

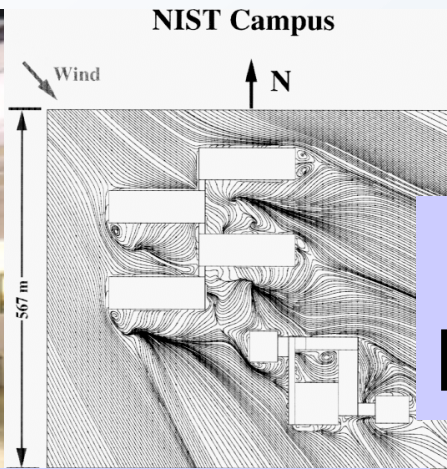
# **NIST WTC Public-Private Response Plan**

National Construction Safety Team Act  
Advisory Committee  
April 29, 2003

Jack E. Snell  
Director, Building and Fire Research Laboratory

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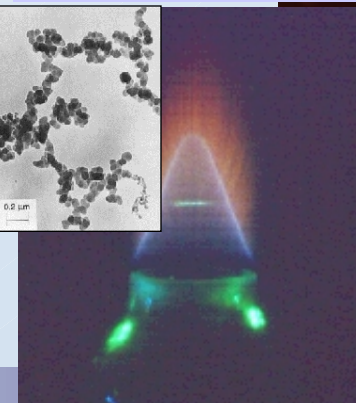
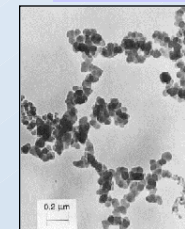
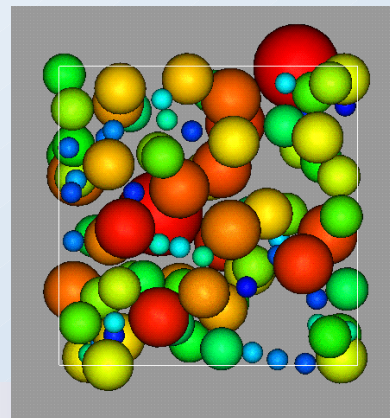
# Building and Fire Research Laboratory



