

National Institute of Standards and Technology FY 2020 Appropriations and FY2021 President's Budget Request

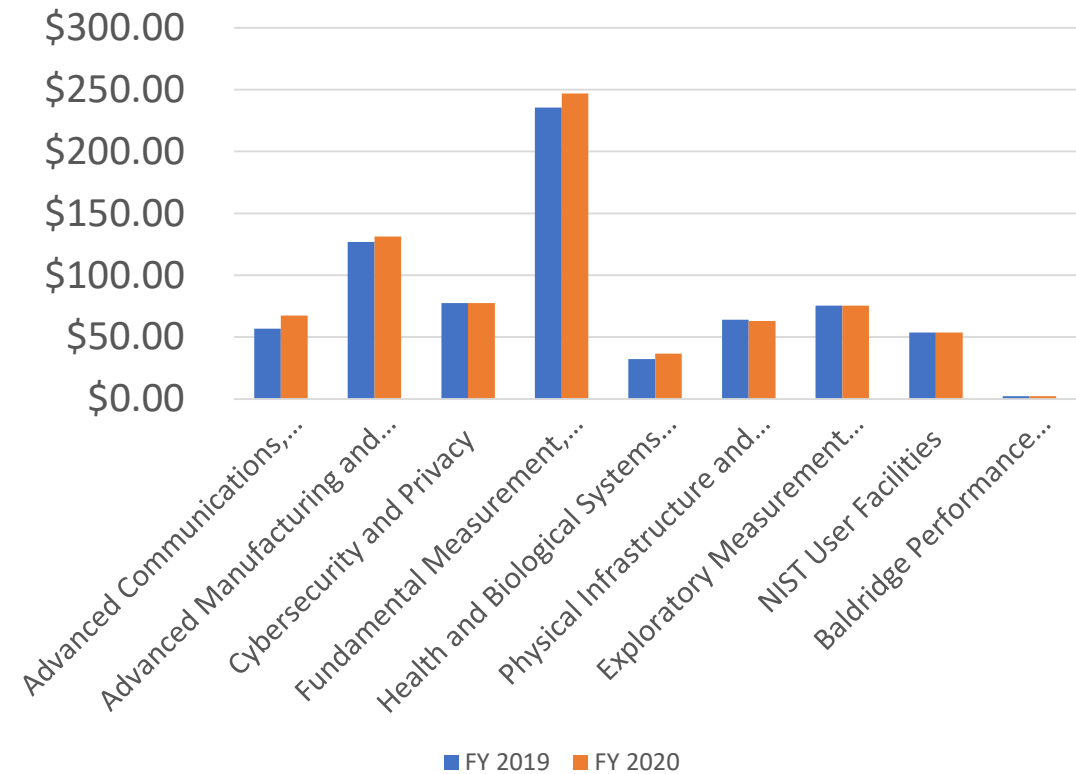
NIST BUDGET (\$M)

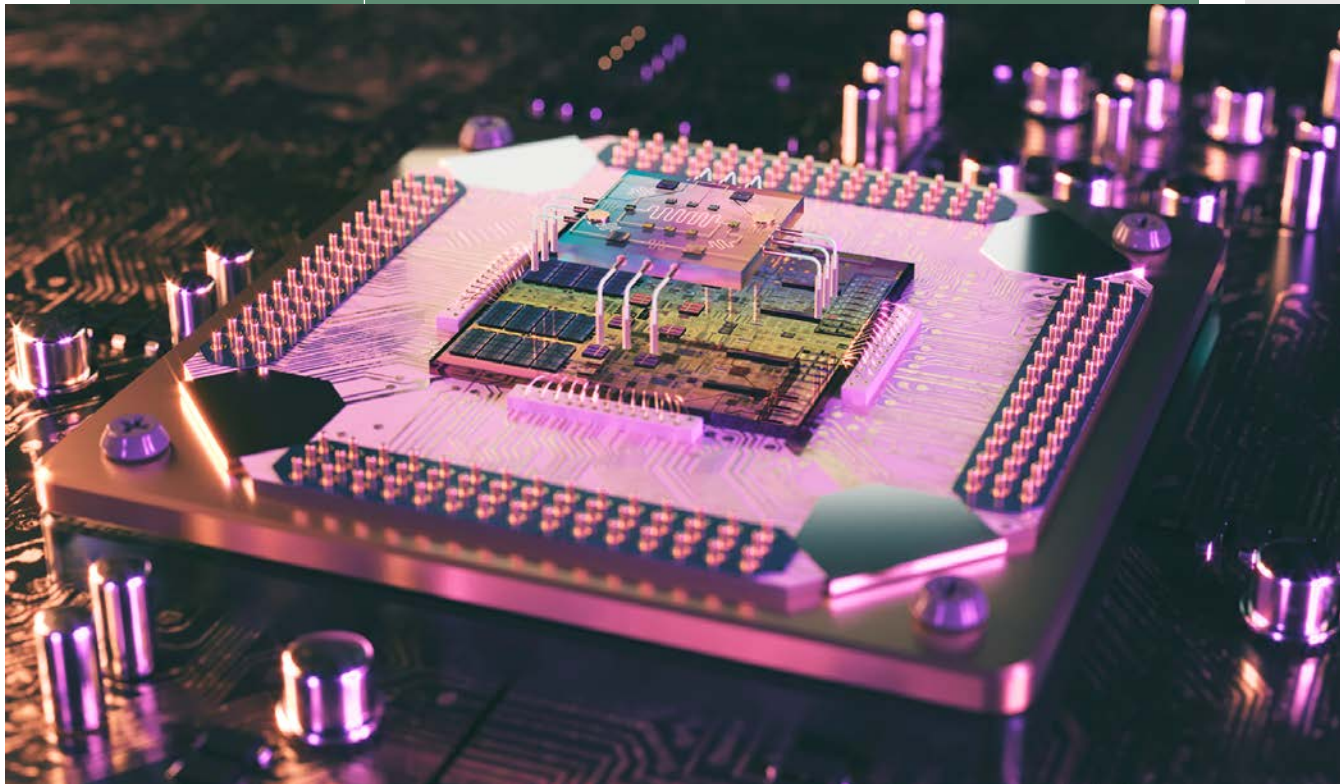
	FY 2018 Enacted	FY 2019 Enacted	FY 2020 Pres. Request	FY 2020 Enacted	Delta
Laboratory Programs (STRS)	\$724.5	\$724.5	\$611.7	\$754.0	\$29.5
Hollings Mfg Ext Partnership (MEP)	\$140.0	\$140.0	\$0.0	\$146.0	\$6.0
Manufacturing USA	\$15.0	\$15.0	\$15.2	\$16.0	\$1.0
Construction & Renovation	\$319.0	\$106.0	\$59.9	\$118.0	\$12.0
Total	\$1,198.5	\$985.5	\$686.8	\$1,034.0	\$48.5

