



THE HIGH PERFORMANCE AND INTEGRATED DESIGN RESILIENCE PROGRAM

The High Performance and Integrated Design Resilience (HP&IDR) Program serves to improve the security and resilience of our nation's buildings and infrastructure. The program's overall goal is to better prepare buildings and infrastructure to recover from earthquakes, floods, and winds; explosive blast, chemical, biological, and radiological threats; or other disaster event by analyzing and compiling a range of high-performance requirements, including energy conservation, fire safety, environmental sustainability, durability, continuity of operations, and rapid recovery.

The program is supported by three primary paradigms: 1) that it is possible to provide a built environment that has the highest level of performance and resiliency in a comprehensive and cost effective manner; 2) that to achieve this, all facets of the process, from design to operation, must be integrated; and 3) that through high performance and integrated design, infrastructure can achieve resilience from a disruptive event.

The HP&IDR Program supports resilience in new and existing buildings by promoting an integrated approach to construction that addresses the capacity of the physical environment to anticipate, absorb, adapt to, and rapidly recover from a disruptive event.



High Performance and Integrated Design Resilience Program

Integrating Resilience into Building Infrastructure Design

High Performance and Integrated Design Resilience Program

INFRASTRUCTURE PROTECTION
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Homeland Security

Science and Technology

The High Performance and Integrated Design Resilience Program (HP&IDR) is under the purview of the DHS S&T IDD. Focused on new and existing buildings and infrastructure, it works to establish an overall resilience strategy for the nation that incorporates high-performance materials and technologies. In particular, HP&IDR strives to integrate and optimize the high-performance attributes included in the Energy Independence and Security Act (EISA) of 2007.

THE HP&IDR PROGRAM IS WORKING ON A VARIETY OF PROJECTS:

Owners Performance Requirements (OPR) Tool. This web-based tool allows owners to analyze a range of high-performance requirements (security, energy conservation and renewal, environmental sustainability, durability, and continuity of operations) to meet their business case model or mission. It lets owners evaluate the effects of changing goals and select the optimal outcome. The OPR Tool helps owners set requirements, view results, understand interactions and cost, and develop an analysis-based plan for the design team.

Integrated Rapid Visual Screening (IRVS) Tools. These user-friendly tools help law enforcement agencies, emergency managers, facility managers, engineers, and architects to obtain a preliminary risk assessment rating for buildings and infrastructure. The rapid visual screening procedure can be used to assess the risk to a tunnel, mass transit station, or building due to a terrorist attack and evaluate the potential catastrophic losses (fatalities, injuries, damage, and business interruption). The IRVS for buildings addresses Chemical, Biological, Radiological and Explosives (CBRE), earthquake, winds, floods and fires. Experts can use the IRVS Information to support higher-level assessments and mitigation measures.

Ultra-High Performance Concrete (UHPC). This material, currently in development, is a high-performance concrete that is being formulated to be easily used when an all-hazard, integrated approach is required. The UHPC needs to meet performance requirements for explosives and other natural hazards such as earthquakes, floods, winds, and fire. Product benefits need to include durability, fewer reinforcement requirements, and low project maintenance. It also must be affordable and competitive in the U.S. market.

Urban Blast Tool (UBT). This tool lets law enforcement and first responders estimate the intensity of potential blast effects caused by a suspicious vehicle, suicide bombers, or packages left behind in an urban environment. The fast-running tool accesses a database

containing analysis, calculations, and modeling that take into account different sizes and shapes of explosive threats, as well as detonation location.

Building and Infrastructure Protection Series (BIPS). This series of publications provides design professionals and owners/operators of critical infrastructure with state-of-the-art research on protecting buildings and infrastructure against terrorist attacks. The series covers a variety of topics, such as protecting college campuses against shootings and techniques for performing risk assessments for mass transit, tunnels, and buildings.

