



## Building US Railroad Bridges within hours a.k.a. 'Railroad Bridge Change-outs'

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### Summary

This paper describes the replacement and upgrading of railroad bridges in the US, through specific "change-outs" case examples, identifying the different factors which make them the keystone of railroad bridge maintenance, repair and replacement nowadays. It also covers advancements in the railroad industry related to railroad bridge upgrades which minimize railroad traffic interruptions. Finally, it identifies potential areas of development and expansion from these lessons learned on railroad engineering which might be useful for other structural engineers involved with infrastructure design, construction and maintenance.

**Keywords:** Bridge; railroads; maintenance; repair; change out; work window; replacement; railroad traffic; short-medium spans.

### 1. Introduction

Within the most important elements of railroads, reliable infrastructures become the key to guarantee a solid reliable network for owners, clients and society in general. Within the infrastructure system, railroad bridges represent a key factor which enlightens the significance of transportation systems for the world.

During the last 50 years, loads, speed and capacities have been increased rapidly whereas the bridges carrying them have not. Many railroad bridges need to be either repaired or replaced in order to maintain a reliable infrastructure for both owners and clients.

The availability of the system for railroad traffic is a paramount demand from the railroad owner when the design and construction of a new bridge is required. No interruptions to traffic are almost certainly impossible when the structure under the track needs to be replaced, but the minimization of those traffic block windows have become the main scope for railroad bridge engineers. The periods of time in which the bridges are built within hours are known as "change-outs", and become a combination of design, management and construction skills in very high demand by private owners of railroads today.

### 2. General Description

#### 2.1 Importance of Railroad Bridges for Society

The criticality of railroad transportation to the economic wellbeing of the United States of America tends to be overlooked by people who are not directly involved in the transportation industry.