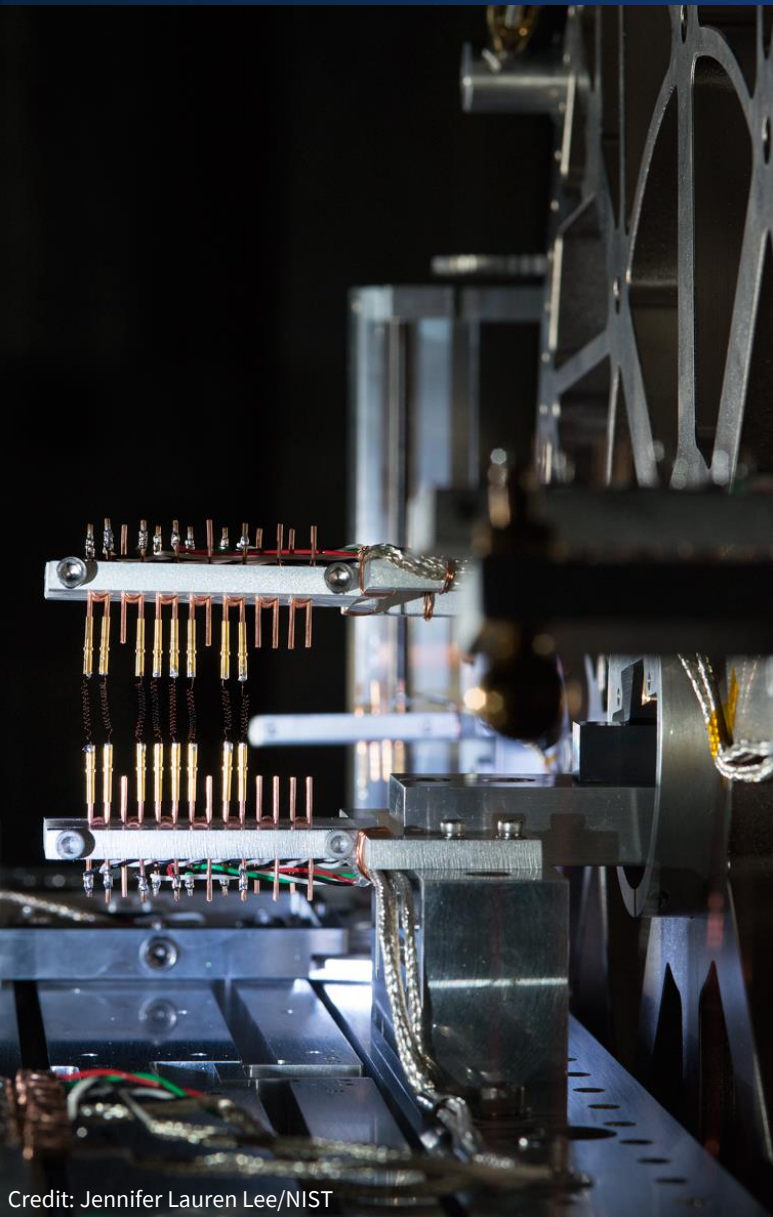


# NIST's Response to VCAT 2024 Annual Report Recommendations

Dr. Jason Boehm  
NIST Chief of Staff

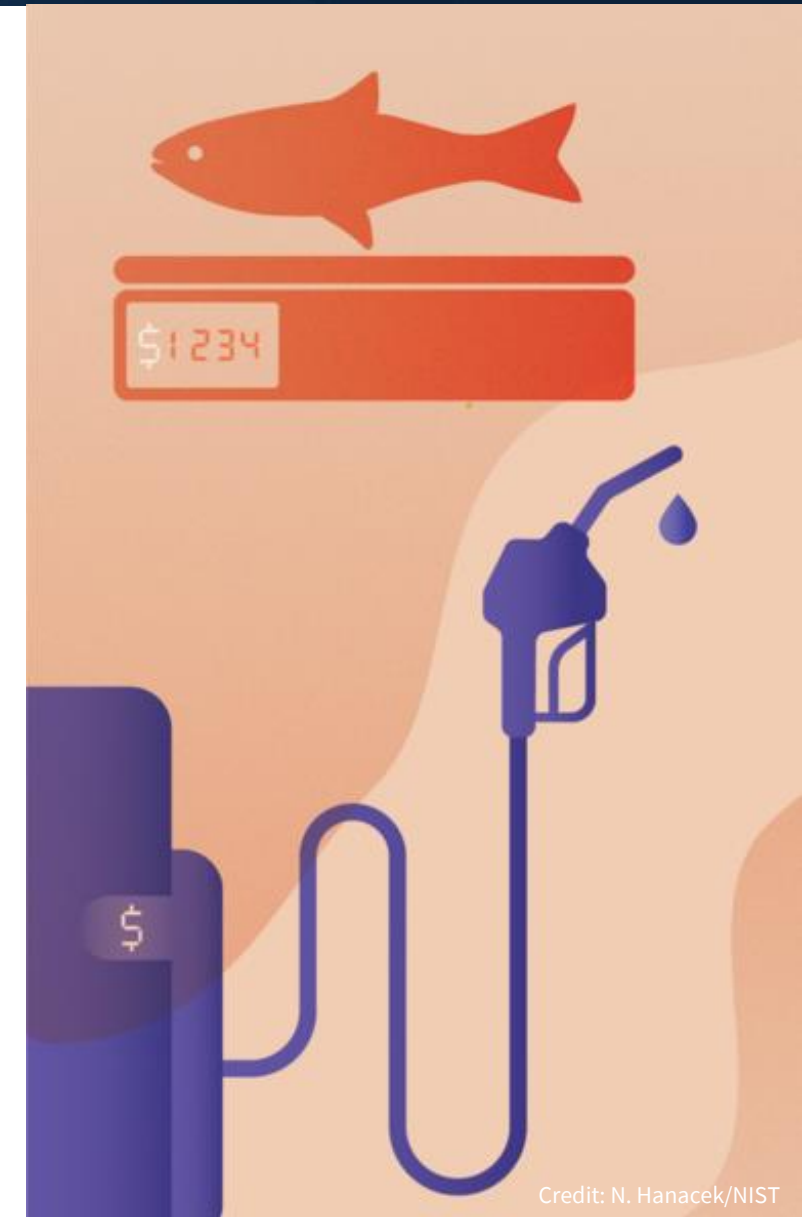
# Emphasizing NIST's Core Mission



Recommendation	NIST's Response
<b>Emphasizing the NIST core mission:</b> NIST should consider leveraging communications to highlight how metrology, and being an NMI, provides the foundation for all of NIST's work and contributions across fields and sectors.	<ul style="list-style-type: none"><li>NIST updated the NIST homepage to include a section called "America's national measurement institute" that links to an <a href="#">NMI FAQ page</a>. NIST also published and promoted a <a href="#">blog post</a> via social media by chief metrologist Jim Olthoff, and NIST highlights the unique measurement role in NIST news releases and a web series called "<a href="#">How do you measure it?</a>". In FY 2026, NIST is planning to update the SI Redefinition site (<a href="https://www.nist.gov/si-redefinition">https://www.nist.gov/si-redefinition</a>) to be a larger "metric" site that will reinforce NIST's role.</li></ul>
<b>Recruiting new talent:</b> When looking to recruit metrology-based talent, NIST should keep metrology integrated with other fields to help attract necessary staff.	<ul style="list-style-type: none"><li>NIST developed processes to continuously assess the role of metrology and optimal staffing level alignment across all programs and will include the importance of metrology in recruitment efforts whenever possible.</li></ul>

# Emphasizing NIST's Core Mission

Recommendation	NIST's Response
<b>Blending role knowledge:</b> When looking to blend roles at NIST, for example service roles and research/technical roles, NIST should increase use of rotation assignments to help build understanding and knowledge.	<ul style="list-style-type: none"><li>NIST is continuing to offer detail opportunities to fill mission-critical areas across the organization, with an intent to focus on increasing NIST Measurement Services knowledge and awareness among staff.</li></ul>
<b>Involving academia in standards activities:</b> NIST should emphasize the importance of being engaged in standards to academia, including pre-standardization research, and involve academia more in the standards space. NIST could also consider a standards bootcamp catered solely to academia.	<ul style="list-style-type: none"><li>NIST has a Standards Curricula Development Cooperative Agreement Program that aims to enrich college curricula to raise awareness of the role of standards and standardization in many fields. The new Standardization Center of Excellence will also be an important resource that will be available to academia to foster engagement in standardization.</li></ul>





