Security & All-Hazards Preparedness, Response, and Recovery Activities

TRB’s All Hazards Context for Coordinated, All Modes, Security-Related Research

August 2012
TRB Mission Statement

To provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal.

1920: Advisory Board on Highway Research
1924: renamed Highway Research Board
1974: renamed Transportation Research Board

TRB Today
1863 Charter of the National Academy of Sciences

“. . . the Academy shall, whenever called upon by any department of the Government, investigate, examine, experiment, and report upon any subject of science or art . . .”

The work of The National Academies is reported through an Annual Report to Congress
The National Academies—Private, Nonprofit Congressionally Chartered 1863

The National Academy of Engineering
Charles M. Vest, President

National Academy of Sciences
Ralph J. Cicerone, President

Institute of Medicine
Harvey Fineberg, President

Office of News and Public Information
Report Review Committee

National Research Council
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Charles M. Vest, Vice-Chair
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Robert Skinner, Exec. Dir.

Division on Policy and Global Affairs (PGAD)
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Richard Bissell, Exec. Dir.

1916
National Research Council
Making the Nation Safer: The Role of Science and Technology in Countering Terrorism

NRC Policy Study released June 25, 2002

- **Predict**: Intelligence and surveillance of targets and means
- **Prevent**: Disrupt networks, contain threats
- **Protect**: Harden targets, immunize populations
- **Interdict**: Frustrate attacks, manage crisis
- **Response & Recovery**: Mitigate damage, expedite cleanup
- **Attribute**: Identify attacker to facilitate response

Source: Downey, TRB Annual Meeting 2003
Making the Nation Safer
General Strategies and Research Needs

- **Biological**  Research, prepare, distribute response to pathogens
- **Chemical/Explosives**  Sensors & filters
- **Info Technology**  Network security/ER communications
- **Energy**  SCADA controls/adaptive grid/vulnerabilities
- **Cities/Infrastructure**  Emergency responder support
- **Transportation**  Layered system security
- **People**  Trusted spokespersons
- **Complex Systems**  Data fusion/data mining/red-teaming
- **Cross-Cutting Technology**  Sensors/robots/SCADAs/systems analysis
- **Deployment**  Homeland Security Institute, Partnerships among feds/states/locals/universities
- **Nuclear**  Control weapons & materials at source

Source: Downey, TRB Annual Meeting 2003
This Congressionally-mandated study by the National Academies will review how the Department of Homeland Security (DHS) is building its capabilities in risk analysis to inform decision-making. More specifically, the study will address the following tasks:

a) Evaluate the quality of the current DHS approach to estimating risk and applying those estimates in its many management, planning, and resource-allocation (including grant-making) activities, through review of a committee-selected sample of models and methods;

b) Assess the capability of DHS risk analysis methods to appropriately represent and analyze risks from across the Department’s spectrum of activities and responsibilities, including both terrorist threats and natural disasters;

c) Assess the capability of DHS risk analysis methods to support DHS decision-making;

d) Review the feasibility of creating integrated risk analyses covering the entire DHS program areas, including both terrorist threats and natural disasters, and make recommendations for best practices, including outreach and communications;

e) Recommend how DHS can improve its risk analyses and how those analyses can be validated and provide improved decision support.
TRB is Broadly Engaged in Hazards and Security

Cooperative Research Programs
National Cooperative Highway Research Program
Transit Cooperative Research Program
Airport Cooperative Research Program
National Cooperative Freight Research Program
Hazardous Materials Cooperative Research Program
National Cooperative Rail Research Program
Commercial Truck and Bus Safety Synthesis Program
Transportation Modes & Disciplines Addressed by 200 TRB Standing Committees

**Modes**
- Highways
- Public Transportation
- Freight Systems
- Rail
- Air
- Marine
- Non-Motorized

**Disciplines**
- Policy and Organization
- Planning & Environment
- Design & Construction
- Operations & Maintenance
- Safety & Systems Users
- Legal Resources
TRB Technical Activities

1. Committee on Critical Transportation Infrastructure Protection

2. Training, Education and Technology Transfer Subcommittee of the Committee on Critical Transportation Infrastructure Protection

3. Task Force on Emergency Evacuation

4. Safety and Security of Bridges and Structures Subcommittee

5. Committee on Aviation Security and Emergency Management

6. Task Force on Logistics of Disaster Response and Recovery

Transportation Hazards and Security Summit 2011
R&D Efforts: Identification of Gaps & Needs (1 of 2)

1. TRB Committee on Critical Transportation Infrastructure Protection shares research results from all sources & identifies research needs

