

Vanderbilt University

Proposals to Improve U.S. Competitiveness

Vanderbilt University strongly believes that we must significantly increase our federal investments in science, engineering, and technology in order to outcompete our global competitors. We believe a bold, aggressive competitiveness and innovation strategy to counter our global adversaries is necessary. Universities such as Vanderbilt can and should play a key role in developing the “industries of the future” and advancing the key technology areas that will be critical to maintaining our position as a global innovation leader. Such an investment in our federal research agencies will improve our innovation ecosystem and we believe that Vanderbilt and Tennessee are well-situated to benefit from these proposals.

General Authorizations

- We support complete five-year authorizations of NSF and DOE Office of Science as proposed in H.R. 2225, the NSF for the Future Act, and H.R. 3593, the DOE Science for the Future Act.
- We support as robust authorizations as possible for both agencies.
- We support the authorization of regional innovation hubs at the Department of Commerce’s Economic Development Administration with as robust an authorization as possible.

National Science Foundation

The National Science Foundation (NSF) plays a pivotal role in the future vitality of the national science, mathematics, and engineering enterprise of the United States. Vanderbilt University is thrilled to support bicameral, bipartisan efforts to significantly bolster the agency through an infusion of funding and a renewed commitment to the federal government-university partnership. We strongly agree with efforts to increase our federal investments in science, engineering, and technology in order to outcompete our global competitors. NSF’s budget has lagged behind other science agencies in recent years and increasing its budget is a national imperative for American competitiveness.

Proposals for a New NSF Directorate

Vanderbilt supports the proposals in both S. 1260, the U.S. Innovation and Competition Act (USICA), and H.R. 2225, the NSF for the Future Act (NSFFTF), to authorize a new directorate at NSF that would advance innovation and use-inspired research. While we prefer the construct of the directorate as proposed by H.R. 2225, we also support some of the specific programs authorized in S. 1260, including University Technology Centers.

Authorized Funding Levels

- NSF is a critical part of the innovation ecosystem; however, NSF funding has stagnated in recent years. An ambitious authorization of appropriations is an important first step to securing the funding need to enable long-term stability in our innovation ecosystem.
- We applaud the ambitious authorization level for a new directorate included in S. 1260. We also strongly support ambitious authorization levels for the rest of NSF to ensure the Foundation can continue to support the full range of scientific and engineering disciplines.
- We appreciate that the sponsors of H.R. 2225 are balancing the need for a robust infusion of funding for both a new directorate and NSF’s current programs with the fiscal reality of the

appropriations process, and we urge Congress to authorize the highest level practical for NSF. Authorizations should set ambitious and aspirational goals for the agency – but should also be tempered with some cognizance of the likelihood of appropriations.

Governance and Other Policy Details

- It is important that the new directorate adopt the structure and policies that NSF's existing directorates have benefited from – such as a qualified assistant director who is advised by a FACA committee of experts from the stakeholder community – and have the additional flexibilities needed to ensure the new directorate will be successful.
- Vanderbilt believes that a new directorate should be provided with a variety of tools to carry out its mission. While this should include the traditional peer review model, it must also include the option for more flexible authorities that will allow the directorate to pursue high risk, high reward strategies and ensure partnerships with a variety of stakeholders, including the private sector. That flexibility might also include granting the new assistant director the authority to develop and test diverse merit review models and mechanisms for selecting and providing awards for use-inspired and translational research and development at different scales, as proposed in H.R. 2225.
- Vanderbilt believes that the NSF director, in close consultation with the new directorate's assistant director and advisory committee, should have the authority to determine the areas of focus for the new directorate. We generally agree that the focus areas listed S. 1260 are currently the key technology areas critical in promoting U.S. innovation and competitiveness. NSF should play an important role in leading research in these emerging technology areas. In general, we believe that while policymakers can play an important role in identifying key technology areas and determining funding levels, there needs to be opportunities for stakeholders, such as science and engineering experts through the National Academies and others, to provide input into determining key focus areas going forward. We applaud provisions that ensure this occurs.
- Vanderbilt strongly supports the proposals in S. 1260 to establish within the new directorate:
 - **University Technology Centers**, consortia that would support the basic and translational research to advance innovation in the key technology focus areas and further the development and commercialization of innovations in the key areas including activities such as translational research, proof-of-concept development, and prototyping;
 - **A laboratory to market commercialization program**, which would build the capacity of institutions of higher education to support technology transfer and facilitate collaboration with firms in the key technology areas; and
 - A program to establish and operate **test beds and fabrication facilities** to advance the operation, integration, deployment, and, as appropriate, manufacturing of new, innovative technologies in the key technology focus areas.
 - The new directorate should also include **support for students**, including undergraduate scholarships, graduate fellowships and traineeships, and postdoctoral awards.