# Meeting National Demands in Critical and Emerging Technologies and Other Cross-Cutting Programs



Recommendation	NIST's Response
<b>Building credibility and understanding of AI guidelines:</b> To enhance credibility, NIST-released AI guidelines, should include explanations of how AI technology works and why counterfactual output is produced. In addition, it is recommended that NIST help the public understand what the properties are of the statistics used for the training of large language models.	<ul style="list-style-type: none"><li>NIST acknowledges the growing body of publications on how AI technology works and of research into counterfactual outputs of AI. However, this specific recommendation is likely beyond the NIST mission space.</li></ul>
<b>Risks of fragmentation:</b> NIST is encouraged to balance pursuing science with what is being asked for by external entities in AI to prevent fragmentation and to maintain a clear vision and end goal.	<ul style="list-style-type: none"><li>NIST's AI efforts all drive towards a common goal to advance measurement science for AI and to identify technical gaps and limitations in AI technologies and related measurements. NIST intends to leverage its AI expertise, guidelines, and tools to support the needs of external entities.</li></ul>

# Meeting National Demands in Critical and Emerging Technologies and Other Cross-Cutting Programs

Recommendation	NIST's Response
<b>Strengthening internal responsible AI practices:</b> NIST leadership is encouraged to strategize responsible AI practices, both as a discipline and as external taskings.	<ul style="list-style-type: none"><li>NIST produces voluntary guidelines, tools, and other voluntary resources to help organizations with the development and deployment of trustworthy and responsible AI technologies. The NIST AI Risk Management Framework is one such tool that can help organizations – including federal agencies – to ensure that they consider and purposefully manage AI benefits and risks. NIST is currently engaged in helping federal agencies and others apply the AI RMF.</li></ul>
<b>Analyzing energy consumption of AI:</b> NIST is encouraged to focus resources on energy consumption of AI, including developing metrics for measurement and evaluation.	<ul style="list-style-type: none"><li>NIST is working on a landscape report in this area and intends to release the report later in calendar year 2025.</li></ul>



# Meeting National Demands in Critical and Emerging Technologies and Other Cross-Cutting Programs



Recommendation	NIST's Response
<b>Ensuring proper implementation of Post-quantum Cryptography (PQC) Standards:</b> NIST should identify a process that outlines consistent and effective implementation of PQC standards. Specifically, NIST should help with organizing a test plan for each of the new PQC algorithms so that the implementations can be done in a stable manner and without compromising security.	<ul style="list-style-type: none"><li>Testing for the PQC algorithms in FIPS 203, FIPS 204, and FIPS 205 was developed concurrently with the PQC standards and is available through the <a href="#">Automated Cryptographic Validation Protocol (ACVP)</a>, with additional testing requirements developed in the <a href="#">FIPS 140-3 Implementation Guidance</a>. To date, 75 implementations of the PQC algorithms have been validated using these tests.</li></ul>
<b>Utilizing existing consortia to drive PQC adoption:</b> The VCAT suggests having a focused discussion with the Quantum Economic Development Consortium (QED-C) to help drive adoption of NIST's PQC standards.	<ul style="list-style-type: none"><li>NIST has fully implemented this recommendation.</li></ul>