**Building Environment**

**Materials and Construction Systems**

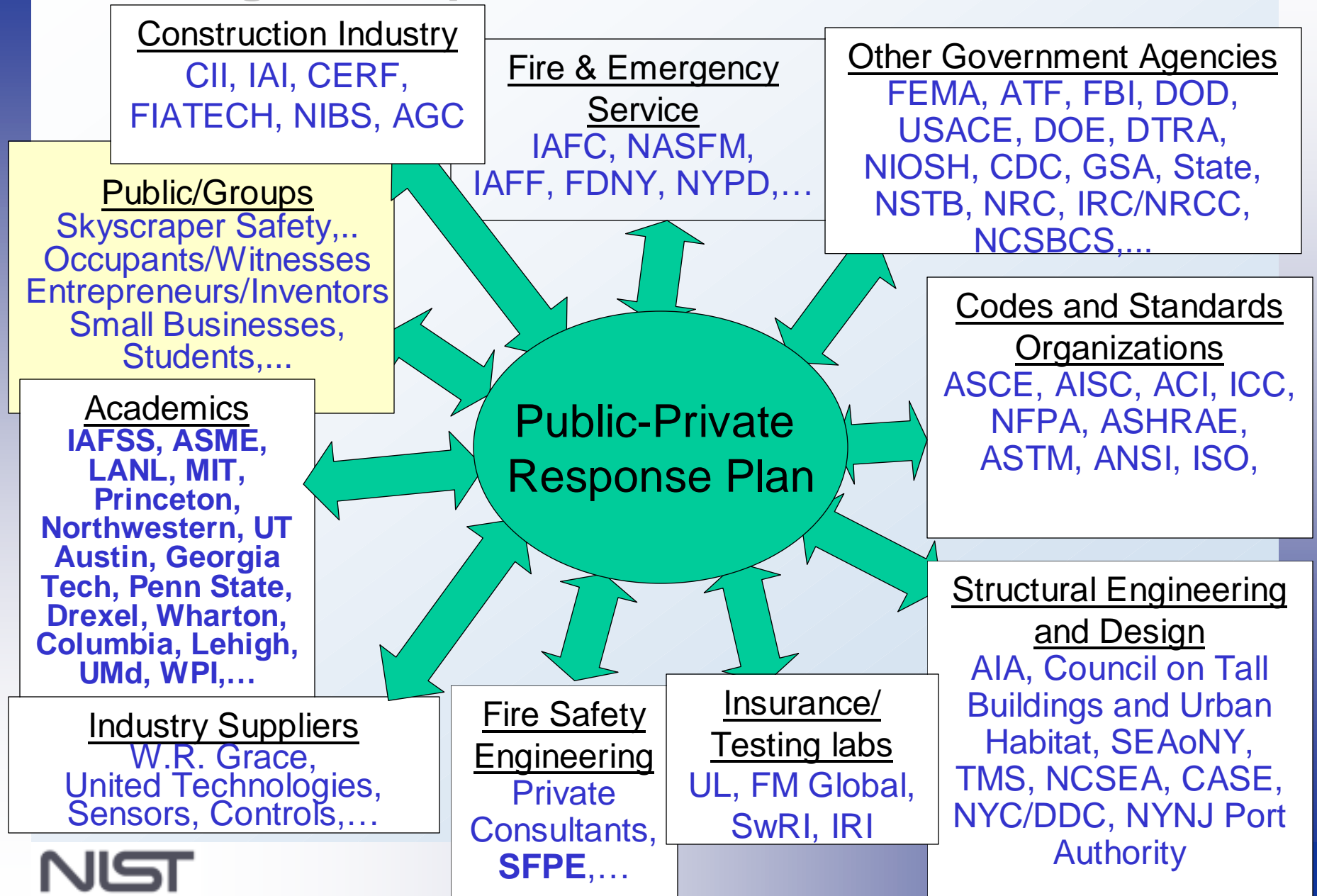
**Fire Research**



