

Training Course: Transportation Systems Security

Instructor and contact information

Dr. Jarret Brachman

E-mail: jarret.brachman@ndsu.edu

Training description

This training examines security threats and solutions related to transportation systems. Specific focus is placed securing passenger and freight modes of transportation including railroad, highway, aviation, maritime and pipelines from acts of terrorism and intentional disruption.

Training objectives

Transportation systems form the essential framework upon which regions grow and develop: they are the circulatory system of today's globalizing communities. Functioning transportation systems provide for the efficient, effective, and safe movement of people and goods; contribute to the region's economic vitality; support transportation-efficient development patterns and the regional land use plan, air quality, natural habitats, and environmental noise; and provide multi-modal transit choices wherever possible while enhancing and preserving the character and livability of communities where transportation facilities are located.

As transportation systems continue to grow in density, complexity and relevance, however, they also offer new opportunities for nefarious actors wishing to disrupt or damage those systems. Securing transportation systems is an ongoing process of reflection, analysis and estimation, all of which require collaboration among professionals from a variety of sectors and industries.

This training will give participants a better understanding of issues related to transportation system security on the strategic, practical, and operational levels. Specifically, participants will:

- To gain an appreciation for the diversity of actors, challenges and opportunities involved in the study of transportation systems security.
- To understand the physical, procedural, and psychological safeguards required to keep all modes of transportation functioning.
- To develop an appreciation for transportation systems layout, core performance issues, and risk assessment; predicting internal and external loss; drills, exercises, and training; as well as layered systems, compliance, and shared information.

Training Topics

Introduction to the Global Transportation System

The overall transportation system is a network. It has intersections and junctions; and while each transportation mode has its own security challenges, there are common vulnerabilities and mitigation strategies. In an effort to use our security resources efficiently, we work closely with transportation networks to leverage our security impact and determine risk-based priorities. Participants will:

- Review the various components of the global transportation system
- Understand how various globalizing and localizing forces are impacting the global transportation system.
- Forecast possible emerging trends that need to be considered when thinking about the future of transportation.

Complex Adaptive Systems

Transportation systems, like other complex systems, comprise a large number of interacting agents, whose aggregate activity is nonlinear and typically exhibits hierarchical self-organization under selective pressures. The control within complex systems tends to be highly dispersed and decentralized, and usually arises from

competition and cooperation among the host of agents who are pursuing their independent goals in parallel, which often leads to unanticipated consequences and adaptive behavior. Participants will:

- Understand the basic attributes and behavioral characteristics of complex systems
- Identify the diverse agents active within a transportation system
- Detail the types and nature of agent interactions within a transportation system.
- Understand metrics for assessing adaptive capacity within a transportation system and how that impacts resilience in the face of system perturbation.

Securing Transportation Systems – Port Security as an Example of the Headaches

A wide variety of public and private agents operating across sector and at different levels of administrative and legal authority and accountability are active within any given transportation system. The first line of defense against potential threats to a transportation system is ensuring that these diverse agents each erect and enforce appropriate safeguards. Participants will:

- Develop a fluency for the various transportation sector sub-systems operating within a given transportation system (Mass transit, passenger, cargo/freight/bulk)
- Identify each the appropriate security safeguards relevant to each sector.
- Have a complete understanding of the various efforts in place to secure the global supply chain.

North American Supply Chain

Border security continues to be raised as a matter of both national security and politics in this country. Let's get to the heart of the matter this week and see what Giermanski's critiques are of America's northern and southern borders. Focus specifically on the policies in place and the human side of the equation. Participants will:

- Understand the current policies in place with regard to the North American supply chain.
- Identify what works. Identify what doesn't.
- Assess whether there are plans in place to address the issues we identify.

Cargo at Risk

The adage, "cargo at rest is cargo at risk" no longer encapsulates the nature of security threats to the transportation of cargo and freight. Security threats and vulnerabilities appear at all steps of the supply chain. This class will focus on security dimensions of transporting bulk cargo and freight. Participants will:

- Understand the basic architecture of the various levels of cargo transportation systems
- Gain a deeper appreciation for maritime transportation systems
- Identify dilemmas likely to occur at the interface of cargo and passenger conveyances
- Be aware of security related technological and policy advances in the transportation of cargo.
- Become familiar with the types of threats facing maritime movement of cargo.