STRS Changes

New Funding in 2020	Increase (\$M)
Pyrrhotite	1.5
Regenerative Medicine	2.5
Plastics & Polymeric Materials	1
Graphene	1.25
PS UAV Challenge	2.5
Microelectronics	2
First Responder Health (PFAS)	2
Quantum	10
AI	8
Forensics	1.15

STRS Funding by Mission Area





QED-C -- \$7M

- Provide full support for QED-C Operations
- Initiate funding of joint research project to develop instrumentation, material characterization tools, and component technologies

Support for NIST QIS R&D -- \$3M

- \$1M for JILA Quantum projects
- \$2M for increased support for NIST Quantum Engineering Efforts

More than 90 Letters of Intent have been received for QED-C Membership

Artificial Intelligence

NIST will become an authoritative source of measurement tools, capabilities, and data necessary to define, develop, and evaluate ***trustworthy AI***.



Trustworthy AI -- \$3M

- Defining technical Requirements of Trustworthy AI
- Development of new measurement and test methodologies

Development of validated data to support AI application areas -- \$3M

- Support targeted efforts around application areas like synthetic biology, advanced materials, manufacturing, spectrum sharing

Next generation AI Hardware R&D -- \$2M

- Neuromorphic computing
- Development of metrology to test AI hardware



MEP -- \$146M

- \$6M increase is to be evenly distributed across existing centers (\$100K/center)

Manufacturing USA -- \$16M

- No more than \$5M for network coordination
- Up to \$1M can be used to support FDA's participation in biomanufacturing institutes.

B/Bldg 1

**Building One Renovation-- \$43M**

- Renovation of Wing 5 – funds the design and installation of IT and security requirements for Wing 5, as well as furniture, fixtures, and, equipment.

Safety, Capacity, Maintenance, and Major Repair-- \$75M

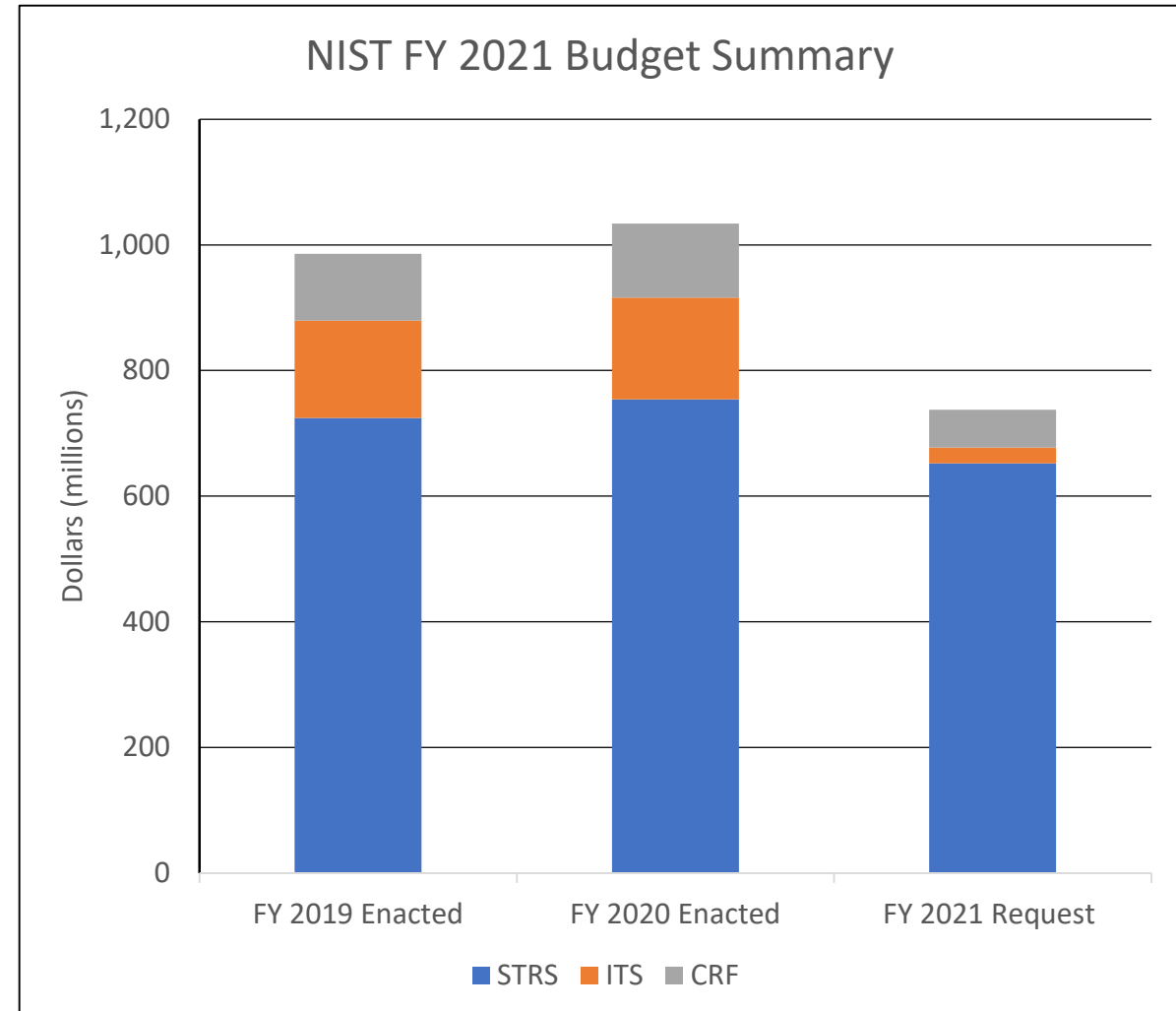
- \$40M – Standing labor costs and contracts
- \$24M – Utility infrastructure repairs
- \$1M – Continuation of multiyear roof replacement
- \$3M – IT infrastructure upgrades
- \$7M – Additional repair and replacement projects

