

**Final Report RDT 97-4**

## **Longitudinal Restraint Response of Existing Bridge Bearings**

### **Description:**

A six month study was conducted for the Missouri Department of Transportation (MoDOT) by the Department of Civil Engineering at the University of Missouri-Columbia to test steel pin bridge roller bearings for longitudinal restraint behavior. The purpose of the tests was to examine the energy dissipation capabilities and the load-deformation characteristics of roller bearings to determine if existing bearings may be utilized in seismic retrofitting of earthquake susceptible bridges.

### **Procedure:**

Sixteen bridge bearings were tested to determine their response to vertical and simulated longitudinal loads. Four bearings were tested to determine the ultimate load-deformation characteristics. The ultimate bearing tests showed that all four bearings were able to move over five inches longitudinally prior to zero load instability.

### **Advantage:**

Existing bearings can be used in seismic retrofitting, which will be more cost effective than total replacement.

### **Results:**

Manufacturers and designers are currently conducting further investigations to verify the study results. It is anticipated that future designs will incorporate existing bearings in seismic retrofitting of bridge structures.

### **Contact:**

Michael Barker, P.E.  
Associate Professor of Civil Engineering  
University of Missouri-Columbia Civil Engineering Department  
E2509 Engr. Bldg. East  
Columbia, MO 65211, or

Keith McGowan  
Missouri Department of Transportation  
1611 Missouri Blvd., P.O. Box 270  
Jefferson City, MO 65102  
(573) 751-4641

### **Research Development and Technology Division**

Missouri  
Department  
of Transportation

1617 Missouri Blvd.  
P.O. Box 270  
Jefferson City,  
Missouri 65101