ROAD SCIENCE EXTENDS LIFE OF SEVERELY CRACKED CONCRETE-PAVED KANSAS HIGHWAY BY MORE THAN A DECADE

CASE STUDY

THE CHALLENGE

The Kansas Department of Transportation (KDOT) was faced with the challenge of fixing the failing concrete-paved US-50 highway in Harvey County, which was displaying multiple critical distresses including poor structure and significant cracking. US-50 is a heavily travelled trucking route with Annual Average Daily Traffic (AADT) of 1,780 trucks and 6,280 vehicles total.

Despite having already completed several concrete patching and underseal projects, none of those measures had been successful in slowing the deterioration of the pavement. To improve motorist satisfaction and ride quality, KDOT wanted a cost-effective solution that would provide additional structure to the pavement and reduce cracking at the surface.

THE SOLUTION

Road Science met with engineers from KDOT and proposed applying the Strata® crack relief interlayer system over the concrete pavement with an asphalt overlay, to help provide additional structure to the pavement while reducing the occurrence of reflective cracking at the surface.

Strata is a specialized high-polymer, fine and densely-graded hot mix asphalt (HMA) applied through conventional paving equipment, followed by a conventional HMA overlay. The Strata interlayer significantly delays reflective cracking in composite pavements keeping the overlay smooth and the traveling public happy. Strata also protects the pavement by preventing water from entering the concrete pavement below, protecting it from further deterioration and preserving the structural integrity of the pavement.

The Strata system and overlay were constructed in 2005 by Ritchie Paving from Wichita, Kansas. The one inch thick Strata crack relief layer was placed over the mainline including covering up the longitudinal joint adjacent to the shoulder. The entire highway was then covered with 3 inches of Superpave mix. Road Science plant and field support personnel were on-hand to ensure the project proceeded smoothly. With Road Science’s Strata system, US-50 in Harvey County Kansas continues to exceed KDOT performance expectations, even to present day.
THE FEEDBACK

“In general this area was horrendous and I just knew any overlay system would be severely cracked and fail in 3-4 years! . . . Well, as we know now, I was wrong (imagine that!) and the overlay system has performed wonderfully at both test sites as well as for the entire project. This overlay project was in 2005 and . . . the surface is still in good shape.”
Cliff Hobson, KDOT Research Engineer

THE ROAD SCIENCE ADVANTAGE

ArrMaz’s Road Science division is a leader in the development of asphalt additives, emulsifiers, and paving and recycling system technologies for the asphalt industry worldwide. Our offerings span the entire customer value chain from producing key chemical components for asphalt refineries, terminals, emulsion plants and hot mix asphalt (HMA) plants, to providing laboratory and field engineering support of pavement applications. Road Science delivers responsive, comprehensive and dependable customer support focused on helping our customers succeed. Through our experienced staff of professionals and world-class, American Association of State Highway and Transportation Officials (AASHTO) resource accredited laboratory, we work alongside our customers to:

- Improve product quality and consistency
- Improve product performance
- Bring new products to market
- Solve product problems
- Increase profitability
- Increase operational efficiency

Contact Road Science today and learn how we can help you make the grade.
Call +1-918-960-3800, email customerservice@roadscience.net or visit our website at roadsence.net for further information.

THE RESULTS

Despite sceptics who thought the overlay would not last much longer than a year or so, more than a decade later, US-50 in Harvey County, Kansas remains in good shape, continuing to support the heavy truck traffic associated with it. The implementation of Road Science’s Strata crack relief interlayer system on US-50 delivered the following key benefits:

- Significantly improved pavement smoothness and ride quality
- Delayed overlay cracking for more than a decade with minimal maintenance actions
- Reduced international roughness index (IRI) from 180 to less than 60 for a period exceeding 10 years
- Extended overlay life by more than 100% compared to conventional Kansas overlays
- Significant cost savings of close to $400,000 so far versus conventional overlay which continues to provide value to Kansas taxpayers while allowing KDOT to stretch paving funds to support other infrastructure needs.

BEFORE (2005)  AFTER (2017)  INTERNATIONAL ROUGHNESS INDEX

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<th>Year</th>
<th>International Roughness Index (inches per mile)</th>
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International Roughness Index (inches per mile)

BEFORE (2005) AFTER (2017) INTERNATIONAL ROUGHNESS INDEX

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