2. AASHTO Special Committee on Transportation Security & Emergency Management identifies and refers research needs

3. NCHRP 20-59 panel funds applied research or refers prioritized requests

"10,000 TRB Annual Meeting Participants"
"30+ other technical meetings"
"TRB Annual State Visits to DOTs, Universities, MPOs, Transit Agencies, Ports, Airports & other agency reps"
"State/Local Government"
"Non-Government Organizations"
"Federal Agencies"
"Private Sector"
R&D Efforts: Identification of Gaps & Needs (2 of 2)

TRID = TRB’s Transportation Research Information Services (TRIS) + ITRD Databases (World’s Largest, ≈ 220 countries)

http://trid.trb.org/

Research In Progress (RiP) Database  http://rip.trb.org/

2012 Transportation Hazards and Security Summit and Peer Exchange

August 20-24, 2012
Arnold and Mabel Beckman Center of the National Academies of Sciences and Engineering
Irvine, California

Joint Summer Meeting of:
AASHTO Special Committee on Transportation Security and Emergency Management (SCOTSEM)
AASHTO Special Committee on Wireless Communications Technology (SCOWCoT)
TRB NCHRP Project Panel 20-59, Surface Transportation Security Research (NCHRP 20-59)
TRB Critical Transportation Infrastructure Protection Committee (TRB ABE40)
TRB Task Force on Emergency Evacuation (TRB ANB80T)
with
USDOT Federal Highway Administration (FHWA)
TSA Highway and Motor Carrier Branch (TSA HMC)
DHS Science & Technology Directorate, Infrastructure and Geophysical Division (S&T IGD)

http://www.trb.org/Calendar/Blurbs/166997.aspx
2012 Transportation Hazards and Security Summit

Nine Peer Exchange Discussion Topics

1. How has your state DOT prepared to manage debris removal and disposal from major natural events?
2. When and how does your state DOT, EMA, or security director get involved in providing requirements for security for new transportation infrastructure?
3. How is your state DOT represented within the Governor’s Homeland Security structure/organization/framework?
4. How involved is your state DOT in agricultural emergency planning?
5. What has your state DOT or EMA done to prepare to receive evacuees from other states or as evacuees move from area to area within your state? How has your state prepared to communicate with vulnerable populations?
6. How does your state DOT coordinate for threat information or intelligence with Federal, state, regional, and local enforcement agencies?
7. How do you prepare newly appointed senior executives at the DOT for their responsibilities in regard to catastrophic emergencies?
8. How is your state DOT dealing with responding to the requirement for cyber security of and cyber response to operational, cyber-dependent systems?
9. What has your state DOT done to ensure the DOT is included early in exercise and operational planning efforts?

Wednesday
August 22, 2012

HSEEP-Aligned Table Top Exercises

A. Flood with Hazardous Materials
B. Active Shooter
C. Vehicle Explosion on Bridge
A Guide to Updating Highway Emergency Response Plans for Terrorist Incidents

available May 2002

Examples of Different Communications Systems to Achieve Redundancy

- Statewide land-mobile radio communication systems
- State microwave telephone systems
- Satellite information systems
- Public telephone systems and facsimile operations
- Cellular telephone systems
- Vehicle scanners
- Auxiliary radio system
- Emergency radio system
- Computer systems
- Two-way direct-connect communications, e.g., NEXTEL, and two-way pagers
- Internet communications
- High priority telephone service for government agencies. For example:

Emergency Transportation Operations Preparedness & Response Workshops For Statewide Applications

June – November 2003

1. New Mexico
2. Minnesota
3. Washington
4. Idaho

CONTRACTOR'S FINAL REPORT

A Guide to Highway Vulnerability Assessment for Critical Asset Identification and Protection

Prepared for
The American Association of State Highway and Transportation Officials' Security Task Force
As National Cooperative Highway Research Program Project 20-677/Task 1518

Prepared by
Science Applications International Corporation (SAIC)
Transportation Policy and Analysis Center
7000 Science Applications Court
Vienna, VA 22182
May 2002

Bridge/Tunnel/Highway Infrastructure Vulnerability Workshops
February-March 2003
1. Sacramento, California
2. Albany, New York
3. Austin, Texas

http://security.transportation.org/sites/security/docs/guide-VA_Appendices.pdf
**REPORT 525 SERIES GUIDES ON TRANSPORTATION SECURITY**

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NCHRP Report 525, Vol. 14
Security 101: A Physical Security Primer for Transportation Agencies (September 2009)

Chapter 1: Risk Management and Risk Assessment
Chapter 2: Plans and Strategies
Chapter 3: Physical Security Measures
Chapter 4: Security Personnel and Training
Chapter 5: Infrastructure Protection
Chapter 6: Homeland Security

Figure 3-2. Layers of security.

