

Crack Sealant Enables Tempe to Maximize the Quality, Lifespan and Budget of Its 1,241-Lane-Mile Road Network

A stitch in time saves nine. That 17th-century proverb sums up the City of Tempe, Arizona’s strategy for keeping its streets in the best possible shape without running into a budgetary dead end.

“My biggest thing is pavement preservation—keeping the new streets good—because once they go bad, it’s very difficult to bring them back to the level that they need to be within budget,” says Ed Bond, the senior civil engineer who supervises the city’s pavement management.

In fact, the city estimates that preservation is so much cheaper than major rehabilitation or replacement that it can maintain four to 10 times more streets than if fixing bad roads was the higher priority.

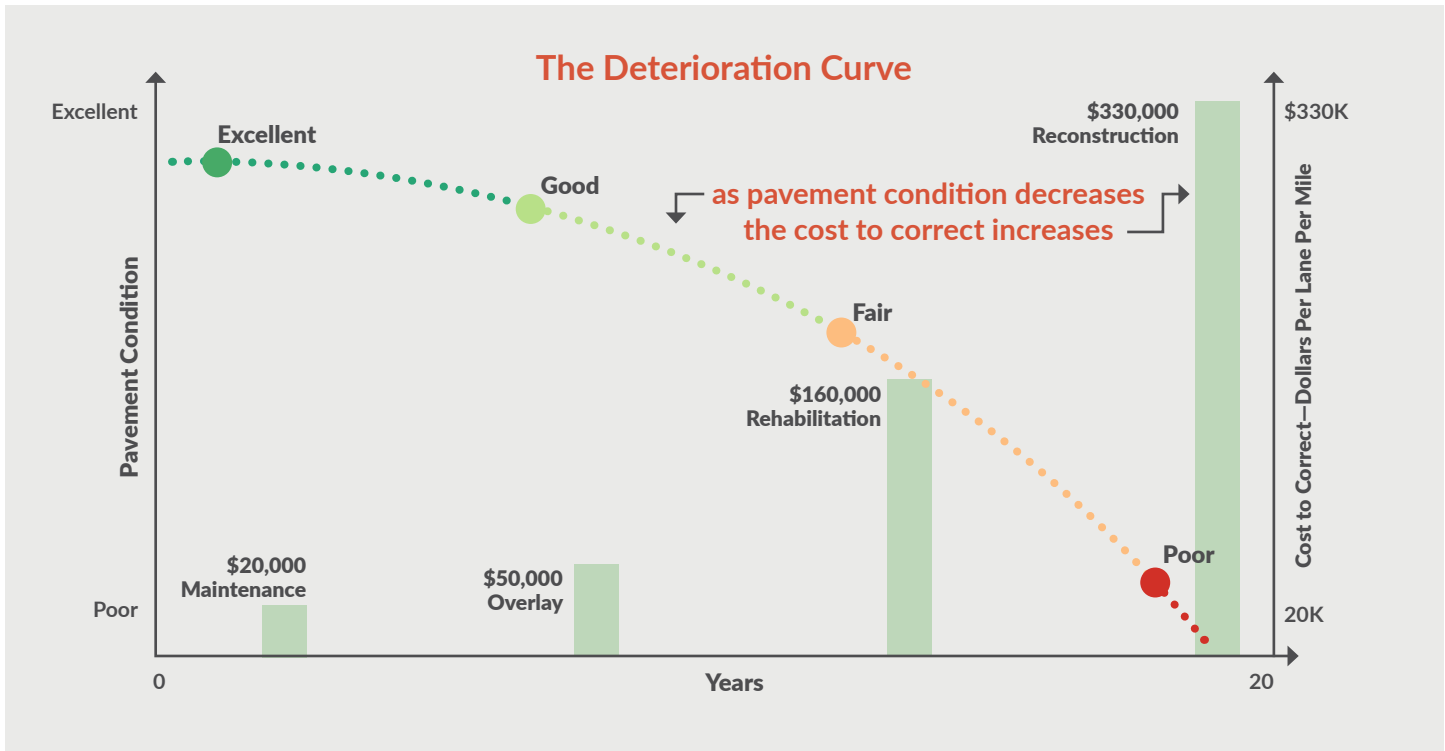
Each street—most of which are asphalt—is assessed every three years using a specialized vehicle equipped with imaging technology and sensors that look for problems such as cracks and potholes. That information is used to assign **a pavement quality index (PQI) score for each street** in the city’s 1,241-lane-mile network, which equates to 532 centerline miles. Those scores are fed into **Stantec’s RoadMatrix software** to create deterioration curves for each segment, enabling Bond’s team to identify the ones that are good candidates for pavement preservation.



