

NIST Civil Infrastructure Showcase

March 13-14, 2014

TIP Purpose ...

“Assisting United States businesses and institutions of higher education or other organizations, such as national laboratories and nonprofit research institutions, to 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

Key Features of TIP

- **Novel Purpose**
- **Rich Teaming**
- **Scientific & Technical Merit**
- **Transformational Results**
- **Societal Challenges**
- **Clear Government Need**

Awards based on “*high-risk, high-reward*” innovation,
need for public funding, and potential to meet unaddressed societal challenges

Key Features of TIP (cont)

- Funding
 - Single company projects up to \$3M for maximum three years.
 - Joint Venture projects may be funded up to \$9M for maximum five years
- Allows institutions of higher education to lead a joint venture R&D project
- Intellectual property will reside with U.S. company or any JV member (including a university JV member)
- Opportunities for state involvement with R&D planning
- Program assessment required
- Annual reports from Program and Advisory Board to Congress

TIP CNN Process...

- Critical National Need identification & selection process shaped TIP collaborative outreach and competitions
- Gap Analysis – Determined unique NIST role within Critical National Needs
 - NRC (National Research Council) of the National Academies of Science
 - STPI (Science & Technology Policy Institute)
 - Published Industry Roadmaps
 - Others
- Competition topic areas based on the **needs**, not **technologies**, for meeting societal challenges

Original CNN Topic Areas

- Civil Infrastructure
- Energy
- Manufacturing
- Water
- Communications
- Complex Networks
- Personalized Medicine

These seven areas represent the potential broad CNN topic areas that TIP originally identified.

Civil Infrastructure...



- The American Association of State Highway and Transportation Officials estimates that poor road conditions cost U.S. motorists \$67 billion a year in repairs and operating costs
- The United States Department of Transportation rates 71,000 of the nation's bridges as "structurally deficient"

Failure to reverse a trend of increasing highway infrastructure deterioration will lead to reductions in national and economic security, lower worker productivity, and a overall reduction in the quality of life.

Civil Infrastructure...

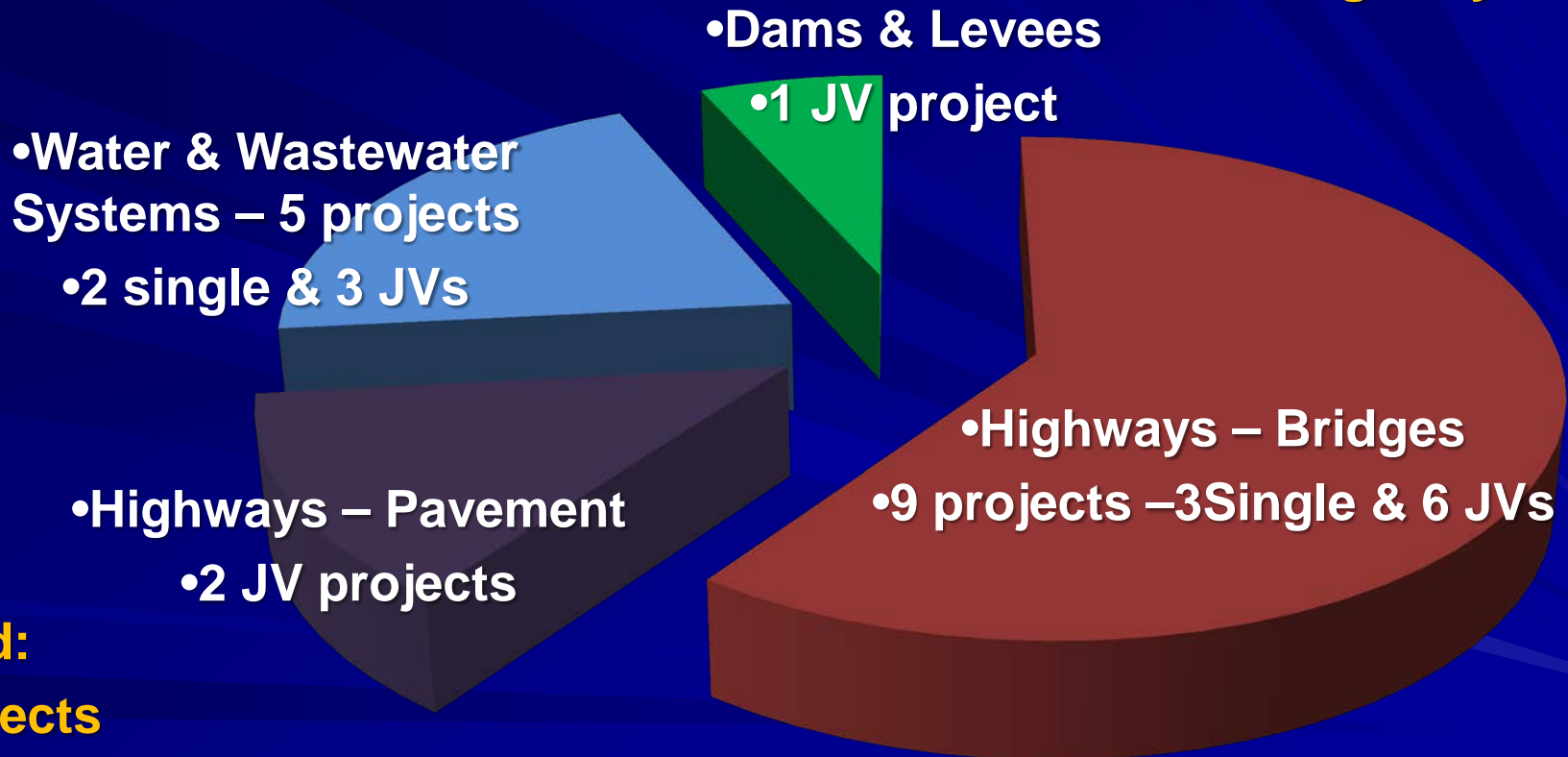
- Six billion gallons per day of clean, treated drinking water disappears, mostly due to old, leaking pipes and water mains... Enough to serve the population of California!





