

**ANNOUNCEMENT OF FEDERAL FUNDING OPPORTUNITY (FFO)
National Network for Manufacturing Innovation (NNMI) Institute Awards**

EXECUTIVE SUMMARY

- **Federal Agency Name:** National Institute of Standards and Technology (NIST), United States Department of Commerce (DoC)
- **Funding Opportunity Title:** National Network for Manufacturing Innovation (NNMI) Institute Awards
- **Announcement Type:** Initial
- **Funding Opportunity Number:** 2016-NIST-NNMI-01
- **Catalog of Federal Domestic Assistance (CFDA) Number:** 11.619 Arrangements for Interdisciplinary Research Infrastructure
- **Dates:** Required Pre-Applications must be received electronically through Grants.gov no later than 11:59 p.m. Eastern Time, April 20, 2016. Pre-Applications received after this deadline will not be reviewed or considered. Paper Pre-Applications will not be accepted. Review of Pre-Applications, selection, and notification to applicants is expected to be complete on or about May 23, 2016. Selected Pre-applicants will then be invited to submit a Full Application. Full Applications must be received electronically through Grants.gov no later than 11:59 p.m. Eastern Time, July 22, 2016. Full Applications received after this deadline will not be reviewed or considered. Paper Full Applications will not be accepted. The earliest anticipated start date for awards under this FFO is expected to be within the first calendar quarter of 2017.

Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance at these times:

From 12:01 a.m. Eastern Time Saturday	To 6:00 a.m. Eastern Time Monday
February 20, 2016	February 22, 2016
March 19, 2016	March 21, 2016
April 16, 2016	April 18, 2016
May 21, 2016	May 23, 2016
June 18, 2016	June 20, 2016
July 16, 2016	July 18, 2016

Applications cannot be submitted when Grants.gov is closed.

NIST strongly recommends that applicants not wait until the last minute to submit either a Pre- or Full Application. NIST will not make any allowances for late

submissions, including but not limited to incomplete Grants.gov registration. To avoid any potential processing backlogs due to last minute Grants.gov registrations, applicants are highly encouraged to start their Grants.gov registration process at least four (4) weeks prior to the Pre-Application due date.

When developing your submission timeline, please keep in mind that: (1) all applicants are required to have a current registration in the System for Award Management (SAM.gov); (2) the free annual registration process in SAM.gov (see Section IV.4 and Section IV.8.a.(2) of this FFO) may take between three and five business days or as long as more than two weeks; (3) applicants are required to have a current registration in Grants.gov; and (4) applicants using Grants.gov will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency's electronic system has received its application. **Please note that a federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.**

- **Application Submission Address:** See Section IV in the Full Announcement Text of this FFO.
- **Program Description:** NIST is soliciting applications for National Network for Manufacturing Innovation (NNMI) Institute Awards from eligible applicants to establish and operate a Manufacturing Innovation Institute¹ in an area of U.S. advanced manufacturing national need. Proposed Institutes in any area of advanced manufacturing will be considered so long as they do not duplicate the technical scope and programs of both existing programs of federally funded Institutes within the National Network for Manufacturing Innovation (NNMI), and technical focus area(s) that are identified within any in-progress Institute funding opportunity announced by a federal agency.
- **Funding Availability:** Up to \$25 million in federal funds are available in FY 2016 for NIST to perform activities related to the National Network for Manufacturing Innovation. With FY 2016 appropriated funds, NIST will fund one Institute award, subject to the multi-year award funding policy (see Section II.3). NIST plans to make additional Institute award(s) from this competition, subject to the availability of funds. NIST anticipates funding approximately \$70 million for each Institute, distributed across five (5) years with the possibility of renewal for an additional two (2) years, subject to the appropriation and availability of funds, required approval of spend plans and the subsequent apportionment to NIST. (See Section II.2).

¹ The terms "Centers for Manufacturing Innovation", "Manufacturing Innovation Institutes (MIIs)", "Institutes for Manufacturing Innovation (IMIs)", and "Clean Energy Manufacturing Innovation Institutes" have all been used in different framing documents to refer to participating Institutes for inclusion in the National Network for Manufacturing Innovation (NNMI). For consistency, an individual institute is here referred to as "NNMI Institutes" within this FFO.

