

# Strategic Thinking for Achieving Broader Impacts

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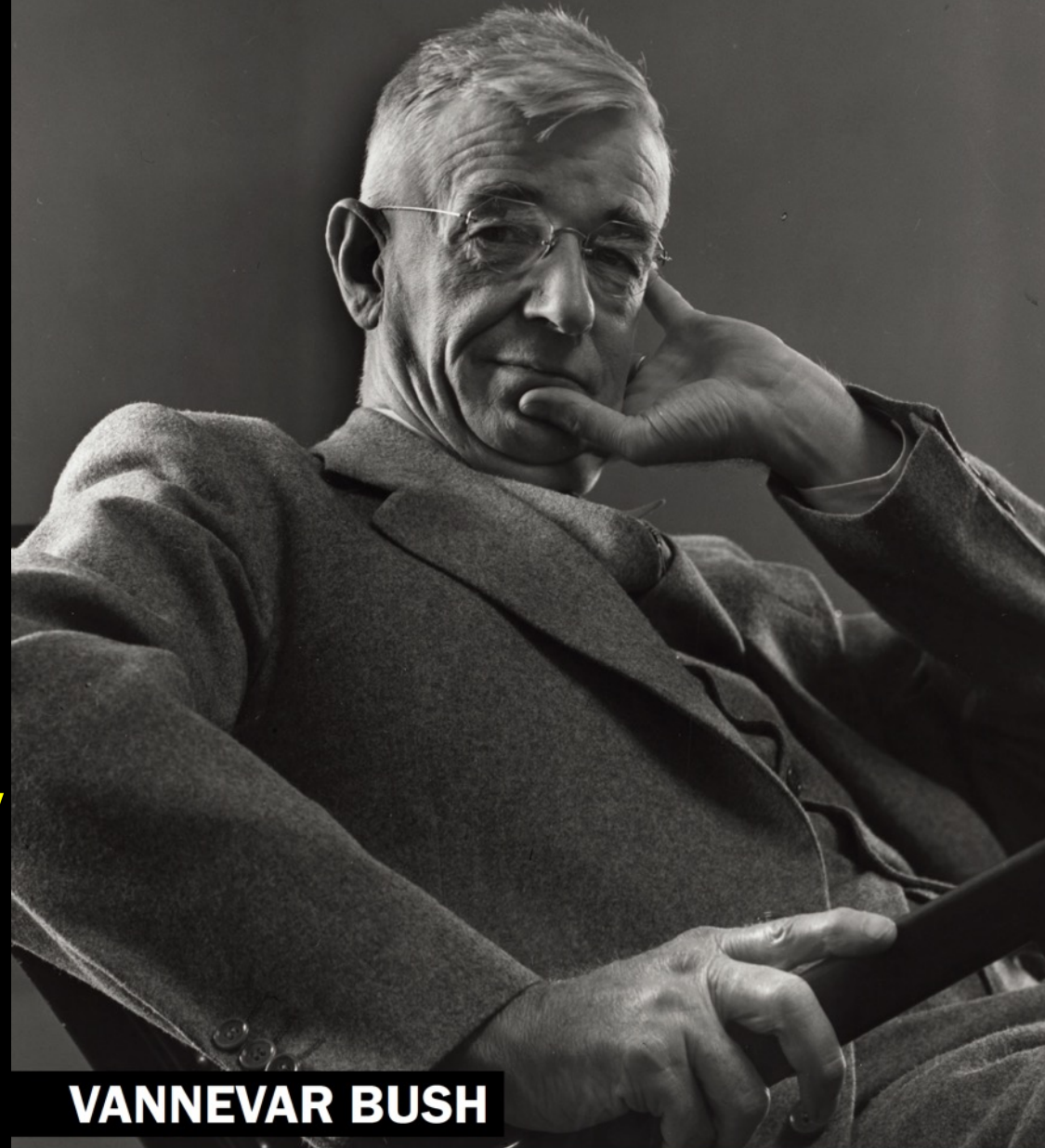
University of Texas at Dallas  
7 October 2020

"to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..." NSF Act, 1950

# SCIENCE

## the endless frontier

*75<sup>th</sup> Anniversary Edition*



**VANNEVAR BUSH**

Reprinted in celebration of the National Science Foundation's 70th anniversary

*1950-2020*

*"Science offers a largely unexplored hinterland for the pioneer who has the tools for his task. The rewards of such exploration both for the Nation and the individual are great. Scientific progress is one essential key to our security as a nation, to our better health, to more jobs, to a higher standard of living, and to our cultural progress."*