Surface Transportation Security: Rail, Truck and Pipeline

The sheer volume and span of roads and rail, the backbone of surface transportation systems, makes traditional approaches to security irrelevant. Rather, risk-based, layered approaches to securing transportation systems, including passenger transit, highway, pipeline and rail security, drive current efforts in the United States and abroad. Participants will:

- Understand how to prepare and apply Threat Vulnerability and Consequence Assessments (TVCs).
- Become familiar with the TSA's baseline standards for freight rail, passenger transit, highway/trucking and pipeline.
- Identify how the TSA's assessments line up with their baseline standards for each sector.
- Understand current close-gap initiatives and be able to generate your own original sector-specific recommendations.

Aviation Security

Although the 9/11/2001 attacks brought the issue of aviation security to the fore for most Americans, aviation transportation systems have faced a wide range of security threats since their inception. This class will examine the nature of threats, actors involved with, and policy instruments available to aviation transportation security professionals. Participants will:

- Understand the historical evolution of security as related to the aviation sector.
- Be able to identify current and estimate future threats to the aviation transportation system.
- Gain a clear understanding for the various technical, physical and other barriers currently in place across the aviation sector for preventing, deterring and mitigating security threats to the industry.
- Gain an appreciation for the interaction between private industry and the federal government with regard to aviation security.

Globalization and Transportation System Security

The unprecedented flow of private capital, ideas, technology, goods and services known as *globalization* has affected nearly every aspect of human existence today in innumerable and often unpredictable ways.

Understanding the ways in which transportation systems both shape and are shaped by corporate, environmental, technological and cultural forces of globalization is critical for efforts to securitize those systems. Participants will:

- Gain an appreciation for globalization as a concept and the ways in which its forces shape and are shaped by transportation systems.
- Develop a better understanding for how major perturbations to transportation systems security (like 9/11) impact policy and behavior in those systems at different levels of aggregation.
- Better understand the relationship between computers, security and transportation

Global Transportation Systems Security Policies and Agencies

Understanding the legislation, regulation and collaborative partners involved in transportation security is key for creating a robust global transportation system security regime. Participants will:

- Become familiar with the major transportation security acts in the US
- Learn more about partner nations' agencies involved with transportation security.
- Understand key points of collaboration and tension between American national interests and partner nations' interests vis-à-vis transportation system security regulations, safeguards and strategic objectives.

Intelligent Transportation Systems and Security

Intelligent transportation systems (ITS) encompass a broad range of wireless and wire line communications-based information and electronics technologies. When integrated into the transportation system's infrastructure, and in vehicles themselves, these technologies relieve congestion, improve safety and enhance American productivity. ITS is made up of 16 types of technology based systems. These systems are divided into intelligent infrastructure systems and intelligent vehicle systems. Participants will:

- Gain a firm understanding for the various components that comprise ITS
- Understand the impact of adding the "I" to Transportation Systems in the real world.
- Identify the challenges and opportunities generated by widespread focus on deploying ITS.

The Human Dimension: Transportation Security Professionals

Surface Transportation Security Inspectors, Federal Air Marshals (FAMs), screeners, highway patrol officers, customs and immigration officers, FBI Special Agents and a host of other professionals are on the front-lines of any functioning transportation system security regime. Participants will:

- Learn about the various types of jobs, expertise and skill-sets are included within the profession of transportation security.
- Learn to recognize critical vulnerabilities in the training, education and assessment programs for respective sectors and across agencies and private industry.
- Suggest new ways to empower transportation security professionals to do their jobs better and more effectively.

Terrorist Attacks Against Transportation Targets

In a span of two years, the United Kingdom suffered a one major terrorist attack and one failed terrorist plot against their passenger rail system and managed to thwart at least one other major plot against their commercial

aviation sector. The resultant shock to both the regional and global transportation systems was serious and worthy of in-depth study. This class will use two case-studies to examine the types of impact that terrorist attacks against urban rail and commercial aviation transportation systems have had. Participants will:

- Gain a working knowledge of two major terrorist plots against transportation systems.
- Identify lessons learned (both what went right and what went wrong) in these two cases.
- Be able to critique subsequent policies as effective for preventing or mitigating similar future attacks.