- **Funding Instrument:** Cooperative Agreement. The nature of NIST’s “substantial involvement” will generally be NIST collaboration and involvement in the direction of the scope of work.
- **Who Is Eligible:** Eligible applicants are non-profit organizations; accredited institutions of higher education; State, local, and Tribal governments; and for-profit organizations that are organized and operated in the United States (including U.S. territories) with majority domestic ownership or control. Federal agencies and Federally Funded Research and Development Centers (FFRDCs) are not eligible to apply for this funding opportunity.

An eligible applicant may work individually or include proposed subrecipients, contractors, and/or unfunded collaborators in its application, effectively forming a team or consortium. In a team or consortium, eligible subrecipients at the application phase must meet the applicant eligibility requirements stated above. Organizations that are ineligible to apply because they are majority foreign-owned or foreign-controlled may be included in a team or consortium as an unfunded collaborator, provided that they are organized and operated in the United States.

Once an Institute award has been issued, on a case-by-case basis and subject to a determination by NIST, majority foreign-owned or foreign-controlled entities organized and operated in the United States may be allowed as subrecipients or contractors, based on the unique and specific needs of the Institute. NIST’s determination of whether a specific foreign-owned or foreign-controlled entity will be allowed to participate as a subrecipient or contractor will be based on information provided by the Institute and by other Federal agencies. NIST will approve participation by the foreign entity if it is in the best interest of the Institute and the United States, including the domestic economy generally, U.S. industry, and U.S. manufacturing competitiveness. In cases of proposed foreign subrecipients or contractors, the Institute must demonstrate that, among other items, adequate intellectual property and data protection protocols exist between the proposed entity and its foreign parent organization(s). A suggested template for providing foreign information pertaining to a proposed post-award foreign subrecipient or contractor will be posted on the NNMI website (www.nist.gov/amo/nnmi) and provided to recipients after awards are issued.

Federal Government organizations and personnel may not participate in the preparation of any application in response to this funding opportunity. After an award is issued, Institutes will be expected to interact with federal government organizations, as appropriate, in a number of manners consistent with those organizations’ respective missions / purposes. Institutes are encouraged to utilize federal entities to support the program goals. Once an Institute award has been issued, federal government organizations, other than NIST, may be allowed as subrecipients or contractors, to the extent otherwise allowed by law, based on the unique and specific needs of the Institute.

At the time of application, a FFRDC may not be included as a funded subrecipient or contractor in response to this funding opportunity. After an award is issued, Institutes will be expected to interact with FFRDCs, as appropriate, in a number of manners consistent with those organizations' respective missions / purposes. Institutes are encouraged to utilize federal entities to support the program goals. Once an Institute award has been issued, FFRDCs may be allowed as subrecipients or contractors, to the extent otherwise allowed by law, based on the unique and specific needs of the Institute, subject to the provisions of FAR 35.017-1.

- **Pre-Applications and Full Applications:** NIST is requiring Pre-Applications under this FFO and NIST will only consider one Pre-Application per applicant; however, an applicant entity may participate as a subrecipient, contractor, or unfunded collaborator within applications submitted by other entities (see the following Sections for further information pertaining to Pre-Applications: Section IV.2 for content and format, Section V.1.a for criteria, and Section V.3 review and selection).

Only an applicant whose Pre-Application has been selected by NIST and who has been invited to submit a Full Application is permitted to submit a Full Application to NIST for this funding opportunity. Full Applications submitted by applicants who were not selected by NIST within the Pre-Application phase, and Full Applications submitted by applicants who did not submit a Pre-Application, will be returned to the applicants without review (see the following Sections for further information pertaining to Full Applications: Section IV.3 for content and format, Section V.1.b for criteria, and Section V.3 review and selection).

- **Cost Sharing or Matching:** This program requires: (1) cost share (financial support) of at least 50 percent annually from non-federal sources over the lifetime of the award, and (2) that the Federal financial assistance provided to the Institute shall decrease after the second year of funding for the Institute and continue to decrease thereafter in each year in which Federal financial assistance is provided (see Sections III.4 and II.5). For purposes of this FFO, the term financial support includes all categories of cost sharing.
- **Public Website, Frequently Asked Questions (FAQs) and Webinars:** NIST has created a public website (<http://www.nist.gov/amo/nnmi>) that provides information pertaining to this Funding Opportunity. NIST anticipates that a "Frequently Asked Questions" section as well as other resource materials will be maintained and updated as needed to provide additional guidance and clarifying information that may arise related to this Funding Opportunity. Any amendments to this FFO will be announced through Grants.gov.

