# + P Organizational Profile: NIST OFFICE OF ADVANCED MANUFACTURING

## P.1 Organizational Description

### a. Organizational Environment

#### (1) Product and/or Service Offerings

The Office of Advanced Manufacturing (OAM) manages and coordinates the National Institute of Standards and Technology (NIST) portfolio of external advanced manufacturing programs and activities. The OAM provides extramural federal financial assistance to grow advanced manufacturing ecosystems, including funding for Commerce-sponsored Manufacturing USA® institutes, Manufacturing Technology road-mapping awards, and public service grants to the existing Manufacturing USA institutes. OAM manages the activities of the National Science and Technology Council (NSTC) Subcommittee on Advanced Manufacturing (NSTC SAM).

OAM serves as the headquarters for the Advanced Manufacturing National Program Office (AMNPO), which convenes and coordinates the Manufacturing USA network, established by the Revitalize American Manufacturing and Innovation Act in 2014 and reauthorized in 2019.[1] Manufacturing USA is a network of federally sponsored manufacturing innovation institutes that strengthens the nation's manufacturing sector by developing advanced manufacturing technologies through public-private partnerships with U.S. industry, universities, and federal government agencies.

Specific activities of OAM include:

**Federal Financial Assistance for Advanced Manufacturing Technology and Workforce Development:**

- Conducting outreach to stakeholders to assess technology and workforce needs in advanced manufacturing;
- Developing and managing requests for information from the public to inform external funding opportunities;
- Running competitions for financial assistance awards;
- Coordinating financial assistance for technology development and education and workforce development programs;
- Managing and assisting with the funded programs and projects;
- Responding to audits of funded programs; and

**Manufacturing USA Program Coordination and Management:**

- Overseeing the planning, management, and coordination of the Program;
- Submitting a triennial strategic plan for the Program;
- Submitting an annual report to Congress that describes the performance of the Program and an assessment of the contributions to the network by institutes sponsored by all agencies;
- Awarding and managing agreements for the funded institutes to join the network;
- Identifying, disseminating, and implementing best practices across the network;
- Enhancing collaboration among Manufacturing USA institutes and federal partners;
- Convening the annual meeting of the network;
- Managing the Manufacturing USA Council to foster collaboration between the institutes;
- Coordinating with network-wide communications and education and workforce development teams;
- Providing education and workforce development services and resources for the network;
- Maintaining and implementing the Manufacturing USA brand
- Establishing a clearinghouse of public information related to the Program on ManufacturingUSA.com with multiple plain language resources.

**Federal Manufacturing Program Coordination:**

- Coordinating with federal agencies whose missions contribute to or are affected by advanced manufacturing;

[1] 15 U.S.C. § 278(s), as revised, https://uscode.house.gov/view.xhtml?req=(title:15%20section:278s%20edition:prelim).

- Establishing procedures, processes, and criteria to maximize cooperation and coordination of program activities with those of other federal agencies;
- Working with federal agencies to explore and develop options for sponsoring or supporting Manufacturing USA institutes;
- Working with federal agencies currently sponsoring or supporting Manufacturing USA institutes to implement the Manufacturing USA Strategic Plan, including developing and implementing network-wide performance goals with measurable targets and timelines;
- Co-leading the NSTC SAM and, through the NSTC SAM, including leading the development of the quadrennial Advanced Manufacturing National Strategic Plan.

(2) Mission, Vision, Values, and Culture

- V**ision:** U.S. global leadership in advanced manufacturing through partnerships and investments that facilitate the development and transition of innovative manufacturing technologies and cultivate an advanced manufacturing workforce.
- **Mission**: Strengthen domestic advanced manufacturing innovation ecosystems by providing extramural competitive funding to develop and transition manufacturing technologies, support workforce development activities, and coordinate programs, communications, and initiatives across federal agencies and Manufacturing USA institutes in alignment with NIST's mission to promote U.S. innovation and industrial competitiveness.
- **Core Values:** Defining characteristics include quality, professionalism, equity, teamwork, and support of fellow staff across organizational lines. We use science, engineering, and creativity to deliver positive impacts for our stakeholders. We are ethical, honest, independent, and objective. We work collaboratively – across the office and with our interagency and institute partners. We value the diversity of people and ideas to attain the best solutions to multidisciplinary challenges. We apply rigor and critical thinking to achieve world-class results and work to uphold the core NIST values of perseverance, integrity, inclusivity, and integrity in everything we do.
- **Culture**: Collaborative environment, emphasizing teamwork, kindness and continuous improvement. We place a high value on safety, diversity, equity, inclusion, and accessibility.
- **Core Competencies:** Judgement, decision making; communication; analysis, problem solving; negotiation; customer service; initiative, independence; diligence, and knowledge of underlying technologies. Stakeholder engagement to build lasting relationships with industry, government, and academia founded on NIST's technical reputation and nonregulatory status.

