Building Infrastructure and Protection Series

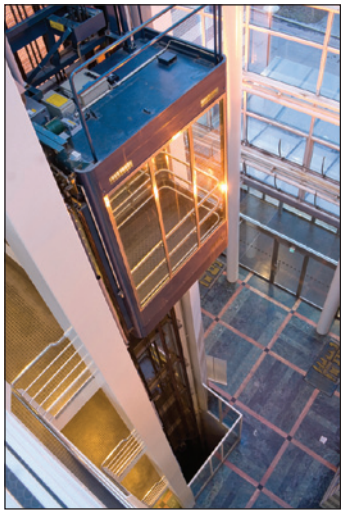
Integrated Rapid Visual Screening of Buildings

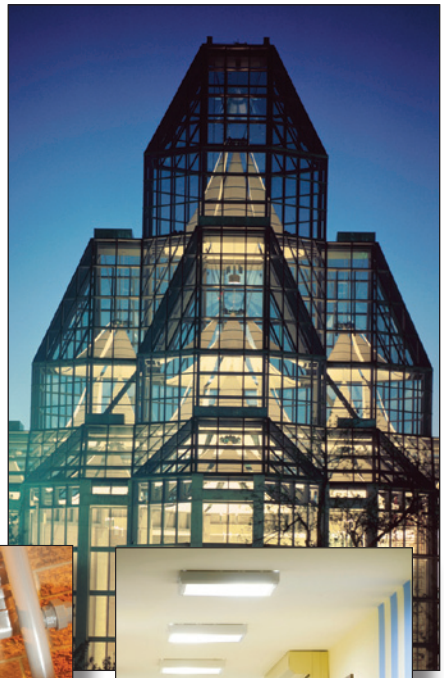
The U.S. Department of Homeland Security (DHS) Science and Technology (S&T) Directorate's Infrastructure Protection and Disaster Management Division (IDD) has developed an integrated rapid visual screening (IRVS) procedure for assessing the risk to a building from natural and human-caused hazards that have the potential to cause catastrophic losses (fatalities, injuries, damage, and business interruption). This procedure is an enhanced version of FEMA 455, Handbook for Rapid Visual Screening of Buildings to Evaluate Terrorism Risk, and includes improvements to the methodology, updates to the catalogue of building characteristics, and updates to the forms that incorporate natural hazards, building types, and critical functions.

IRVS is a simple and quick procedure for obtaining a preliminary risk assessment rating. Risk is determined by evaluating key building characteristics for consequences, threats, and vulnerabilities. The screening process can be conducted by one or two screeners and completed in a few hours. The procedure is intended to be used to identify the level of risk for a single building, to identify the relative risk among buildings in a community or region, and to be used as a prioritization tool for further risk management activities. Information from the visual inspection can be used to support higher level assessments and mitigation options by experts.

Goal

The goal of the IRVS procedure is to determine the level of risk to a building from natural and man-made hazards.





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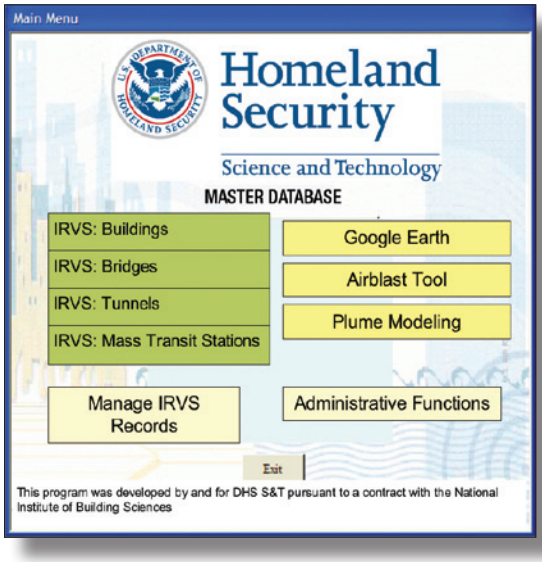
Homeland Security

Science and Technology

IRVS Threat Types and Scenarios

Threat Type	Threat Scenario
Internal	1. Internal Explosive Attack 2. Internal Chemical, Biological, Radiological (CBR) Release 3. Intrusion
External Explosive Attack	4. External Zone 1 Explosive Attack 5. External Zone 2 Explosive Attack 6. External Zone 3 Explosive Attack
External CBR Release	7. External Zone I CBR Release 8. External Zone II CBR Release 9. External Zone III CBR Release
Earthquake	10. Ground Shaking 11. Ground Failure
Flood	12. Stillwater 13. Velocity Surge
Wind	14. Hurricane (Wind and Water) 15. Tornado 16. Other High Wind
Landslide	17. Rainfall
Fire	18. Resulting from Earthquake 19. Resulting from Blast 20. Arson or Incidental



IRVS Database Software

With the improvements to the IRVS database software, the IRVS methodology is now completely digital. The software facilitates data collection and functions as a data management tool. Assessors can use the software on a PC tablet or laptop to systematically collect, store, and report screening data. The software can be used during all phases of the IRVS procedure (pre-field, field, and post-field).

Capabilities

- Digital catalogue and forms
- Field data collection and storage
- Automatic risk scoring
- Printable reports
- Interaction with Hazus-MH
- Google Earth application
- Fast running air blast tool
- Chemical, biological, and radiological (CBR) plume modeling
- Resiliency model
- Cost-effectiveness tool

Audience

- Engineers, architects, and other design professionals
- City, county, and State officials
- Emergency managers
- Law enforcement agencies
- Lenders
- Insurers
- Building owners/operators
- Facility managers
- Security consultants

IRVS Tools Timetable

- FY2010
  - IRVS Tool 2.0 for Buildings
  - IRVS Tool for Mass Transit Stations
  - IRVS Tool for Tunnels
  - IRVS Database Software
- FY2011
  - IRVS Tool for Bridges

Sample Building Characteristics

Consequences

- Locality Type
- Number of Occupants
- Replacement Value
- On Historic Registry
- Business Continuity
- Physical Loss Impact

Threat

- Occupancy Use
- Number of Occupants
- Site Population Density
- Visibility/Symbolic Value
- Target Density
- Overall Site Accessibility
- Target Potential

Vulnerability

- Site
- Architecture
- Building Envelope
- Structural Components and Systems
- Mechanical/Electrical/Plumbing Systems
- Security