



**Homeland  
Security**

# S&T Stakeholders Conference

## Infrastructure and Geophysical Division Overview

Mary Ellen Hynes  
Director of Research  
Infrastructure and Geophysical Division  
Science and Technology Directorate



June 2-5, 2008

*PARTNERING FOR A SAFER NATION*

# Infrastructure/Geophysical Division

- **IGD Mission space:**
  - first responders/emergency management & preparedness
  - natural hazards of all types; accidents, and other man-made events
  - infrastructure protection – all hazards
- **Coordination activities:**
  - All: S&T, fed agencies, states, universities, labs, OSTP, HSC, NSTC, NAS, CIPAC, IPTs, associations (PERSI, ASIS, ASCE, others), & international with SME team – examine budgets, determine requirements and shared interests, hold meetings/workshops
- **Gap Analysis:** intelligence, sectors, risk, components, policy
- **Next:**
  - Mature plans within IGD, S&T, DHS components; unite with NAS, OSTP, NSF, NIST, PERSI, CIPAC, IPTs, & others in future plans; update given progress; develop metrics and exit strategies



**Homeland  
Security**

# IGD Goals

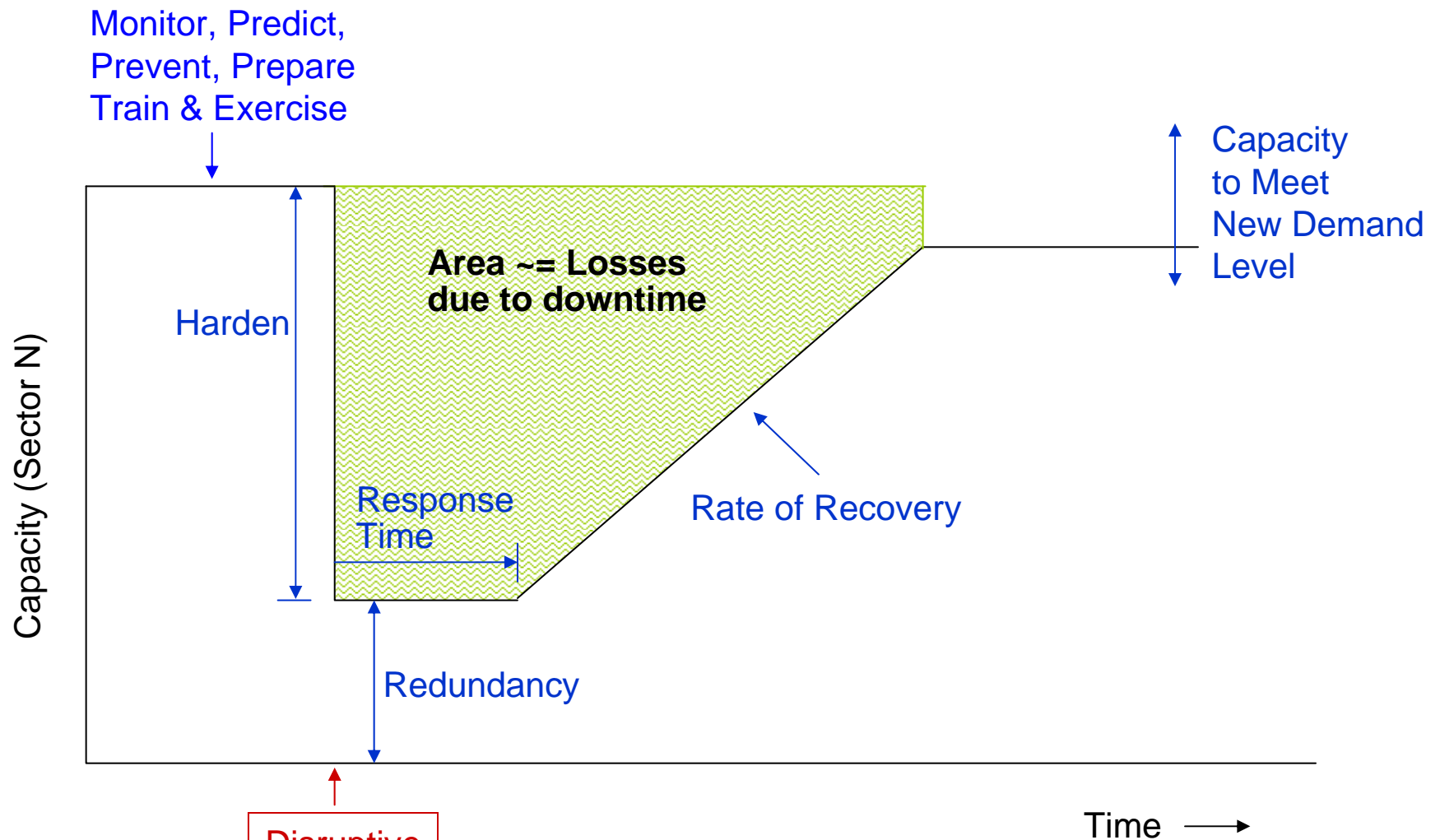
## IGD Goals:

