Fixed Facilities and Infrastructure Protection and Passenger Rail and Rail Transit Security

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Overview of Presentation

• Introduction

• (U)/FOUO TSA Unclassified Assessment

• Background
  ▪ The Risk Assessment Process in general
  ▪ Threat and Vulnerability Assessment requirements
  ▪ Methodologies

• Design Guidelines

• Application to Planning and Design Process
  ▪ Threats
  ▪ Vulnerabilities
  ▪ Sample TVA Methodology
  ▪ Methodology
Overview of Presentation (Cont.)

• Approach
  ▪ General
  ▪ Asset Analysis
  ▪ Target or threat identification
  ▪ Vulnerability Assessment
  ▪ Consequence Analysis
  ▪ Countermeasure recommendations

• Security Sensitive Information (SSI)

• Conclusions and Recommendations
Introduction

• Safety and Security are becoming more important to the rail transit industry given the known threats and current history (Tokyo, Madrid, London, etc.)
• Threats are becoming more widespread
• Because of the openness of the systems, they are relatively easily exploitable
• Threat and vulnerability assessments are not a new concept, but are not readily addressed in AREMA chapters
• The planning and conceptual engineering phase(s) of a project are the logical phases at which safety and security should be considered
• There are many agencies that have requirements that address safety and security, so specific requirements may vary based on agency, project, Location, etc., and many methodologies that address that address threat, risk, etc.
• How risk, threats, vulnerabilities, etc. are addressed are a function of the transit system’s operations, demographics, infrastructure, etc.
(U) TSA Freight Rail Threat Assessment

• (U) Key Findings
  • (U//FOUO) Threat to freight rail is low
  • (U//FOUO) Threat to mass transit is medium

• (U//FOUO) Potential actors:
  • (U//FOUO) Al-Qa’ida and affiliates
  • (U//FOUO) Lone offenders, industry insiders

• (U//FOUO) Tactics
  • (U//FOUO) IEDs most common tactic against freight rail and mass transit worldwide
  • (U//FOUO) Recent emphasis on derailments

• (U//FOUO) Suspicious incidents targeting freight rail
(U) TSA Freight and Mass Transit Assessments

- **(U//FOUO) Al-Qa’ida and affiliates**
  - **(U//FOUO) Al-Qa’ida** demonstrates continuing desire to attack Homeland and U.S. transportation

- **(U//FOUO) Violent homegrown extremists pose increasing threat to U.S.**

(U) U.S. Transportation as a Focus of Terrorism Since 9/11

September: Najibullah Zazi, Ferid Imam, Zarein Ahmedzay, and Adis Medarjarin planned to detonate bombs on a New York subway.

May: Faisal Shahzad, the Times Square attempted bomber, plotted a follow-on attack against Grand Central Station.

October: Inspired by AQ ideology, Anwar al-Aulaqi, two packages each containing a bomb consisting of 300-400 grams of plastic explosives and a detonating mechanism, were found on separate cargo planes bound from Yemen to the U.S.

Travel warnings issued for United Kingdom, Yemen, and Libya.

February: Khalid Ali-M Alawazeni, a citizen of Saudi Arabia and resident of Lubbock, Texas, was arrested on VMD charges related to targeting U.S. infrastructure.

October: Farouq Ahmad plotted to carry out terrorist bombings at Washington, D.C. metro stations.

December: Umar Farouk Abdulmutallab, a Nigerian engineering student, flew from Amsterdam to Detroit and attempted to detonate a bomb hidden in his underwear as the plane began to land.

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

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Risk Assessment Process

• What is Risk?

• Risk Assessments Steps
  ▪ Identify assets
  ▪ Measure to protect assets
  ▪ Threat Assessment
  ▪ Vulnerability Assessment

• Threat and Vulnerability Assessment
  references, guidelines, etc.
  ▪ 49 FR 659 – Rail Fixed Guideway Systems: State Safety Oversight
  ▪ DHS Urban Area Security Initiative (UASI)
  ▪ APTA Recommended Practice for the Development & Implementation of a SEPP
  ▪ FTA System Security and Emergency Preparedness Guide
  ▪ 9/11 Commission Act of 2007 (PL 110-53)
Methodologies and Procedures

General Security Risk Assessment Guideline, ASIS International
- 7 Step Process – Asset identification, determination of loss events, frequency of the events, impact of the events, options to mitigate, feasibility of mitigation options and cost/benefit analysis

(The Public Transportation System) Guidelines for the Development of Safety and Security Management Plans, FTA (Purple Book)
- 5 Step Process – Asset analysis, target and threat identification, vulnerability assessment, consequence analysis (scenarios) and countermeasure recommendations

Terrorism Risk Assessment and Management (Tool – TRAM), DHS
- 3 Components – Assessment of terrorism risk to assets, evaluation of risk mitigation strategies and evaluation of changes in criticality, threat and preparedness
Security Focused Design Guidelines

Transit Security Design Considerations, FTA
• Post 9/11
• Looks at threats and vulnerabilities
• Addresses infrastructure hardening and protection, and system redundancies

Crime Prevention Through Environmental Design (CPTED)
• Widely used by transit agencies in station location and design
• Key Strategies - territorial reinforcement, natural surveillance and access control

APTA Standards Development Program
• Standards for passenger transportation industry
• Relevant Working Groups
  ▪ Rail Transit Fixed Structures Committee
  ▪ Transit Security Infrastructure Work Group
Application to Planning and Design Process

Reference Chapter 5 of the FTA “Purple Book” for threat and vulnerability assessment (TVA) process

5 Element Process
- Asset Analysis
- Target or Threat Identification
- Vulnerability Assessment
- Consequence Analysis (Scenarios)
- Counter Measure Recommendations

Looking at Threats – Transit Focused
- IEDs
- VBIEDs
- Active shooters
- Chemical, biological, radiological and nuclear
- Tampering with infrastructure
Application to Planning and Design Process (Cont.)

