NSF Broader Impacts

NSF Merit Review Criteria - Discussion of Broader Impacts (BI):
https://www.nsf.gov/pubs/policydocs/pappg18_1/pappg_3.jsp#IIIA2b

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

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

Broadening Participation in Computing (BPC):  

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

Mathematical and Physical Sciences (MPS):  
https://www.nsf.gov/mps/broadening_participation/index.jsp