# NSF Merit Review Criteria

- **Intellectual Merit:** The Intellectual Merit criterion encompasses the potential to advance knowledge;
- **Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

# America COMPETES - 2010

## SEC. 526. BROADER IMPACTS REVIEW CRITERION.

(a) GOALS.—The Foundation shall apply a Broader Impacts Review Criterion to achieve the following goals:

- (1) Increased economic competitiveness of the United States.
- (2) Development of a globally competitive STEM workforce.
- (3) Increased participation of women and underrepresented minorities in STEM.
- (4) Increased partnerships between academia and industry.
- (5) Improved pre-K–12 STEM education and teacher development.
- (6) Improved undergraduate STEM education.
- (7) Increased public scientific literacy.
- (8) Increased national security.

# National Science Board: *Broader Impacts*

- The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.
- These outcomes include:
  - increased participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM);
  - improved STEM education at all levels;
  - increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society;
  - development of a globally competitive STEM workforce;
  - increased partnerships between academia, industry, and others;
  - increased national security;
  - increased economic competitiveness of the United States;
  - and enhanced infrastructure for research and education.
- These examples of societally relevant outcomes should not be considered either comprehensive or prescriptive. Investigators may include appropriate outcomes not covered by these examples.

# American Innovation and Competitiveness Act - 2016

BROADER IMPACTS REVIEW CRITERION UPDATE.—Section 526(a) of the America COMPETES Reauthorization Act of 2010 (42 U.S.C. 1862p–14(a)) is amended to read as follows:

(a) GOALS.—The Foundation shall apply a broader impacts review criterion to identify and demonstrate project support of the following goals:

- (1) Increasing the economic competitiveness of the United States.
- (2) Advancing of the health and welfare of the American public.
- (3) Supporting the national defense of the United States.
- (4) Enhancing partnerships between academia and industry in the United States.
- (5) Developing an American STEM workforce that is globally competitive through improved pre-kindergarten through grade 12 STEM education and teacher development, and improved undergraduate STEM education and instruction.
- (6) Improving public scientific literacy and engagement with science and technology in the United States.
- (7) Expanding participation of women and individuals from underrepresented groups in STEM.

# From NSF PAPPG – Chapter 2

“Broader impacts may be accomplished through the research itself, through the activities that are directly related to specific research projects, or through activities that are supported by, but are complementary to the project. NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes.”

# From NSF PAPPG – Chapter 2

“Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education. *These examples of societally relevant outcomes should not be considered either comprehensive or prescriptive. Proposers may include appropriate outcomes not covered by these examples.*”

