

Project Title: Macro-level Intermodal Capacity Modeling

Principal Investigators:

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Matching Funds: \$102,194

Project Summary:

A good understanding on the capacity and delay patterns of three major freight transportation modes and their intermodal connectivity is necessary for yielding true intermodal solutions with high mobility and resilience for freight transportation. In the literature and practices, there are no unified capacity models from the intermodal perspective. Although there are well-accepted models and formulations for some single modes, such as highways and railway links. *The objective of this project is to build a systematic model to define and measure the capacities of links and nodes of all three major surface transportation modes and their connections at the macro level.* The research will focus on freight transportation over highways, railways, and inland waterways. The intermodal capacity models and the relationship functions between transportation volume and travel time (or speed) at the macro level will have a significant impact on intermodal transportation management and planning. At the operational level, the congested traffic can be efficiently guided to alternative routes and other transportation modes that have extra capacity. At the strategic level, the predicted traffic demand can be assigned to intermodal networks to identify the best investment to improve transportation efficiency. The model is expected to build a foundation for future freight transportation research from the true intermodal perspective. Because of the large scope of the proposed study, the efforts of several ongoing projects funded by U.S. Department of Transportation and U.S. Department of Homeland Security with the resources at several research centers at Hampton University and the University of Tennessee at Knoxville will be leveraged to achieve the goal. The research also includes a case study, for which the team has data through previous and ongoing projects, to demonstrate the benefits of the unified intermodal capacity model.