



## 0-6748: Best Practice for Flexible Pavement Structure Widening Projects

### Background

The Texas Department of Transportation (TxDOT) has experienced problems with construction quality and performance on narrow widening projects (e.g., adding a 2- to 5-ft shoulder). Texas has approximately 40,000 lane-miles of FM roads with 9- to 10-ft-wide lanes. In addition, approximately 20 percent, 26 percent, and 36 percent of roadways with 9-ft, 10-ft, and 11-ft lanes, respectively, have either no shoulder or a 1-ft shoulder. These roads are potential candidates for lane or shoulder widening to improve safety performance and increase capacity. However, due to constraints regarding construction equipment limitations, material selection options and compatibility, construction methods, and other issues, problems with narrow widening projects can arise. These challenges include inadequate compaction at the base layer joint interface, drainage within the pavement and at the pavement surface, either high or depressed surface layer construction joints, and potential safety concerns.

To effectively overcome these challenges, TxDOT has initiated this project to prepare a compendium of best practices and lessons learned regarding narrow widening projects. The primary goal of this project is to identify best practices for improving pavement performance on projects involving widening of narrow pavement structures.

### What the Researchers Did

The project team conducted a thorough literature review; more than 20 interviews with TxDOT personnel, contractors, and equipment and material suppliers; more than 10 narrow pavement widening project site visits; and two webinars with TxDOT and Construction Division personnel familiar with narrow widening projects. Through these efforts, the team identified key design, construction, and materials problem areas, as well as lessons learned and best practices based on project documentation from TxDOT, other departments of transportation, and international agencies.

The research team summarized this information into categories to guide evaluation of narrow widening past project performance and to identify methods to improve design, construction, and future performance. These categories included the following:

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1. Reasons/goals for the narrow widening project:
  - a. Safety.
  - b. Increasing lane width.
  - c. Mitigating pavement distresses
  - d. Other reasons identified by the district.
2. Narrow widening project performance related to constrained right of way.
3. Project priority with regard to the following entities:
  - a. General public.
  - b. County judge(s).
  - c. Local government officials (e.g., city/county engineers).
  - d. Metropolitan planning organizations.
  - e. The legislature.
  - f. Other organizations.
4. Performance problems:
  - a. Cracking.
  - b. Rutting.
  - c. Others.
5. Construction problems.
6. Equipment used by construction companies or district maintenance.

## What They Found

Based on these categories, the information obtained during the study was used to develop a Narrow Pavement Widening Decision Support Tool (DST) and Master Document. The DST guides evaluation of a new project based on the above categories and produces a *Narrow Widening Project Report*, based on the Master Document, that incorporates information and data compiled by the project designer based the on DST's step-wise evaluation process.

## What This Means

Using the DST, narrow pavement widening project designers have a tool that provides a report documenting the purpose of their specific project as well as past problems with design, construction, and short- or long-term performance. In addition, the report contains best practices, lessons learned, and other insights for the specific topics selected by the designer and excerpted from the Master Document. In this way, each project report is tailored specifically for the district and district experience with narrow widening projects. In addition, maintenance offices that perform narrow widening projects, typically without prepared plan sets, can now document the information and decision processes used during narrow widening project planning.

### For More Information

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