NIST FY 2021 Budget Summary



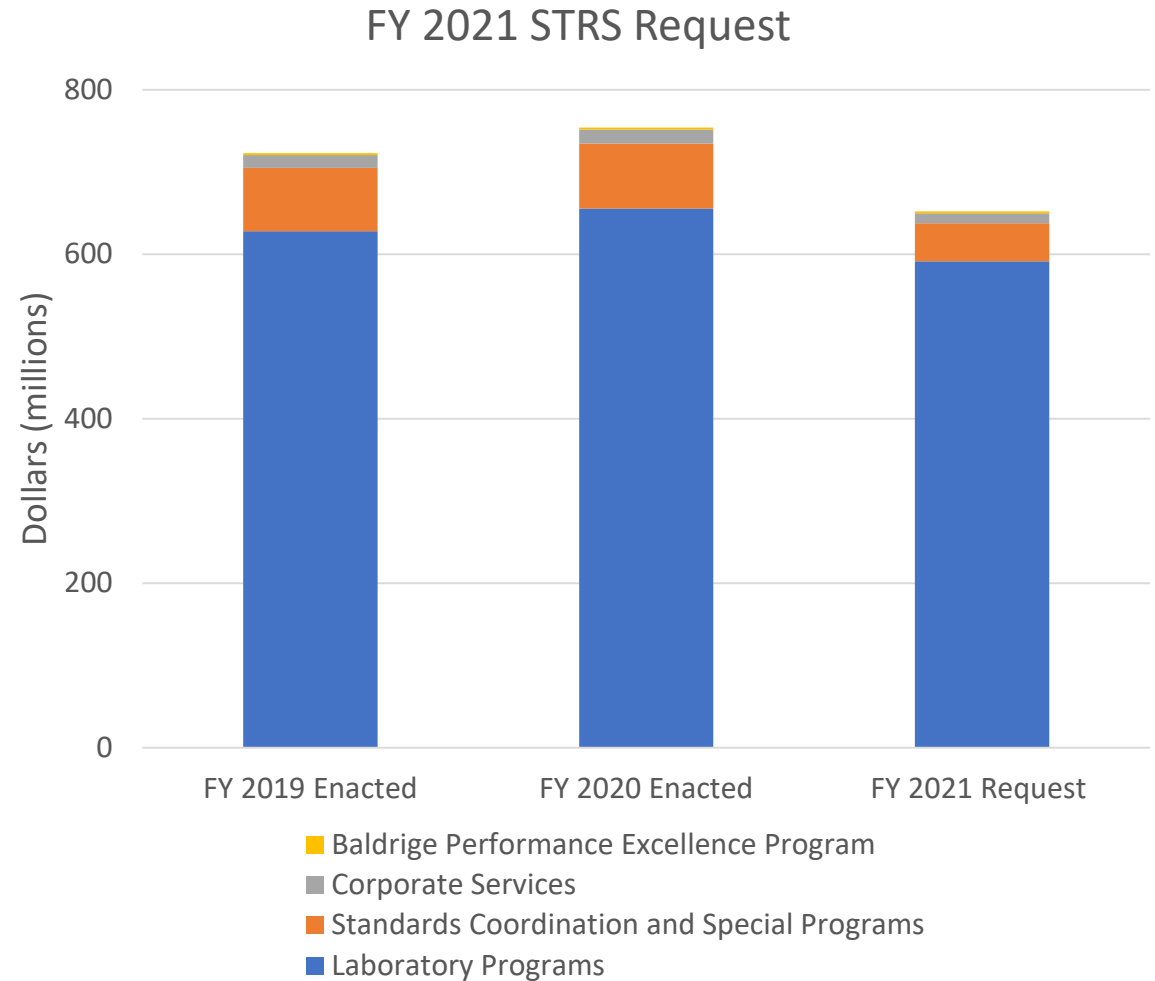
The President's FY 2021 Budget:

- Emphasizes NIST's role in Industries of the Future, with priority on Artificial Intelligence
- Prioritizes NIST's core measurement mission
- Significant Programmatic Reductions
 - -13.5% reduction to R&D
 - -84.4% reduction to IIS Programs
 - Eliminates funding for MEP
 - -49.0% reduction to construction and maintenance



STRS: \$652.0 M (-\$102.0 M and -391 Positions)

- Supports Administration priorities in Industries of the Future
- A reduction of 13.5% from FY 2020 levels for NIST research programs
- Would necessitate a reduction of almost 400 staff, approximately 15 % reduction in scientists and engineers



NIST Advancing U.S. Technological Leadership in the Industries of the Future



NIST will continue to expand research efforts in these five areas and work to strengthen U.S. engagement in standardization efforts