Applicants must submit all questions in writing to nnmifund@nist.gov. Questions submitted to NIST may be posted on the NNMI website (<http://www.nist.gov/amo/nnmi>) as part of a FAQ document. Alternatively, applicants may ask questions during one or more public events and informational webinars as described in the next paragraph.

NIST plans to hold one or more public events and informational webinars on the NIST-funded NNMI Institute Awards competition. The event(s) and webinar(s) schedule will be posted and maintained on the NIST NNMI website (<http://www.nist.gov/amo/nnmi>). The public event(s) and webinar(s) will provide information on the NNMI Program, this NNMI Institute Awards FFO, general guidance on preparing applications, and offer opportunities for the public to ask questions about the program. Proprietary technical discussions about specific proposal ideas will not be permitted, and NIST will not critique or provide feedback on any proposal ideas brought forth during the event(s), webinar(s) or at any time before submission of an application to NIST (see the previous paragraph above). There is no cost to attend either the public event(s) or webinar(s), but participants must register for each in advance. Participation in either the public event(s) or the webinar(s) is not required for the submission of a Pre-Application or a Full Application and attendance/participation will not be considered as part of the application review process. The webinar(s) will be recorded and a link to the recordings will be available for public access on the NIST NNMI website (<http://www.nist.gov/amo/nnmi>). Additional information concerning the public event(s), webinar(s), and advance registration is available at <http://www.nist.gov/amo/nnmi>.

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FULL ANNOUNCEMENT TEXT

I. Program Description

The statutory authority for the National Network for Manufacturing Innovation (NNMI) Institute Program is Section 34(d) of the NIST Act, codified at 15 U.S.C 278s.

- 1. Scope.** NIST is soliciting applications for National Network for Manufacturing Innovation (NNMI) Institute Awards from eligible applicants to establish and operate a Manufacturing Innovation Institute in areas of U.S. advanced manufacturing national need. A proposed Institute in any area of advanced manufacturing will be considered so long as it does not duplicate the technical scope and programs of existing federally funded Institutes within the National Network for Manufacturing Innovation (NNMI), and technical focus area(s) that are identified within any in-progress Institute funding opportunity announced by a federal agency. With FY 2016 appropriated funds, NIST will fund one Institute award, subject to the multi-year award funding policy. NIST plans to make additional Institute award(s) from this competition, subject to the availability of funds.

Applications for product development and commercialization are not considered responsive to this FFO.

2. Background.

- a. Legislation.** In December 2014, Congress passed the *Revitalize American Manufacturing and Innovation Act*² (RAMI), which established the Network for Manufacturing Innovation Program. This Program is generally referred to as the National Network for Manufacturing Innovation (NNMI). The purpose of the NNMI Program is to:
 - a) Improve the competitiveness of U.S. manufacturing and increase the production of goods manufactured predominantly within the U.S.;
 - b) Stimulate U.S. leadership in advanced manufacturing research, innovation, and technology;
 - c) Facilitate the transition of innovative technologies into scalable, cost-effective, and high-performing manufacturing capabilities;
 - d) Facilitate access by manufacturing enterprises to capital-intensive infrastructure, including high-performance electronics, computing, and the supply chains that enable these technologies;
 - e) Accelerate the development of an advanced manufacturing workforce;
 - f) Facilitate peer exchange and documentation of best practices in addressing advanced manufacturing challenges;
 - g) Leverage non-Federal sources of support to promote a stable and sustainable business model without the need for long-term Federal funding; and

² See 15 U.S.C. § 278s – Network for Manufacturing Innovation; <http://www.gpo.gov/fdsys/pkg/USCODE-2014-title15/pdf/USCODE-2014-title15-chap7-sec278s.pdf>, 2014.

h) Create and preserve jobs.

The NNMI Program consists of three essential parts: “Centers for Manufacturing Innovation;” the “Network for Manufacturing Innovation” (more commonly called the “Network”); and the “National Office of the Network for Manufacturing Innovation Program” (more commonly called the “National Program Office”). To keep the nomenclature aligned with the existing NNMI Institutes³ (see Section I.2.b), “Centers for Manufacturing Innovation” will be called “NNMI Institutes” within this funding opportunity.

