

IDD Resilience Program

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Science and Technology Directorate
Infrastructure Protection and Disaster
Management Division

**Working toward Resilience in
the Built Environment**



**Homeland
Security**

Science and Technology

IDD Resilience Model

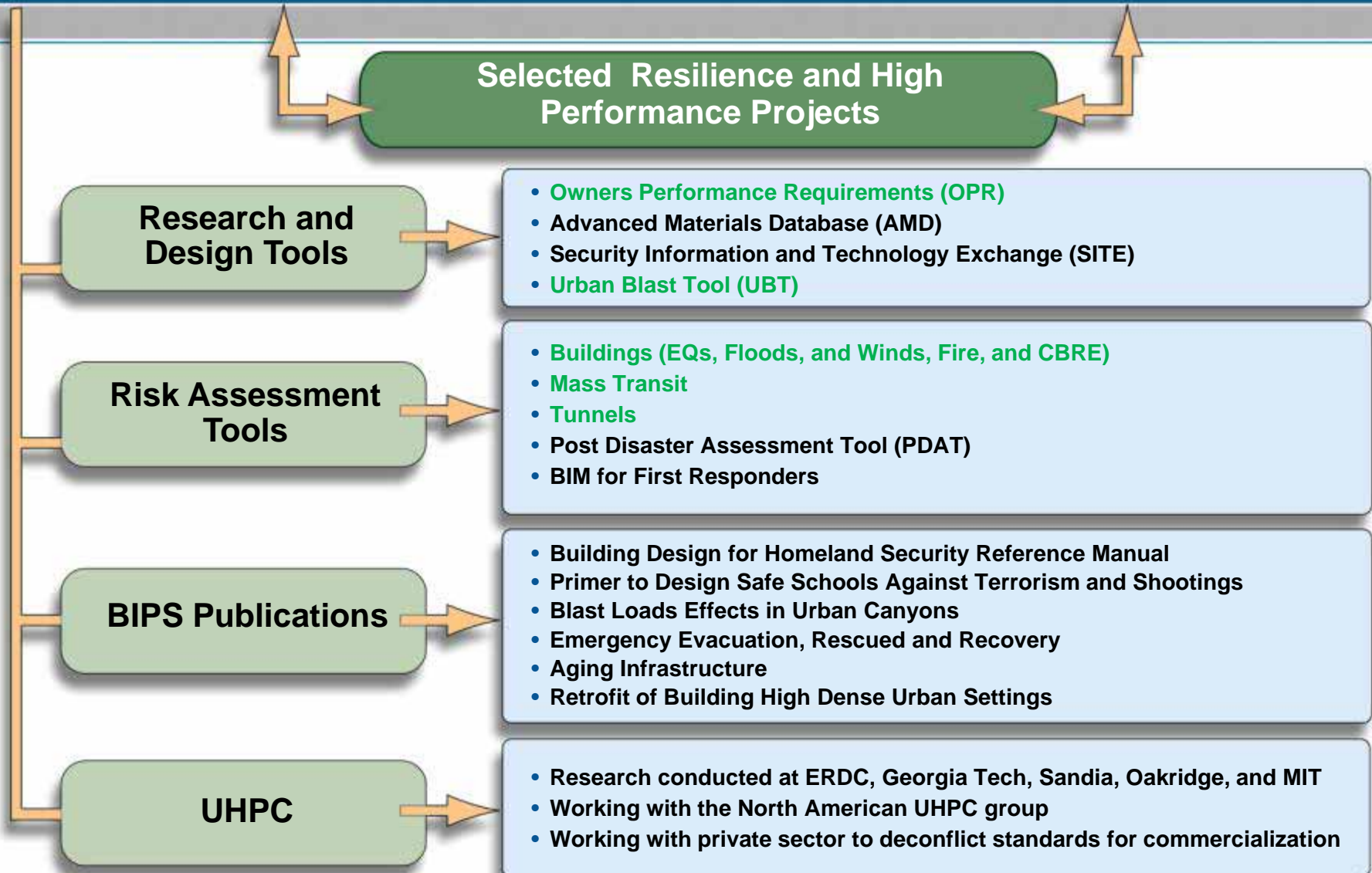
- Resilience will be achieved by the adoption of a model that allows the building community and its decision makers to adopt an integrated approach that promotes:
 - Blast, earthquake, high wind, and flood resistance and cyber security
 - Energy efficiency, environmental sustainability
 - Durability/extension of life and continuity of operations
 - Life Cycle and functional effectiveness and a high rate of return in high performance attribute investments



