

This topic is “practice ready.” Yes No

Upgrading Bridge Rails on Low-Volume Roads in Iowa

Zachary Hans¹, Basak Aldemir Bektas², Nicole Fox³ and Emmanuel Nketah⁴

Abstract

Building on previous research, the goal of this project was to identify significant influencing factors for the Iowa Department of Transportation (DOT) to consider in future updates of its Instructional Memorandum (I.M.) 3.213, which provides guidelines for determining the need for traffic barriers (guardrail and bridge rail) at secondary roadway bridges. A literature review of policies and guidelines in other states and, specifically, of studies related to traffic barrier safety countermeasures at bridges were conducted. In addition, a safety impact study was conducted to evaluate possible non-driver-related behavior characteristics of crashes on secondary road structures in Iowa using road data, structure data, and crash data from 2004 to 2013. Statistical models were used to determine significant factors in regard to crash volume and crash severity. The study found that crashes are somewhat more frequent on/at bridges possessing certain characteristics—high traffic volumes, long bridge lengths, bridge width narrower than its approach or narrower than 20 ft., and bridges older than 25 years.

No specific roadway or bridge characteristic was found to contribute to more serious crashes. The study also confirmed previous research findings that crashes with bridges on secondary roads are rare, low-severity events.

Although the findings of the study support the need for appropriate use of bridge rails, it concludes that prescriptive guidelines for bridge rail use on secondary roads may not be necessary, given the limited crash expectancy and lack of differences in crash expectancy among the various combinations of explanatory characteristics. The Iowa DOT Office of Local Systems has utilized findings of this research to develop a new policy regarding low-volume road bridge rails.

Keywords: bridge barrier rails— bridge guardrails— low-volume roads— secondary road bridges — safety countermeasures

¹ Zachary Hans Research Engineer; InTrans; 2711 South Loop Drive, Suite 4700, Ames, IA 50010-8664; phone (515) 294-2329; fax (515) 294-0467; email: zhans@iastate.edu

² Basak Aldemir Bektas Research Scientist; InTrans; 2711 South Loop Drive, Suite 4700, Ames, IA 50010-8664; phone (515) 294-4033; fax (515) 294-0467; email: basak@iastate.edu

³ Nicole Fox Deputy Director Office of Local Systems, Iowa Department of Transportation; 800 Lincoln Way, Ames, IA 50010; phone 515-239-1506 email: nicole.fox@iowadot.us

⁴ Emmanuel Nketah Transportation Studies Specialist; CBB; 12400 Olive Boulevard, Suite 430, St. Louis, MO 63141; phone 314-878-6644, Ext. 13; email: enketah@cbbtraffic.com