Quantum Science

New quantum networking grand challenge will build on NIST world-leading science, while NIST expands industry partnerships in the Quantum Economic Development Consortium



Artificial Intelligence

Leading efforts to prioritize and address key AI standards needs while developing training and testing tools for research domains, from materials science to robotics



Advanced Communications/5G

AI-enabled measurement systems to support wide deployment of 5G wireless technologies, participating and leading in 5G standards development



Advanced Manufacturing

Providing technical support and key infrastructure to the nation's manufacturing industries as they strive to out-innovate global competitors



Engineering Biology

Living Systems Foundry for safe, predictable design and control of biological systems

STRS Spending Changes by Activity Area



Budget (Dollars in millions)	FY 2020 Enacted	FY 2021 Request	Difference	
Advanced Communications, Networks, and Scientific Data Systems	\$67.4	\$60.6	(\$6.8)	-10.1%
Advanced Manufacturing and Material Measurements	\$131.2	\$92.5	(\$38.7)	-29.5%
Cybersecurity and Privacy	\$77.5	\$79.4	+\$1.9	+2.5%
Exploratory Measurement Science	\$75.4	\$75.5	+\$0.1	+0.1%
Fundamental Measurement, Quantum Science, and Measurement Dissemination	\$246.9	\$213.6	(\$33.3)	-13.5%
Health and Biological Systems Measurement	\$36.6	\$34.5	(\$2.1)	-5.7%
User Facilities	\$53.7	\$50.0	(\$3.7)	-6.9%
Physical Infrastructure and Resilience	\$63.1	\$43.7	(\$19.4)	-30.7%
Totals:	\$751.8	\$649.8	(\$102)	-13.6%

Totals do not include the \$2.2 M for BPEP

Industries of the Future: Focus on AI (+\$27.4 M and +24 Positions)



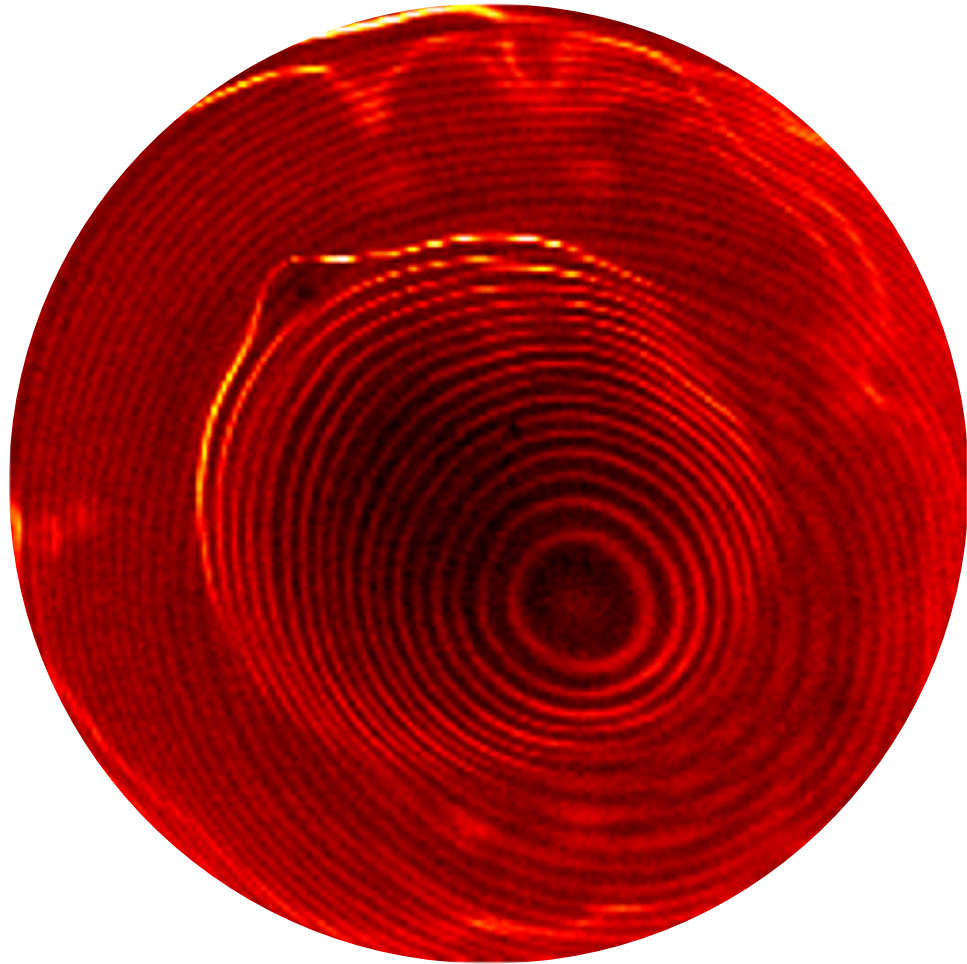
+\$25.0 M for measurement tools and testbeds to accelerate the development and adoption of interoperable, secure, and reliable AI technologies, bringing NIST's total AI investment to **\$48.9 M**



+\$1.4 M to support a prominent U.S. role in standards development efforts for 5G that will underpin the successful deployment of 5G technologies



+\$1.0 M to accelerate efforts to develop position, navigation, and timing profiles that strengthen national resilience by leveraging the NIST Cybersecurity Framework and working with public and private sectors



+40.3 M invested in portfolio of foundational quantum research impacting quantum computing, communications, and cryptography