2008 & 2009 Competition Awards in Civil Infrastructure

- **Advanced Sensing Technologies and Advanced Repair Materials for the Infrastructure: Water Systems, Dams, Levees, Bridges, Roads, and Highways**



Funded:

17 Projects

\$150M in R&D (\$73M TIP, 77M Matching Funds)

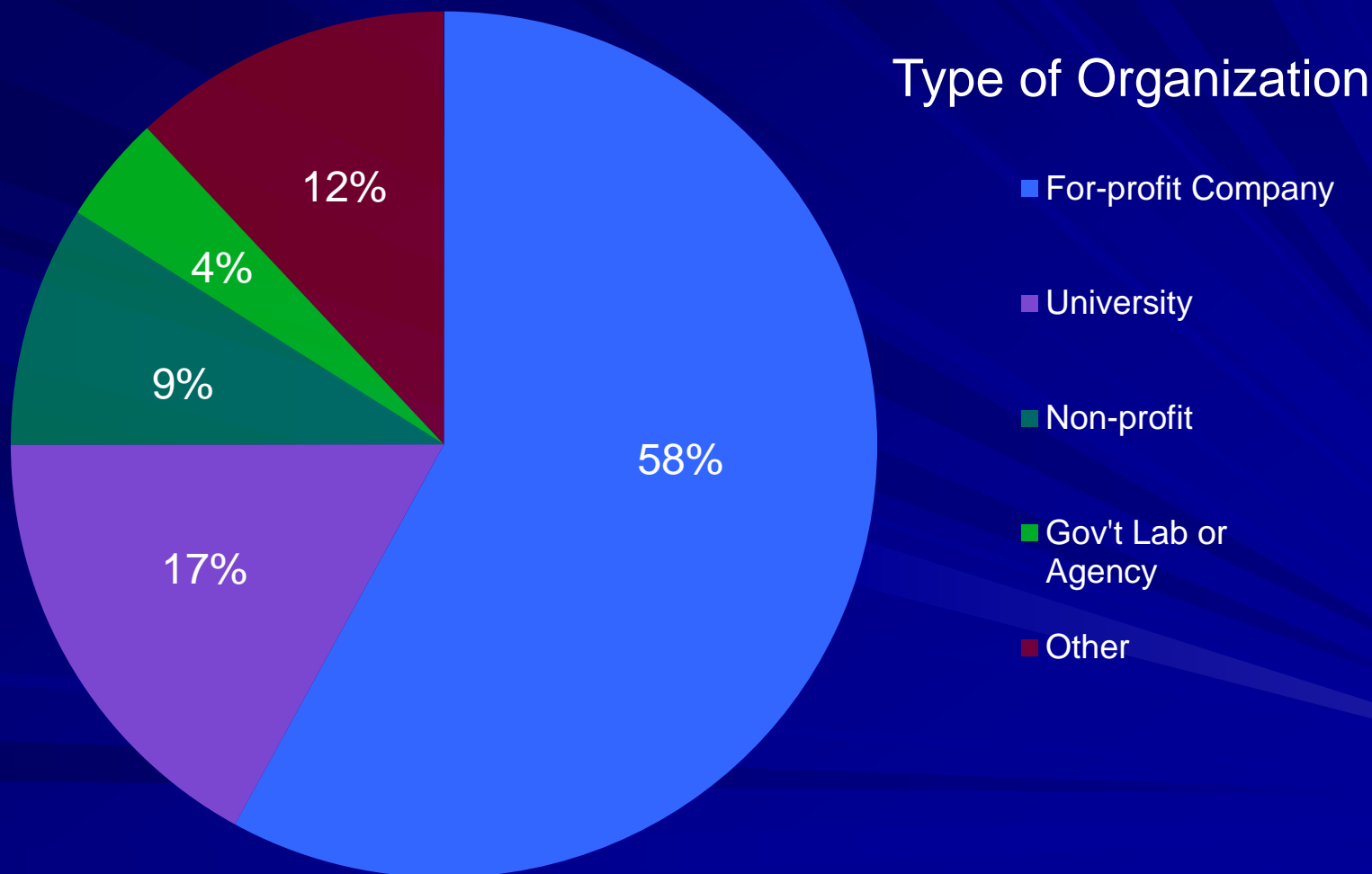
Early Evaluation Results

TIP 2008 and 2009 Surveys

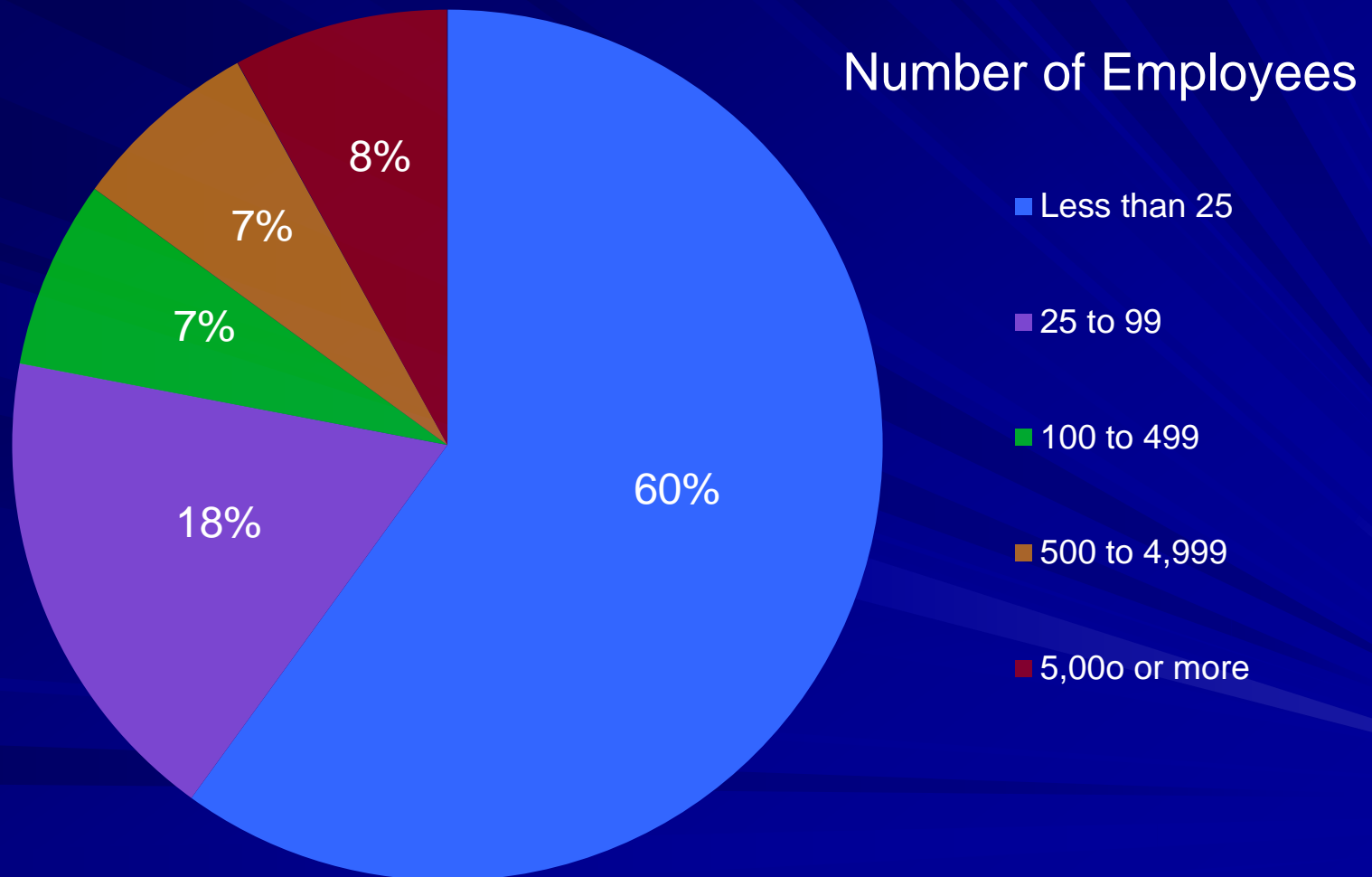
2008 Survey of TIP Mailing List

