NIST Laboratory Programs Strategic Vision

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American Innovation and Competitiveness Act Requirement

(a) The Director of NIST, acting through the Associate Director for Laboratory Programs, shall develop and implement a comprehensive strategic plan for laboratory programs that expands-

(1) interactions with academia, international researchers, and industry; and

(2) commercial and industrial applications.

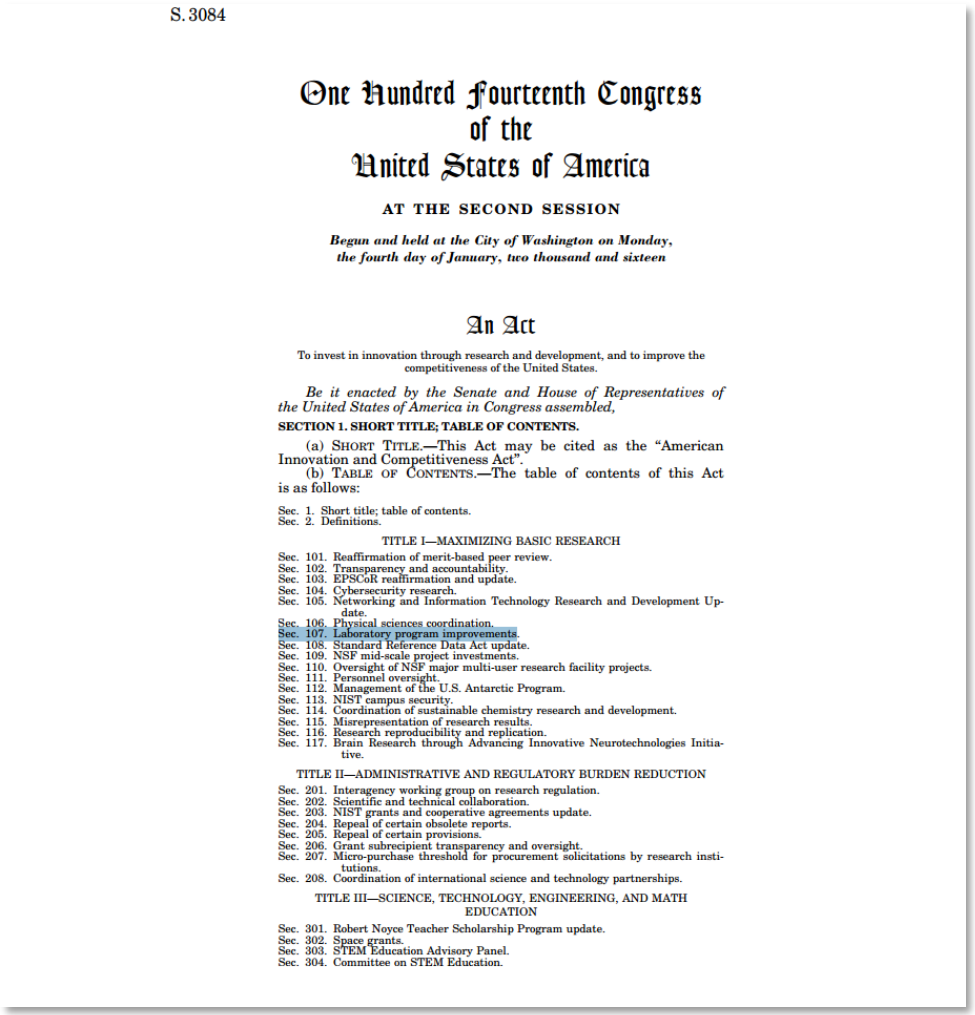
(b) To advance, through cooperative efforts among industries, universities, and government laboratories, promising research and development projects, which can be optimized by the private sector for commercial and industrial applications, the comprehensive strategic plan shall-

(1) include **performance metrics** for the dissemination of fundamental research results, measurements, and standards research results to industry, including manufacturing, and other interested parties;

(2) **document any positive benefits** of research on the competitiveness of the interested parties described in paragraph (1);

(3) clarify the current **approach to the technology transfer** activities of NIST; and

(4) consider recommendations from the **National Academy of Sciences**.



S. 3084

One Hundred Fourteenth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Monday, the fourth day of January, two thousand and sixteen

An Act

To invest in innovation through research and development, and to improve the competitiveness of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the "American Innovation and Competitiveness Act".

(b) TABLE OF CONTENTS.—The table of contents of this Act is as follows:

Strong Planning Needed in Uncertain Times

Embarked on a process to identify high-level priorities to best position NIST in 10 years

- Current budget situation is likely not changing
- NIST will have to make choices to ensure that NIST remains positioned to meet our mission
- We must be purposeful and focused in an ever changing landscape of funding priorities and technical opportunities

Purposeful and Focused

If you don't know where you're going, you'll end up somewhere else

- Yogi Berra

Bedrock of Our Planning

Values

NIST is an organization with strong values, reflected both in our history and our current work. NIST leadership and staff will uphold these values to ensure a high performing environment that is safe and respectful of all.