Source: FTA Security Design Considerations, 2004
Guide

- Summary
- Overview for state transportation agencies (authorities, etc.)
- High-level requirements based on national policies and guidelines
- High-level self-assessment with pointers

Section 6: Resource Guide

- Organizational/staffing/position guidance
- Decision-making sequences
- Detailed self-assessment and resource lists
Transportation Sector Rationale for An All Hazards Approach to Natural Hazards and Security

1. **Safety first**: build on the successful experience of the systems approach, and extend the mission of existing safety personnel

2. **Build on DOT expertise in response**: urban areas work with law enforcement, fire, rescue, and towing and recovery on traffic incident management; statewide presence with emergency contracting, equipment (e.g., communications systems), personnel, and common response to weather emergencies; trained to observe and report

3. **Build on transit expertise in security**: in urban areas parallel size and location of high-value infrastructure; invested; bring expertise on policing and security; trained to observe and report

4. **Make interdependence an asset**: transportation depends on, and is depended on, by other critical infrastructures; roads and transit are publicly owned and managed, and house public involvement experts
Six Goals for Transportation Security

1. **Social**: Involve the public--make pre-operational surveillance riskier

2. **Budget & Policy**: Make risk-informed decisions the norm

3. **Technical**: focus on countermeasures & design (instead of vulnerabilities & threats) with dual benefits

4. **Operational**: quick, layered response with effective surge capability

5. **Psychological**:
   a. for the public, peace of mind/acceptance of risk: security ≈ satisfaction
   b. for the attack planner, transportation is a difficult target, prepare more or attack something easier

6. **Intelligence**: Support police/military/intelligence by having trained transportation employees report suspicious activities and by making the bad guys stretch out their planning time
Six Goals for Transportation Security

 Desired Outcome

Mainstreaming an integrated, high level, all-hazard, National Incident Management System (NIMS)-responsive, multimodal risk management process into major transportation agency programs and activities
Six Goals for Transportation Security

Desired Outcome

Five Pillars

1. A systems approach to emergency management functions focusing on a holistic approach to risk reduction: A Guide to Planning Resources on Transportation and Hazards

2. Understanding security fundamentals: Security 101: A Physical Security Primer for Transportation Agencies (Security 101)

3. Organizing to be a reliable partner in emergency management: Guide for Emergency Transportation Operations (ETO)

4. Risk-informed decision support to buy down risk: Costing Asset Protection: An All Hazards Guide for Transportation Agencies (CAPTA)

Panelists Needed

20-59(30) Role of Transportation in the Incident Command System Structure & the National Incident Management System Structure
20-59(35) Securing Transportation Structures, Systems, and Facilities—Long Term R&D Plan
20-59(38) Voice and Data Interoperability for Transportation
20-59(47) Developing Improvements for Evacuating Tunnels During Emergencies

20-59(14B) Research Support for the AASHTO Special Committee on Transportation Security and Emergency Management
20-59(50) Costing Asset Protection: An All Hazards Guide for Transportation Agencies (CAPTA) – Update & Implementation
20-59(52) Communications Worker Credentialing Requirements
Workshops and Research Connectivity: Ideas to Solutions

Effective Practices

Issues/Concerns

Research

• Publish
• Web postings
• Web casts
• Workshops
• Meetings
• Other venues

• Policy change/clarification
• Training
• Standards

Transportation Infrastructure Protection & Emergency Management Workshops

AASHTO SCOTSEM

TRB ABE40 Committee

New/Changing Policies

Other Venues

Academia

Government Agencies

Transportation Research Board

Industry

Cooperative [Applied] Research Programs

NCHRP - DOTs
TCRP - Transit
ACRP - Airports
NCFRP - Freight
HMCRP - Hazmat

Source: adapted from Ferezan, FHWA (March 2009)
Transportation Research Board Communications & Outreach

- TR News magazine
- Weekly e-Newsletter
- Webinars
- Open calls for papers
- Open solicitations for
  - Research problems
  - Project proposals
  - IDEA proposals
  - Panel nominations
- Interactive Annual Meeting program

TRB.org
TRB.org/SecurityPubs = 100+ items
TRB.org/NASecurityProducts
TCRPonline.org

July-August 2011
May-June 2007

November-December 2000
May-June 2005