(3) Workforce Profile

Our workforce consists of over 25 skilled professionals with diverse technical and professional expertise. We are organized into three divisions but work collaboratively across the divisions in project-focused teams. Our workforce has doubled over the past year, with growth expected to continue. Key changes to the management processes are being developed to adapt to growth and ensure efficient and high-quality deliverables. In addition to NIST-OAM staff, our workforce includes technical experts detailed from NIST laboratory programs, occasional detailees from federal agencies with manufacturing-related missions, AAAS and professional society Fellows, and Federal Fellows from manufacturing companies and universities. Through the NIST Acquisitions Management Division, the office also contracts with external organizations to augment our services and offerings to the network.

(4) Assets

OAM has no significant physical assets. It is the caretaker for the Manufacturing USA brand, including registered trademarks, and for ManufacturingUSA.com, which provides a clearinghouse of information about the Manufacturing USA programs and activities. OAM also provides secure SharePoint collaboration sites to agency partners, the Manufacturing USA Council, and the NSTC SAM for collaboration with agencies and institutes. We also provide functional sites for communications and EWD activities at no cost to agencies and institutes.

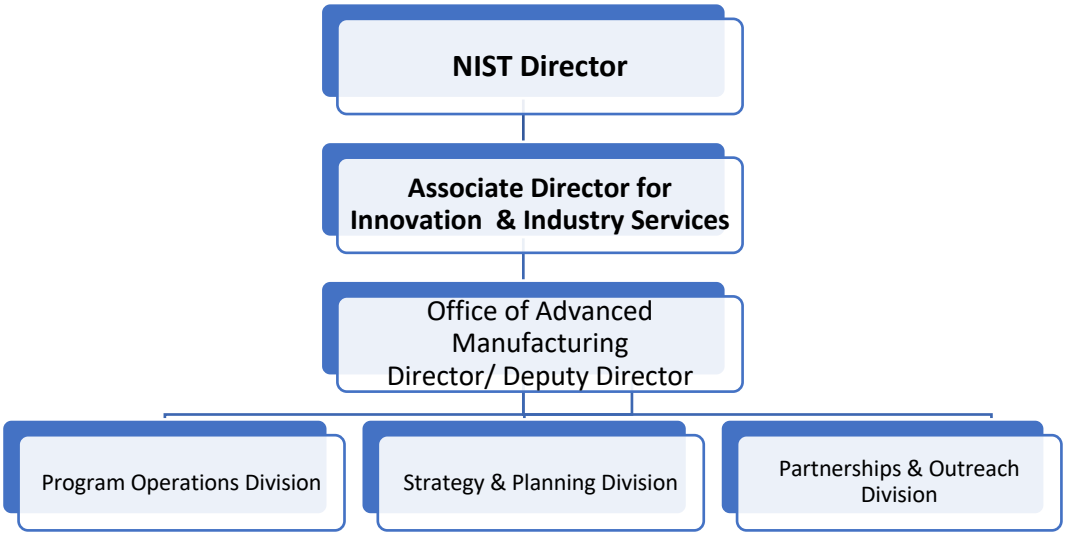
(5) Regulatory Environment

The Manufacturing USA Program authorizing statute, codified as part of the NIST Organic Act in 15 USC 278(s), gives the OAM-led AMNPO statutory requirements for coordinating the program and managing Commerce-funded Program awards. External financial assistance awards managed by the OAM comply with the Code of Federal Regulations. OAM products and services consistently comply with all applicable federal regulations and laws. Our collaboration and communication tools meet the privacy, security, military, and government

standards (DoD Cybersecurity and NIST SP 800-171).

### b. Organizational Relationships

#### (1) Organizational Structure




OAM is broadly organized into three (3) interconnected divisions supporting all the OAM programs and activities.

**Program Operations Division:** Develops and manages federal financial assistance awards to support advanced manufacturing technology and workforce development, including awards to establish Commerce-sponsored Manufacturing USA institutes; develops and implements metrics to assess the performance of awardees aligned with program and project goals; responds to audits of funded programs.