Other Policy Proposals for NSF

STEM Education

- PreK-12 Education: Vanderbilt supports provisions in H.R. 2225 to identify research priorities and ensure widespread implementation of STEM education innovations. Researchers at Vanderbilt's Peabody College of education and human development are particularly excited

about proposals that would expand NSF support for STEM education research, including provisions that would:

- Create new multidisciplinary research and translation centers to scale STEM education innovations;
 - Direct NSF to focus on research and development to improve the alignment of undergraduate STEM education and training with workforce needs; and
 - Direct NSF to focus on research on the graduate STEM education system.
- Graduate Education: Vanderbilt appreciates that H.R. 2225 focuses on graduate education. While there is some concern that the new requirements – including requiring individualized development plans and expanding the mentoring plan requirements – could increase administrative burden, there is general agreement that additional structure would benefit our graduate students. We would expect NSF to respond to remaining key questions as these provisions are implemented, including:
 - Many Vanderbilt University programs already require graduate students to have individualized development plans; what specific requirements might NSF put in place for these IDPs?
 - How should PIs expect these new requirements to be used to reach a funding decision for their grant application?

Broadening NSF Research

- Vanderbilt believes that a diversity in funding recipients – including researchers, students, and institutions – adds to the richness of science and research and we support efforts to build research capacity at a diverse array of institutions. We support a number of the capacity building programs authorized in H.R. 2225 that will increase research capacity in locations and among personnel historically under-represented in NSF funding without resorting to statutory mandates for certain percentages of funding to be set aside for specific regions, states, or institutions. NSF's peer-review model is the gold standard in awarding research funding and is replicated around the world. We believe that NSF should preserve the peer-review funding model to the extent possible.
- Vanderbilt is proud of our existing partnerships with Fisk University, Tennessee State University, Lipscomb University, and others. These partnerships support our ability to broaden participation of traditionally underserved minorities. New capacity building programs authorized in H.R. 2225 could support the expansion of these partnerships. We encourage clarification over which NSF programs would qualify for the pilot programs authorized in H.R. 2225 and whether a partnership could involve more than two institutions. We also encourage clarification around how success would be determined for each partnership and for the pilot overall. We suggest that NSF clearly state their expectations for each partnership and the pilot overall as early as possible, because this will significantly impact how emerging research institutions and research-intensive institutions develop their proposals for partnerships.

Fundamental Research Provisions

- Research Ethics: Vanderbilt appreciates that Sec. 7(e) of H.R. 2225 would require NSF to incorporate stakeholder feedback as they determine requirements for research ethics statements.
- Research Reproducibility and Replicability: Vanderbilt agrees with the goal of Sec. 7(f) of H.R. 2225 to improve public access to research products, including data, software, and code, developed as part of NSF-supported projects. However, there are several challenges to making

data open and accessible; we encourage NSF to clearly define “trusted open repository,” ensure any requirements factor in discipline-specific considerations – such as machine-readable requirements for qualitative data, and harmonize requirements with other agencies. NSF must also address the expense for maintaining these data repositories.

