

Project 16b: Critical Infrastructure for Border Security (Zimmerman)

This work is estimating the role of infrastructure in the vulnerability of border crossings to terrorist attack, and the severity of consequences of such attacks attributable to infrastructure.

Modeling Area: Risk Analysis

Case Studies Supported: Border Security

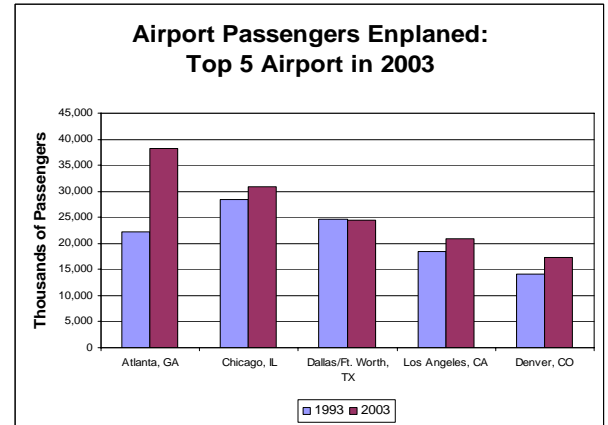
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User activity at airports. Source: Graphed from U.S. Census Bureau of Transportation Statistics data.

Brief Description:

U.S. borders are a high priority for homeland security, given their connection to economic activity for international and domestic trade. Electric power, telecommunications, and other infrastructure are a hidden dimension not only supporting transportation’s direct role in people, goods and services movement across U.S. borders, but also providing direct cross-border transfers of the goods and services these infrastructures provide. The role of these critical infrastructures for border security has not been systematically studied, and this project provides an approach to identify and prioritize infrastructure systems that supports border security, using a limited number of ports, that potentially can be applied to many different kinds of ports.

Objectives:

The objective of this research is to develop the means to portray infrastructure’s role in border security on the basis of its interconnectivity with border activities and functions, in order to establish risks of terrorist attacks at border areas by means of attack on infrastructures upon which these border areas depend.

Major Products and Customers:

This project will develop a tool consisting of indicators and ways to use databases for assessing infrastructure’s role in border security. This tool is comprised of a screening process and means to identify border dependency on infrastructure. Its customers are students and decision-makers such as managers of border operations and security. Specific customers expected to be involved in the project include the Port Authority of NY and NJ and port agencies from other ports selected for in-depth study.

Interfaces to other CREATE Projects:

This project will interact closely with the Border Security Case Study and researchers at USC.

Interfaces to non-CREATE Projects:

Interfaces with other port projects underway are expected as the project proceeds.

Technical Approach:

- Develop criteria to prioritize border crossings for more in-depth study and as inputs for risk and consequence assessment for selected ports. These criteria are expressed in terms of risk factors and measures reflecting vulnerabilities unique to infrastructures at border crossings. Some examples of such criteria are (i) importance of the role in sustaining border activity, (ii) volume of activity, (iii) infrastructure asset value, (iv) value of commodities shipped, and (v) uniqueness (non-redundant configurations)
- Screen border crossings according to criteria related to the importance of infrastructure in supporting the viability of these borders.
- For selected crossings and key infrastructures at those crossings, identify infrastructure facilities and activity for more detailed study.
- Characterize key infrastructure vulnerabilities in the context of an attack (based on or in terms of factors that include criteria above), netting out security measures now in place.
- Include the role of critical infrastructure interdependencies as contributors to vulnerability and as a basis for prioritizing those vulnerabilities.
- Develop a set of scenarios that reflect the impact of hypothetical attacks on border infrastructure.
- Use catastrophic events that have affected port areas as prototypes to understand role and effect upon interconnected infrastructure. Included in port case studies will be a case study of the interconnectivity of critical infrastructures with port operations in the Gulf Coast, and the effect that Hurricane Katrina had on these operations. The Port of South Louisiana ranks first in the nation in tonnage of cargo throughput. Although this was not a terrorist attack, the case exemplifies what could happen in a very wide area attack on port infrastructure.

Major Milestones and Dates:

1. Identify types of U.S. border crossings -- Spring 2005.
2. Begin to identify selected characteristics of infrastructure, including infrastructure components at typical borders -- Summer 2005.
3. Develop criteria for importance of infrastructure for border functions; initial work will be conducted using airport databases -- Fall 2005.
4. Screen/select a set of border crossings for in depth study; Identify infrastructure at selected border crossings, document screening process, and include measures of border dependency on infrastructure; Develop scenarios for hypothetical attacks on border infrastructure for selected area(s); Develop transferable tool to decision-makers and students -- Spring 2006.