Infrastructure/Geophysical Division Overview

NDIA Conference

Mike Matthews
Infrastructure/Geophysical Division
Department of Homeland Security
Science and Technology Directorate
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Homeland Security

Infrastructure/Geophysical Division

Mission Statement: Increase the Nation's preparedness for and response to natural and man-made threats through superior situational awareness, enhanced emergency responder capabilities, and critical infrastructure protection.

Key Deliverables:

- Decision tools for interdependency analysis of sectors
- Protective measures for critical infrastructure against multiple hits
- Advanced first responder technologies, such as
  - 3-D locator for person (i.e. firefighter) in building
  - Real-time system for stand-off measurement of structural stability
  - Advanced urban search and rescue breaching tool
- Next generation protective gear for first responders
- Unified Incident Command Decision Support for multiple jurisdictional response
- Interactive emergency response training and exercise system
- Unified blast tool for critical infrastructure
- Evacuation, surge capacity modeling
- Real-time decision support tools

Customers: Office of Infrastructure Protection, Preparedness, FEMA

End User: First responders, S/L/Fed emergency managers and Private Sector infrastructure owners and operators

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Thrust Areas:	**Programs:**
	Enabling Homeland Capabilities (EHC):
Critical Infrastructure Protection (CIP)	• Protective Technologies • Modeling, Simulation, and Analysis • Advanced Surveillance • Rapid Response and Recovery
Geophysical	• Southeast Region Research Initiative (SERRI)
Preparedness and Response (P&R)	• Incident Management Enterprise • Integrated Modeling, Mapping and Simulation for Incident Planning and Response • Personnel Monitoring and Tracking

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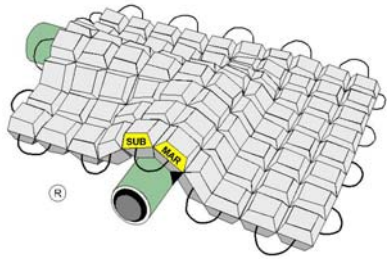
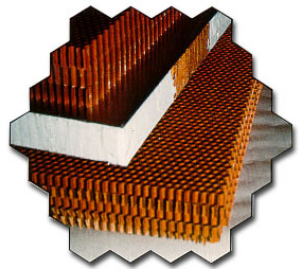
Protective (Risk Reduction) Technologies - EHC



•Enable owners and operators of the most vital critical infrastructure sites to implement affordable, reliable blast and projectile mitigation measures

•Improve Critical Infrastructures and Key Resources (CI/KR) capabilities to withstand blast and projectile threats



•Provide design and innovative construction methods to harden or increase resiliency of critical assets

•Provide innovative response technologies to prevent catastrophic losses

Current Programs:	**Future Programs:**
• Blast Analysis Tool for CI	• Advanced materials and blast mitigating design tools • Blast mitigating materials that can be retrofitted into existing CI (performer TBD)

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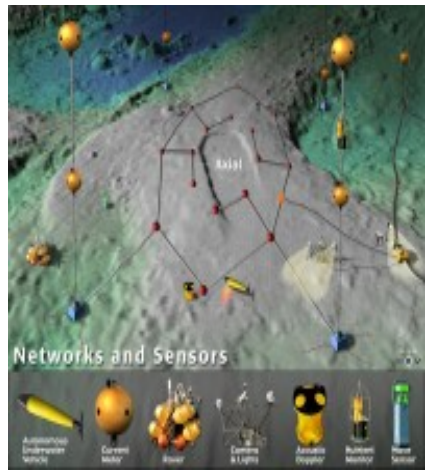
Modeling, Simulation and Analysis - EHC



- Aid in understanding consequences of policy and investment options before enacting solutions
- Enable rapid examination of: interdependencies; trade-offs between risk reduction benefits and protective actions costs; the incorporation of threat information; vulnerability assessments; and disruption consequences
- Visualize analytically-based, quantitative changes in risk and readiness conditions as a function of resource investments
- Facilitate “what-if” scenarios and near real-time analysis of emerging threats