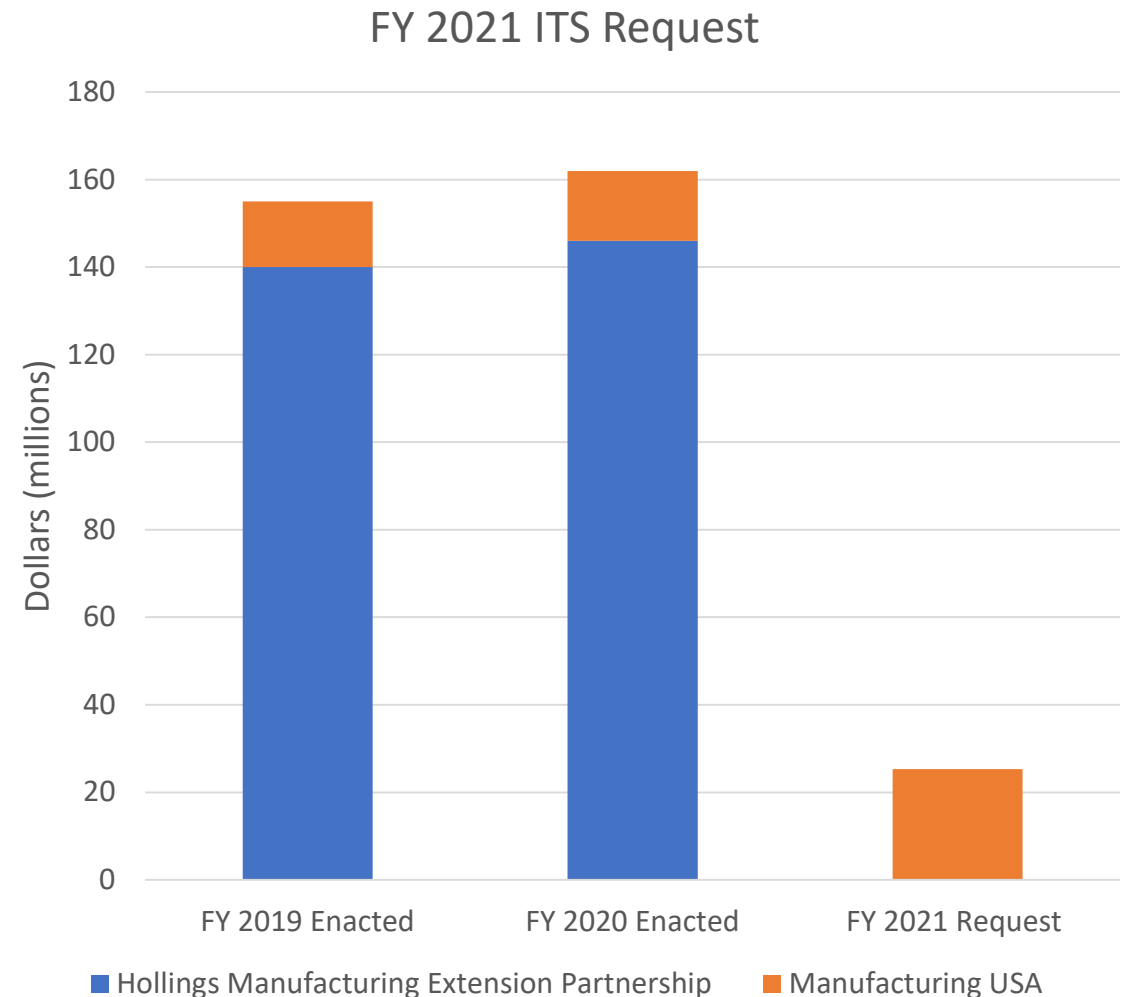
Network of joint institutes with **University of Maryland** and **University of Colorado**, together with the **Quantum Economic Development Consortium**, make NIST a hub of quantum innovation



Focus on the long-term evolution of quantum technologies and the ability to securely and efficiently transmit quantum information

ITS: \$25.3 M (-\$136.7 M and 81 Positions)

- The FY 2021 President's Budget provides support to coordinate the Manufacturing USA institute network and to open a competition to select a new institute.
- The request eliminates Federal funding for the Manufacturing Extension Partnership.



NIST will continue to advance and modernize technology transfer from federal laboratories



Major Activities

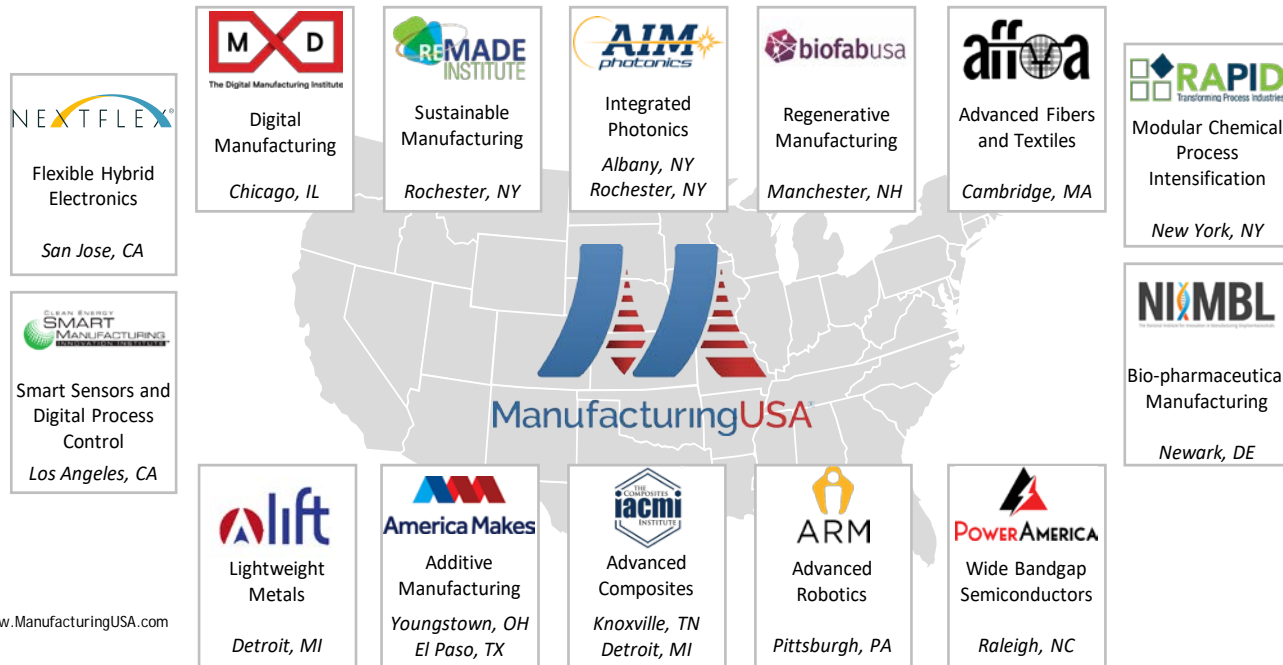
- Raise national awareness of tech transfer opportunities and successes with Manufacturing USA institutes and agency partners
- Launch a DOC/NIST competition for a new Manufacturing USA institute, target selection 12/20
- Rebuild iEdison reporting system for extramural inventions, RFI open now
- Continue to advance legislative updates to increase return on investment from federally-funded R&D
- Update metrics for Federal Technology Transfer Report to improve tracking and value capture
- Promote regional tech development and small business engagements