- SUPERIOR SITUATIONAL AWARENESS:
  - Informed by sensing, analysis & decision support systems
  - Scaled & available to multiple decision makers and incident command
- FIRST RESPONDERS AND EMERGENCY MANAGERS: Fully enabled to rapidly, safely, and effectively respond to any damaging event
- INFRASTRUCTURE OF THE FUTURE:
  - resilient communities, states & regions
  - self-diagnosing, self-healing infrastructure
  - Sustainable, multi-hazard design
    - *Global supply chain dependencies, balanced investments*



**Homeland  
Security**

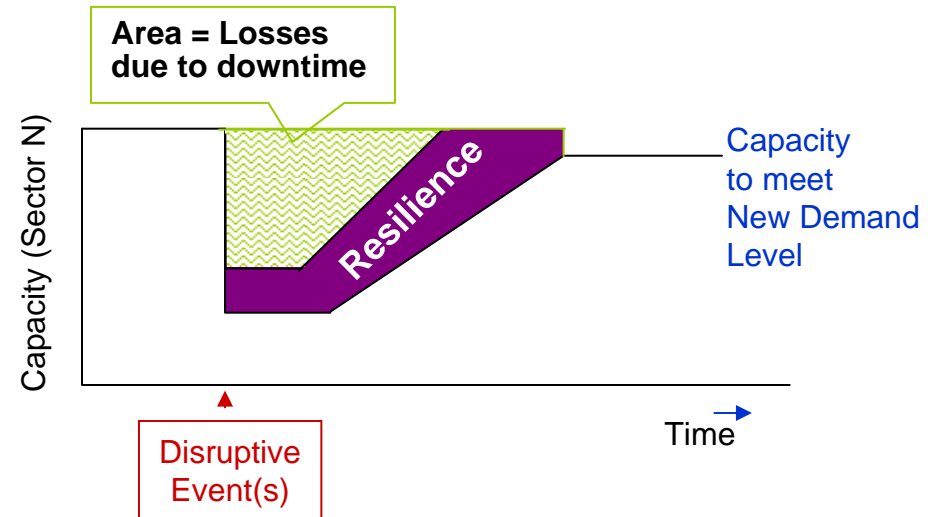
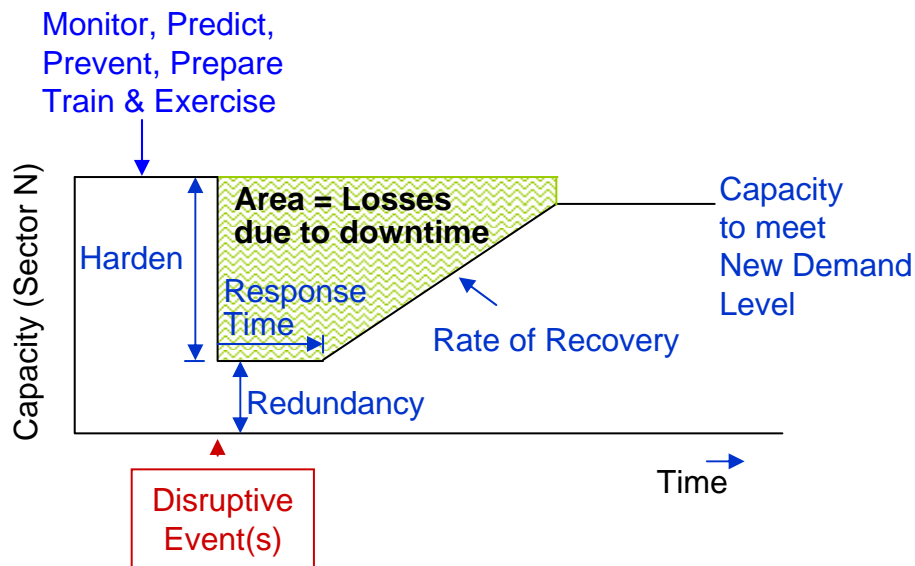
# Minimize Losses, Minimize Downtime