Current Programs:	**Future Programs:**
• Critical Infrastructure Protection Decision Support System	• Real-time database updating capability, using sensor and software technologies (performer TBD) • Real-time Decision Support System for Federal decision-makers

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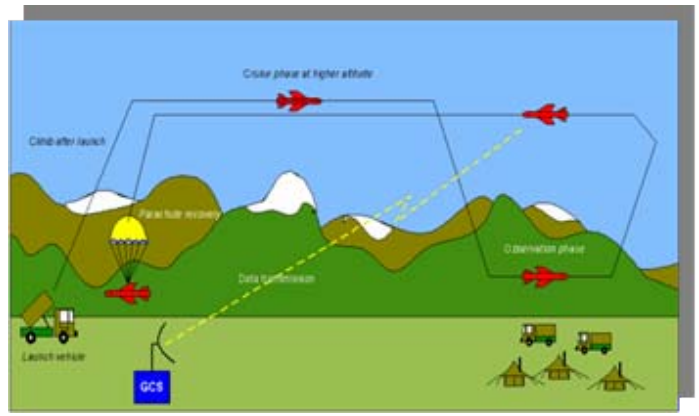
Advanced Surveillance and Detection - EHC

- Examine other agencies' activities in advanced surveillance and detection
- Transition other agencies' GOTS and COTS for Critical Infrastructure Protection
- Integrate affordable, effective, chemical, biological, and explosives detection into Critical Infrastructure and key assets
- Facilitate testing environments for suites of advanced surveillance and detection technologies



Current Programs:	**Future Programs:**
• Examine other agencies' activities in advanced surveillance and detection	• Testing and Evaluation of Advanced Surveillance and Detection technologies in IP environments

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Rapid Response and Recovery - EHC

• Develop rapid response and recovery technologies for infrastructure assets, including underwater tunnels, levees, and dams

• Integrate technologies into testing environments

• Facilitate deployment of tested technologies – may include program to make technologies affordable, or for appropriate retrofit

Current Programs:	**Future Programs:**
• Rapid Levee Repair	• Development of Tier 1 and 2 rapid response and recovery technologies

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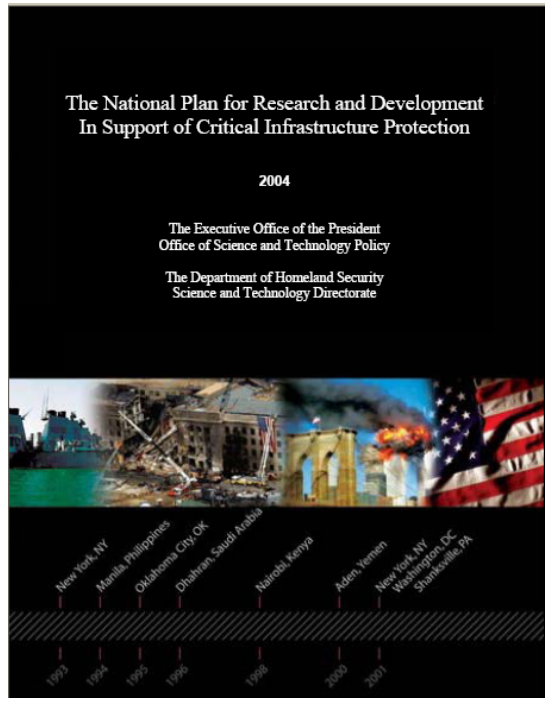
National CIP R&D Plan - EHC

• DHS S&T is required to develop the annual Update to the NCIP R&D Plan in coordination with the OSTP by Homeland Security Presidential Directive – 7

• Providing the first and only National coordination program for Research and Development in Critical Infrastructure Protection



Current Programs:	Future Programs:
• Currently getting the 2006 Update to the National CIP R&D Plan signed off by DHS and OSTP	• Development of updated plans and roadmaps for CIP Research and Development (performer TBD)

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Southeast Regional Research Initiative (SERRI)