**Strategy and Planning Division:** Provides thought leadership, planning, and strategy development for OAM. Manages the activities of the NSTC Subcommittee on Advanced Manufacturing and the Manufacturing USA Council. Develops new initiatives and leads annual planning for OAM. Reviews and coordinates statutory compliance with OAM programs. Conducts domestic and international benchmarking of manufacturing R&D and technology forecasting. Develops and monitors the implementation of the triennial Manufacturing USA Strategic Plan and the quadrennial National Strategy on Advanced Manufacturing. Conducts regular legislative analyses that might affect the OAM programs and operations.

**Partnerships and Outreach Division:** Develops and maintains strategic relationships with interagency and institute partners and customers through outreach and communication strategies. Highlights advanced manufacturing efforts to a broad audience. Pilots, develops, and implement sprograms to prepare the U.S. workforce for jobs in technologies developed by Manufacturing USA institutes. Plans, arranges, and executes annual Manufacturing USA Network meetings. Manages communications and outreach for NIST OAM competitions, including webinars and events.

#### (2) Customers and stakeholders

To fulfill its mission, the OAM works closely with a diverse set of customers and stakeholders. These include several units in the Executive Office of the President (EOP), federal departments and agencies with direct or indirect interest in advanced manufacturing, as well as state and local government organizations. The industrial sectors involved in manufacturing high-value-added products and academic and educational organizations are all part of the advanced manufacturing ecosystems that must work together to grow the economy.

As documented in the Manufacturing USA brand manual, agency and institute partners have identified five key audiences, each with identified needs, requirements, and messaging. These include: 1. Inner Circle (agencies, institutes, members); 2. Manufacturing Community (manufacturers of all sizes, academia, government, and nonprofit entities); 3. Policy representatives; 4. General Public (current and potential workers, educators, and students); and 5. Media.

Customers and stakeholders' key requirements include timely responses, referrals to appropriate individuals or organizations when OAM cannot directly meet their requests, adherence to statutory requirements, maintaining up-to-date social media information and an informative website, accurate and

timely required reporting, and professional and efficient administration of funding opportunities. Customers and stakeholders expect OAM to operate with integrity and provide services through deliberately equitable and accessible means.

(3) Suppliers, Partners, and Collaborators

OAM works closely with all federal agencies with a direct or indirect interest in advanced manufacturing. We work particularly closely with the advanced manufacturing offices in the Department of Defense and the Department of Energy, which are sponsors of their respective Manufacturing USA institutes. We also collaborate with other agencies through the Manufacturing USA interagency working team, the NSTC SAM, and the Manufacturing USA Council to coordinate shared interests in advanced manufacturing. The agencies in SAM include the U.S. Departments of Agriculture, Commerce, Defense, Energy, Education, Health and Human Services, Labor, State, Transportation, along with NASA, the National Science Foundation, the Small Business Administration, the U.S. Patent and Trade Office and the Executive Office of the President. These federal agencies support the development of the National Strategic Plan for Advanced Manufacturing. Many of the same agencies collaborate with us to develop the Manufacturing USA Strategic Plan and other strategy documents and share funding opportunities and best practices in establishing applied research and EWD initiatives to benefit the Manufacturing USA program.

We collaborate in close partnership with other offices at NIST, including the Grants Management Division, Financial Assistance Law Division, the Office of the General Council, the Office of Congressional and Legislative Affairs, the CHIPS R&D Office, the NIST Manufacturing Extension Partnership, Technology Partnership Office, the Baldrige Performance Excellence Program, and NIST laboratories as well as with the Department of Commerce and its other bureaus. The partnerships within NIST support the operational aspects of developing extramural funding opportunities and other externally facing documents as key OAM products. These internal collaborations also ensure that OAM operates within all federal laws and DOC policies in delivering services to stakeholders. Collaborations with NIST Laboratory Programs, CRDO, and NIST MEP identify opportunities to leverage other NIST equities for mutual benefit and more significant impact. The Department of Commerce supports NIST efforts to ensure alignment with administration priorities in all significant OAM products and services.

Each partner or collaborating agency or unit within DOC or outside brings a unique perspective to the program due to the diverse missions of the agencies or the various offices.

OAM also engages key industry partners, such as national associations and technical societies, in our communications, outreach, and workforce national initiatives. This engagement ensures that services and products are aligned with the needs of the industry in alignment with NIST's mission and the statutory purposes of Manufacturing USA.