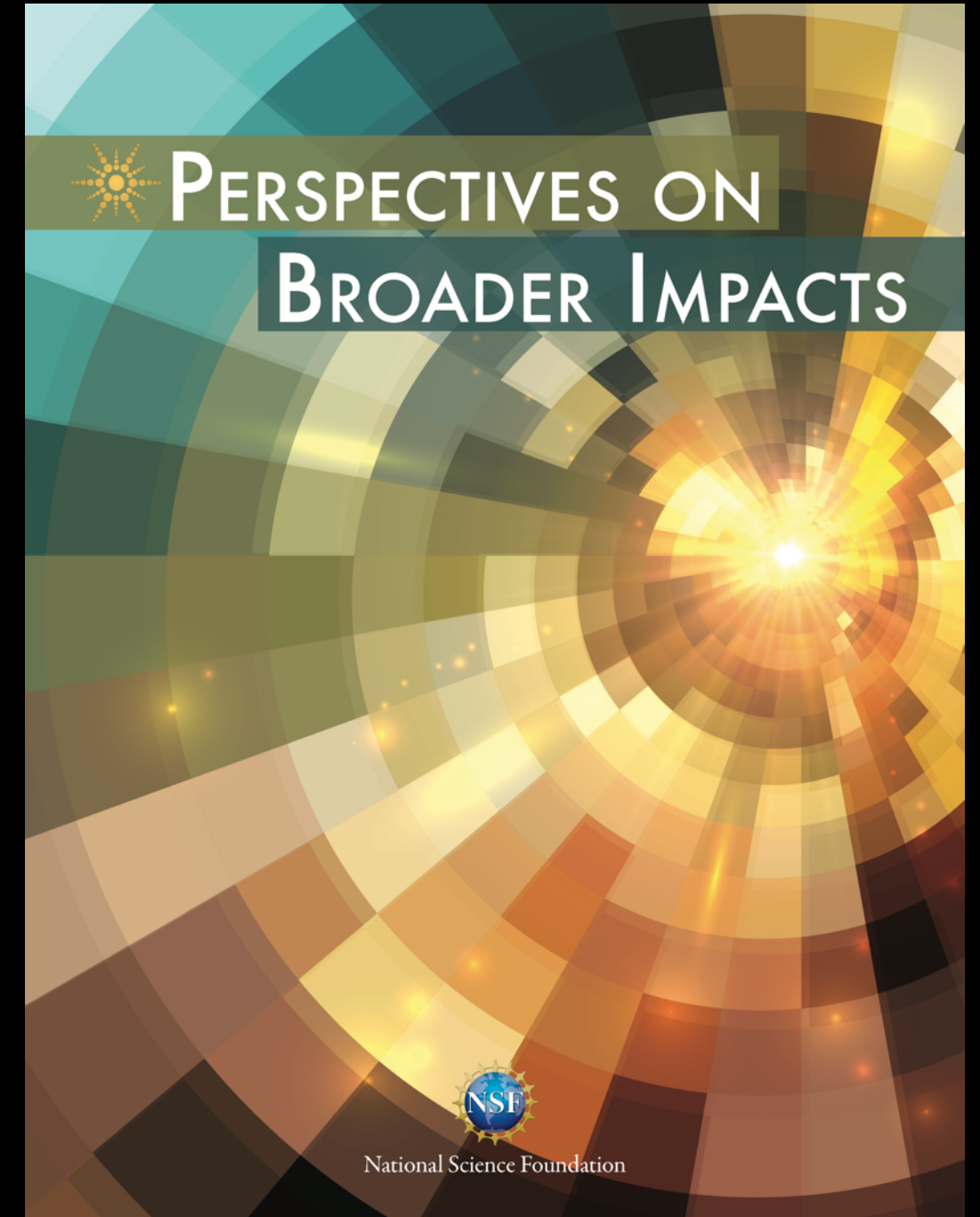
# NSB Recommendations

- “Just as institutions play an important role in facilitating research-related activities of their investigators, often in ways that align with strategic departmental and institutional (and possibly state-wide, regional, or national) priorities and investments, such a role can extend to activities directed toward the broader impacts of the project as well.”
- “... such efforts might be more effective if coordinated appropriately in ways that leverage particular institutional assets or strategic directions and even link investigators from multiple projects.”
- “NSF should encourage institutions to pursue such cooperative possibilities, which have the dual benefit of retaining the contributions of individual investigators while addressing national goals and yielding benefits broader than those within a given project.”

# Broader Impacts - Stakeholders

- Public
- Policymakers
- Institutions – Universities
- Researchers
- Students
- NSF

Broader Impacts Infrastructure Summit  
April 2014, Arlington, VA



# Feedback from Committees of Visitors

- Greater clarification about the meaning of and expectations about the Broader Impacts criterion needed.
  - How important is it for Broader Impacts to be novel?
- Inconsistent interpretation and handling of BI criterion by reviewers as well as NSF staff.
  - Variability across Programs, Divisions, Directorates
- Recommendations:
  - Improved training for reviewers and NSF staff
  - Clarification of the language used to define Broader Impacts,
  - Provision of examples of significant Broader Impacts

How can we turn BI into exciting opportunities?

# Key Elements

- Frameworks for thinking about BI
- Non-prescriptive models for BI
- Roles for Institutions
  - Universities
  - K-12, community colleges
  - Foundations
  - Local, regional, national organizations
  - Industry and private sector
  - NSF

# Possible Mechanisms

- **Facilitation** on campuses for BI formulations
- **Leveraging** complementary activities
- **Alignment** and coherence among BI activities and goals
- Together, these mechanisms have the potential to achieve results at scale

# University Strategic Plans – UC Irvine



## UCI was born 50 years ago to advance an audacious goal:

improve society through globally preeminent research, life-enhancing discoveries, and a world-class education for the most talented people regardless of background.