# Meeting National Demands in Critical and Emerging Technologies and Other Cross-Cutting Programs

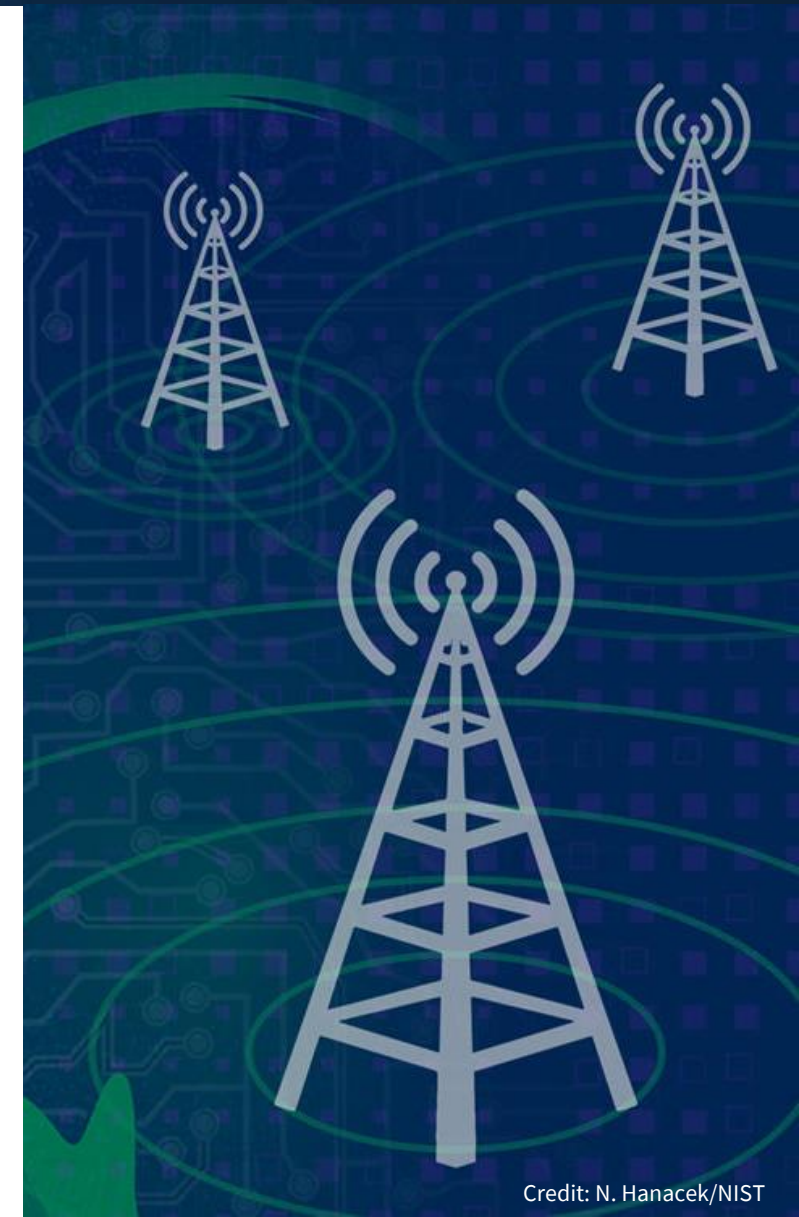


## Recommendation

**Growing next-generation communications research areas:** NIST is encouraged to consider satellite communications as a growth area in the next-generation communications programmatic priority area.

## NIST's Response

- The Communications Technology Laboratory (CTL) research portfolio currently consists of several projects that address satellite communications, including new traceable broadband antenna metrology, developing analysis techniques to inform spectrum sharing between incumbent fixed satellite services and new users, as well as looking at the impact of aggregate terrestrial emissions to on-orbit sensing assets. NIST is also currently developing a “NIST in Space” strategic roadmap to further identify high-impact research efforts on non-terrestrial networks.



# Strengthening U.S. Manufacturing Leadership



Recommendation	NIST's Response
<b>Avoid duplication of efforts:</b> NIST is encouraged to look for efficiencies across funding recipients to avoid duplication of efforts, where possible.	<ul style="list-style-type: none"><li>CHIPS R&amp;D regularly participates in multiple interagency collaborative efforts to avoid duplication. For example, multiple DOE National Labs joined the application for NIST's new Manufacturing USA institute, focused on domestic semiconductor manufacturing. NIST also established a Steering Committee for the National Semiconductor Technology Center, with representation from DOE, NSF, and DoD, to ensure that work is complementary and not duplicative.</li></ul>

