Security Activities at the Texas DOT Related to Bridges

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Texas Bridges

16,498 Off-System Bridges
49,024 On-System Bridges
Total Bridges in Texas (September 17, 2001)

- Off-System
- On-System
- Total
Bridge Security Approach

- Identify the most critical bridges
- Consider options for deterrence / surveillance and protection
- Conduct research, as needed
- Ensure military needs are properly addressed
- Ensure preparedness
Identify Critical Bridges by Assessing Vulnerability
Methodology

- Automate to the extent possible
- Use Bridge Inspection Database for bridge data
- Develop formula that takes Texas priorities into account
Methodology, cont’d.

- Develop Weighted Selection Criteria
  - Consider terrorist objectives: disruption, demoralization, and killing
  - Make consistent with survey responses
  - Do not consider “Under Records” (Underpasses)
Texas Responses to Factors for Identifying Critical Transportation Infrastructure Assets
Rated from Extremely Important (5) to Less Important (1)

- 5 - Impact on Local, State, and National Economy
- 5 - Major Commercial Route
- 4 - Major Passenger Route
- 3 - Cost to Repair or Replace
- 3 - Time to Repair or Replace
Texas Responses to Factors for Identifying Critical Transportation Infrastructure Assets, cont’d.
Rated from Extremely Important (5) to Less Important (1)

- 2 - Relative Vulnerability to Attack
- 1 - Ability to Provide Adequate Protection
- 1 - Symbolic Nature of the Target
- 1 - Environmental Consequences
Texas Bridge Vulnerability Assessment

Vulnerability Criteria

- Commerce - Truck ADT
- Transportation Needs - Total ADT, Detour length
- Navigational Access - Coast Guard permits
- International Access - Border with Mexico
- Military Movement - STRAHTNE (Strategic Highway Network)
- Repair/Replacement Index - Type, Span (cost + ease of repair)
TxDOT’s Bridge Vulnerability Formula

\[
\begin{align*}
&\text{(Truck ADT x Truck ADT Factor)} \\
&\quad \text{Max Truck ADT} \\
&\quad + \\
&\quad \text{(ADT x ADT Factor)} \\
&\quad \text{Max ADT} \\
&\quad + \\
&\quad \text{(Detour x ADT x Detour Factor)} \\
&\quad \text{Max Detour x Max ADT} \\
&\quad + \\
&\quad \text{Navigation Factor} \\
&\quad + \\
&\quad \text{International Factor} \\
&\quad + \\
&\quad \text{Military Factor} \\
&\quad + \\
&\quad 6
\end{align*}
\]

\[\times\] Replacement Factor
Criteria Not in Bridge Inspection Database

- Capacity of detour
- Alternate detour(s)
- Utilities carried across bridge
Verify data for top 50 critical bridge candidates

Get district input on ranking

Look at changes in ranking needed to take into account criteria not in database, and make manual adjustments accordingly

Evaluate need for deterrence / surveillance / protection options on case-by-case basis
Potential Deterrence / Surveillance Options

- Eliminate parking areas beneath bridge
- Restrict ingress and egress routes from adjacent areas
- Provide additional lighting
- Limit / monitor access to plans of existing bridges
Potential Deterrence / Surveillance Options, cont’d.

- Install motion sensors or other active sensors
- Install surveillance cameras
- Apprise local law enforcement officials of critical bridges
Potential Protection Options

- Provide column protection
- Provide pass-through in concrete median barriers
- Install advance warning systems
Transportation Security Research

- Looked for topics that would add value
- Topics are non-traditional; academia will likely need to pull in outside resources
Research - Rapid Bridge Replacement

- Important to restore use of bridge quickly
- May be some simple things that can be done
- Also applicable to loss of bridge from other events - e.g., flood, earthquake

Note: Funding approved by TxDOT, RFP out December 2001
Research - Design for Security

- Fundamental difference between threat & consequence of natural disaster vs. terrorist attack
- Bridges hardened for natural disasters are not necessarily hardened for terrorist attack
- Security design solutions
  - Reduce the threat
  - Mitigate the consequences
Innovation based on assessment of consequences of terrorist threat is needed, rather than replication of designs responsive to consequences of natural disasters.

Note: Funding approved by TxDOT, RFP out December 2001
Research - Surveillance

- Surveillance may provide low-cost, easy to implement protection
- Need to determine optimal surveillance for bridges
- Explore latest technology
Military Mobility Needs

- Texas National Guard coordinates all military movement in Texas
- TxDOT assists Texas National Guard
  - Provides routes
  - Checks bridge capacities
- Most large military convoys use the Strategic Highway Network (STRAHNET)
Military Mobility Needs, cont’d.