## P.2 Organizational Situation

### a. Competitive Environment

(1) Competitive Position

The mission of OAM is to strengthen U.S. economic prosperity, resilience, and national security by advancing important manufacturing technologies. The Manufacturing USA Program, managed and coordinated by OAM through AMNPO, is a public-private partnership focused on accelerating the development and commercialization of critical emerging advanced manufacturing technologies and training domestic workers in these new technologies. The Program is part of the federal government's overall innovation portfolio, which includes basic and applied R&D support, investment incentives, and programs and policies related to taxes, trade, and regulations. While all these approaches are needed for economic growth from manufacturing, appropriation of federal funds is often adjusted in competition between these programs.

Since the goal is to strengthen the U.S. competitive position in the global market for manufactured products, we continuously monitor similar programs and investments at the international level. It should be noted that government R&D expenditures in other advanced economies often outpace the investments by the U.S. government. We have a working relationship with allied countries, especially concerning manufacturing technologies and the manufacturing supply chains that fuel economic development and national security.

(2) Competitiveness Changes

With the advent of new and emerging technologies, OAM and NIST are continuously evaluating potential new technologies that should enter the manufacturing ecosystem, in collaboration with other federal agencies. The

CHIPS and Science Act sponsored programs such as the EDA Tech Hubs and the NSF Regional Innovation Engines are creating new models for public-private partnerships that are expanding the national conversation regarding regional economic development structures. OAM and Manufacturing USA must be responsive to opportunities exist to expand collaboration with state and local organizations, industry and academia.

The NIST sponsored Manufacturing USA institutes strengthen sector-based partnerships and engagement with NIST laboratory programs, such as that with the biopharmaceutical industry spurred by NIIMBL (the National Institute for Innovation in Manufacturing Biopharmaceuticals). The launch of the new CHIPS Manufacturing USA institute offers new opportunities for OAM to collaborate with the semiconductor industry, other parts of the Department of Commerce, local and federal governments, international partners, and other agencies within the U.S. government. Similarly, the new AI for Resilient Manufacturing Institute will create additional synergies and collaborators across technology ecosystems that should be fostered for greatest impact.

(3) Comparative Data

A measure of economic growth in manufacturing is the balance of trade, especially with respect to advanced technical products. We monitor such data as well as data for the workforce in manufacturing, in general, and advanced manufacturing, in particular.

### b. Strategic Context

Ever-changing technology space including emerging technologies is a strategic challenge but provides new opportunities to initiate new institutes and innovative institute projects. Budget constraints and potential lapses in Federal funding have major impacts on delivering the best technology and EWD programs to benefit the Nation. Shifting budget and program priorities is also a challenge and threat in maintaining continuous program elements. Development and nurturing new R&D programs require long-term commitments and any disruptions, such as lapses in funding, geopolitical events, or natural disasters delay progress in delivering the outcomes needed for economic growth.

Globally, multiple countries and regions are developing industrial strategies and investment portfolios to address these same market segments. Some competitor nations, including China, make significantly greater investments than the U.S. in transitioning critical technologies into production. OAM monitors these initiatives, including through regular benchmarking visits with both allies and competitors. OAM attempts to alert policymakers about investment disparities between US and foreign industrial policies, and it adjusts its programs within a changing advanced manufacturing landscape.

### c. Performance Improvement system

OAM is a major Operating Unit (OU) of NIST and follows all performance review processes established for the NIST programs. These include reviews by the NIST Director and NIST Associate Director for Industry, Innovation Services. Working with the Department of Commerce Office of Performance Evaluation and Risk Management, NIST develops and reports on annual performance measures and other elements required by the Government Performance and Results Act (GPRA) Modernization Act of 2010. Other formal processes include reviews and evaluation by the NIST Visiting Committee on Advanced Technology, and entities with the National Academies of Sciences, Engineering and Medicine (NASEM).

OAM works closely with sponsoring agencies to review the success and impact of the Manufacturing USA institutes using a set of metrics developed to collect key data. These data are included in the Annual Report to Congress and are used as part of a rigorous evaluation process when an institute is being evaluated for funding renewal. NIST has also developed a renewal process for Commerce-sponsored Manufacturing USA institutes modeled on evaluation processes used by other agencies. This process includes a rigorous merit review by an external evaluation panel of key stakeholders in industry, academia, and government.

The Manufacturing USA Program is evaluated through several studies by the NASEM and other groups, as well as a triennial review by the Government Accountability Office (GAO). The recommendations from these reviews are used to adjust and revise the program structure and approach. OAM's oversight of extramural financial assistance awards is also audited by the Office of the Inspector General (OIG) and other third-party entities.