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IDD Resilience Project Taxonomy



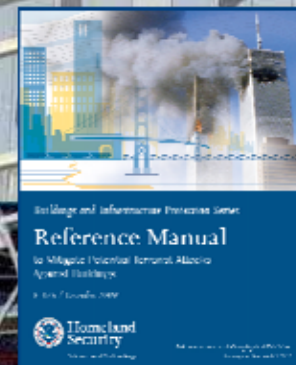
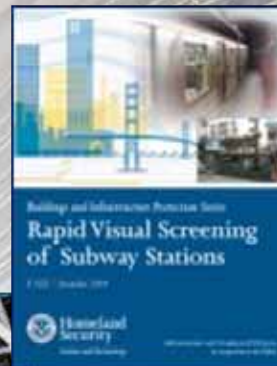
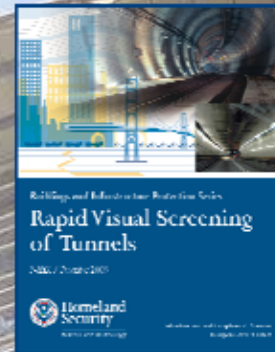
BIPS Publications

- **Publications**

- Aging Infrastructure
- **RVS Manuals**
- Update of FEMA 426
- Update of FEMA 428

- **IRVS Family**

- Buildings, Subway Stations, and Tunnels includes Blast, CBR, Earthquakes, High Winds, Floods, and Fire



