BUILDING AN EMPIRICAL FOUNDATION FOR ALLOCATING SECURITY RESOURCES TO REDUCE RISKS IN SURFACE TRANSPORTATION--THE MTI DATABASE

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PREVENTION REALLY MEANS RISK REDUCTION

- One hundred percent prevention of attacks is an unrealistic goal--if we're in a war, we must anticipate losses
- Passenger volumes, required ease of access, constraints on budgets and delays preclude the application of an aviation security model to public surface transportation
- Realistically, the goal is risk reduction

RISK REDUCTION MEANS RAISING THE STAKES FOR THE ATTACKERS WHILE REDUCING FRIENDLY CASUALTIES AND MINIMIZING DISRUPTION

- **Risk reduction comprises all measures to deter, detect, and prevent successful attacks…**
- **Or make things more difficult for the attackers**
- **Reduce casualties if an attack occurs, and…**
- **Effectively respond to save lives and restore operations**
- **In aviation, the emphasis is on the front end--deterrence, detection and prevention**
- **In surface transportation, the effort is more evenly spread across the spectrum**

TO EFFECTIVELY ALLOCATE LIMITED SECURITY RESOURCES, ACCURATE THREAT INFORMATION IS NEEDED

- **Ideally, intelligence efforts will be able to uncover and thwart all terrorist plots (five attacks against surface transportation in U.S. foiled since 9/11)**
- **Perfect intelligence would obviate need for security--but intelligence is not perfect**
- **Absent specific warning, security must be based upon analysis of past attacks and current trends to anticipate terrorist targets and tactics**

THREAT INFORMATION CAN BE GAINED FROM:

- **Detailed case studies of past events to illustrate terrorist tactics and distill lessons learned**
- **Quantitative analysis of all past events to identify terrorists targets, tactics, techniques, and trends**

MTI'S CASE STUDIES

- **IRA's 25-year campaign against rail and tube**
- **1995-96 terrorist campaign in France**
- **1995 sarin attack in Tokyo's subway**
- **1995 Amtrak derailment**
- **1995 attempted TGV derailment**
- **2004-2006 Madrid, London, and Mumbai attacks**

THERE IS NO KNOWN COMPREHENSIVE LIST OF ACCURATE DATA THAT ALLOWS FOR DETAILED EMPIRICAL ANALYSIS OF TERRORIST ATTACKS IN PUBLIC SURFACE TRANSPORTATION

- **In general databases, transportation details have to be culled out--not easy**
- **No existing general data has all transportation events**
- **All databases miss some**
- **Some inaccuracies in all**
- **The MTI database will include and augment all known lists in the U.S.**

MTI'S DATABASE OF TERRORIST ATTACKS ON SURFACE TRANSPORATION

- **1,633 attacks on public surface transportation (1,211 explosive or incendiary attacks)**
- **January 1970 to present (some incidents between 1920 and 1970)**
- **Database being expanded with fill-ins from the past and new incidents--adding about 75 incidents a month plus 2 to 3 new attacks a week**
- **We expect to go past 2,000 incidents**
- **Variety of sources: MTI chronology, UMSTART, MIPT, RAND, Public FTA/TSA chronology, news media, etc.**

10+ CURRENT FIELDS WITH OVER 100 DATA CELLS

- **Geographic distribution**
- **Targets (37)**
- **Weapon and attack mode (26)**
- **Explosives used (8)**
- **Location (above ground, enclosed area, etc.)**
- **Adversary intentions (derailment versus disruption)**
- **Different ways of delivering and concealing bombs(16)**
- **Single or multiple bomb**
- **Outcome (5)**

ALSO EXPANDING HORIZONTALLY--FUTURE DATA FIELDS

- **Timing of attacks (day of week, peak versus off-peak)**
- **Greater detail on target and physical environment**
- **Device details**
- **Success in detecting the attack/device**
- **Existing security measures**

SOME NOTEWORTHY FINDINGS

- **74% of all attacks involve explosives or incendiary devices**
- **181 attempts to derail trains**
- **32% of all attacks directed against trains, stations, tracks (22% against trains)**
- **48% directed against buses, depots, bus stops (41% against buses alone)**
- **10% against highway infrastructure**
- **Suicide bombers account for 5% of all attacks, but 10% of total fatalities**

SOME NOTEWORTHY FINDINGS (cont'd)

- **All attacks on surface transportation on average cause 3.8 fatalities**
- **All attacks on buses on average cause 4.8 fatalities per attack**
- **All attacks on surface trains cause 6.7 fatalities per attack**
- **All attacks on subway trains cause 13.2 fatalities per attack**
- **But bombs on buses cause an average of 5.3 fatalities while bombs on trains on average cause only 3.3 fatalities per attack**

SOME NOTEWORTHY FINDINGS (cont'd)

- **Shooters on average cause more fatalities (5.5) than bombs (3.3)**
- **85% of bombing incidents involve only one device, but 15% involve multiple devices**
- **77% of bombs detonate on target; 6% detonate early, fail to detonate or otherwise malfunction; 17% are rendered safe**
- **The deadliest attacks are bombs concealed on persons (6.8 fatalities on average); those placed near a bus (5.4); those concealed in bags (4.7); those left in passenger compartments (3.9)**

MTI'S DATABASE USED TO SUPPORT ON-GOING BUS OPERATORS TRAINING PROJECT

- **786 attacks directed against buses (66% against scheduled buses; 14% against bus stations; 6% against bus stops)**
- **Bombs account for 63% of all attacks on buses and 51% of all fatalities**
- **Bombs on scheduled buses account for 60% of all bomb attacks on buses and 85% of all fatalities**
- **Bombs concealed or left in passenger compartment are most common form of bomb attacks on buses (35%)**
- **But 61 suicide attacks average more than twice as many fatalities per attack**