Research Topics Areas

- Structural Water Management
  - Levees, Dams, Marshes, Spillways and Floodgates
- Natural Disaster Recovery
  - Innovative Debris Removal
  - Sustainable Reconstruction
  - Rapid Restoration of Services
- Building Regional Resilience
  - Mutual Aid Structures
  - Continuity of Operation Plans
  - Decision Maker Awareness Training
  - Business Cases for Regional Resilience

Research Partners

- Oak Ridge National Laboratories
- Mississippi State University
- University of Mississippi
- Southern Mississippi University
- Alcorn State University
- Jackson State University

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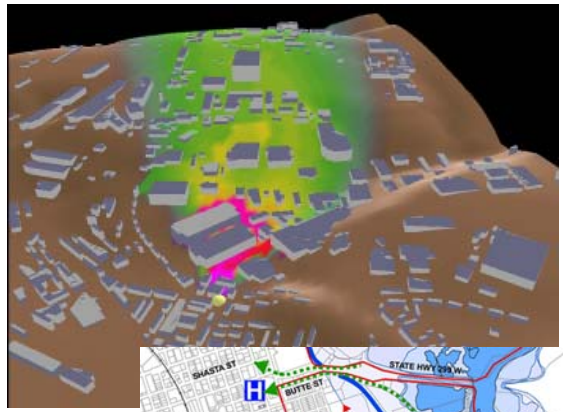
EHC: Integrated Modeling, Mapping, & Simulation

- Models of possible hazards from a wide range of natural and terrorist events (NRP)
- Predictive route mapping during mass evacuations or the post-event flow of emergency supplies
- Impact Analysis – Natural and Terrorist Events



Current Program:	**Future Program:**
• Modeling Pilot in NY	• Model and Simulation Based Disaster Planning

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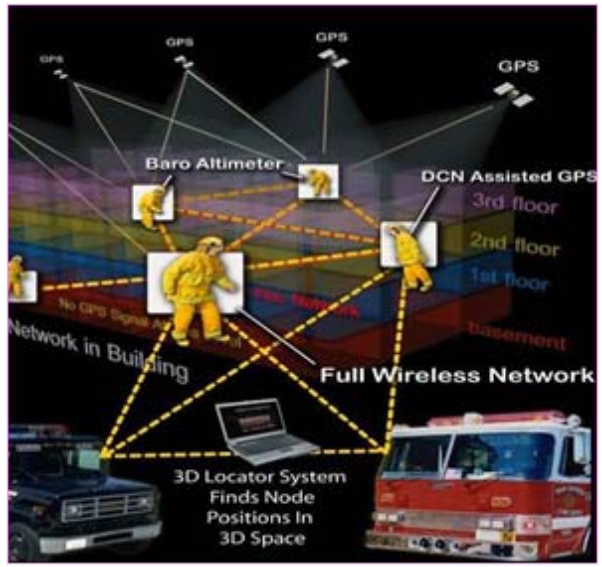
EHC: Emergency Responder Technology

- Develop advanced protection technologies for first responders, emergency managers, and incident commanders
- Real-Time Tracking and Monitoring
- Situational Awareness for Incident Commanders



Current Program:	**Future Program:**
• Prototype 3D Locator Sensor for First Responders	• Responder Locator System • Physiological Monitoring System

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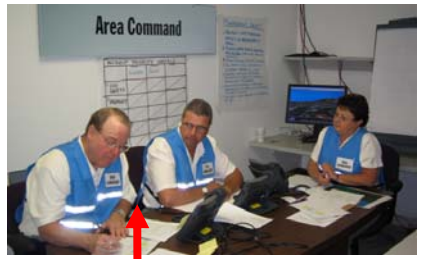
EHC: Incident Management Enterprise

- Situational awareness of incident activities for Incident Manager
- Unified Incident Management Common Operating Picture
- Incident Information and Resource Management



Current Program:	**Future Program:**
• Unified Incident Command and Decision Support (UICDS) • Simulation Based Training and Decision Analysis [Training Exercise & Lessons Learned (TELL)]	• Advanced Incident Management Enterprise System