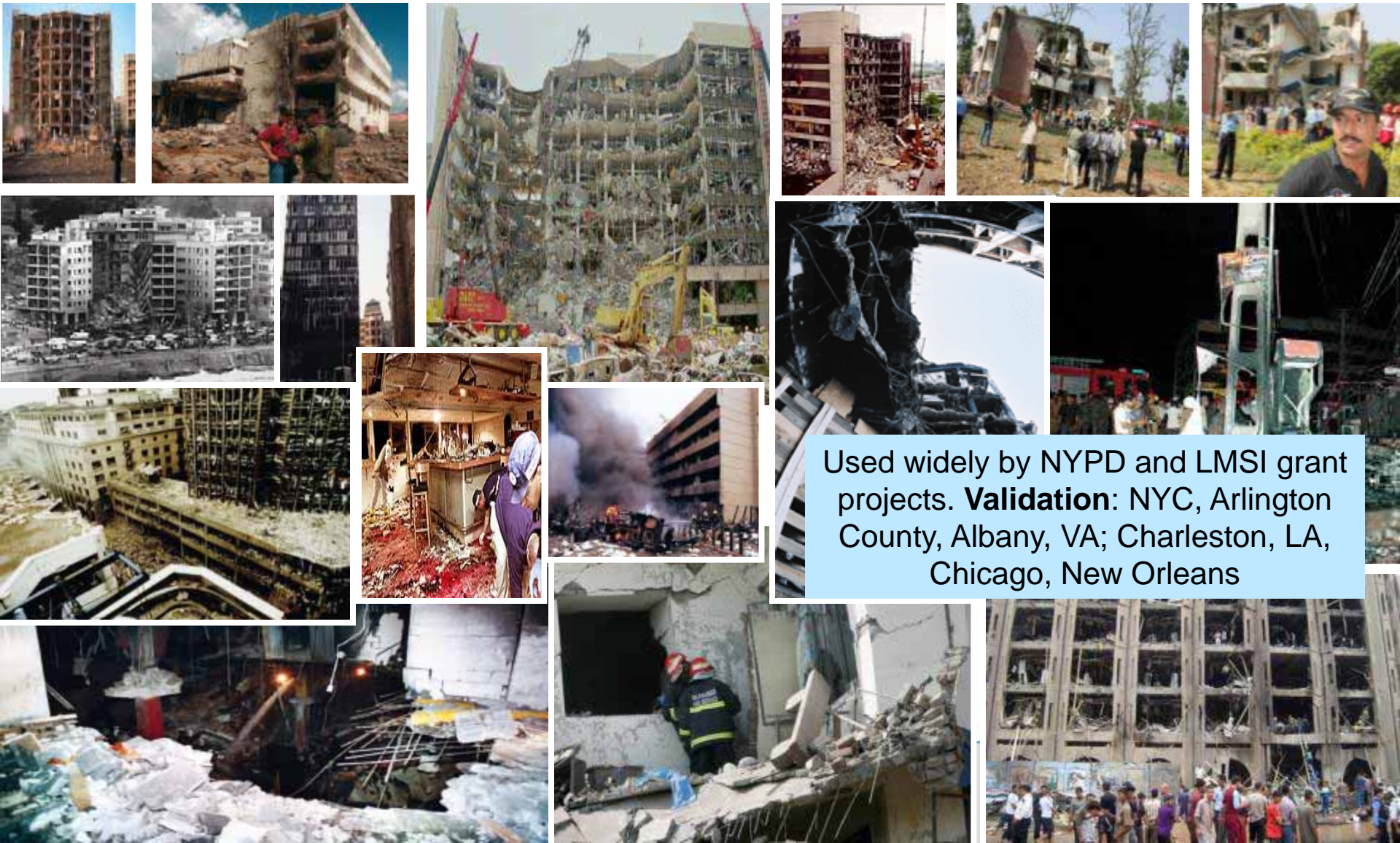
BIPS - IRVS

- The IRVS family is a software based tool
- Assessments take a few hours to complete
- Designed to be conducted by 1 or 2 screeners with limited expertise
- Expert knowledge has been embedded in the tool
- The tool scores risk and resilience

The image shows a stack of FEMA 455 Data Collection Forms, specifically Pages 2 through 7. The forms are titled 'VULNERABILITY ASSESSMENT RATING (Part V)' and 'ASSET VALUE & THREAT RATING'. The forms contain various tables and sections, including 'BUILDING CHARACTERISTICS', 'ATTRIBUTE OPTIONS', and 'THREAT RATING FOR GIVEN THREAT SCENARIO'. The tables have columns for 'ASSET VALUE' and 'THREAT RATING'.