- Numerous pre-approved non-STRAHNET routes for single vehicle moves
- Pre-approved routes are re-evaluated every two years
- For a new route, maximum review time for bridge capacity is 10 working days
- If requested, same day review
TxDOT Preparedness

- Established points of contact
- Consider current TxDOT emergency preparedness activities / needs
- Identify training needs
Points of Contact

- 24-hour contacts (names / numbers)
  - TxDOT Divisions
  - TxDOT Districts
  - TxDOT Administration
  - Division of Emergency Management
  - AGC / Contractors
  - Equipment and material suppliers
Texas Division of Emergency Management (DEM)

- Established by Governor’s Office
- Under control and direction of Texas Department of Public Safety (DPS)
- Administers the State’s Emergency Management Plan
State Emergency Management Plan

- Provides system for the mitigation of, preparedness for, response to, and recovery from natural or man-made disasters
  - Reduces vulnerability of citizens and communities to
    - Damage
    - Injury
    - Loss of life and property
TxDOT Preparedness, cont’d.

- Standard Emergency Process
  - TxDOT maintenance personnel work with local first responders (DPS, local law enforcement, fire dept., etc.)
  - Events off DOT ROW typically responded to after approval by DPS District Commander or DEM Director
TxDOT Preparedness, cont’d.

➢ Standard Emergency Process, cont’d.
  ❖ TxDOT assists as needed with traffic control, debris clearance and disposal, and making fire breaks
  ❖ Sometimes TxDOT is tasked with repair of local county or city roads when local capability is exceeded
State-level Terrorism Working Group

- Functions under DEM
- Purpose - to determine needs for response to acts of domestic terrorism
  - training
  - equipment
  - organization

TxDOT participates
TxDOT Preparedness, cont’d.

- Terrorist Incident Response Annex to State Emergency Management Plan
  - Developed in 1998 by DEM Terrorism Working Group
  - Clarifies roles and responsibilities of state & federal agencies, including TxDOT
TxDOT Preparedness, cont’d.

- Incident Command System (ICS)
  - Part of State Emergency Management Plan
  - System used to manage disasters or other emergencies
  - Most TxDOT districts have trained personnel
TxDOT Preparedness, cont’d.

- Terrorism Awareness Conferences / Seminars
  - Sponsored by DEM
  - Several TxDOT districts have participated
Weapons of Mass Destruction (WMD) / Terrorism Incident Exercise Program

- Sponsored by DEM
- Assesses existing state and local plans and procedures for consequence management of terrorist act or incident
- Provides opportunity to enhance those plans and procedures
- TxDOT participates
TxDOT Preparedness, cont’d.

Foreign Animal Disease Exercise

- Sponsored by DEM
- Same methods used during this exercise could be applied in cases of bio-terrorism attack
- TxDOT participated with 24 other agencies in 2001 exercise
TxDOT Preparedness, cont’d.

- Texas Emergency Highway Traffic Regulation Plan
  - Directed by DPS
  - Traffic management and control system
    - Regulates use of highways
    - Expedites and facilitates priority vehicle movement before, during, and after a national security emergency
  - Revised with focus on WMD
Military Mobility Exercise

- Sponsored by Federal Highway Administration
- Scheduled for March 2002
- Simulates large-scale movement of military equipment
- Purpose - to improve coordination between military and civilians using public roads
- TxDOT participation
TxDOT Preparedness, cont’d.

Hazardous Materials (HAZMAT) Recognition and Awareness Training

- Sponsored by TxDOT
- Provides ability to adequately respond to HAZMAT incidents while protecting self
- All TxDOT maintenance personnel are trained
Governor’s Task Force on Homeland Security

- Coordinates efforts to detect and deter threats
- Assures Texans of state and local preparedness to respond to threats
- Assesses ability of state and local governmental agencies to respond to threats and to effectively provide victim assistance
TxDOT Preparedness, cont’d.

Governor’s Task Force on Homeland Security - cont’d.

- Aids coordination among federal, state, and local efforts
- Develops recommendations on how to improve Texas’ ability to detect, develop and coordinate response to any terrorist events
TxDOT Preparedness, cont’d.

Governor’s Task Force on Homeland Security - cont’d.

- Helps Texas coordinate with federal Office of Homeland Security
- TxDOT, as a member of the DEM Terrorism Working Group, is a resource agency
Future Preparedness

- TxDOT training for terrorism recognition and awareness
- TxDOT to serve on State Preparedness Council for Bio-terrorism, sponsored by Texas Department of Health
Questions?
Thank You