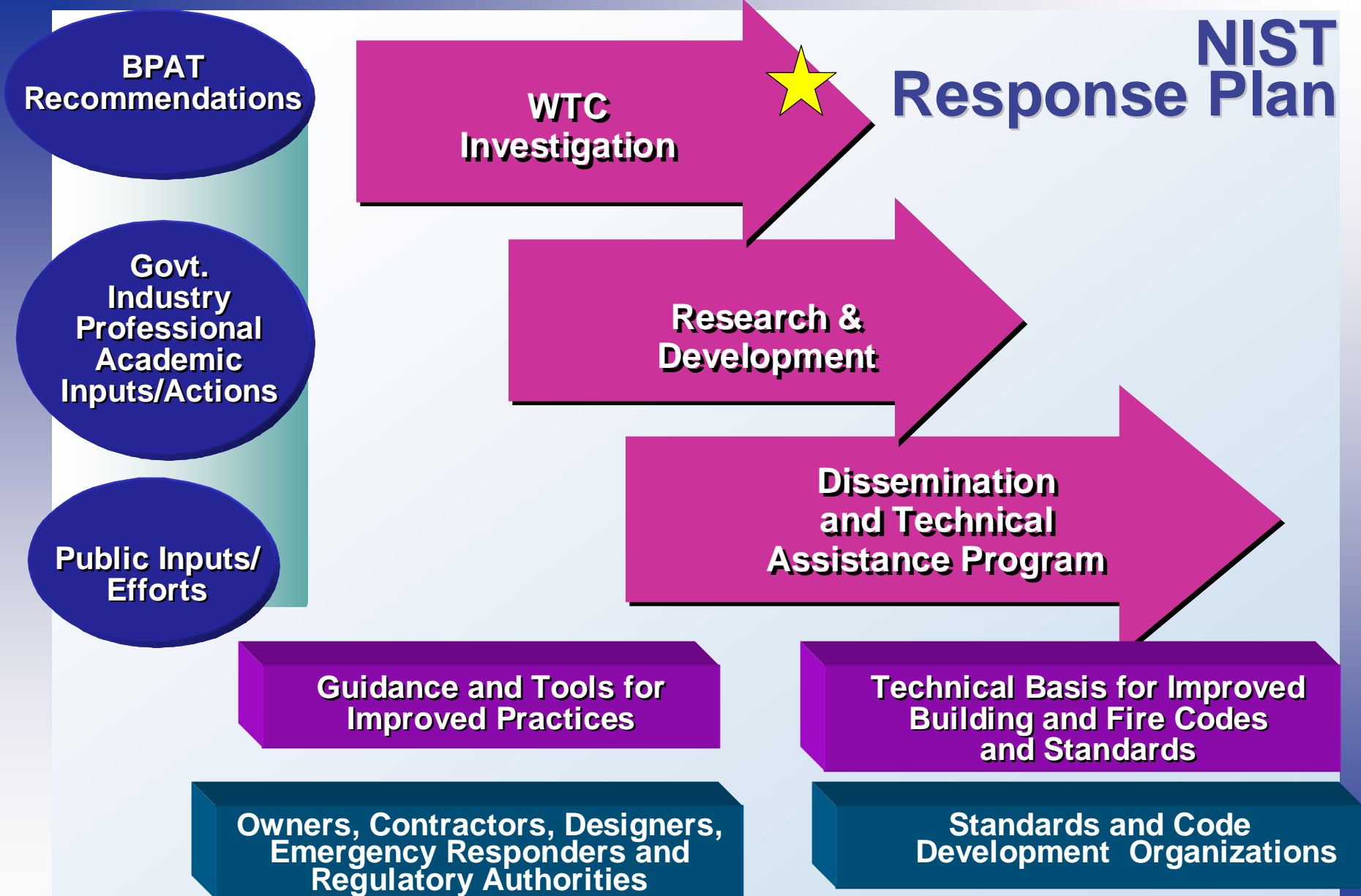
**Standards, Technology, and Practices for:  
Cost-Effective Safety and Security of  
Buildings and Critical Facilities**

