First Responder Support
Beyond the ability of single state/local agency to address all capability needs

DHS S&T mission provides support when:
- Needs cannot be satisfied at the state and local level; and
- Investments in science and technology can provide national advances to first responders

Project Responder initially funded in April 2001
Technology Adoption Studies started in 2014
Evaluation of R&D Impact on first responders started in 2017
Project Responder Timeline

2001
• Project Responder
  • National Technology Plan for Emergency Response to Catastrophic Terrorism

2008
• Project Responder 2
  • Review of Emergency Response Capability Needs

2011
• Project Responder 3
  • Toward the First Responder of the Future

2014
• Project Responder 4
  • 2014 National Technology Plan for Emergency Response to Catastrophic Incidents
  • Evaluation Studies

2017
• Project Responder 5
  • Evaluation Studies

2019
• Project Responder 6
Evolving Response Environment
First Responders Face Diverse and Evolving Threats

Threats and Hazards
Increased frequency and severity of violent incidents and natural disasters

Human Behavior and Perception
Human activities and threat perceptions affect how people act during incidents

Media Coverage
Incident details are disseminated at an accelerated pace and distance, often in real time and from victims and bystanders

Advances in Technology
Ever greater access to new technologies that improve responder capabilities
Capability domains are broad operational categories where similar needs are consistently identified. Such categories provide an organizational construct for the discussion of response needs.
# PR Priorities Across Time

<table>
<thead>
<tr>
<th>Capability Priorities Across Time</th>
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</thead>
<tbody>
<tr>
<td><strong>2004 Priorities</strong></td>
</tr>
<tr>
<td>Body protection from all hazards</td>
</tr>
<tr>
<td>On-scene detection</td>
</tr>
<tr>
<td>Remote &amp; standoff detection</td>
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<tr>
<td>Point location &amp; identification</td>
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<tr>
<td>Seamless connectivity &amp; integration</td>
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<tr>
<td>Mass victim decontamination</td>
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<tr>
<td>Risk awareness &amp; assessment</td>
</tr>
<tr>
<td>Mass medical prophylaxis</td>
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<tr>
<td>Mass casualty medical care management</td>
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<tr>
<td>Individual &amp; collective protection</td>
</tr>
<tr>
<td>Surveillance &amp; information integration</td>
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<tr>
<td>Logistics information systems</td>
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<tr>
<td>Threat assessment/data collection/analysis</td>
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</tbody>
</table>
Identifying Organizational Barriers to Tech Adoption

• DHS new technologies can only be successful if our customers – first responders – purchase and use them to improve their missions

• For some new technologies, there are organizational barriers to adoption beyond available funding – training requirements, staff reluctance, union policy, and privacy issues

• To identify and mitigate these barriers, DHS aims to identify organization specific technology adoption issues and solutions
Evaluation Research and Impact

Example:

Wildland Firefighter Personal Protection

- Develop and evaluate improved (single layer) garments for wildland firefighters
- Intended to improve:
  - Heat absorption
  - Thermal protection
  - Comfort
  - ID Problem
  - Assist with Integration
- Evaluate impact
- Objective & Subjective Measures
Evaluation of Impact Results

Wildland Firefighter Advanced Personal Protection System

- Reduction of Fatality and Injury Risks: 5% to 20%
- Market Penetration/Year: 3% to 10%
- Annual Injury Risk (Garment Related): 3.00% to 10.00%
- Annual Fatality Risk (Garment Related): 5.0E-05 to 1.0E-04
- Cost of Injury: $16,000 to $20,000
- Cost of Fatality: $8,000,000 to $12,000,000
- Cost difference (APPS - Legacy Garment): $334 to $234
- S&T Project Cost: $1,000,000 to $250,000
Future Planning

• Project Responder 6
  • Estimated start date: late Autumn 2019
  • Will be used by DHS S&T to identify R&D funding opportunities

• Tech Adoption – Support and Research Program

• Formalized Impact Evaluation
  • Social Science Leadership

• Additional Input – National of Survey First Responder Organizations