

## NSF Broader Impacts

NSF Merit Review Criteria - Discussion of Broader Impacts (BI):

[https://www.nsf.gov/pubs/policydocs/pappg18\\_1/pappg\\_3.jsp#IIA2b](https://www.nsf.gov/pubs/policydocs/pappg18_1/pappg_3.jsp#IIA2b)

### Planning Your BI Plan

#### **Step 1: Perform an inventory of internal factors:**

- What are your strengths?
- What are you passionate about?
- What does your research lend itself to?
- What constraints (i.e. time, effort, budget, logistics) are you likely to encounter?

#### **Step 2: Perform an inventory of external factors:**

- Who is your target audience?
- What does your audience already know? What don't they know?
- What is the context?
- What exists already? What is missing?

#### **Step 3: Define goals. Goals should be:**

- Specific
- Measurable
- Achievable

#### **Step 4: Establish implementation plans**

- Timeline (with milestones)
- Budget
- Effort, personnel
- Assessment (tied to goals)

### Important BI Plan Criteria

#### **1. Which are the groups identified by NSF as underrepresented in science and engineering?**

Underrepresented minorities (Blacks, Hispanics, Native Americans, Alaskan Natives, Native Pacific Islanders); Women; Persons of Disabilities; Veterans

#### **2. What is NSF's central objective in promoting the BI criteria?**

Lack of diversity in STEM is viewed as a significant problem, and broadening participation in STEM an ongoing commitment. Also read this Chronicle of Higher Ed article for an excellent analysis of NSF's increased focus on Review Criteria [http://chronicle.com/article/Dont-Underestimate-NSFs-New/136521/?cid=at&utm\\_source=at&utm\\_medium=en](http://chronicle.com/article/Dont-Underestimate-NSFs-New/136521/?cid=at&utm_source=at&utm_medium=en)

#### **3. What are some Broader Impact categories?**

NSF values the advancement of *scientific knowledge and activities that contribute to the achievement of societally relevant outcomes*. Categories of BI activities outcomes include but are not limited to:

- Full participation of women, persons with disabilities, and underrepresented minorities in 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 U.S.
- Enhanced infrastructure for research and education

**4. What are important questions to ask while developing a BI plan?**

- What is the project doing to enhance the participation of the targeted population?
- What is the rationale for choosing that activity?
- How is progress being evaluated?

**5. What are some strengths of a 'good' BI plan?**

(Examples)

- Improved STEM education and educator development
- Increased public scientific literacy and public engagement with science and technology
- Full participation of women, persons of disabilities, and underrepresented minorities in STEM
- Employing multiple strategies to achieve one or more of the above goals

**6. What can be some potential weaknesses of a BI plan?**

(Examples)

- Dissemination of project results through routine unnamed publications (specific conferences /publications should be given)
- No specifics for a marketing plan
- No evaluation plan for BI
- No workshop details (number of participants, sessions, etc.)

**7. BI Activity Examples and Strategies:**

- Establish mentoring programs (High school students; engineers from underrepresented groups; colleges for women)
- Encourage student participation at professional meetings
- Encourage student and faculty participation from underrepresented groups
- Partner with museums, nature centers, science centers
- Report analysis results in manners appropriate to general audiences
- Publish and present in diverse media and settings
- Present results appropriate for audiences such as Congress
- Describe links between discovery and societal benefits
- Specific strategies to broaden impact of the project
- Develop a module for middle or high school teachers. Deliver content in a 90 min, two hour, or 3 hour Saturday workshop

**8. FSE BI Activities:**

- Host a high school student in lab (need to follow ASU protocol for minors in a research lab with ASU Risk Management)
- Host teacher in lab, write curriculum, test with classroom (like RET)
- Develop summer camp or be a part of an established summer camp
- Show lab/activity at ASU Open Door and/or Homecoming
- Host a module, session for Girls Make-a-thon
- Develop and host workshop for high school youth
- Develop Podcast or videos to be used in Engineering Fast Track courses or educator use
- Host workshops for undergraduate students that showcases research and impact on society
- Host FURI (Fulton Undergraduate Research Initiative) student(s)
- Design and facilitate new course
- Create REU -a group of ten or so undergraduates who work in the research programs of the host institution
- Design workshops for industries to learn about research and how it can be applied
- Partner with industry to test and utilize research.

Also look at these Broadening Participation Resources from the National Science Foundation.

Broadening Participation, Office of the Director:

<https://www.nsf.gov/od/broadeningparticipation/bp.jsp>

Broadening Participation in Engineering (BPE):

[https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505632](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505632)

Broadening Participation in Computing (BPC):

[https://www.nsf.gov/cise/bpc/White\\_Paper.pdf](https://www.nsf.gov/cise/bpc/White_Paper.pdf)

Social Behavioral and Economic Sciences (SBE) Science of Broadening Participation:

[https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505235&org=SBE&from=home](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505235&org=SBE&from=home)

Mathematical and Physical Sciences (MPS):

[https://www.nsf.gov/mps/broadening\\_participation/index.jsp](https://www.nsf.gov/mps/broadening_participation/index.jsp)