

**AN ABSTRACT OF A THESIS**  
**COMPARISON OF THE LRFR HL-93 TRUCK MODEL TO LRFR STATE**  
**SPECIFIC AND AASHTO LEGAL LOAD MODELS**  
**AND TO THE LFR HS20 TRUCK MODEL.**

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Bridge load rating involves performing a series of calculations synonymous with bridge design calculations in order to determine if a bridge is safe for public traffic loads. Load and Resistance Factor Rating (LRFR) is a bridge load rating procedure that follows the same philosophy and methods as AASHTO Load and Resistance Factor Design (LRFD). The AASHTO LRFR and LRFD bridge codes introduce to the United States an innovative approach, which will provide a uniform level of safety to all bridges.

This project examines trends between LRFR ratings of the LRFR HL-93 design truck, AASHTO legal loads and state legal loads in order to determine whether the established LRFR tiered approach is applicable. In addition, this project examines trends between LRFR ratings of the LRFR HL-93 design truck and Load Factor Rating (LFR) ratings of the LFR HS20 design truck.

The plans of sixteen current in-service Tennessee bridges were obtained and modeled in the Virtis/Opis load rating and design software. Several state legal loads were obtained and eight were selected for use in this project. The AASHTO legal load trucks and the selected state legal load trucks were modeled in the Virtis/Opis load rating and design software. For all the sixteen bridges modeled, load rating analyses of the thirteen project trucks were completed with the aid of the Virtis/Opis software.

In comparing the HL-93 ratings to the AASHTO legal load ratings, it was found that the LRFR tiered approach was valid and that the HL-93 truck does indeed provide a uniform level of safety for all bridge lengths. In comparing the HL-93 ratings to state specific ratings, it was found that the ratings of heavier trucks with closer axle spacing were less likely to be governed by the HL-93 truck ratings; especially for bridges with high ADT's and short span lengths. In comparing HL-93 ratings to HS20 ratings, it was found that the HS20 truck governed in some cases while the HL-93 truck governed for other cases.

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