Status Report:  
NIST Public-Private Response Plan

# Evolving Participation



# NIST Response Plan



# Authorities and Legal Proceedings

- NIST is a non-regulatory agency of the U.S. Department of Commerce
  - Private sector develops building and fire codes and standards
  - State and local authorities adopt and enforce regulations
- Investigation Authority:
  - National Construction Safety Team Act (P.L. 107-231)
- No part of any report resulting from a NIST investigation can be used in any suit or action for damages arising out of any matter mentioned in such report
  - 15 U.S.C. 281a; as amended by P.L. 107-231

# **NIST WTC Investigation: Goals & Process**

To investigate the building construction, the materials used, and the technical conditions that combined to cause the World Trade Center (WTC) disaster. (Towers and WTC 7)

To serve as the basis for:

- **Improvements in the way buildings are designed, constructed, maintained and used.**
- **Improved tools, guidance for industry and safety officials.**
- **Revisions to codes, standards, and practices.**
- **Improved public safety, and business and insurance stability.**

Process:

- **2 years, Open, Independent, best available talent**
- **Lead Investigator - Dr. Shyam Sunder**
- **Associate - Dr. William Grosshandler**

# NIST WTC Investigation: Objectives

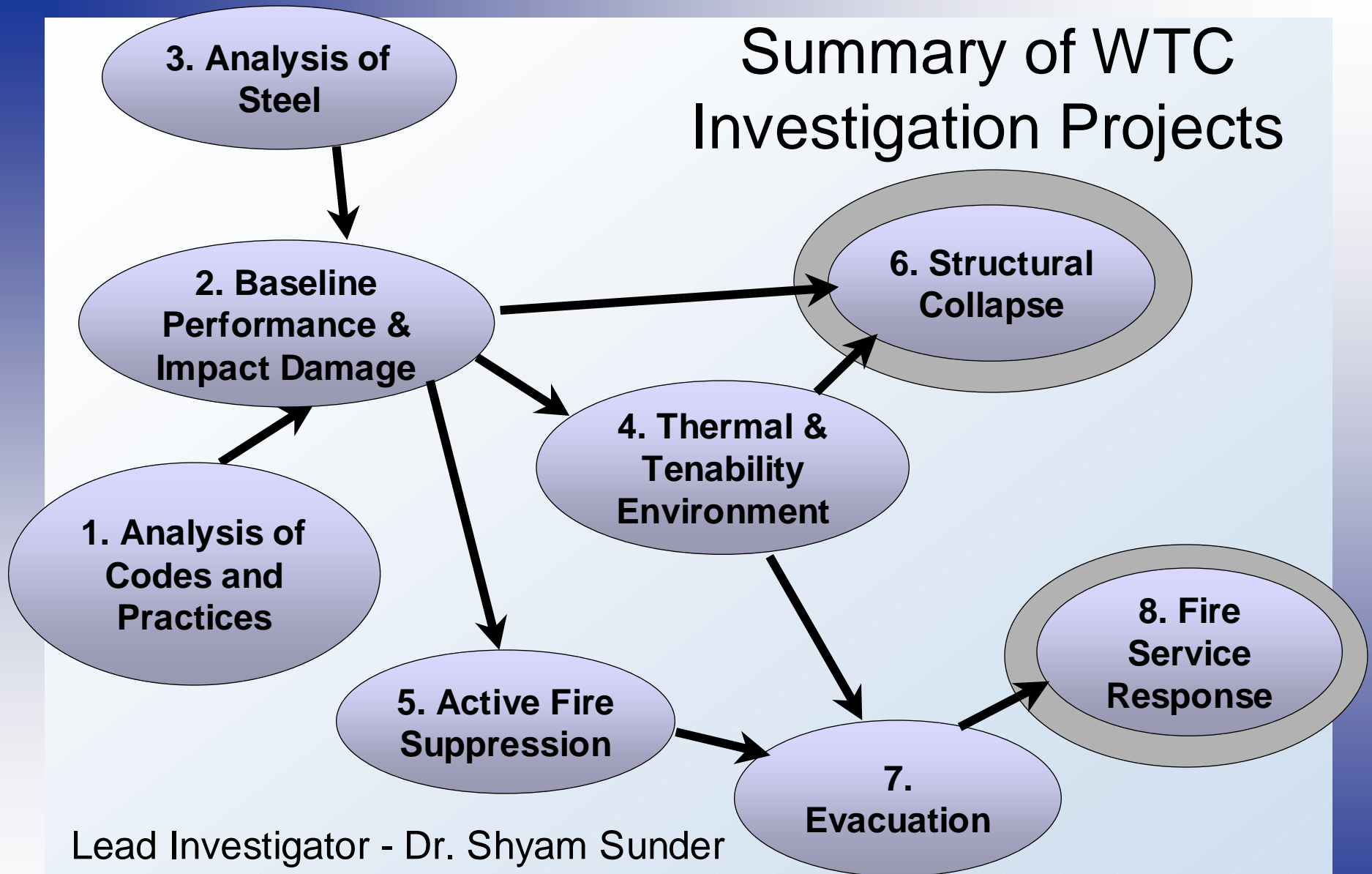
1. Determine *why and how* the World Trade Center buildings collapsed;
2. Determine *why the injuries were so low or high* depending on location, including all technical aspects of fire protection, occupant behavior, evacuation and emergency response;
3. Determine *procedures and practices* used in the design, construction, operation, and maintenance of the World Trade Center Buildings; and
4. Identify *building and fire codes, standards, and practices* that warrant revision.