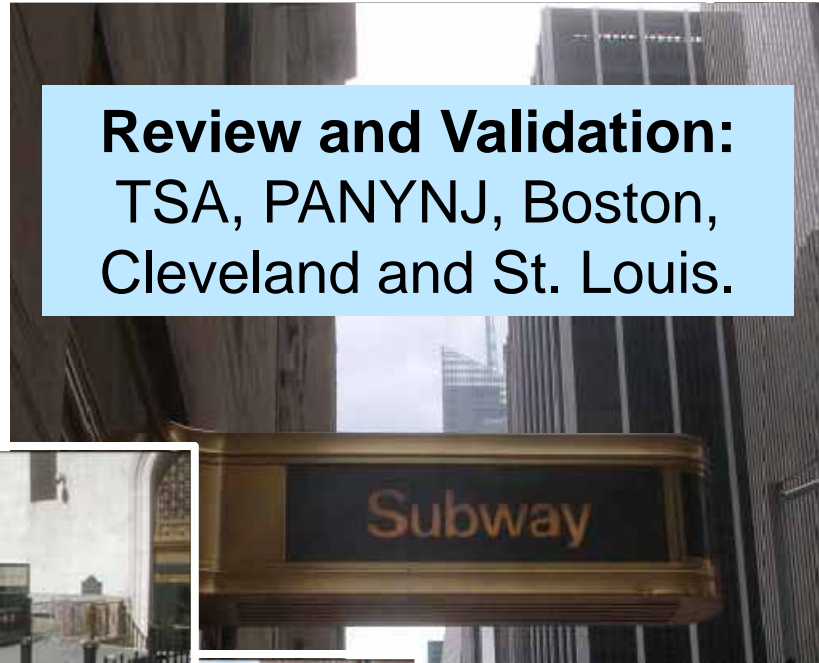
IRVS: Buildings



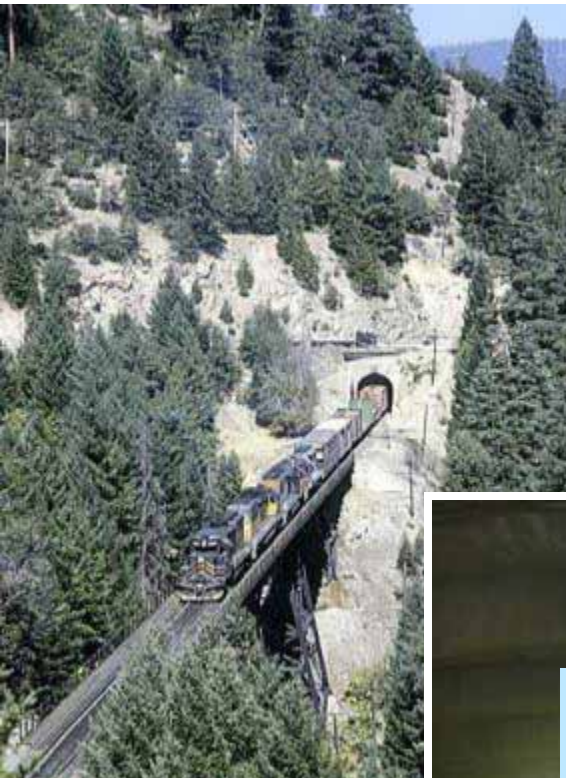
Used widely by NYPD and LMSI grant projects. **Validation:** NYC, Arlington County, Albany, VA; Charleston, LA, Chicago, New Orleans

IRVS: Mass Transit Stations

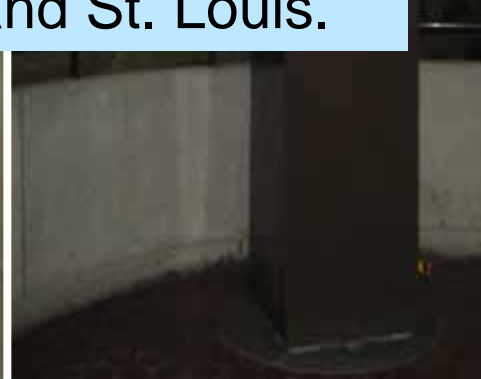
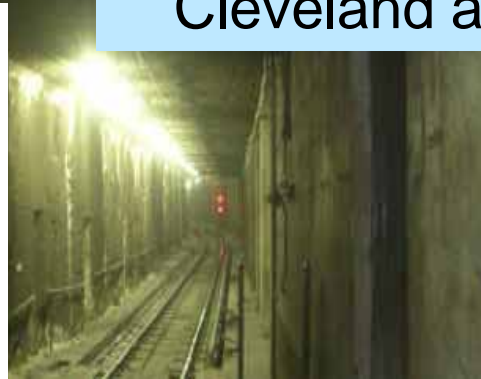
Review and Validation:
TSA, PANYNJ, Boston,
Cleveland and St. Louis.



IRVS: Tunnels



Validation: Boston, Cleveland and St. Louis.




BIPS - IRVS

iRVS Site Record

Facility Name *: Demo 2 Tunnel
Facility ID#: 1001
Org. Name: HIC
Address1: I95 Overpass to Rt. 1
Address2:
City: Demo City 2 **St**: VA
Zip: 12345 **Sector**: Transportation **Facility Importance**: Primary
Site Type*: Tunnel **Subsector**: Road

Default Facility Image: airintake1.jpg
Facility Descriptive Text:



Assessment(s) Desktop Work **Coordinates**

* Enter coordinates in either **DD:MM:SS.##-x** format or in: **Decimal Degrees ###.####**

Point Number	Lat DD:MM:SS.##-N	Long DDD:MM:SS.##-W	Lat Dec. Deg.	Long Dec. Deg.	Comment
1	40:45:25.60-N	073:59:49.25-W	40.75711	-73.99702	Demo Tunnel 2: West entr.
2	40:45:58.63-N	074:01:22.11-W	40.76628	-74.02281	Demo Tunnel 2: East entr.