- Survey of TIP Mailing List
- 701 Responses (\approx 30 percent response rate)
- Looked at diversity across types of organizations
- Looked at employment characteristics for companies

Diversity of Organizations



For-Profit Company Size



Customer Satisfaction Elements (Preliminary)

- Questions asked of all *applicants* to the TIP 2008 competition
- Is the process “fair”?
 - Only 4 percent felt the review process was not fair
- Sources of information about TIP

	Used source	Satisfaction with source
• TIP Website	94%	96%
• Interaction with TIP Staff	78%	87%
• TIP Proposers' Conference	69%	89%
• Industry or Organization Colleagues	64%	75%
• Information Booth at Meetings	24%	42%

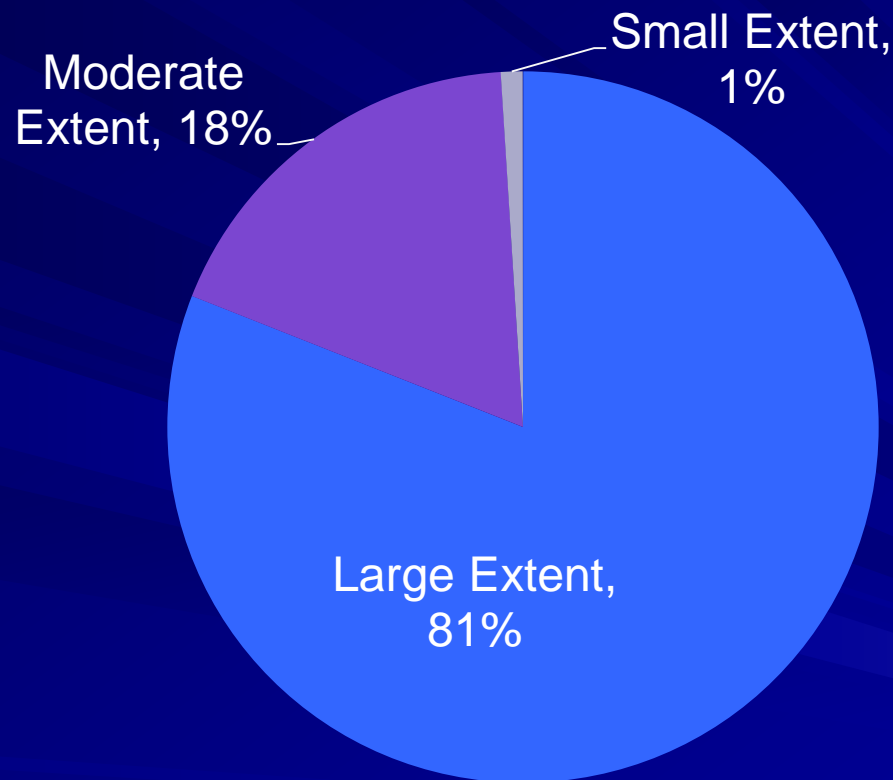
- Satisfaction with the Proposal Preparation Kit
 - Ease of Use 84%
 - Clarity of Content 78%
 - Comprehensiveness 82%

