



THE COUNCIL FOR CHEMICAL RESEARCH

Advancing the Chemical Enterprise through Collaboration

Technology Innovation Program
Innovating for
Critical National Needs
2009 TIP Funding Opportunities

Michael Schen, *Senior Scientific Advisor*
Tel: 301.975.6741 - Email: michael.schen@nist.gov

**National Institute of
Standards and Technology**
U.S. Department of Commerce





Transformative Research Funding

On March 26th, the Technology Innovation Program (TIP) announced its 2009 Competition for multiyear research funding in two major areas of national interest:

- Civil infrastructure*
- Manufacturing*





What is TIP?

TIP is a cost-shared, federal funding program that focuses on high-risk, high-reward research that is expected to transform the Nation's capacity to deal with major societal challenges that are not being addressed.



TIP's Purpose

- Assist United States businesses and institutes of higher education or other organizations, such as national laboratories and nonprofit research institutes
- Support, promote, and accelerate innovation in the United States through high-risk, high-reward research
- In areas of critical national need

*America COMPETES Act, (PL 110-69)
August 9, 2007*



Technology Innovation Program: Part of NIST

Funding

- \$65 million for FY 2009, including management of ongoing TIP and Advanced Technology Program awards

TIP draws upon NIST scientific and technical expertise

- Help identify and select areas of critical national need for TIP funding
- Evaluate proposals

NIST benefits from collaborating with TIP

- Apply understanding of critical national needs to NIST research programs
- Enhance knowledge, skills, abilities through TIP program development





Key Features of TIP

- **Novel Purpose**
 - Address societal challenges not being addressed in areas of critical national need with benefits that extend significantly beyond proposers
- **Scientific & Technical Merit**
 - High-risk, high-reward research
- **Transformational Results**
 - Strong potential for advancing state-of-the-art and contributing to U.S. science and technology base



Key Features of TIP

(cont'd)

- **Recipients CAN be**
 - Small and medium-sized, U.S., for-profit businesses
 - Institutes of higher education
 - National laboratories (with the exception of NIST)
 - Nonprofit research institutes
 - Other organizations
- **Large companies (i.e., Fortune 1000 companies)**
 - MAY participate as a JV member and fully fund their participation, a contractor, or an informal collaborator
 - MAY NOT directly receive federal funds



Single Company Proposers

- **Single Company** – a small or medium-sized for-profit company doing a majority of its business in the U.S. and is either:
 - A U.S. owned company or
 - A U.S. subsidiary of a foreign parent
- **Funding limitations**
 - Up to \$3M federal funds for up to 3 years
 - May be used only for direct costs
 - Must be not greater than 50 percent of total project costs



Joint Venture Proposers

- **Joint Venture – A business arrangement that includes either:**
 - At least two separately owned small or medium-sized for-profit; or
 - At least one small or medium-sized for-profit company and one institute of higher education or other organization such as a national laboratory, governmental laboratory (not NIST) or nonprofit research institute.
- **Funding limitations**
 - Up to \$9M federal funds for project lengths up to 5 years
 - May be used only for direct costs
 - Must be not greater than 50 percent of total project costs

Either a small or medium-sized business or an institute of higher education may lead a joint venture project



Critical National Need

What is a Critical National Need?

An area that justifies government attention because the magnitude of the problem is large and the societal challenges that need to be overcome are not being addressed, but could be addressed through high-risk, high-reward research



Societal Challenge

What is a TIP Societal Challenge?

- A problem or issue (*not a solution or answer*) confronted by society that
 - when not addressed could negatively affect the overall function and quality of life of the nation, and as such justifies government attention
 - can be addressed through high-risk, high-reward research



National Challenges

- **When evaluating Societal Challenges and Critical National Needs, TIP**
 - Uses a critical national need identification & selection process to shape TIP competitions and collaborative programs
 - Assesses a diversity of areas and challenges where transformative research could be expected to have large societal impacts
 - Conducts an analysis of federal funding to determine unique TIP role(s) within a critical national need and associated societal challenges
- **TIP seeks input from a host of external stakeholders and organizations**
 - Government agencies and advisory bodies
 - Science and Technology Policy Institute
 - Industry organizations, leading researchers from academic institutions, and others



Current TIP Critical National Need and Interest Areas

Critical National Need Areas

- **Civil Infrastructure**
- **Manufacturing**

Interest Areas

- **Energy**
- **Green Technologies**
- **Healthcare**
- **Networks**
- **Water**

This is a list of Critical National Need and interest areas that TIP has identified to date. It is not exhaustive and others may be added in the future



2009 TIP Competition Important Dates

- The Competition is currently **OPEN**
- Paper submission or electronic submission via Grants.gov
- The **deadline** is:
 - **Tuesday, June 23, 2009**
 - All proposals must be received by TIP by 3:00 PM Eastern time (regardless of submission method) **WITHOUT EXCEPTION**

*To ensure timely receipt, don't wait to submit until
deadline day!*



White Paper - Stakeholder Views Sought

- TIP also has a call for White Papers on Critical National Needs
 - Due May 11, 2009, and July 13, 2009
 - “A Guide for Preparing and Submitting White Papers on Areas of Critical National Need” – December 2008
 - Federal Register Notice

Help shape future TIP competitions!