Dept. of Commerce

Vanderbilt University supports provisions in the Endless Frontier Act and [H.R. 4588, the Regional Innovation Act](#), to establish new programs at the Dept. of Commerce that would promote the regional activities that maintain the U.S. competitive edge in technology and innovation sectors critical to national and economic security. Vanderbilt further supports the important role that research universities ought to play in leading these initiatives, which include:

- Regional Technology Hubs, consortia that would support the ability of regions across the U.S. to develop their technology and innovation sectors; and
- Regional Technology Strategy Grant program, which would support regions in developing or updating a comprehensive regional technology strategy.

We are strongly supportive of the USICA language authorizing the Dept. of Commerce’s Economic Development Administration to establish regional technology hubs. We would encourage these hubs be allowed to each focus on multiple key technology areas (as outlined in the USICA), given the diverse strengths of the particular regions, the overlap in the academic and research subjects underlying the specified technology areas, and the importance of avoiding technology silos.

We agree with many of the consortia requirements specified in the USICA, including provisions that would award Regional Technology Hubs by EDA regions and provide three per region. We also believe that requiring the involvement of a diverse set of organizations in each consortium will support the broader economic development goal of the regional technology hubs and strategy grants programs while affirming the key role that research universities play in their regions.

We support as robust an authorization and appropriation as possible for these important economic development programs. We note the USICA authorizes \$10 billion while H.R. 4588 authorizes approximately \$8 billion; the House Science Committee reconciliation package includes \$5 billion in funding.

Research Security

Vanderbilt shares many of the concerns about undue foreign influence in our research enterprise and takes seriously national security threats posed by certain international actors. We support numerous provisions of USICA and NSF for the Future Act but we also have serious concerns with numerous research security provisions that have been included in USICA. Generally, we encourage Congress to refine the various proposals to ensure that research security provisions are not duplicative or overly broad, do not impede valuable international scientific collaborations, use a risk-based approach to ensuring research security, and do not impose requirements that significantly increase administrative burden and impede the very types of research and innovation these bills are seeking to ensure U.S. competitiveness.

Provisions of most concern include:

- **Review by the Committee on Foreign Investment in the United States:** Section 3138 of S. 1260, would require review by the Committee on Foreign Investment in the United States (CFIUS) of certain foreign gifts and contracts to higher education institutions that equal or exceed \$1 million in a single year or aggregate gifts or contracts from the same foreign source of a value over \$1 million during a two-year period. We strongly oppose this provision. CFIUS was designed to review foreign investment in companies; applying CFIUS to university gifts and contracts would undermine national security and significantly overwhelm the CFIUS review process with review of gifts beyond its original scope and intent. Additionally, this would needlessly delay important research projects that are addressing national priorities relating to health and national and economic security. With regards to U.S. universities, it is not clear what a CFIUS review of gifts and contracts would be designed to counter or how proper review would be determined when applied to university gifts and contracts. No provision of the bill limits CFIUS's scope in a clear or significant way and the bill requires review by CFIUS regardless of whether or not a country of origin is hostile to the United States.
 - As an example, under the current language, it is possible that Vanderbilt agreements with British pharmaceutical companies related to drug discovery could be subject to CFIUS review, potentially threatening (or at least slowing down) the partnership.
 - Note that Section 5212 of S. 1260 prohibits CFIUS from reviewing or investigating gifts to an institution of higher education from a foreign person and prohibits use of funds to review or investigate gifts to an institution of higher education from a foreign person. We support this language.
- **Section 117 foreign gift reporting and expansion with new Sec. 124 on individual foreign gift reporting:** Sec. 6124 of S. 1260 lowers the Sec. 117 reporting threshold of foreign gifts and contracts to \$50,000; provides an annual disclosure date; outlines content of disclosure reporting; addresses sanctions for noncompliance; and establishes a single point of contact within the Department of Education. While we have concerns with the changes proposed to Sec. 117 and the increased reporting it would require, we are very strongly opposed to the new requirement in Sec. 124 of the Higher Education Act entitled "Institutional Policy Regarding Foreign Gifts and Contracts to Faculty and Staff" that would require universities to ensure that faculty and staff report any gifts from, or contracts entered into, with a foreign source (with no threshold for reporting), and then maintain this information in a searchable database and effectively manage potential espionage by foreign sources targeting faculty and staff. The section would also expand the definition of a contract for Sec. 124 reporting to include any "affiliation, agreement, or similar transaction" involving the use of the "name, likeness, time, services, or resources" of faculty and staff. This is an onerous requirement and would sacrifice the privacy rights of university faculty and staff. It would perpetuate a perception that common joint activities with our foreign partners – often in allied countries – are dangerous, and we believe it could discourage some Vanderbilt researchers from collaborating with international partners, including in EU countries and Great Britain.
- **NSF collection of supporting documents:** We oppose Sec. 2526 of S. 1260, which would require NSF to collect an incredibly broad set of unnecessary new information. The massive influx of information would overwhelm the agency and would not be helpful to ensuring research security. We support the more narrowly defined Sec. 7(c)(7) of H.R. 2225, which would allow NSF, at the discretion of the NSF Office of Research Security and Policy, to conduct risk assessments and to request the submission of supporting documentation, including copies of contracts, grants, or any other agreement specific to foreign appointments, employment with a

