



July 27, 2023

RE: RFI Response: Roadmap for TIP

On behalf of the STEM Education Coalition, we are pleased to submit these comments in response to the request for information to inform the development of an investment roadmap for its Directorate for Technology, Innovation and Partnerships, or TIP.

The STEM Education Coalition is an alliance of education, business, and professional organizations nationwide that works to inform federal, state, and local decision makers about the critical role that science, technology, engineering, and mathematics (STEM) education plays in enabling students to thrive, innovate, and invent and therefore support American competitiveness and domestic economic development. We believe that our nation must improve the way our students learn STEM and that the business, education, and STEM communities must work together to achieve this goal.

These comments focus on topic three, workforce.

*3. Workforce. Which of the technologies listed above will have the greatest workforce needs in the next 1 to 5 years, understanding that investments in workforce initiatives often have longer time horizons to produce results? To meet this growing demand, how could TIP programs be structured to best supply these workforce needs, including pathways to the state and local levels, considering education and training at every level?*

First, this topic would be better understood as “Workforce and Education.” Any investment strategy implemented by TIP needs to incorporate the critical role education will have in meeting the workforce needs in the priority technology fields listed in the RFI.

TIP programs need to be structured with the overarching purpose of collaboration and facilitating partnerships that put use-inspired research into action directly with industry, ensuring that federal dollars are spent not only to meet today’s talent needs, but also to build pipelines for securing the talent for the future. TIP programs should also meet employers and the communities they serve where they are at, structuring programs that promote community-driven, human-centered strategies and equitably generate workforce opportunities for workers of every educational level based on an employer’s current and future needs.

The good news is that TIP does not need to recreate the wheel. In working with educational institutions, TIP should scale the experience and use-inspired research already happening around NSF, particularly with cross-directorate initiatives between EDU and TIP. The 2022-2026 NSF Strategic Plan highlights the importance of U.S. global competitiveness and its critical dependence on the readiness of the Nation's STEM workforce. NSF is already investing in programs that directly advance workforce goals through the [Improving Undergraduate STEM Education](#) (IUSE) program and the [Experiential Learning for Emerging and Novel Technologies \(ExLENT\)](#) program that build on or leverage strong industry-academic partnerships to strengthen the workforce in the priority areas detailed in the RFI. Of note, these programs are being leveraged to encourage a partnership model among companies; state, local, and tribal government offices; non-profits; schools; professional organizations; and/or institutions of higher education (including two-year and minority serving institutions (MSIs)). The I-TEST and S-STEM programs at the EDU directorate can be a valuable resource for supplementing TIP's workforce initiatives. These programs aims to bolster a highly proficient and diverse technological and computational STEM workforce by providing students with equitable access to a STEM education related to the technical and scientific workforce. The S-STEM program, specifically, is well aligned to fulfill Congress' objectives for TIP to "support the education, mentoring, and training of undergraduate students, graduate students, and postdoctoral researchers, to both advance use-inspired and translational research and to address workforce challenges, through scholarships, fellowships, and traineeships."

Congress tasked TIP with scaling innovations in PreK-12 STEM education through the establishment or expansion of STEM ecosystems. TIP should prioritize these efforts and investments as STEM ecosystems play a valuable role connecting stakeholders involved in the education-to-workforce pipeline in the key technology fields. STEM ecosystems promote evidence-based approaches sensitive to the unique combinations of capabilities, resources, and workforce needs of varying localities. Employers participate in STEM ecosystems because they are uniquely suited to engage education stakeholders, both formal and informal, and promote programming and policies to bolster an equitable near-term and long-term workforce pipeline in key technology fields.

- a. *How could TIP collaborate with other government and private organizations to ensure workforce development activities address industry priorities across the key technology focus areas and societal, national, and geostrategic challenges while broadening the talent base through diversity, equity, inclusion, and accessibility?*

In addition to structuring TIP programs as mentioned in the response above, TIP should leverage programs in the foundation-wide [Broadening Participation portfolio](#) to take the translational research focused on diversity, equity, inclusion, and accessibility and implement these practices with industry and education stakeholders participating in TIP programming. TIP should also participate in the [INCLUDES Network](#) to promote collaboration with organizations focused on improving diversity, equity, inclusion, and accessibility in the design of TIP programming.

TIP can also look to their colleagues at the Economic Development Administration (EDA) as a model for investing in workforce development in key industries. Their workforce development investments are strategically aligned to their [Investment Priorities](#).

For example, the [Good Jobs Challenge](#) program announced last year led to the establishment of 32 industry-led workforce-training partnerships that developed innovative approaches to workforce development in key industries. Similarly, the [STEM Talent Challenge](#) provides funding for programs that help build robust STEM workforce in emerging and transformative sectors such as aerospace, aeronautics, biotechnology, advanced manufacturing, cybersecurity, and others. Grantees from this program have created apprenticeships in quality science careers through job training, leveraged employer partnerships in the semi-autonomous aeronautic industry to provide training for high-wage jobs for Native Alaskans, and provided traineeships with coaching and skills development to increase the number of women, especially women of color, in geospatial careers.

- b. *How could the directorate inform state, local, and tribal government of the knowledge, skills, and abilities needed to build pathways to prepare future workers and reskill current workers for entry into the key technology focus areas?*

TIP can once again leverage experience from other federal agencies on this point and support a multi-agency approach, if not lead. Back to the EDA, their ability to engage state, local, and tribal government leaders on workforce development provides a roadmap for TIP. Specifically, EDA recently announced the [inclusion of workforce development strategies](#) in their [Comprehensive Economic Development Strategies](#) (CEDS) program to help states and localities establish and maintain a robust economic ecosystem by providing a means to engage community leaders, leverage the involvement of the private sector, and establish a strategic blueprint for regional collaboration.

TIP should also work with the Department of Labor to promote collaboration with federal workforce investments and support efforts to modernize federal, state, and local workforce data systems that provide real-time labor market data and promote best practices for education and employers to more efficiently adapt to this data.

We appreciate the opportunity to provide comment and look forward to working with TIP in the implementation of the strategy.

Sincerely,

STEM Education Coalition