- b. Institutes.** A key component of the NNMI Program is the Institutes themselves and their supporting members.⁴ The Institutes bring industry, academia (universities, community colleges, technical institutes, etc.), Federal laboratories, and Federal, state, and local governments together to: address challenges in advanced manufacturing; assist manufacturers in retaining or expanding industrial production in the United States; and address precompetitive industrial problems with economic or national security implications. The Institutes have a predominant focus on a manufacturing process, novel material, enabling technology, supply chain integration methodology, or another relevant aspect of advanced manufacturing. It is expected that the Institutes will improve the competitiveness of U.S. manufacturing, help fill the gap between basic research and commercialization, accelerate non-Federal investment in advanced manufacturing production capacity in the U.S., and enable the commercial application of new technologies.⁵

The Institutes are private-public partnerships that catalyze stakeholders to work together to accelerate innovation by co-investing in industrially relevant, cross-cutting advanced manufacturing products and processes. The Institutes work on industry priorities and big challenges solvable only by collaboration. Each Institute is organized to foster an open exchange of pre-competitive manufacturing best practices and “know-how” – including design and processing tools, qualification and certification approaches, and fabrication – while protecting participating individual company proprietary intellectual property. By staying within the “pre-competitive” space, they address critical technical manufacturing challenges and connect research discoveries and ideas for new technologies and products with current U.S. manufacturers as well as with startup firms. In other words, the Institutes will transition from the discovery phase through the manufacturing scale-up phase, i.e., manufacturing readiness levels (MRL) 4 through 7.⁶

³ See footnote 1 on p. 2 (Executive Summary).

⁴ The business model for Institutes relies on a group of persons and/or organizations coming together for a common purpose. This model generally results in a membership structure and its associated agreement that formalizes the relationship between a stakeholder organization and the Institute entity itself. Stakeholder organizations that establish this type of relationship with an Institute are generally referred to as members.

⁵ 15 U.S.C. § 278s (c)(1)(C)

⁶ “Manufacturing Readiness Level (MRL) Deskbook.” Version 2.0. OSD Manufacturing Technology Program, May 2011. 2-2 – 2-4 & Appendix A. *OSD Manufacturing Technology Program*. http://www.dodmrl.com/MRL_Deskbook_V2.pdf.

In addition to working on technology, the Institutes prepare current and future workforces for the latest manufacturing methods and technologies. The Institutes serve as regional hubs of advanced manufacturing excellence and provide a shared infrastructure and facility for Institute members to learn new skills and collaborate on pre-competitive technical challenges. These facilities create dynamic and highly collaborative environments that spur manufacturing technology innovation and technology transfer.

The Institutes engage with the broader community by hosting research internships and developmental assignments for individuals from industry, academia, and government to accelerate development of advanced manufacturing pre-competitive technologies and support the technical education and workforce development of the manufacturing community relevant to the Institute. Each Institute interacts and engages with other national, regional, and local resources and facilities and participates within the NNMI network (see Section I.2.c).

A key concept of the NNMI Program is that Institutes are expected to leverage non-Federal sources of support to promote a stable and sustainable business model without the need for long-term Federal funding. An Institute's budget and plan to achieve sustainability will: (1) maintain at least a 50% cost share on a per year basis from non-federal sources over the lifetime of the award, (2) include realistic strategies to increase revenue in the later years of the award period to ensure financial self-sufficiency, (3) recognize that the Federal financial assistance provided to the Institute shall decrease after the second year of funding for the Institute and continue to decrease thereafter in each year in which Federal financial assistance is provided, and (4) be independent of Federal NNMI Program funding within five (5) to seven (7) years of when financial assistance to the Institute is first awarded.

The cost sharing contributions that an Institute assembles may include cash, in-kind and other contributions, each with its own merits, uncertainties, and/or risks⁷. To allow the Institute to achieve its programmatic objectives and manage any cost sharing risks, a NIST NNMI Institute Competition applicant will need to determine and explain the appropriate mix of cost sharing types and sources. Once established, an Institute's participants may engage and conduct work at the Institute using a variety of contracting and collaboration instruments.

The Institutes are expected to reduce risks and costs of production scale-up and commercialization while strengthening the nation's vital manufacturing innovation ecosystem. More detailed information about the design tenets of the network are captured

⁷ See NIST NNMI Guidance on Merits and Uncertainties of Cost Share found on the NIST NNMI website (www.nist.gov/amo/nnmi).

within *National Network for Manufacturing Innovation: A Preliminary Design*⁸, a report issued by the White House National Science and Technology Council and in the *Report to the President: Accelerating U.S. Advanced Manufacturing*⁹ submitted by the Advanced Manufacturing Partnership 2.0 advisory group through the Office of Science and Technology Policy.