foreign institution, participation in a foreign talent program and other information and various mechanisms for enforcement of related NSF policies.

- **Sensitive or controlled information and background screenings:** We oppose Sec. 2308 in S. 1260, which would task NSF with creating a plan with respect to sensitive or controlled information and background screenings. This should not be a responsibility for NSF or other federal research agencies and should be left to the Department of Commerce Bureau of Industry and Security (BIS) which is already statutorily required to define and identify emerging and foundational technologies that need additional controls and protection under the current Export Control Reform Act (ECRA). Tasking NSF with this responsibility would duplicate what the Department of Commerce BIS is already charged with doing under ECRA.
- **Federal research security council at OMB:** Vanderbilt supports continuing the work across all federal agencies advanced through OSTP's Joint Committee on the Research Environment (JCORE) and further transparency on the implementation of NSPM-33 in accordance with Sec. 1746 of the FY 2020 National Defense Authorization Act. We believe that Sec. 4493 of S. 1260, which creates a new federal research security council at OMB, is unnecessary and duplicative to the existing and effective efforts of the NSTC JCORE working group.

Vanderbilt supports the following provisions:

- **Foreign Talent Recruitment:** We support Section 7(c)(8) of H.R. 2225, which would require NSF applicants to certify they are not an active participant of a malign foreign talent recruitment program from a foreign country of concern and will not be a participant for the duration of the NSF award. It also requires institutions applying for an award to certify that each covered individual who is employed by the institution has been made aware of the requirement. It includes language to not limit scholarly presentations, participation in international conferences or other international exchanges/partnerships/programs that involve open and reciprocal exchange of scientific information, and other activities. We believe that this provision is narrowly enough defined to target truly malign programs and nations. Secs. 2303 and 6101 of S. 1260 do not have sufficient guardrails in place and are less clear on the definition of "malign."
- **Requirements for Coordination:** Vanderbilt generally supports proposals that would improve the ability of the federal government to coordinate across agencies and with institutions of higher education. For example:
 - Section 2304 of S. 1260 would require NSF to establish an initiative to work with institutions of higher education to support protection of intellectual property, limit undue influence, including through talent recruitment programs, and support efforts toward development of domestic talent in relevant science and engineering fields.
 - Section 7(c)(1), (2), and (3) of H.R. 2225 would establish a Research Security and Policy Office within the NSF Director's office.
- **Additional Research Security Materials:** In general, Vanderbilt supports clear guidance and robust training resources. For example:
 - Sec. 7(c)(4) and (9) of H.R. 2225 require NSF to develop an online resources and security training models for both institutions and researchers on NSF security policies, potential security risks and mitigation strategies, and examples of positive international collaborations vs. foreign government interference efforts.

