

# The Rideability of a Deflected Bridge Approach Slab

*Start Date:* 6/1/2003  
*Duration:* 24 months  
*Completion:* 5/31/2005  
*Funding:* SP&R

*Principal Investigator:*  
Mark Martinez, E.I.  
*Pavement Research Intern*  
LTRC

*Co-Principal Investigator:*  
Zhongjie Zhang, Ph.D., P.E.  
*Senior Geotechnical*  
*Research Engineer*  
LTRC

## LTRC Contacts

*Administrative:*  
Harold "Skip" Paul, P.E.  
*Assoc. Director, Research*  
(225) 767-9102

*Technical:*  
Masood Rasoulia, P.E.  
*Senior Pavement*  
*Research Engineer*  
(225) 767-9112

## Problem

The Louisiana Quality Initiative (LQI) titled "Preservation of Bridge Approach Rideability" will explore potential methods for solving bridge approach settlement problems. Field observation indicates that "bumps" at bridge ends result from detrimental pavement deflections that worsen over time as slabs shift and settle.

An index that can be used to rate the bridge approach "bumps" must be developed. Correlation between approach slab deflection and rideability is necessary. Once a correlation is developed, it can be used to establish a criterion for controlling approach slab deflection.



Corrective overlay on deflected approach slab



LTRC



Louisiana Transportation  
Research Center

Sponsored jointly by the  
Louisiana Department of  
Transportation and  
Development  
and Louisiana State University

4101 Gourrier Avenue  
Baton Rouge, LA 70808-4443

## Objective

The primary objective of this research is to develop simple, systematic, and repeatable methods for evaluating bridge approaches in terms of rideability. Since much work has already been performed in the area of pavement roughness evaluation using high-speed profiler technologies, the desired bridge approach evaluation program will use the International Roughness Index (IRI) criterion as its model.

## Description

The IRI is a well-established criterion that has been used to index ride quality on roadways for a number of years. The IRI criterion has not typically been used for evaluating the ride quality of bridges and their approaches due to the unique geometries associated with bridges. However, if these conditions are taken into account, the IRI philosophy may prove to be applicable.

The main difficulties associated with using the IRI on bridge approaches relate to the shifts in driver psychology as bridge approach geometries are encountered. Bridge approaches tend to exhibit higher IRI values than the roadways that lead to and from them. A driver will make allowances for the geometry while the IRI criterion will not.

If the differences in IRI values on a perfectly smooth road and a perfectly smooth bridge

approach are negligible at posted speed limits, then the IRI criterion can be directly applied to bridge approaches with only minor interpretational adjustments. If the aforementioned differences are significant, the model supporting the IRI criterion will require modification.

## Implementation Potential

Results of this work may provide a simple and repeatable means of rating bridge approaches. With these ratings, pavement managers can better monitor and oversee Louisiana's extensive bridge approach inventory.