2009 Competition Area A: Civil Infrastructure Structural Integrity



TIP 2009 Competition

Area A: Civil Infrastructure



- Poor road conditions cost the U.S. \$54 billion a year in repairs
- More than 27% of the nation's 600,000 bridges are rated structurally deficient or functionally obsolete
- Water main leakages and breaks consume 6 billion gallons of treated water each day

Failure to reverse a trend of increasing highway infrastructure deterioration will lead to reductions in national and economic security,

lower worker productivity, and an overall reduction in the quality of life

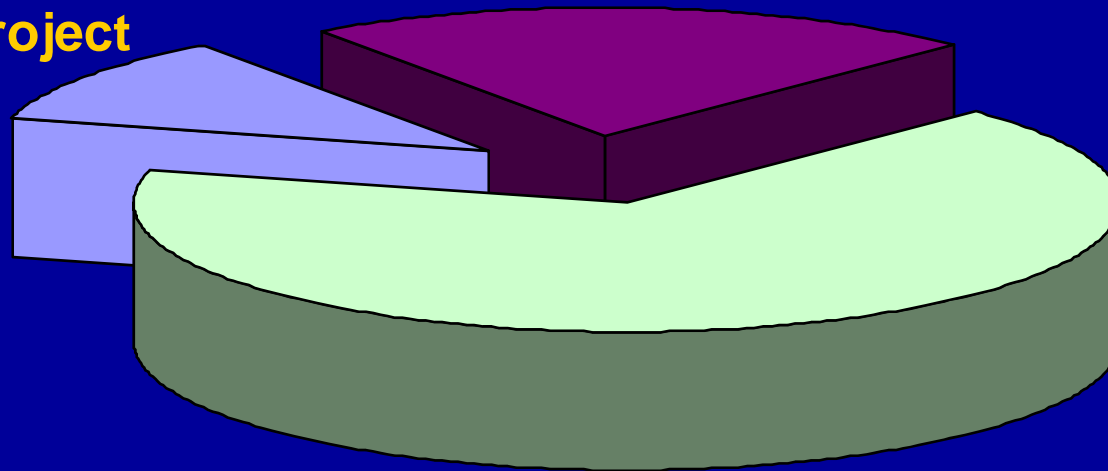


2008 Competition Awards Civil Infrastructure

**Advanced Sensing Technologies for the Infrastructure: Roads,
Highways, Bridges and Water Systems**

**Highways – Pavement
1 JV project**

**Water & Wastewater Systems
2 JV projects**



**Highways – Bridges
6 projects – 2 Single & 4 JVs**



2009 Competition Area A: Civil Infrastructure

- **Critical National Need**
 - Civil Infrastructure
- **Societal Challenge**
 - Managing the structural integrity of the United States' infrastructure
 - The absence of cost-effective means for establishing accurate assessments of the integrity and condition of civil infrastructure elements and for providing long-lived repairs to deteriorating infrastructure
- **TIP's Response for 2009**
 - “Advanced Sensing Technologies and Advanced Repair Materials for the Infrastructure: Water Systems, Dams, Levees, Bridges, Roads, and Highways”
 - Two elements:
 - Inspection and/or Monitoring Technologies
 - Repair/Retrofit Materials and Application Technologies



2009 Competition Area A: Civil Infrastructure (cont'd)

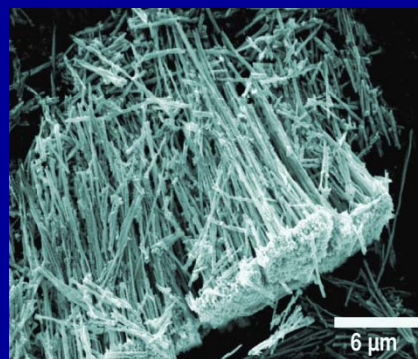
What's Different for 2009?

- **Expanded emphasis**
 - Dams, levees and navigation lock structures, in addition to water mains and wastewater collection systems, bridges, roads, and highways
- **Two elements**
 - Element 1: Inspection and/or monitoring technologies (sole focus in 2008)
 - Element 2: Repair/retrofit materials and application technologies (new for 2009)



***2009 Competition Area B:
Accelerating the Incorporation of Materials
Advances into Manufacturing Processes***

TIP 2009 Competition Area B: Manufacturing



- Manufacturing is a significant part of the U.S. economy
 - In 2007, represented 11.7% of U.S. GDP, 10.1% of U.S. employment
- Manufacturing sector struggling
 - In 2002, the U.S. manufacturing sector represented 5th largest economy in the world, by 2007 had fallen to 8th largest
 - Institute for Supply Management New Orders Index remains negative for 15 consecutive months

Failure to invest in technology advances that can be implemented by the manufacturing sector will result in continued reductions in economic security, and an overall reduction in the quality of life



2009 Competition Area B: Manufacturing

- **Critical National Need**
 - Manufacturing
- **Societal Challenge**
 - Providing manufacturers and end users
 - Improved access to adequate quantities of advanced materials at competitive costs
 - That allow evaluation and utilization of these materials in innovative ways
- **TIP Response**
 - *“Accelerating the Incorporation of Materials Advances into Manufacturing Processes”*
 - Two elements:
 - Process scale-up, integration, and design of advanced materials
 - Predictive modeling for advanced materials and materials processing



2009 Competition Area B: Manufacturing Scope

What TIP is Seeking

- Manufacturing solutions that have the potential to create significant performance improvements in new products by accelerating the utilization of an advanced material's new functionality
- Limited to three classes of materials considered most critical to emerging or other potential growth areas for manufacturing
 - Nanomaterials
 - Superalloys, alloys and smart materials
 - Composites

All proposals must address how the outcomes of the research will enable manufacturers to produce advanced materials faster, better and cheaper, as well as enable the new uses for the advanced materials



For Info on TIP . .

- Visit TIP's website
 - *www.nist.gov/tip*
- Register for the TIP mailing list
 - *http://tipmailing.nist.gov/forms/mailling_list.cfm*
- SUBMIT your TIP White Paper

Thank you