- Sec. 7(c)(10) of H.R. 2225 adds a new requirement to the Responsible Conduct in Research Training for faculty and other senior personnel to include research security topics.
- Sec. 7(c)(11) of H.R. 2225 requires the National Academies to update their report “On Being a Scientist: A Guide to Responsible Conduct in Research” to include research security topics.
- **Additional Research on Research Security:** We support Sec. 7(c)(6) of H.R. 2225, which would provide funding for research grants pertaining to better understanding research security and protecting research integrity from foreign talents.

Technology Transfer

Vanderbilt supports provisions of S. 1260 that encourage technology transfer activities within the new NSF directorate. We appreciate the bill’s clear direction for NSF to advance the important objective of moving NSF-funded ideas from the laboratory to the marketplace. This includes:

- Authorizing NSF, in coordination with NIST, to make awards to advance the development and commercialization of technologies, particularly those in the key technology focus areas.
- Authorizes \$4.06 billion from FY 2022 – FY 2026 for an NSF program to improve technology transfer in academia, to be carried out in coordination with NIST.
- Authorizes the creation of regional collaborative tech transfer resource centers. If enacted and funded, it would be the first time the federal government has provided direct support to tech transfer offices. Tech transfer always has been essentially an unfunded mandate under the Bayh-Dole Act. While the criteria and metrics used to evaluate improvements are unclear, we are generally supportive of this concept.

Dept. of Energy Office of Science

Vanderbilt supports H.R. 3593, the DOE Science for the Future Act and strongly encourages that a complete five-year authorization of DOE’s Office of Science be included in a final competitiveness package. We strongly support the most robust authorizations possible for DOE’s Office of Science, providing sustained and robust growth for both existing and new programs.

Title VI International Education

Title VI provides important resources to colleges and universities such as Vanderbilt across the country to ensure that they can develop and maintain high-quality, innovative international programs of strategic interest. We support the inclusion in S. 1260 of the “Advancing International and Foreign Language Education Act” that reauthorizes Title VI of the Higher Education Act and makes improvements to the law that enhances the program in support of foreign language and international studies. The reauthorization of the Title VI program will ensure that American students will have access to high-quality international and foreign language education programs. These programs will meet the needs of our nation and help our students remain globally competitive. The inclusion of the bill will also strengthen the essential role that Title VI plays in training individuals who will make important contributions to our nation’s international relations and economic and national security.

Sexual Harassment

We support efforts to address sexual harassment in the sciences and appreciate congressional efforts to respond to this persistent problem. Generally, we prefer the language included in Sec. 2521 of S. 1260 although we do have some further refinements we would like to see.

- We support efforts to harmonize definitions (such as “sexual harassment”) and reporting/disclosure requirements across federal agencies. We note that Sec. 2521 aligns the definition with the EEOC, not Title IX.
- We support updating the report “On Being a Scientist: A Guide to Responsible Conduct in Research” issued by the National Academies.
- We have some concerns about potential reporting guidelines and how those might interact with our existing Title IX obligations and institutional policies and procedures to address these cases, particularly given the use of the EEOC definition. In general, we have concerns with language requiring us to report to federal agencies on interim administrative measures before a finding has been made. We worry such requirements could chill reporting, particularly by graduate students.
- Vanderbilt is committed to regularly surveying our community and reporting the results. (See: <https://www.vanderbilt.edu/genderharassment/campus-surveys/>) The surveys are on a four-year cycle which fits well with higher education and allows surveys on other important subjects without survey fatigue. We have access to only aggregated, deidentified data as a way to protect respondents and encourage candor. Recently, the NASEM Action Collaborative on Preventing Sexual Harassment in Higher Education featured our use of the survey in its [repository](#).

DARPA

Vanderbilt supports the supplemental authorization of appropriations for the Defense Advanced Research Projects Agency (DARPA) to conduct research and development in key technology focus areas.