## Scope

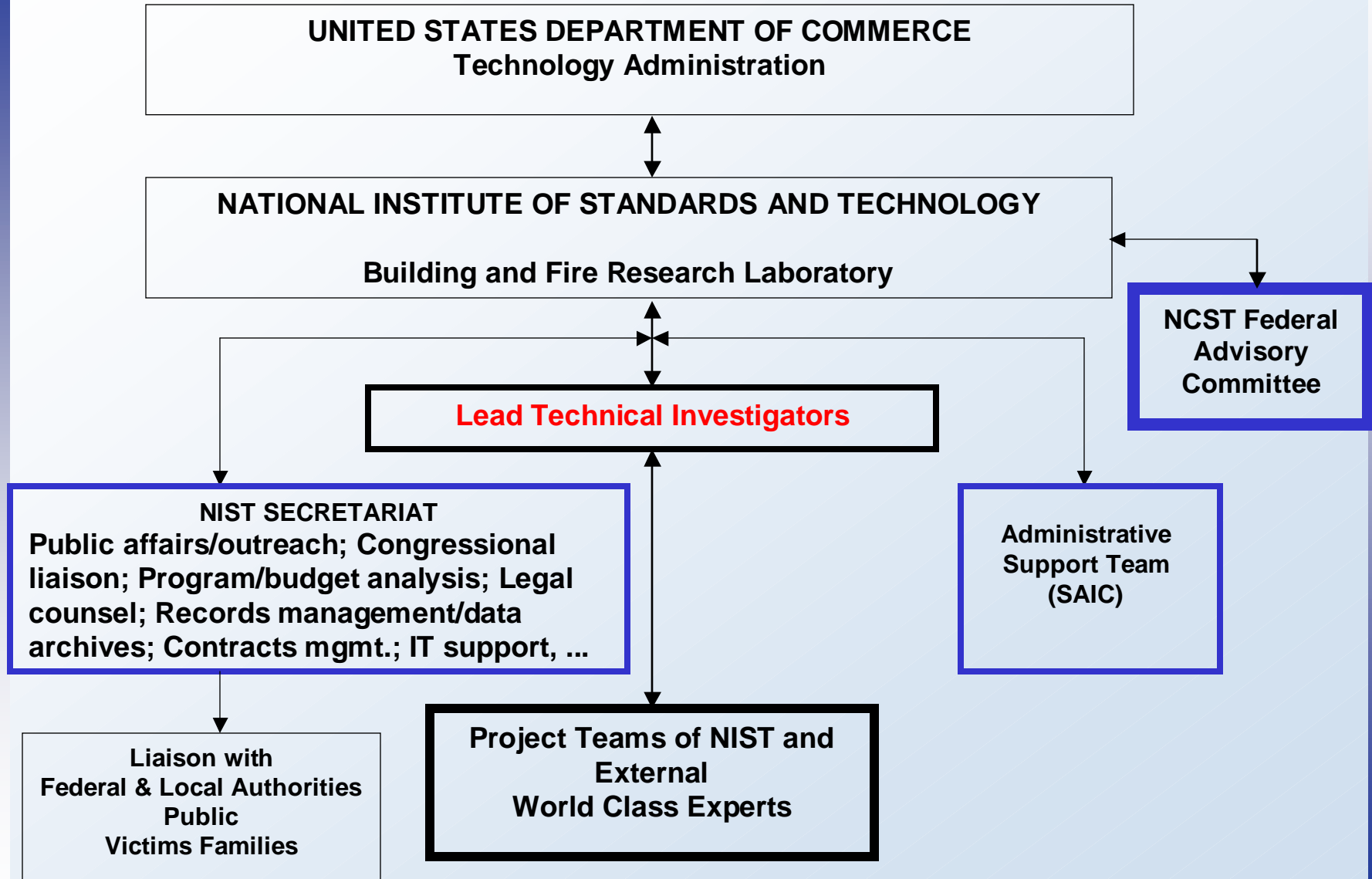
- Builds upon BPAT recommendations that additional studies of Twin Towers and WTC 7 should be conducted.
- Investigation approach considers the interplay between the building, the occupants, and the emergency responders
- Review, analysis, and re-creation modeling and testing work based upon a solid foundation of technical evidence
- Lessons to be derived will be applicable to a broad range of building types, not just the specific buildings that are studied