- **Growth That Makes a Difference:**  
Expanding Our Capacity to Improve Lives
- **First in Class:**  
Elevating the Student Experience to Prepare Future Leaders
- **Great Partners:**  
Making Regional and Global Connections That Enhance Our Mission and Serve the People
- **New Paths for Our Brilliant Future:**  
Forging Best Practices to Power the Coming Century



# UT Dallas Strategic Plan



**STRATEGIC PLAN**  
*for*  
**THE UNIVERSITY OF TEXAS AT DALLAS**

**OUR GOALS**

The University of Texas at Dallas aspires to be:

- |  |  |
|--|--|
| 1<br>A top-tier public research university with collaborative centers of excellence, prepared to meet the challenges of a rapidly changing, technology-driven global society | 2<br>A force in innovative, transdisciplinary research and education in emerging areas of technology, science and learning                               |
| 3<br>A groundbreaking leader in both framing and answering the questions faced by business, policymakers, health care and the public   | 4<br>A synergistic partner with local industry, government and cultural organizations as well as local K-12 schools, community colleges and universities |
| 5<br>A responsible global citizen that enthusiastically attends to our duty to create a sustainable environment  | 6<br>One of the most creative and innovative universities in the world   |

**STRATEGIC THEME 1**  
*Attract Talent*

**STRATEGIC THEME 2**  
*Enrich the Student Experience*

**STRATEGIC THEME 3**  
*Engage Globally*

**STRATEGIC THEME 4**  
*Enrich the Arts*

**STRATEGIC THEME 5**  
*Advance Research*

**STRATEGIC THEME 6**  
*Become an Economic Engine for the Region*

**STRATEGIC THEME 7**  
*Develop Financial and Administrative Systems That Sustain Excellence*

**STRATEGIC THEME 8**  
*Create a Culture of Philanthropy*

**STRATEGIC THEME 9**  
*Ensure a Sustainable, Rewarding Campus Environment*

University strategic plans offer a platform for alignment and leveraging for achievement of meaningful broader impacts

# International Impact Series

Next session **Oct. 14: RSVP now**

LEARN MORE

International Impact Series

**“Societal Impact in the Netherlands –  
From a promise of relevance to dedicated impact practices”**



**Leonie van Drooge**  
Dutch Rathenau Instituut

Events

News

Resources

## Events

[VIEW ALL EVENTS >](#)

[ARIS International  
Impact Series>](#)

**Oct. 14: Societal Impact  
in the Netherlands –  
From a promise ...**

[ARIS Office Hours>](#)

**Date/time for Oct. TBD  
... The next Virtual  
Office Hours date ...**

[ARIS Webinar:  
Broader Impacts 101>](#)

**Nov. 4, 2020  
1:00 pm - 3:00 pm**

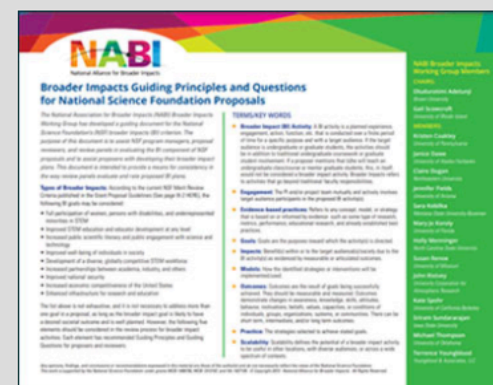
[ARIS Webinar:  
Broader Impacts 101>](#)

**Dec. 3, 2020  
2:00 pm - 4:00 pm**



[ARIS Community>](#)

Learn about and join ARIS. One of the membership benefits is access to the online ARIS Community platform!



[Guiding Principles \(PDF\)>](#)

A guiding document offering a clear, concise overview of the NSF's expectations with respect to addressing



[Go to the Toolkit>](#)

This repository of impact tools is focused on topics such as knowledge mobilization planning, stakeholder

# Possible Steps for Making Progress

- Group conversations about broader impacts: departments, centers, schools, ...
- Conversations at review panels, funding agencies, community events, professional society meetings, ...
- Identification of opportunities, resources, partnerships, ...
- Planning for broader impacts ahead of time
- Celebration of successes
- Post award reflection

# Food for Thought

- IM : Publications :: BI : ?
- How can we fuel “competition” for great BI concepts and outcomes?
- How can the conversation at this meeting be sustained over time in the research community?
- Are there “early adopters” of new ways of thinking about BI?
- How can we partner with the funding agencies to advance BI achievements?

It is critical that all stakeholders achieve common and shared understanding of BI and engage in mutually reinforcing activities to achieve the promise and expectations behind BI.

QUESTIONS?

*IDEAS?*

*SUGGESTIONS?*

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