- **Perseverance**
- **Integrity**
- **Inclusivity**
- **Excellence**

Core Capabilities

To promote U.S. innovation and industrial competitiveness by advancing **measurement science**, **standards**, and **technology** in ways that enhance economic security and improve our quality of life

measurement science
Creating the experimental and theoretical tools – methods, metrics, instruments, and data – that enable innovation

standards
Disseminating physical standards and providing technical expertise to documentary standards that enable comparison, ensure interoperability, and support commerce

technology
Driving innovation through knowledge dissemination and public-private partnerships that bridge the gap between discovery and the marketplace

How Did We Identify Priority Areas ?

- Multi-year NIST and Lab Plans
- Technical landscape scans and analyses
- Interviews with NIST Senior Leadership
- Interviews with “Friends of NIST”
  - Former NIST Directors
  - Former VCAT members
  - Technical thought leaders
- Lab Director Offsite

Multiple inputs highlighted the same sets of issues

- Bioscience
- Quantum Science
- Internet of Things
- Data and Artificial Intelligence
- Systems-level thinking
- Democratization of Measurement

Laboratory Programs Strategic Vision

Provide a foundation of trust in new industries

- Enabling the future bioeconomy through engineered biological systems
- Unleashing the economic potential of the Internet of Things

Apply new technologies to revolutionize mission delivery

- Enhancing mission-critical research through AI and data
- Revolutionizing commerce through quantum measurements

Draft Plan Development

PCO staff held focus groups to gather feedback, engaging more than 50 NIST employees.

Drawn from:

- recent IMS winners,
- recent Foundations of Leadership Program participants from the Lab Programs,
- recent Program Coordination Office rotators,
- NIST Fellows.

What will NIST's contributions to each of the four areas of focus be in 10 years?

What **deliverables** will be important? What will new industries and capabilities need to ensure societal, commercial, and regulatory trust and acceptance? What NIST products and outputs will deliver value?

What kinds of **changes** do we need to make to get there? Do we need different capabilities? Competencies?

What changes have to **start today**? What will be most important? What will be most challenging?

What Does This Mean for the Labs?

- Laboratory leadership has recognized the need to build new or strengthen existing capabilities in these areas
- The 4 new priorities will build on and cut across NIST's expansive research portfolio
- NIST leadership will make focused investments at the lab and NIST-level to build competence in these areas

NIST's Current Research Portfolio Remains Critical

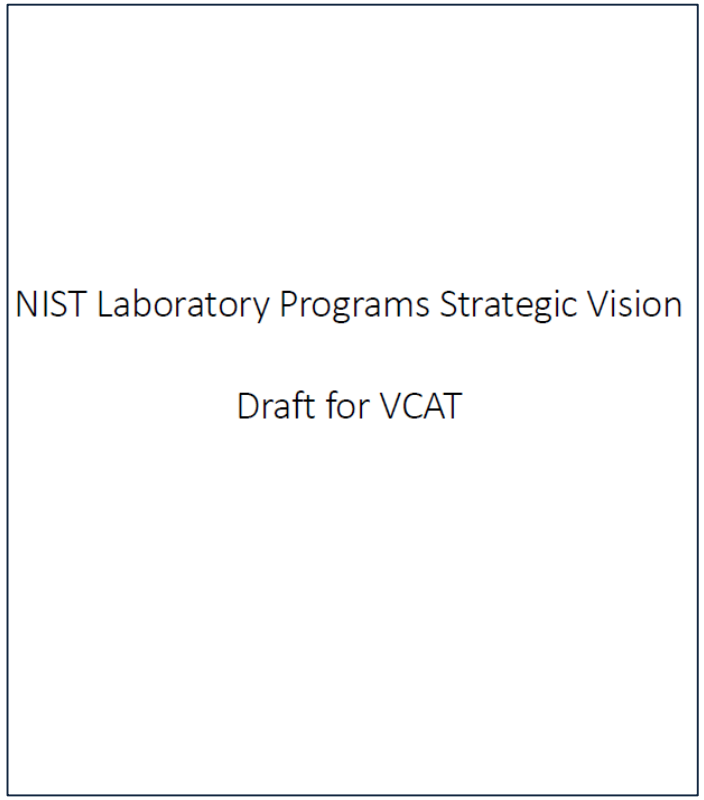
- Adv Communications, Networks, and Scientific Data Systems
- Adv Manufacturing and Material Measurements
- Cybersecurity and Privacy
- Health and Bio Systems Measurements
- Physical Infrastructure and Resilience
- Exploratory Measurement Science
- Fundamental Measurements, Quantum Science, and Measurement Dissemination
- User Facilities

Next Steps

Development and implementation:

- Phase I: Assign groups to produce draft plans
  - Seeded with 1-page scope/background
  - 8-9 stakeholders from across NIST / PCO Editor
  - **VCAT Check-in**

- Phase II: Implement plans through:
  - Operational plans developed by Lab Leadership
  - Lead has regular check-ins with ADLP



VCAT Input

- 30-minute working session on each of four areas
  - 10 minute PCO presentation
  - 20 minute discussion

- Consider:
  - Are these the right priorities?
  - Are we approaching each priority the right way?
  - What are important considerations in implementation?
  - How do we balance with legacy programs?

Bioscience

Quantum Science

Internet of Things

Data and AI

- Adv Communications, Networks, and Scientific Data Systems
- Adv Manufacturing and Material Measurements
- Cybersecurity and Privacy
- Health and Bio Systems Measurements
- Physical Infrastructure and Resilience
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