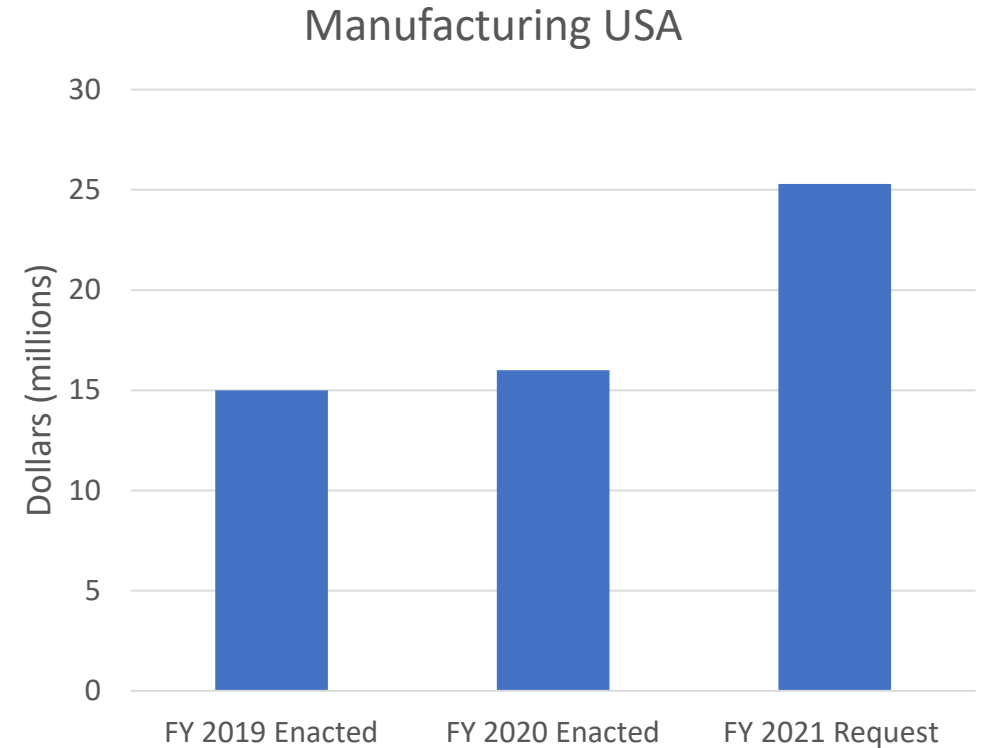
Manufacturing USA (+9.3 M and 0 Positions)

NIST coordinates the nationwide Manufacturing USA network of 14 innovation institutes.

- In FY 2021, NIST requests a total of \$25.3 million. Of this total \$5M will provide for the coordination of the network and the remaining \$20 million will fund one new institute while discontinuing funding for NIIMBL, NIST's first manufacturing innovation institute.



