Methodology to Transfer Global to Local Transfer Response Using Finite Element Model and Field Test of Two Connecticut Steel Truss Railroad Bridges

by

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Abstract

Most railroad bridges in the United States were constructed in the late 19th and early 20th century with outdated design codes and technology. Although the bridges are still in operation under periodic inspection and enforced rating plans, they show unpredictable dynamic behavior due to wear and tear. As they are approaching their intended lifespan, it is important to understand their dynamic behavior using cost-effective methods. This study aims to study the structural performance of the two CT steel truss railroad bridges, Cos Cob and Devon Bridge using a field verified Finite Element (FE) Analysis. FE model is used to understand the load transfer from the global model to the local model of the bridges. The two selected bridges for this study are an integral part of the Northeast Corridor which is the busiest passenger rail corridor in the United States. The research aims to understand the behavior of the local members of the bridges and their connection subjected to passenger train loads. The goal of the research is to develop a methodology that can efficiently evaluate aging bridges. By doing so, this research will aid in ensuring safety and maintaining the structural integrity of historic bridges.

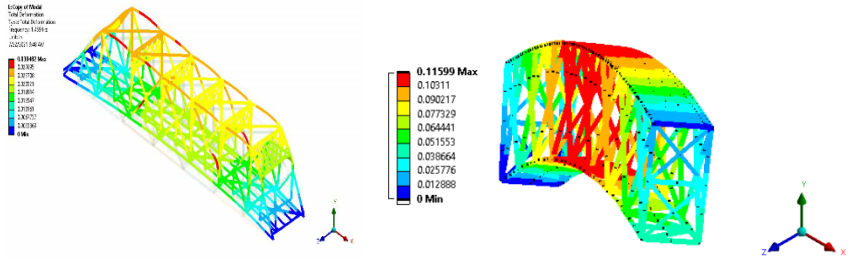

Fig 1: Cos Cob Beidge FEM Displacement (left), Devon Bridge FEM Displacement (right)

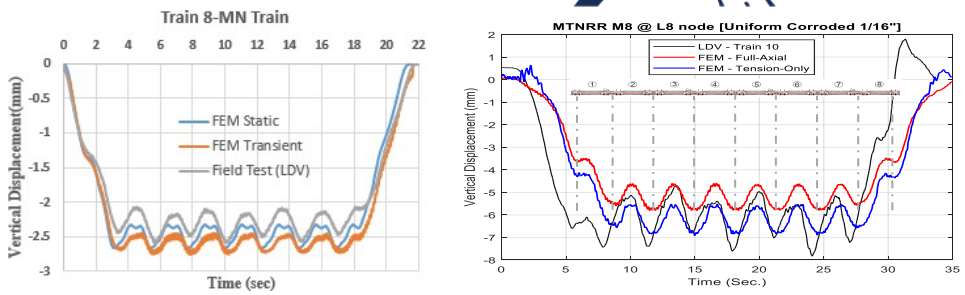

Fig 2: Processed Vertical Displacement of Cos Cob Bridge (left, Processed Vertical Displacement of Devon Bridge (right)

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