects can take place in a single season.

"Full reconstruction would take us 20-to-30 years—and our roads are already rough. We want to get the necessary work done in four-to-five years," said Echelle.



With 163 total centerline miles to repair between 2020 and 2025, including the work already done on the Cimarron, Bailey and Indian Nation turnpikes in 2020, the OTA estimates a total cost of only $95 million to perform CPP. It would take a projected $634 million to perform reconstruction. (Echelle notes that in Oklahoma, where local DBR and diamond grinding crews are not available and out-of-state contractors must be brought in, the state maximizes its budget by grouping projects together to get the most value.)

» APPROVAL FROM THE DRIVING PUBLIC

In addition to the cost savings, Oklahoma's restored, diamond-ground surfaces received positive reviews from the driving public.

"Anyone who works highway construction knows that for every 'attaboy' you get, there are many more complaints. But for the first time in my career, we've had quite a few people reaching out via social media, and through other channels, thanking us for how much smoother the pavement has been on our turnpikes. The compliments started coming in as soon as we completed the diamond grinding," said Echelle.

CPP performed in Oklahoma is expected to extend the life of the turnpikes at least 15 to 20 more years, with minimal maintenance.

"To be able to get a 50-to-60-year service life out of concrete pavement is a major advantage," said Echelle.