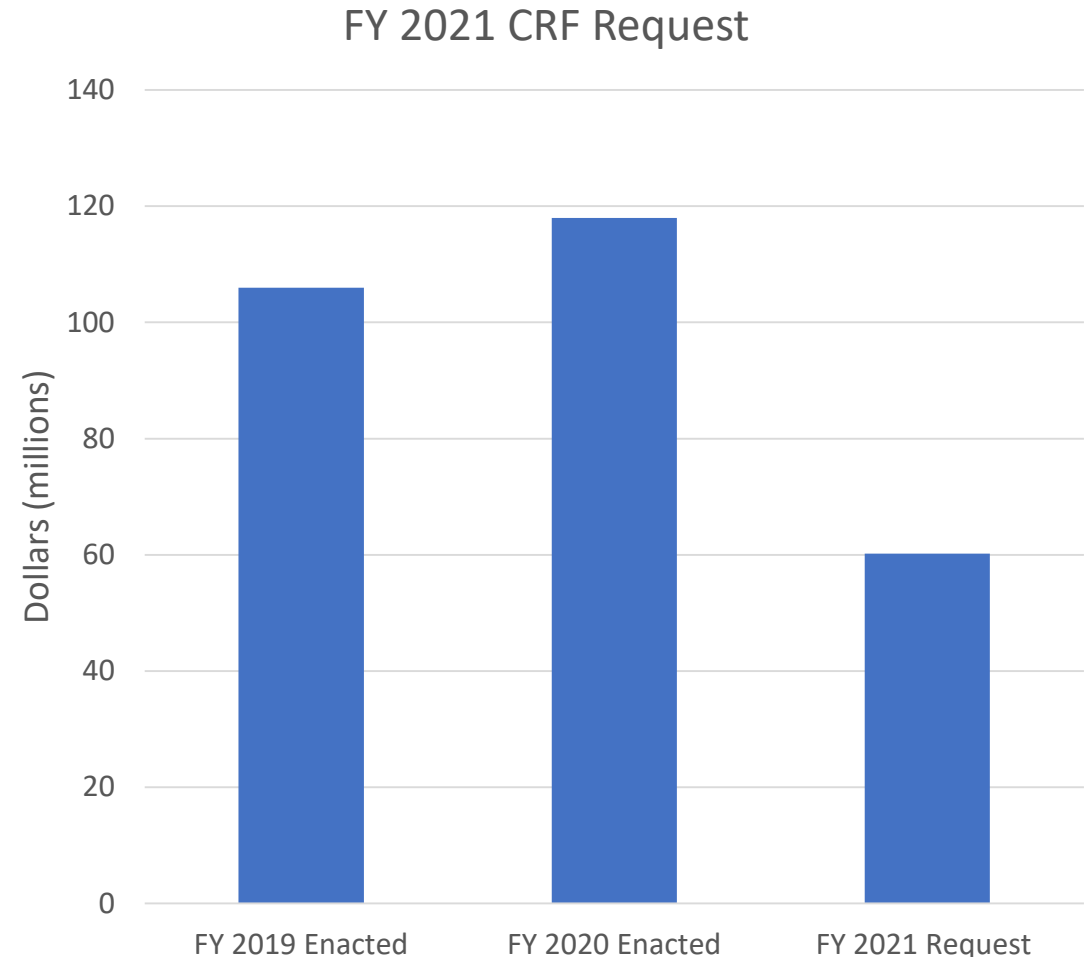
www.ManufacturingUSA.com



FY 2020 Enacted	FY 2021 Request	Difference	
\$16.0	\$25.3	\$9.3	+58.1%

CRF \$60.2 M (-\$57.8 M and 0 Positions)

- Identifies NIST's Building 1 project as a candidate project to be funded through the GSA Federal Capital Revolving Fund.
- Supports staff salaries and recurring preventive maintenance contracts and materials.
- Previously scheduled equipment replacements for FY 2021 will be delayed.
- Deferred maintenance backlog (over \$700 million) will not be addressed.



Boulder Building One (+19.6 M)

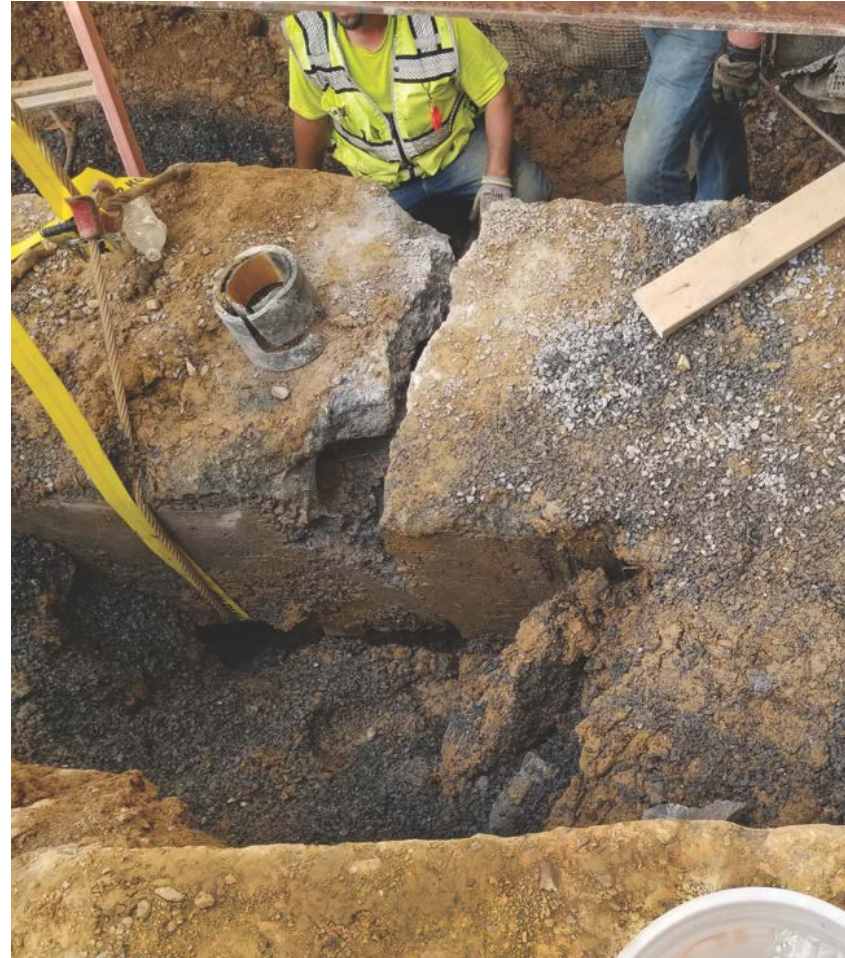
- The FY 2021 Request includes +\$19.6 million to provide for the repayment of the *GSA Federal Capital Revolving Fund* to renovate NIST's Building 1 in Boulder, Colorado, estimated at \$294 million.
- NIST would repay this mandatory fund through annual discretionary appropriations in 15 payments.



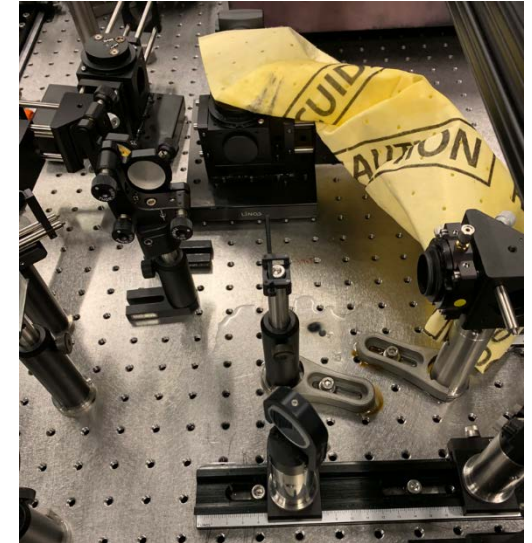
Safety, Capacity, Maintenance and Major Repairs (\$40.6 M)

The SCMMR request of \$40.6 million will primarily fund annual fixed costs for salaries, recurring contracts, capital asset management, and planning/support costs.