- c. **NNMI Network.** RAMI also establishes a network of Institutes as a part of the strategy to revitalize American manufacturing. The network will enhance America's global competitiveness by bringing together the best talents and capabilities from all the partners to build the proving grounds where innovations can flourish. As part of the network, Institutes are expected to share best practices, identify and address gaps in America's technology base, train the next-generation of skilled workers, and leverage expertise across multiple disciplines. The Institutes are expected to create good jobs now and prepare American workers for future opportunities in the advanced manufacturing sector. The Network holds periodic meetings to strengthen the impacts of the individual Institutes.

The Institutes resulting from this competition will join the growing network that already includes Institutes funded by the Department of Defense (DoD) and the Department of Energy (DOE). As of January 2016 these are: America Makes,¹⁰ Digital Manufacturing and Design Innovation Institute (DMDII),¹¹ Lightweight Innovations for Tomorrow (LIFT),¹² PowerAmerica,¹³ The Institute for Advanced Composites Manufacturing Innovation (IACMI),¹⁴ AIM Photonics,¹⁵ NextFlex - Flexible Hybrid Electronics Manufacturing Innovation,¹⁶ Revolutionary Fibers and Textiles-Institute for Manufacturing Innovation;¹⁷ and Clean Energy Manufacturing Innovation Institute on Smart Manufacturing: Advanced Sensors, Controls, Platforms and Modeling for Manufacturing.¹⁸

⁸ National Science and Technology Council (U.S.). *National Network for Manufacturing Innovation: A Preliminary Design*. Executive Office of the President of the United States, 2013. http://www.manufacturing.gov/docs/nnmi_prelim_design.pdf.

⁹ President's Council of Advisors on Science and Technology (U.S.). *Report to the President: Accelerating U.S. Advanced Manufacturing*. Executive Office of the President of the United States, 2014. https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/amp20_report_final.pdf

¹⁰ America Makes. 2015. <http://americamakes.us/>

¹¹ Digital Manufacturing and Design Innovation Institute. 2015. <http://www.dmdii.uilabs.org/>

¹² LIFT: Lightweight Innovations for Tomorrow. 2015. <http://lift.technology/>

¹³ PowerAmerica. 2015. <http://www.poweramericainstitute.com/>

¹⁴ Institute for Advanced Composites Manufacturing Innovation, IACMI. 2015. <http://iacmi.org/>

¹⁵ American Institute for Manufacturing Integrated Photonics, AIM Photonics. 2015. <http://www.aimphotonics.com/>

¹⁶ NextFlex -Flexible Hybrid Electronics Manufacturing Innovation Institute. 2015. <http://www.fhemii.com/>

¹⁷ See <http://www.grants.gov/web/grants/view-opportunity.html?oppld=276514>. 2015.

¹⁸ See US Department of Energy's Funding Opportunity Announcement (FOA) Number: DE-FOA-0001263. September 2015. <https://eere-exchange.energy.gov/#Foalda7d7bd9b-c3b2-45c5-8111-55384aaf6393>

3. **Goal.** At this time, NIST is seeking applications for the NNMI Institute Competition. Awards resulting from the competition will provide funding to entities to establish a sustainable NNMI Institute in any area of advanced manufacturing that does not duplicate the technical scope and programs of other Institutes within the National Network for Manufacturing Innovation (NNMI), funded by the Department of Commerce or other Federal agencies. The awards provide financial resources to startup (i.e., establish a lead organization, as necessary; gain commitment from partners; develop various Institute agreements; and develop visions and plans for Institute operations, technical focus area and agenda(s), shared infrastructure and facilities, and workforce, education and technology transfer models) and operate a national effort in the identified area(s) of technical focus.
4. **Anticipated Impacts.** The NIST-funded NNMI Institute awards will contribute to strengthening U.S. innovation capacity and cultivating capabilities within U.S. industry for establishing future NNMI Institutes. The Federal investment in NNMI serves to create an effective manufacturing research infrastructure for U.S. industry and academia to solve industry-relevant problems. In an Institute, industry, academia, and government partners leverage resources, collaborate, and co-invest to nurture manufacturing innovation and accelerate commercialization.
5. **About NNMI.** Manufacturing plays a critical role in the U.S. economy. In 2011, the Federal Government initiated several efforts to assist the manufacturing sector, including launching the Advanced Manufacturing Partnership (AMP), a national effort that brought together industry, universities, the Federal Government, and other stakeholders to identify emerging technologies with the potential to create high-quality domestic manufacturing jobs and enhance U.S. global competitiveness. In the 2012 *“Report to the President on Capturing Domestic Competitive Advantage in Advanced Manufacturing,”*¹⁹ the AMP Steering Committee made several recommendations for improving the manufacturing competitiveness of the United States.