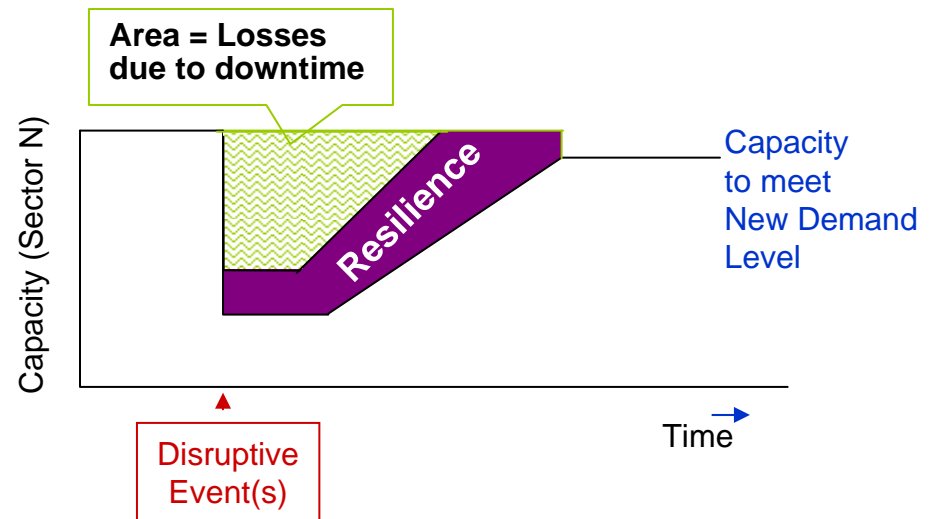
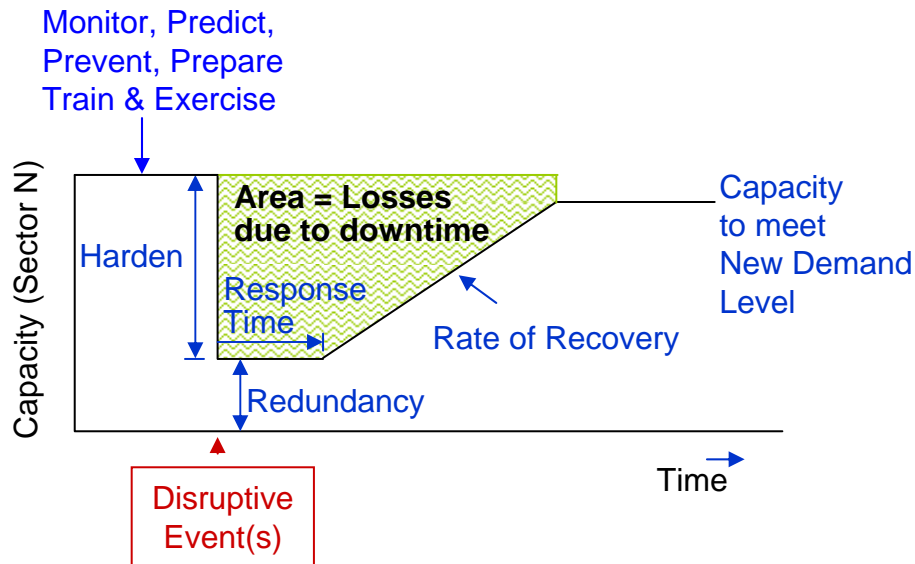
Homeland Security

Disruptive Event(s)

# Minimize Losses, Minimize Downtime



# Minimize Losses, Minimize Downtime



## National Objectives:

- Minimize loss of life
- Minimize downtime/economic losses
- Enable first responders
- Minimize environmental consequences
- Enable continued societal objectives




**Homeland Security**

## Criteria for Success - Solutions are:

- Practical
- Effective
- Affordable
- Sustainable
- Attractive in the marketplace