Looking at Vulnerabilities
- Identifies weaknesses and gaps that can be exploited
- Identify safety and security vulnerabilities
- Measures to minimize intrusion or adversarial exploitation
- Identify assets that need protection
- Identify protective measures for gaps and weaknesses
- Recommendations to mitigate risk
- Looks at continuity of operations
Sample TVA Methodology

TVA Organization
• Introduction
• Project Overview
• Basis of Design
• Assessment
• Analysis description – Asset, threat, potential impact severity and frequency of Impact
• Findings and recommendations of threats and vulnerabilities

TVA Used:
• Chapter 5 of the FTA “Purple Book” as a Guide
• Scenario-Based and Qualitative Methodology Approach
• Worksheets to analyze assets, threats, impact, countermeasures and resolutions
• Workshop to “Role Play” scenarios
• Impact Rating Table - determine impact severity and prioritize countermeasures

<table>
<thead>
<tr>
<th>Impact Assessment Classification</th>
<th>Impact Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A, 1B, 1C, 2A, 2B, 3A</td>
<td>Unacceptable – corrective action ASAP</td>
</tr>
<tr>
<td>1D, 2C, 2D, 3B, 3C</td>
<td>Undesirable – timely corrective action</td>
</tr>
<tr>
<td>1E, 2E, 3D, 3E, 4A, 4B</td>
<td>Manageable - management review</td>
</tr>
<tr>
<td>4C, 4D, 4E</td>
<td>Acceptable – no action required</td>
</tr>
</tbody>
</table>
Possible Approach to TVAs for Projects

General Methodology
• Qualitative methodology recommended
• FTA “Purple Book” as a guide

Asset Analysis
• Includes, in addition to physical assets and infrastructure:
  ▪ Riders
  ▪ Workers
  ▪ General Public
• Covers O&M procedures, vehicle control and power systems
• Also looks at:
  ▪ Asset value
  ▪ Location
  ▪ “Target value” to a terrorist
  ▪ Impact if asset is lost
Possible Approach to TVAs for Projects

**Target or Threat Identification**
• Looks at an action that has the potential to:
  ▪ Cause harm, injury or death
  ▪ Destruction or damage to an asset
  ▪ Disrupt operations
• Planner and/or designer should look at:
  ▪ Attractiveness of asset to hostility (underground stations, high ridership, etc.)
  ▪ Political events that could generate an attack (London, Madrid, Tokyo, 9/11, etc.)
  ▪ Accessibility of the asset (wayside stations, at-grade, street running, etc.)
  ▪ History of attacks on similar targets

**Vulnerability Assessment**
• Includes riders, workers and general public in addition to the physical assets
• Covers O&M procedures, vehicle control and power systems
• Also looks at:
  ▪ Asset value
  ▪ Location
  ▪ “Target value” to a terrorist
  ▪ Impact if asset is lost
Possible Approach to TVAs for Projects

Consequence Analysis (Scenarios)
• Vulnerabilities are prioritized through scenarios that pair threats and vulnerabilities
• Workshop approach that matches threats to critical assets to create an awareness of how to recognize, prevent and mitigate the consequences of an attack
• Assault planners often used
• Chronological scenarios that reflect a worst “credible”, rather than worst “case” scenario so that recommendations are appropriate for the size and operation of the transit system
• Can help distinguish between rail and bus relevant scenarios
• Time of day, demographics, environment and operations also factor into scenario analysis

Countermeasure Recommendations
• Mitigate vulnerabilities
• Understand that threats cannot be eliminated
• Focus on reducing the vulnerability of an asset or operation
• Effective countermeasures:
  ▪ Physical protection measures that reduces asset vulnerability
  ▪ Operational security that enhances vigilance and detection to mitigate a threat
• Should determine effective available countermeasures and alternatives
• Cost effectiveness of the countermeasure
• Rings of protection concept
Sensitive Security Information

• 49 CFR 1520

• Proper access

• Proper use

• Storage and protection
Conclusions and Recommendations

General Comments
• Reference and background material for planners, designers and transit systems
• Use the FTA “Purple Book” and APTA as resources in the TVA process
• Be aware of regulations on safety and security, and how they impact the planning and design process

Process Specific Comments
• Use a qualitative method to simplify the TVA process
• Do during conceptual design and/or route location study
• May be able to minimize the threat assessment, as threats are known from history and current events and are easily identified
• Use the FTA “Purple Book” 5 Step TVA process detailed in Chapter 5
• Solicit and consider “best practices” from other transit systems and not be limited to U.S. transit systems
• Distinguish between system and asset specific threats
• Make sure asset specific threats are not overlooked
Conclusions and Recommendations (Cont.)

Improper consideration of security during the planning and design process could lead to, among other things:

- Potential future addition of security enhancements at a higher cost
- Possible exploitation of a vulnerability
- Critical security elements taken out of a project because of cost constraints
- Poorly located stations, facilities and infrastructure where there is a greater vulnerability to a known threat

Way Forward

- Be more cognizant of safety and security in the planning and design process
- Include early in the planning and design process
- Use available resources in addressing safety and security
- Consult safety and security specialists that are expert in the field
- Develop AREMA standards and guidelines to accompany available resources
Questions