2009 Survey of Applicants

TIP surveys all applicants to determine:

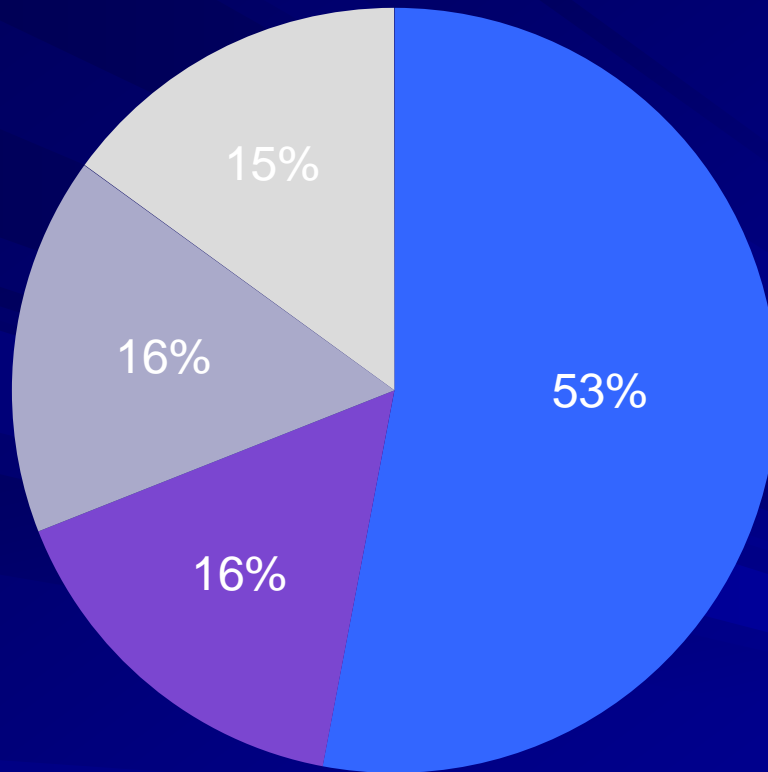
- If we are attracting the right R&D
- If we are selecting the right proposals
- If our customers are satisfied
- In 2009
 - Survey sent to 202 organizations in proposals to the 2009 TIP competition in Civil Infrastructure and Manufacturing
 - 115 surveys completed (57% response rate)
 - Survey conducted by Westat and responses are anonymous
- What are a few things we learned?

Does TIP Stretch Proposers in “How” They do R&D?



