

Joint Deterioration Synthesis

PROBLEM

Concrete pavements are built with joints to accommodate for shrinkage and to induce cracking in control locations. Proper joint type selection and application are key for adequate concrete pavement performance. Nevertheless, various challenges have been identified, including joint sealant loss, loss of subgrade support, joint faulting, poor load transfer efficiency, and appalling. These issues not only affect the joints but the entire pavement system as well.

Early joint deterioration is usually considered a cold-weather issue. Overall, Louisiana is considered to have a subtropical climate; however, early joint deterioration has been observed in some local pavements. On the other hand, long-term joint deterioration is a common issue and related to various mechanical factors, including lack of proper base support, low dowel/concrete interaction, and poor concrete properties. As such, there is a need to investigate this matter throughout the state.

Another problem that has been noticed is the exposure of the joint reinforcement or dowel bar to the environment prior to placement. This issue makes the bars susceptible to weather-related issues such as corrosion, leading to integrity loss. This study aims to collect information about this issue to propose ways to prevent joint deterioration due to improper storage practices.

In general, this investigation will focus on exploring and compiling different state practices to prevent further deterioration. Further, the current extent of joint deterioration of concrete pavements in Louisiana will be assessed through survey analysis.



Figure 1. Examples of joint deterioration

Start Date

July 1, 2025

Duration

12 months

Funding

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OBJECTIVE

The objectives of this study are to:

- Compile a literature review that includes the mechanisms of joint deterioration, joint types, and their respective applications, as well as different state practices used to avoid this issue.
- Conduct surveys on the joints of recent projects and older projects throughout the state of Louisiana.
- Analyze the results of the surveys and indicate the overall state of joints in Louisiana.

METHODOLOGY

The methodology will be structured around five key tasks, including:

- **Task 1, Literature Review.** Assess the current practices regarding the prevention of joint deterioration, joint types, and their respective application. The effect and application of the joint sealant will also be analyzed.
- **Task 2, District Surveys.** Districts across Louisiana will be contacted, and a survey will be sent to them. The survey has several points for consideration, including: age, joint spacing, pavement thickness, distress type, joint type, road type, traffic, presence of joint sealant, availability of proper drainage, and amount of faulting, if existing.
- **Task 3, Survey Results Analysis.** This analysis will indicate the condition of the joints for the respective concrete pavements in Louisiana.
- **Task 4, Recommendations Proposal.** Recommendations will be based on the gathered information and results of the survey analysis.
- **Task 5, Final Report and Technical Summary.**

IMPLEMENTATION POTENTIAL

This research will help DOTD determine the extent of joint deterioration in Louisiana and adopt related measures to prevent further/new joint deterioration.