# Summary of WTC Investigation Projects



Lead Investigator - Dr. Shyam Sunder  
Associate - Dr. William Grosshandler

# WTC Investigation: Organization

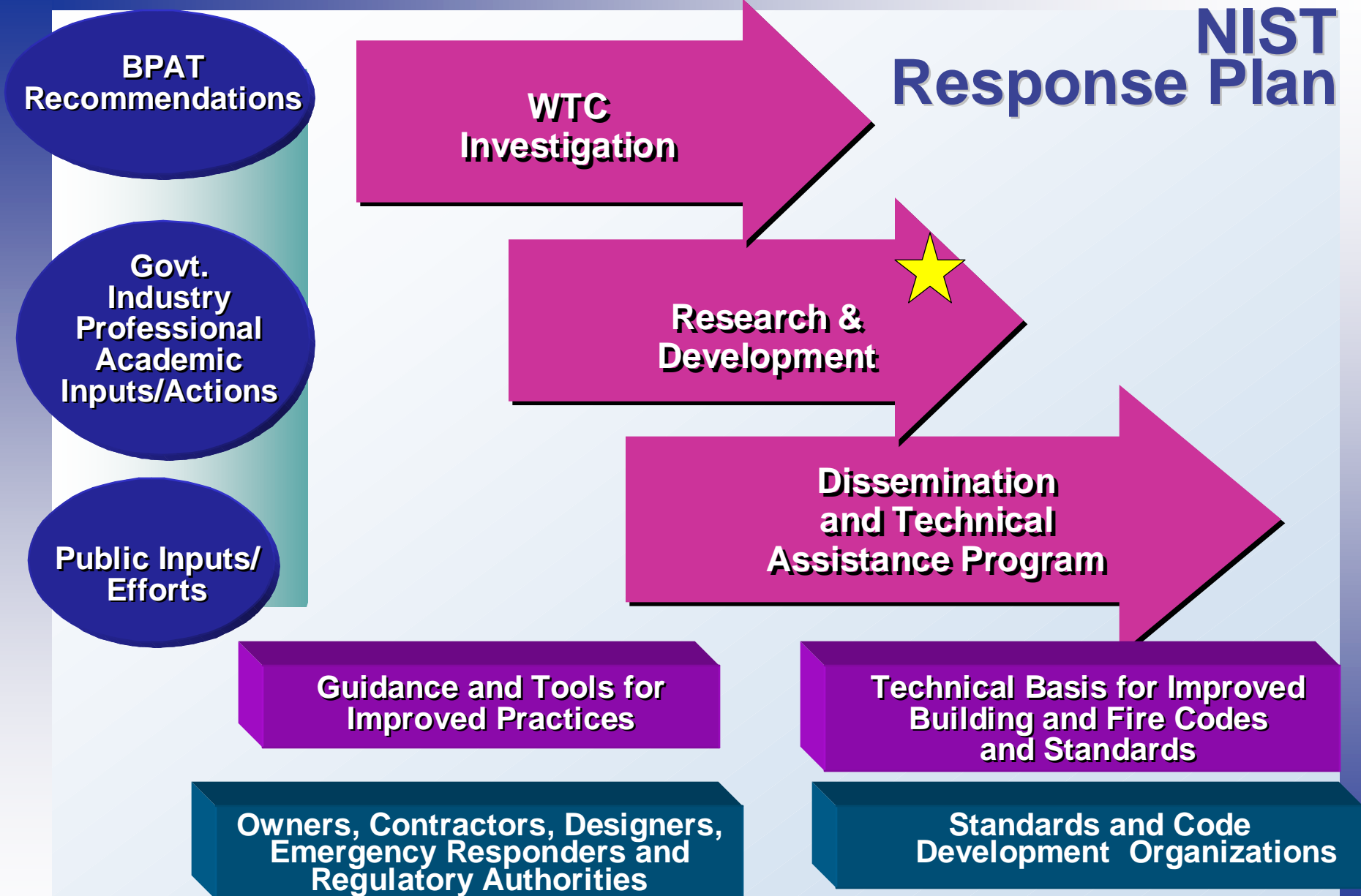


# WTC Investigation Status

(two presentations after break)

See <http://wtc.nist.gov>

# NIST Response Plan



# Research and Development Program:

## Structural Fire Protection

1. Fire safety design & retrofit of structures
2. Method of fire resistance determination
3. Prevention of progressive structural collapse
4. Improved fire resistance coatings

## Human Behavior, Occupant Response, and Mobility

1. Fire simulation re-creation tool
2. Occupant behavior & response
3. Technology for emergency mobility
4. Guidelines, equipment standards for fire & emergency responders