TIP Research Represents a New Technical Approach

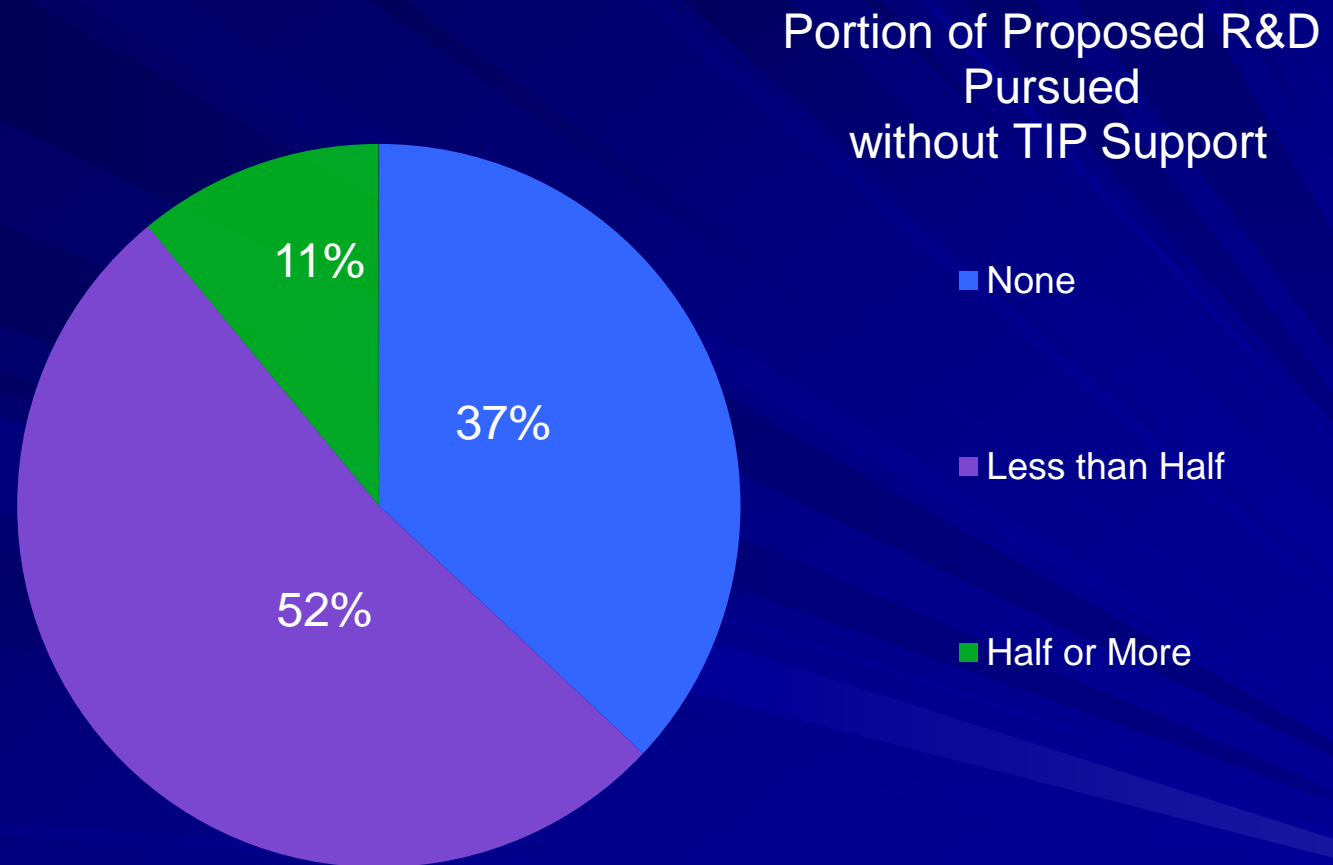
Does TIP Represent New Funding?



- Less than one-quarter internal R&D \$
- One-quarter to less than one-half internal R&D \$
- One-half to less than three-quarters internal R&D \$
- Three-quarters or more internal R&D \$

TIP Research Did NOT Duplicate Existing Research Areas

What Happens to Unfunded Research?



Unfunded Projects are NOT Fully Pursued

Special Thanks to Our Presenters...

- Mistras Group (and JV partners)
- Acellent Technologies
- SC Solutions (University of Michigan JV)
- Louisiana Technical University (ELXSI JV)
- CyPhy Works
- University of Illinois, Chicago (DST JV)
- WJE Associates (University of Texas, Austin JV)
- Northeastern University (and JV partners)
- Rutgers, The State University of New Jersey (and JV partners)
- Rensselaer Polytechnic University (and JV partner)
- University of California, Los Angeles (and JV partner)
- MesoCoat (and JV partners)