Add coordinates for this site Plot These Lat/Long Help

Record: 1 of 2 No Filter Search

* Required Field(s) For Help, Press the F1 Key Close



BIPS - IRVS

iRVS Site Scoring

Hazards Desktop Structure Type Consequences Threat Site Architectural Building Envelope Structural MEP Fire -1 Fire -2 Security Cyber Continuity - Medical Opera < >

Question	Clear Choice	Choice	Red Flag	Unk	Comments	Value Returned	Key Cell
Hazard: Blast	<input checked="" type="checkbox"/>	▼ Blast	<input checked="" type="checkbox"/>	<input type="checkbox"/>	◆	X	E11
Hazard: CBR	<input checked="" type="checkbox"/>	▼ CBR	<input type="checkbox"/>	<input type="checkbox"/>		X	E12
Hazard: Seismic	<input checked="" type="checkbox"/>	▼	<input checked="" type="checkbox"/>	<input type="checkbox"/>	◆		
Hazard: Flood	<input checked="" type="checkbox"/>	▼ Flood	<input type="checkbox"/>	<input checked="" type="checkbox"/>		X	E14
Hazard: Wind	<input checked="" type="checkbox"/>	▼ Wind	<input type="checkbox"/>	<input type="checkbox"/>		X	E15
Hazard: Fire	<input checked="" type="checkbox"/>	▼	<input type="checkbox"/>	<input type="checkbox"/>			
Resiliency Computations (Required Question)	<input checked="" type="checkbox"/>	▼ Medical	<input type="checkbox"/>	<input type="checkbox"/>		X	H14

BIPS - IRVS

Risk and Resiliency Summary

RVS Building/Facility:

Facility ID#:

Assessment Date:

Site Type:

Scales	Scores and Color Mapping			
Risk Color Scale	0-30	30-50	50-70	70-100
Resiliency Color Scale	100-70	70-50	50-30	30-0

Summary Categories	Internal Intrusion	Internal Explosive	Internal CBR	Explosive Zone 1	Explosive Zone 2	Explosive Zone 3	CBR Zone 1	CBR Zone 2	CBR Zone 3
Total Consequences (%)	66.83%	59.61%	57.91%	61.97%	59.33%	69.13%	57.41%	61.75%	65.10%
Total Threat (%)	27.18%	66.34%	62.83%	85.34%	58.67%	49.69%	84.00%	71.16%	53.30%
Total Vulnerabilities (%)	8.92%	61.04%	61.62%	56.01%	57.28%	57.10%	57.42%	56.99%	60.93%
Total Risk Percent (%)	25.30%	62.26%	60.75%	66.66%	58.42%	58.10%	65.18%	63.03%	59.57%

Summary Categories	Earthquake General Shaking	Earthquake Ground Failure	Flood Stillwater	Flood Velocity Surge	Wind Hurricane	Wind Tornado	Wind Other	Landslide Rainfall	Fire From Earthquake	Fire From Blast	Fire From Arson
Total Consequences (%)	61.31%	59.45%	61.04%	59.50%	61.30%	61.97%	61.33%	61.47%	61.15%	63.67%	62.90%
Total Threat (%)	0.00%	0.00%	77.76%	78.22%	54.31%	48.44%	52.10%	62.05%	0.00%	67.89%	29.80%
Total Vulnerabilities (%)	30.30%	35.30%	35.34%	41.30%	42.99%	38.99%	39.50%	33.16%	2.04%	3.19%	3.12%
Total Risk Percent (%)	0.00%	0.00%	55.15%	57.71%	52.31%	48.92%	50.16%	50.19%	0.00%	23.97%	18.02%

Resiliency Scales (%)				
Performance Measure	Time Measure	Robustness Measure	Resource-fulness Measure	Recovery Measure
48.6%	47.3%	43.4%	43.6%	49.3%
Total Risk All Scenarios (%)		Resiliency (%)		
60.88%		29%		

Multihazards Interaction Matrix						
... will result in this change for other hazards:						
a change in:	Blast	CBR	Seismic	Flood	Wind	Fire
a change in Blast	100.0%	9.3%	33.0%	9.7%	47.5%	22.6%
a change in CBR	12.7%	100.0%	0.0%	16.8%	1.2%	5.2%
a change in Seismic	55.5%	0.0%	100.0%	35.9%	50.7%	16.3%
a change in Flood	7.5%	9.6%	16.7%	100.0%	8.8%	10.2%
a change in Wind	68.2%	1.3%	43.3%	16.3%	100.0%	16.1%
a change in Fire	83.2%	14.1%	35.7%	48.4%	41.5%	100.0%

Record: 1 of 6

No Filter Search

Print

Close





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