# IGD Program Drivers

<p><b>University - COEs</b></p> <p>CREATE – economics and risk assessment</p> <p>PACER – public health and response to WMD</p> <p>SMART – intelligence and human factors</p> <p>CAMRA – microbial risk assessment</p> <p>Food defense (NCFPD) and zoonotic diseases (FAZD)</p> <p>Discrete Sciences &amp; Visualization</p> <p>Explosives detection &amp; countermeasures</p> <p>Border security &amp; immigration</p> <p>Maritime, island &amp; remote/extreme environments</p> <p>Natural hazards, coastal infrastructure, and emergency management</p>	<p><b>Sectors</b></p> <p>Ag &amp; Food</p> <p>Banking &amp; Finance</p> <p>Chemical</p> <p>Commercial facilities</p> <p>Dams</p> <p>Defense industrial base</p> <p>Emergency services</p> <p>Energy</p> <p>Government facilities and schools</p> <p>Information technology</p> <p>Manufacturing</p> <p>National monuments &amp; icons</p> <p>Nuclear</p> <p>Postal &amp; shipping</p> <p>Public health &amp; healthcare</p> <p>Tele-communications</p> <p>Transportation</p> <p>Water</p>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• CBRN - <i>others</i></li> <li>• Cyber - <i>others</i></li> <li>• Assault, hijacking, hostage, intrusion</li> <li>• IEDs – vehicle, person, marine</li> <li>• Guided and unguided projectiles</li> <li>• All natural hazards and accidents (fire, deterioration, mold, flood, drought, wind, landslides, nasty spills, seismic, volcanic eruptions, more...)</li> <li>• New, more, others</li> </ul>	<p><b>IPTs</b></p> <ul style="list-style-type: none"> <li>• Information sharing</li> <li>• Border security</li> <li>• Chem/bio defense</li> <li>• Maritime security</li> <li>• Cyber security</li> <li>• Transportation security</li> <li>• Counter-IED</li> <li>• Cargo security</li> <li>• People screening</li> <li>• Infrastructure protection</li> <li>• Preparedness &amp; response: incident management</li> <li>• Preparedness &amp; response: interoperability</li> </ul>
 <p><b>Homeland Security</b></p>		<p><b>Others:</b></p> <ul style="list-style-type: none"> <li>• NAS, OSTP, NIST, NSF, NSTC, HSC,</li> <li>• labs, universities</li> <li>• professional groups</li> <li>• international</li> <li>• national strategies,</li> <li>• other policy &amp; research sources</li> </ul>	<p><b>S&amp;T Divisions:</b></p> <ul style="list-style-type: none"> <li>• CBD</li> <li>• BMD</li> <li>• EXD</li> <li>• HFD</li> <li>• CCI</li> <li>• IGD</li> </ul>

# IGD program overview

Full time-spectrum activities

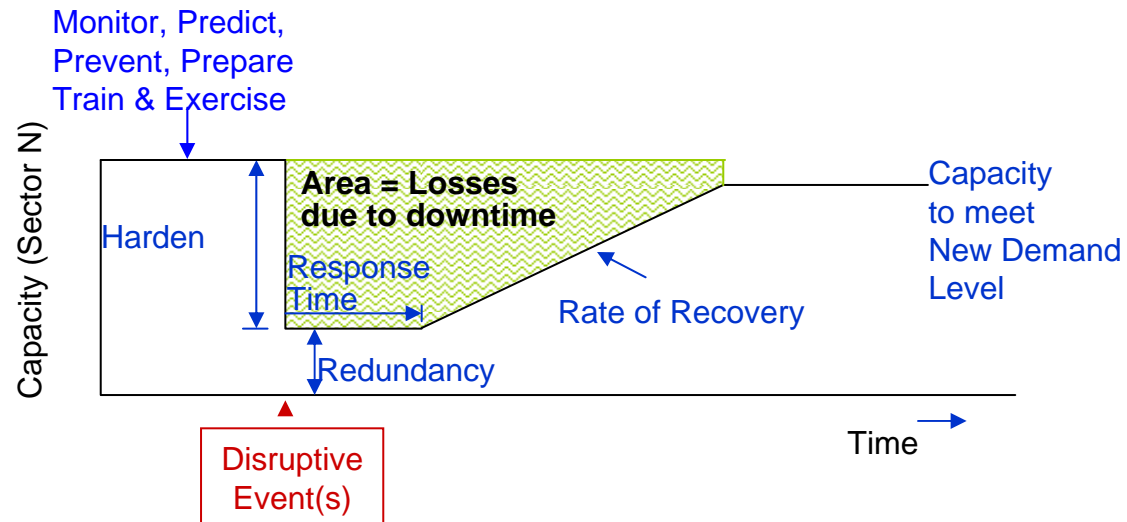
Modeling, simulation and analysis platforms for decision support, consequence estimation, multi-hazards planning, policy evaluation, logistics, incident command, building and regional evacuation, and training

Understanding emerging technologies, threats, economics, social issues, supply chains, political will and community commitment, and how they influence IGD activities

Advanced surveillance, situational awareness, predict natural events

Harden

Blast and projectile analysis & protection, to include advanced materials and sustainable design for many threats, and fundamental phenomena



Respond

First responder and emergency management technologies (such as 3D locator, escape hood, new jack hammer, new protective suits...)

Rapid response & recovery technologies for infrastructure and first responders (e.g., SAFE, Hurricane Mitigation, Levees, temporary and permanent construction)



**Homeland Security**





Homeland  
Security