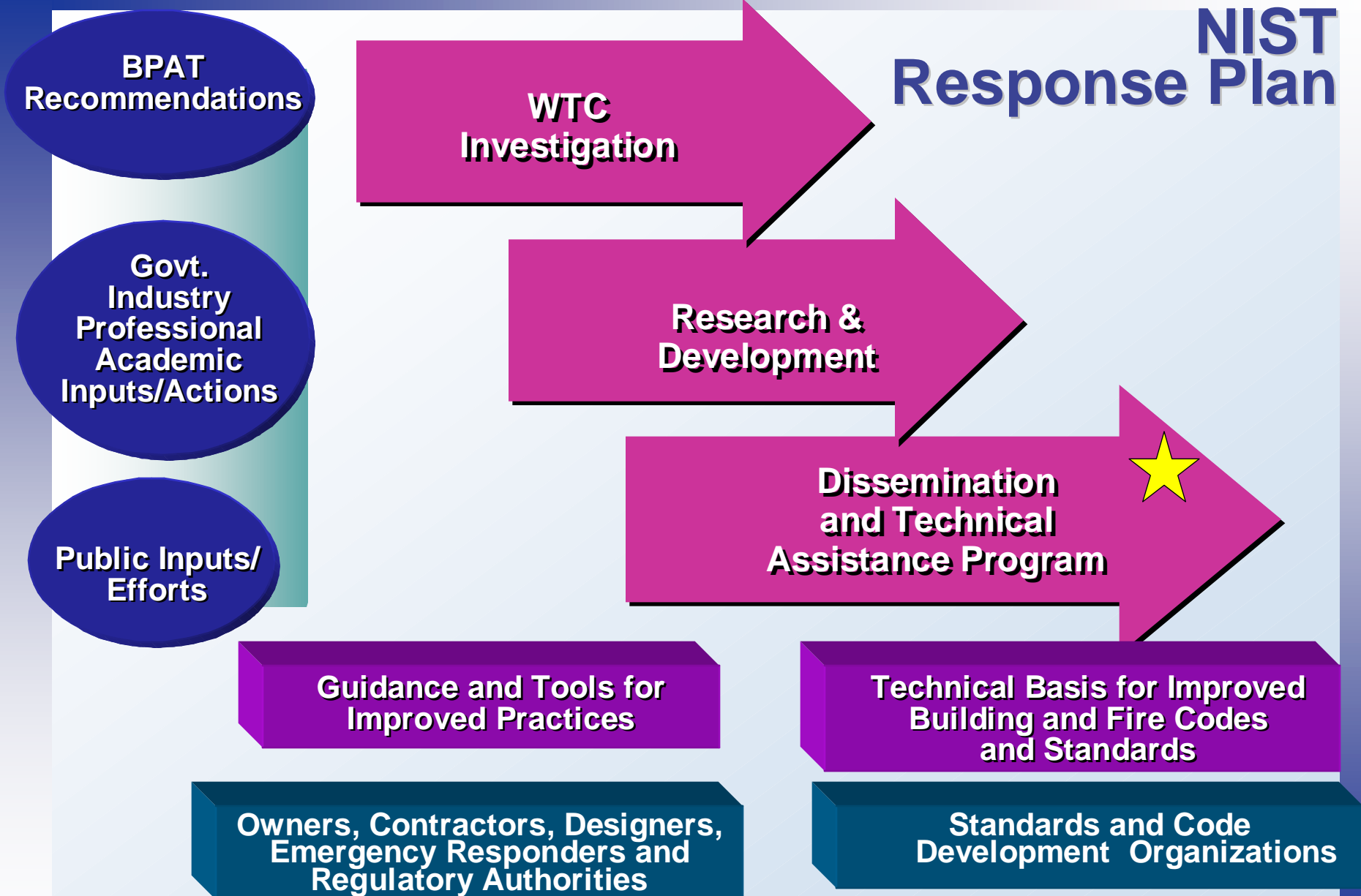
## Building Vulnerability Reduction

1. Standard information models
2. Guidelines, advanced technology for Chem., Bio., Radiological attack
3. Cost-effective risk management tools

## R&D Program: Status

1. NIST engaged with numerous Public and private sector partners and collaborators in each project.
2. R&D projects funded at limited level through NIST redirection and increase in FY'03 Budget.
3. Further funding included in President's FY'04 Budget proposal to Congress. Actively seeking support and partnering for full range of critical needs.

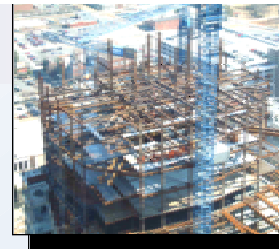
# NIST Response Plan







## Industry-Led Dissemination and Technical Assistance Program



### Concept:

Partner with Key national, professional, technical society, trade association, etc., organizations to develop demand pull for needed changes and take charge of dissemination, deployment, implementation and assessment of resulting benefits.

### Functions:

Provide advice on best practices, guidance on vulnerability assessment, guidance on standards and codes needs.

Disseminate and implement R&D outputs.

Act as clearinghouse (Q&As, industry inputs, needs/priorities, etc,...)

Benchmark results

### Potential Partners:

Codes and Standards developers, e.g., ICC, NFPA, ASME, ASTM...

Professional, engineering organizations IAFC, IAFC, ASCE, SFPE, AIA, AGC...

Industrial/trade bodies, e.g. CII, FIATECH, CERF, NIBS,...

# Dissemination and Technical Assistance Program: Status

1. NIST engaged with numerous Public and private sector partners.
2. Initial activities supported in FY'02 and FY'03:
  - OSTP Workshop, “Critical Infrastructure Protection Priorities”
  - FIATECH Roadmap update for Implications of Homeland Security
  - National Alliance for Building Regulatory Reform (first responder database) National Conference of States on Building Codes and Standards,
  - Construction Industry Institute, Industry Best Practices
  - (additional projects pending)
3. Actively aligning individual R&D outputs with external support and partnering.

Thank you.

Questions?