- Preventing Structures from Collapsing to Limit Damage to Adjacent Structures and Additional Loss of Life when Explosives Devices Impact Highly Populated Urban Centers
- Integrated Rapid Visual Screening for Mass Transit (Available)
- Integrated Rapid Visual Screening for Tunnels (Available)
- Integrated Rapid Visual Screening for Buildings (Currently only available to a reduced audience)
- Reference Manual to Mitigate Potential Terrorist Attacks Against Buildings (Summer 2011)
- Primer to Design Safe School Projects in Case of School Shooting and Terrorist Attacks (Summer 2011)
- Aging Infrastructure: Issues Research, and Technology (Available)

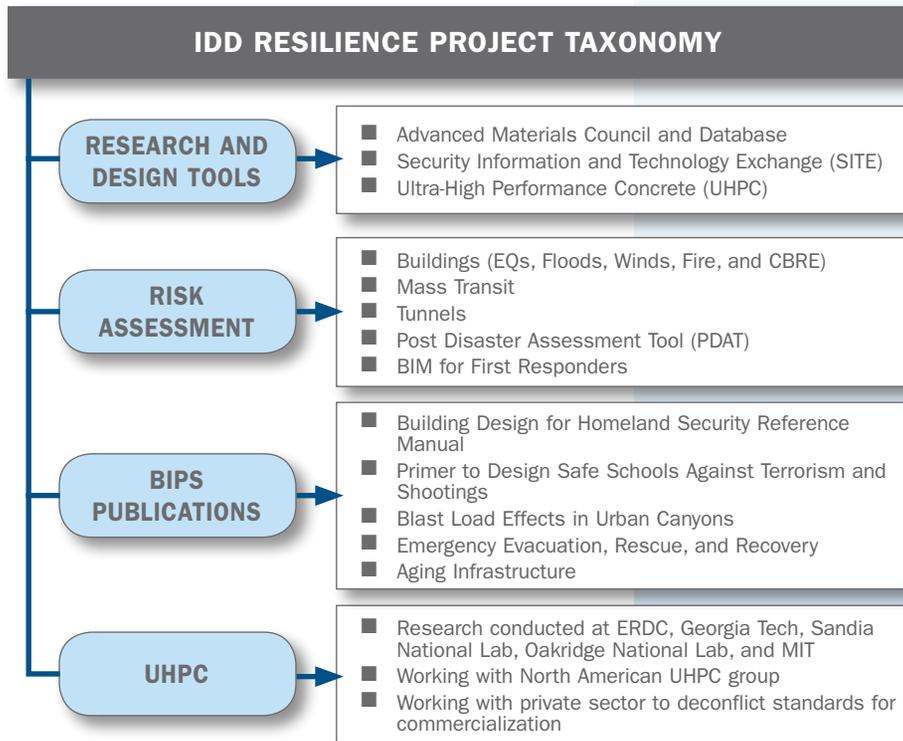
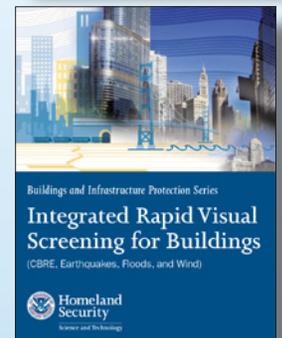
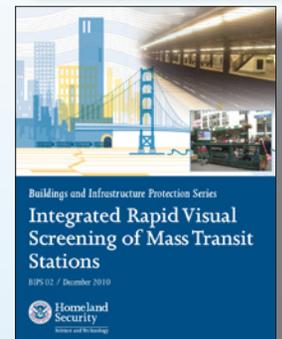
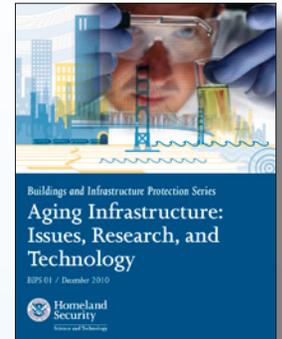


Figure 1. Select IDD Resilience Projects