The Challenges of Obtaining Credible Data for Transportation Security Modeling

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EXECUTIVE SUMMARY

The National Transportation Security Center of Excellence (NTSCOE) was established in August 2007 to develop new approaches to defend, protect, and increase the resilience of the nation's multi-modal transportation infrastructure, and to create education and training programs for transportation security. The Center for Transportation Safety, Security, and Risk (CTSSR) at Rutgers University, an NTSCOE institution, developed models that address multi-modal resilience of freight and transit transportation networks. Data collection processes for each project presented significant hurdles for the research team in developing credible and accurate modeling tools. For any given data need, the potential exists for data gaps, collection, and processing errors, publication and use restrictions, and the need to obtain the most timely information. These challenges must be foreseen by researchers and practitioners in order to better accommodate potential restrictions on both data collection and dissemination while still providing users with a tool that improves decision making.

INTRODUCTION

The United States Department of Homeland Security (2007b) defines the NTSCOE as a consortium of seven different universities with goals that include the development of new technologies, tools and advanced methods to defend, protect and increase the resilience of the multimodal transportation infrastructure in the United States. University members included:

1. Connecticut Transportation Institute at the University of Connecticut,
2. Tougaloo College,
3. Texas Southern University,
4. Center for Transportation Safety, Security and Risk (CTSSR) at Rutgers, the State University of New Jersey,
5. Homeland Security Management Institute at Long Island University,
6. Mack Blackwell National Rural Transportation Study Center at the University of Arkansas,
7. Mineta Transportation Institute at San José State University.

As part of this Center of Excellence, CTSSR undertook the development of resilience modeling tools for use by transportation related agencies and stakeholders, in addition to the development of front-line employee training videos and associated training products. Two of these tools, each of which contains several simulation models, will be discussed herein, Supporting Secure and Resilient Inland Waterways and the Rail Security Model.

The Supporting Secure and Resilient Inland Waterways (SSRIW) project sought to develop a Web-based prototype decision support system that could integrate geographic information systems and optimization models to assist in planning support for offloading barge cargo during a sudden catastrophic closure of an inland waterway. A project goal is to assist the United States Coast Guard (USCG), United States Army Corps of Engineers (USACE), and other waterway security stakeholders in understanding the resiliency of inland waterway transportation system components and to create a planning tool that will allow public and private parties to plan and collaborate on emergency freight movement decisions.

The Rail Security Model developed by CTSSR brought together three complementary simulation models to offer insights into events that can cause cascading impacts in rail and connected transportation systems, explore the consequences of those events, and identify investments that could increase system resilience after accidents and attacks. The models work together to examine how a terrorist event would affect passenger flows and train movements, visualize and quantify contaminant exposure, and estimate regional economic impacts of these events. To obtain

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