# **National Construction Safety Team Act, PL 107-231**

National Construction Safety Team Act  
Advisory Committee  
April 29, 2003

Jack E. Snell  
Director, Building and Fire Research Laboratory

**[snell@nist.gov](mailto:snell@nist.gov)**

# Legislative Authorities

## **Structural Failures [P.L. 99-73, Sec. 7; 15 U.S.C. 281a]**

The National Institute of Standards and Technology, on its own initiative but only after consultation with local authorities, may initiate and conduct investigations to determine the causes of structural failures in structures which are used or occupied by the general public. No part of any report resulting from such investigation shall be submitted as evidence or used in any suit or action for damages arising out of any matter mentioned in the report.

## **Fire Prevention and Control Act [P.L. 93-498, Sec.16, (a), (3)]**

NIST conducts and supports research on all aspects of fire with the aim of providing scientific and technical knowledge applicable to the prevention and control of fires. The Act authorizes NIST to conduct "...operation tests, demonstration projects and fire investigations in support of the activities set forth in this section."

# National Construction Safety Team Act, PL 107-231

Issue: No one had the responsibility to derive lessons learned.

An “NTSB-like” body...

- Independent, objective, fact, not fault-finding
- Ability to collect, analyze, make public critical information

National Construction Safety Team Act:

- Introduced by Boehlert in House, Clinton in Senate
- Signed into law October 1, 2002
- Establish Federal Advisory Committee
- Applies to WTC investigation as well.

Tasks NIST Director to establish teams, develop reports, track outcomes:

- Launched within 48 hours
- Include at least one NIST employee

# National Construction Safety Team Act (cont.)

## Purpose of Act:

“...to provide for the establishment of investigative teams to assess building performance and emergency response and evacuation procedures in the wake of any building failure that has resulted in substantial loss of life or that posed the potential for substantial loss of life.”

## Purpose of Investigations:

“...to improve the safety and structural integrity of buildings in the United States.”

# National Construction Safety Team Act (cont.)

## Team Duties:

1. Establish likely technical cause or causes of building failure;
2. Evaluate technical aspects of evacuation and emergency response procedures;
3. Recommend as necessary, specific improvements to building standards, codes and practices based on findings made pursuant to the above;
4. Recommend any research or other appropriate actions needed to improve the structural safety of buildings.



# National Construction Safety Team Act (cont.)

## Composition of Teams:

- At least one employee of NIST
- Other experts
- May include private sector experts, experts from academe, professional organizations, Federal, State or Local officials

## Functions of Teams:

- Conduct investigations
- Disclosure of information
- Resource requirements
- Coordination with search and rescue efforts
- Regular public briefings
- Coordination with other authorities, e.g. Earthquake Investigations

## Procedures to be Published in 3 months:

(to be addressed at 3:15 pm by Dr. Hill)

# National Construction Safety Team Act (cont.)

## Authorities:

- Entry and Inspection
  - does not unnecessarily interfere with services provided by Owner/operator
  - preserves evidence related to building failure
- Coordination (MOUs with other agencies with related authorities)
- Priority over other investigations except: NTSB, Criminal
- Briefings, Hearings, Witnesses
- Subpoenas
- Additional powers ( procure, request, confer, accept, contract, compensate)

## NIST Actions:

- Launch investigation teams
- Conduct, enable or encourage research recommended by Team
- Promote appropriate adoption of recommendations

# NCST Advisory Committee

- Director appoints in consultation with Administrator of USFA, and heads of other appropriate agencies, appoints,
- Functions...
  - review procedures
  - evaluate activities of teams
  - assess implementation of recommendations
  - annual report to Congress

## Advisory Committee Members

- Dr. Charles Thornton, Co-Chairman, Thornton-Tomasetti.
- Dr. Robert Hanson, Professor Emeritus, University of Michigan.
  
- Mr. Philip DiNenno, President, Hughes Associates.
- Dr. John Bryan, Professor Emeritus, University of Maryland.
- Professor Glenn Corbett, Associate Professor, John-Jay College, NYC.
  
- Dr. Kathleen Tierney, Professor, University of Delaware.
  
- Mr. Paul Fitzgerald, Executive Vice President FM Global, (retired).
  
- Mr. David Collins, President, The Preview Group.
  
- Dr. Forman Williams, Professor, University of California at San Diego.
- Dr. John Barsom, President, Barsom Consulting.

Thank You.

Questions?