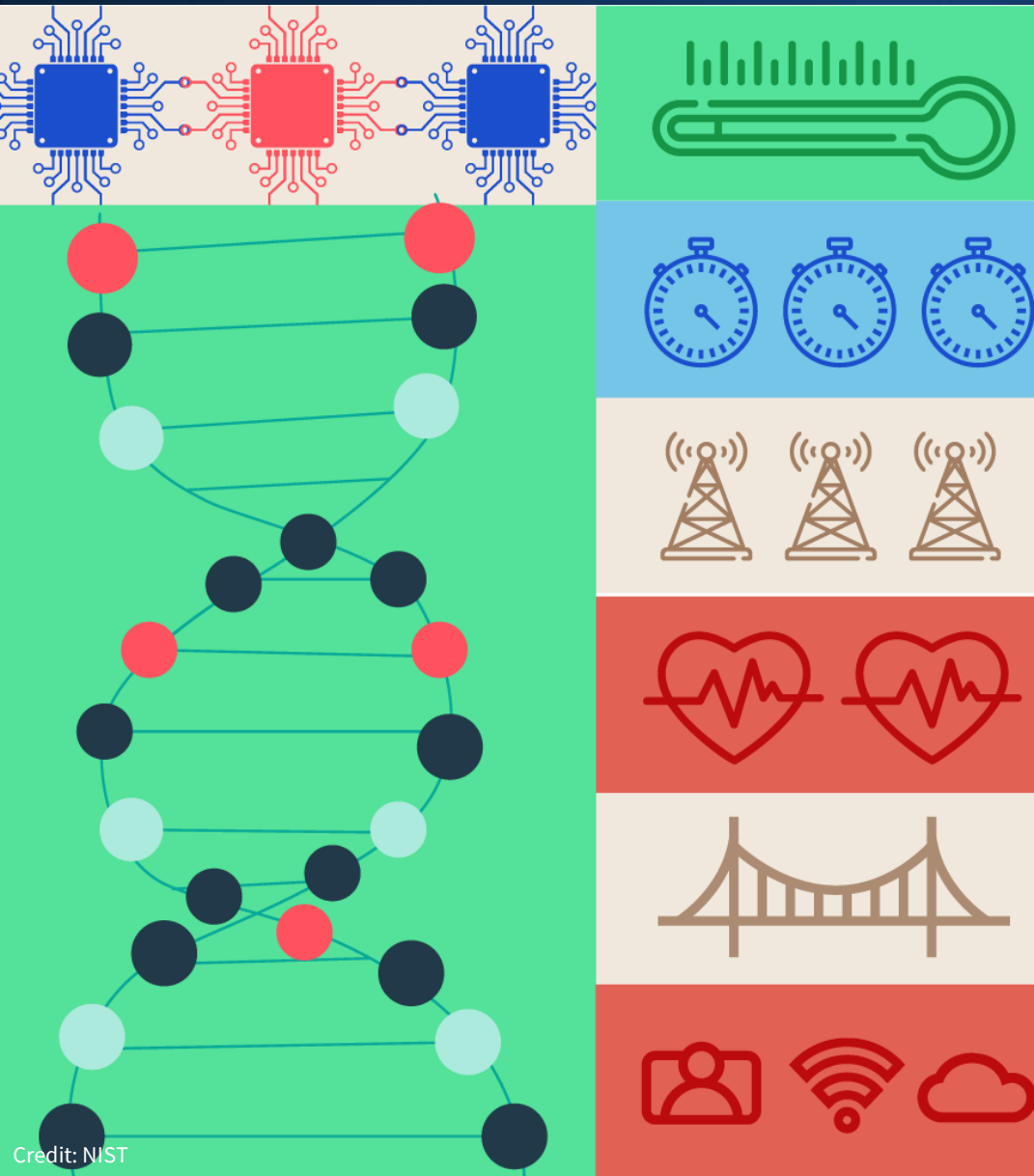


# Future Opportunities and Strategic Planning

Recommendation	NIST's Response
<b>Building new CET convergence areas:</b> NIST is encouraged to bring together NIST technical leads to discuss and map potential convergence opportunities for future focus NIST priority areas. Once mapped, opportunities should be ranked, by advantageousness, timeliness, or similar metric, and further strategized how to focus resources to support these new efforts.	<ul style="list-style-type: none"><li>NIST has already begun prioritizing CET convergence areas that are also in line with Administration priorities including AI &amp; biotechnology, quantum &amp; semiconductors, quantum &amp; next-generation communications, and cybersecurity &amp; biotechnology. NIST will continue to look for additional convergence areas based on stakeholder needs.</li></ul>
<b>Providing more learning opportunities for AI:</b> NIST is encouraged to provide opportunities to teach their staff or give them opportunities to explore AI to help foster the development of new convergence areas with AI.	<ul style="list-style-type: none"><li>NIST supports providing staff opportunities to explore AI, including through events like AI@NIST day, highlighting NIST's work in AI and fostering discussion across the organization. NIST is also currently piloting an on-premises, AI large language model service campus-wide.</li></ul>



# NIST Budget



Recommendation	NIST's Response
<b>Assess core priorities:</b> The VCAT recommends that NIST leadership continually reassess core priorities to prepare for potential reductions in budget.	<ul style="list-style-type: none"><li>NIST has developed and implemented processes to continuously assess core priorities in preparation for both budget increases and reductions, while also aligning with the Department of Commerce and Administration priorities.</li></ul>