INTELLIGENT EVACUATION, RESCUE AND RECOVERY

- Real-time assessment of extent of blast damage to building. Full-scale BDA & TVA tool.
- Emergency preparedness planning and on-line dynamically updated instructions to evacuees.
- Dynamically updated instructions to rescue workers (paths to trapped evacuees & in seeking safe egress/refuge).
- Updated mitigation actions, optimal demolition/construction actions, restoring functionality of building.

The IERR system will aid decision-making processes in emergency preparedness and post-attack ERR operations:
- Will permit continuous assessment.
- Will provide dynamically updated instructions for on-line operations in response to evolving conditions.

**Network Representation**
The building corridors are represented as a network of arcs whose attributes change over time.

**Functional System Description**
Network representation is exploited in developing optimization techniques used to find best paths along which the evacuees and rescue workers are guided.

- Pre-event operational conditions of building & circulation systems
- Real-time update and prediction of structural performance, load carrying capacity & reliability of building
- Real-time update of operational conditions of circulation systems (e.g., collapse, fire)
- Communication between the system and the evacuees and rescue workers will be established by hand-held devices and changeable message signs...
- On-line information will be provided to rescue workers to enable them to reach the areas where help is needed as quickly as possible.

**System Benefits**
- Enables processes with reduced labor intensity, increased consistency, increased speed of response.
- Enables effective and objective exchange of information and rapid planning and execution.
- Meets complicated variable emergency conditions with lower resource requirements.
- Permits recovery efforts to begin quickly.
- Explicitly considers inherent stochastic and dynamic nature of future conditions.
- Employs information on current and near-term performance of building and its circulation systems.

Enables robust and rapid decision-making.
Robust evacuation plans that are quickly updated in response to evolving conditions aid in avoiding potentially unnecessary imposed risk and unnecessary lost lives.

**System Overview**
Enables prediction of future arc traversal time & capacity likelihoods.