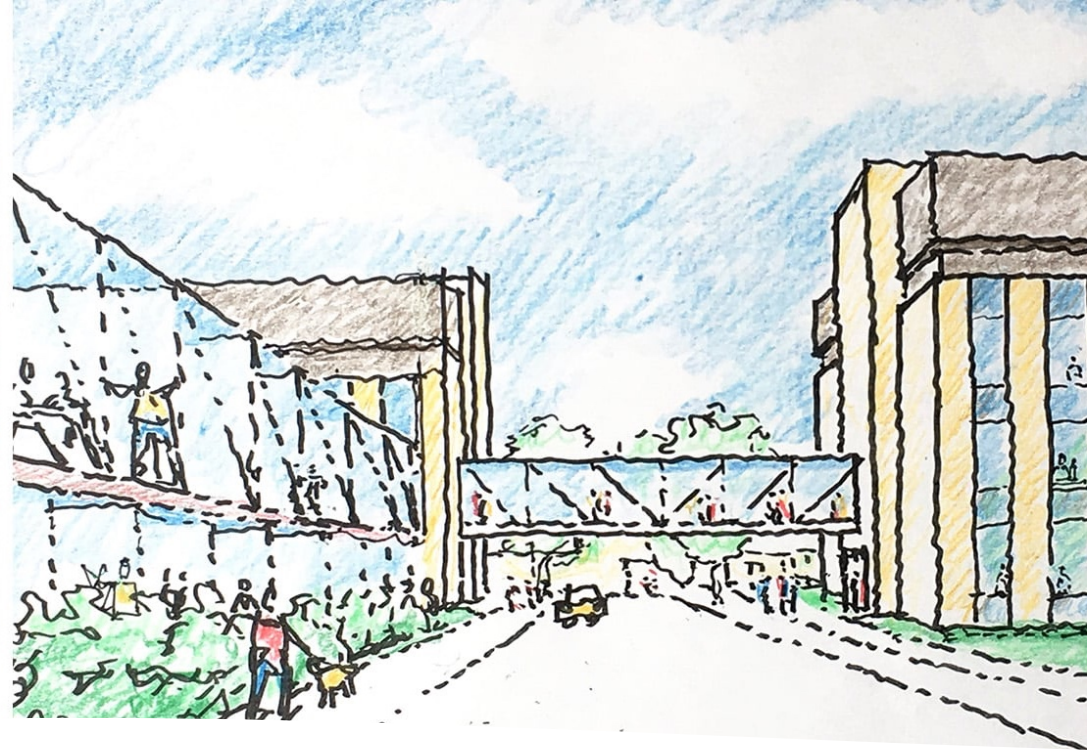
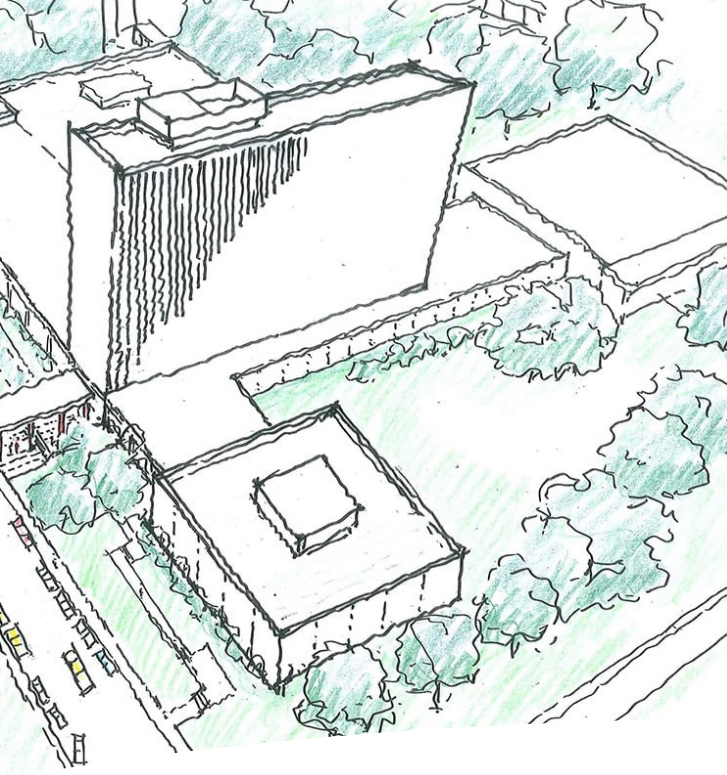
- NIST would defer SCMMR projects to FY 2022, including critical site and facility infrastructure projects necessary for routine facility operations.
- Previously planned facilities work will be reprioritized to address emergency projects.
- Funding level will result in an increase to the NIST deferred maintenance backlog (over \$700 M).



Emergency response crews stabilize a broken concrete duct bank carrying power feeder cables, one of three similar failures discovered, which necessitated a project to replace all electrical duct banks.



Flooding in one of NIST's high precision laboratories damaged sensitive optical equipment and significantly delayed critical research projects.



NIST Vision of the Future: Campus Implementation Plan

NIST awarded a contract for a 20-year implementation plan for the Gaithersburg and Boulder master plans including timing, phasing, and budget estimates.

- Implementation plan will be finalized in late FY 2020.
- NIST will gladly provide updates on the progress of the plan.