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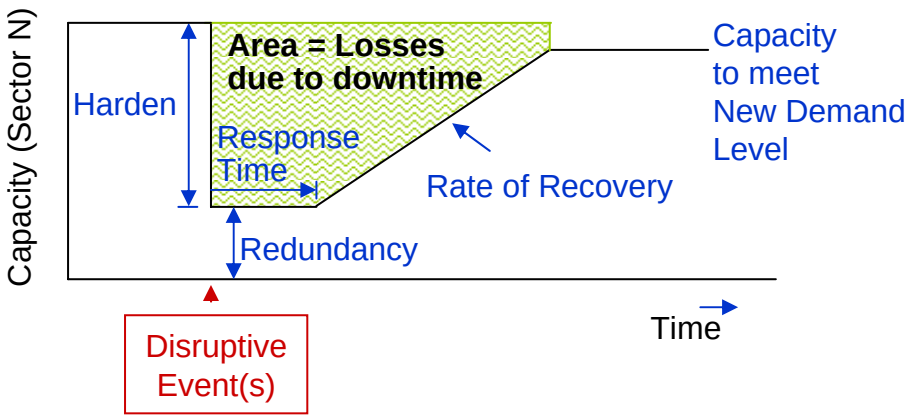
Critical Infrastructure Protection

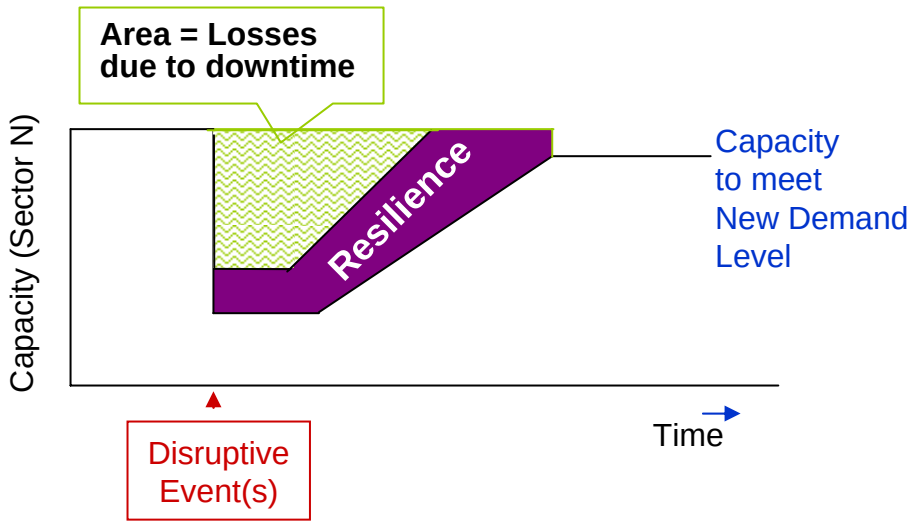
High Impact Technical Solutions

- Wide area surveillance and change detection for urban and remote locations
- Resilient Tunnel – ways to rapidly limit extent of damage in tunnel emergencies

Homeland Innovative Prototypical Solutions

- Resilient electric grid – prevent cascading effects of surge
- Levee evaluation, strengthening, and rapid repair
- Hurricane mitigation and storm surge defeat





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What We Need From You:

Critical Infrastructure Protection

- Real-time data collection
- Advanced surveillance
- Hardening technologies
- Automatic response/repair
- Rapid reconstruction
- Strong economic and systems modeling
- Insights for private industry technical directions
- Critical infrastructure sector requirements

Incident Management

- Insight into internal R&D Programs
- Systems in difficult environments
- Plug&Play, interoperable, distributed modeling & simulation
- Intelligent, easy to use, secure workflow IM engines
- Innovative System integration framework/platform
- Integrated First Responder protection systems

Natural Hazards

- Hurricane Mitigation
- Storm surge defeat
- Long-term solutions, sustainable
- Early warning for all hazards
- Affordable protection
- Flood proofing – e.g. hospitals
- New directions from basic research
- Full spectrum of hazards

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