Without proper sealing, cracks turn into potholes.

FINDING THE RIGHT CRACK SEALER

Crack sealing is a key part of Tempe’s preservation program. The city’s go-to sealers are Crafcó’s Polyflex hot-applied products designed for asphalt or Portland cement concrete pavements. Crafcó Polyflex comes in several types designed for different climates. They are designed to resist cracking in the winter temperatures and bleeding or tracking in the hot summer months. The exceptional performance of this sealant comes from the unique properties achieved with the combination of recycled rubber, polymer, elasticizers, viscosity modifiers and select asphalts.



As pavement condition decreases the cost to correct increases.

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“The Polyflex Type 3 is used on local/collectors, and Type 4 is used on arterials,” Bond says. “Type 4 can withstand higher temperatures and correlates with the higher temperatures experienced on our busier arterial roadway system.”

Both types are based on asphalt rather than reclaimed rubber, so they’re much more resistant to flow and pick-

up in very hot climates—a major plus in Tempe, where the average temperature is above 100 all summer. They also resist cracking in the winter temperatures, which can dip to freezing in Tempe.

“The challenge we tend to run into is our binder gets too soft in the summer,” Bond says. “That gives us problems at the intersections with the stop-and-go movements and the turning movements. One of our biggest things that we battle is rutting at the intersections, as well as just the dryness of the area. It doesn’t rain very much, so our pavements tend to become very brittle very quickly.

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Bond’s team particularly likes the way Polyflex performs, especially after the first year.

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“Crafco is required to give us at least a one-year warranty for the full product,” Bond says. “After that, it’s on us to watch it. We’ve seen good performance even after the one-year initial application.”

PREVENTION ENABLES ACCELERATION

Tempe’s success with crack sealing has helped Tempe’s transportation department get the funding it needs to maximize preventative maintenance.

“We have the history of what’s been done; we’re able to use the software to predict where we’re going,” Bond says. “Then we can go to our budget office to say, ‘Based off of the allocations that we’ve been receiving, this is where we’re going and this is what we would like to do going forward.’ It helps tremendously.”

Crack sealing also helps the city meet the goals of its Tempe Accelerates program, whose initiatives include creating a safe and secure community, improving quality of life, achieving sustainable development and more. For example, the Refresh Tempe initiative focuses on quality of life goals such as rehabilitating and maintaining roads.

“Tempe’s pavement quality is a Council priority that has been identified for acceleration, allowing the city to reach its goal of a PQI of 70 by 2028, due to increased budgetary funding,” the city said in a September 2022 press release describing the 20 projects scheduled for fiscal 2023.

The city traditionally plans road improvement projects over a five-year period, but Tempe Accelerates adds flexibility.

“In the past, we would just get a standard amount of money on a yearly basis, and there wasn’t really much room for changing that because it was always a five-year plan,” Bond says. “But Tempe Accelerates gave us the ability to ask for increases over and above what the standard budget amount was.

“It has worked out great. Besides the one year we went through COVID reductions, we’ve pretty much almost doubled our pavement budget amount on the yearly basis.”

All of these benefits highlight the importance of having not only a diligent crack-sealing program, but also one that uses a high-quality, high-performance sealant. For Tempe, Crafco PolyFlex sealant has proven to be the ideal choice for ensuring that the city’s drivers can look forward to smooth roads.