

Appalachian Transportation Institute (ATI) Research Project Description

Project Number: ATI TRP 99-25

Project Title: Bolt Installations at Railroad Crossings

Primary Investigator Contact Information:

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Project Objective: This project will identify, develop and test procedures for reducing maintenance cost and reducing safety risks at railroad crossings as a function of the bolt and nut connections currently employed.

Abstract: Torque bleeding, the unwanted loosening of the nut from a bolt connected assembly, is a common occurrence throughout industry. The phenomenon occurs for various reasons, but it mainly results from improper torque requirements upon fastening due, in part, to the improper characterization of static and dynamic loadings in which the connected assembly is subjected. This project will review the torque bleeding problem for railway crossings and perform several field tests designed to improve the performance of the bolts in railway crossings.

Task Descriptions:

1. A review of the state-of-art bolting technology will be performed. The search will also focus on the experimental techniques and experimental process that may need to be designed to fully ascertain the extent of the problem and the solution.

2. A review of the current bolt materials, installation and maintenance procedures will be assessed in addition to a more detailed problem definition related to site specific issues.

3. Computer simulations will be designed to simulate the conditions in question and to ascertain the effect of the different alternative solutions.

4. Field trials and or laboratory experiment of various scenarios will be suggested to ascertain the effects of the various alternative solutions.

Milestones, Dates, Schedule: Start Date: 01/01/01 End Date: 08/31/01

Budget: \$35,230.00

Student Involvement: The project will provide employment support for at least 1 undergraduate and 1 graduate student. The student workers will support the Principal Investigator as project assistants. This project is anticipated to lead to at least one undergraduate student thesis directly.

Relationship to Other Research Projects: This project is related to ATI project 99-04.

Technology Transfer Activities: Final reports will be available on the ATI website. All, ATI Principal Investigators will present findings through the ATI Transportation Seminar Series to invited guests from WVDOT, USDOT, other ATI Principal Investigators, students and other invited guests. Other opportunities to present the project results will be explored including conferences and peer reviewed journals, etc.

Potential Benefits of this Project: Improved Safety at locations at rail/rail crossing and reduced operation costs for rail transportation.

TRB Keywords: Railroad safety, Railroad Engineering, Bolt Torque