In addition to recommending the formation of the National Network for Manufacturing Innovation (NNMI),²⁰ the AMP report identified the need to increase funding for cross-cutting technology areas²¹ that have the potential to significantly impact key U.S. advanced manufacturing national needs and are pivotal in enabling U.S. manufacturing competitiveness with the recognition that none of them have quick fixes. They require stakeholders from across industry, academia, and government to partner together to support research, development, and deployment of these manufacturing technologies, and to develop the talent pipeline for industry.

¹⁹ President’s Council of Advisors on Science and Technology. *Report To The President On Capturing Domestic Competitive Advantage In Advanced Manufacturing*. Executive Office of the President. 2012. https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_amp_steering_committee_report_final_july_17_2012.pdf

²⁰ Ibid. p. 21.

²¹ Ibid. p 18.

Based on the AMP recommendations, the White House called for the formal creation of the Nationwide Network for Manufacturing Innovation (NNMI) to scale up advanced manufacturing technologies and processes.²²

6. **The NIST Strategy for Establishing Institutes.** Under the authority of RAMI,²³ Institutes funded by NIST will be solicited via an open process in any area of advanced manufacturing. This 2016 competition consists of a single competition that quickly allows the establishment of the first NIST funded Institute(s). A key aspect of Institutes funded using this approach is that the Institute leads must perform both the Institute's startup and begin its ongoing operations within a single award. A five year award is planned with the possibility of a renewal²⁴ for up to an additional two (2) years, subject to the availability of funds and satisfactory performance.
7. **This NNMI Institute Competition.** The NIST-funded NNMI Institute Award(s) resulting from this competition will establish new NNMI Institutes. NIST will fund one Institute award with FY 2016 appropriated funds, subject to the multi-year award funding policy. NIST plans to also make additional Institute award(s) from this competition, subject to the availability of funds. Each NNMI Institute will focus on complex issues in a unique and well-defined focus area of advanced manufacturing, as proposed by applicants. Applications may be in any area of advanced manufacturing so long as they do not duplicate the technical scope and programs of other Institutes within the National Network for Manufacturing Innovation (NNMI), funded by the Department of Commerce or other Federal agencies.

The PCAST Advanced Manufacturing Partnership²⁵ has previously identified opportunities for investments in advanced manufacturing that have the potential to transform U.S. industry, and developed a "starter list" of vital cross-cutting technologies for advanced manufacturing. Some of these technologies are now being addressed by other Institutes within the NNMI network (see Section I.2.c). Other cross-cutting technologies with the potential to transform U.S. industry remain unaddressed and may be the subject of applications under this FFO.

The awardee should be prepared to develop solutions for cost-effective advanced manufacturing capabilities that offset the risk to the U.S. industrial base in adopting

²² Obama, Barack H. "State of the Union Address." 2013 & 2014 State of the Union. Capitol Building. Washington, DC. 2013. <http://www.whitehouse.gov/the-press-office/2013/02/12/remarks-president-state-union-address>. & 2014. <https://www.whitehouse.gov/the-press-office/2014/01/28/president-barack-obamas-state-union-address>.

²³ See 15 U.S.C. § 278s(d)(3)

²⁴ A renewal is an amendment of the award that extends the project period and funding period, while at the same time adding additional funds to the award.

²⁵ President's Council of Advisors on Science and Technology, *Report To The President On Capturing Domestic Competitive Advantage In Advanced Manufacturing*, Executive Office of the President, 2012. (https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_amp_steering_committee_report_final_july_17_2012.pdf) and associated Annexes 1-10 – Manufacturing Technologies (<https://www.whitehouse.gov/sites/default/files/microsites/ostp/PCAST/amp2.0-annex1-10-manufacturingtechnologyareas.pdf>)

these new technologies using a collaborative approach between industry, academia, and government. Award recipients will have a Startup Phase of up to one year within which to complete all actions needed to begin ongoing Institute operations.

The proposed NNMI Institute Award recipient must manage the Institute within three primary areas of operation: 1) advancement of Technology Development, 2) development of Shared Infrastructure and Facilities, and 3) development of an Educated and Skilled Workforce that can support advanced manufacturing.

NIST-funded NNMI Institute Awards will help fragmented U.S. industries organize and develop a coherent ecosystem to better position U.S. manufacturers relative to global competition. Educational programs will enable workforce training, provide students and visiting engineers access to state-of-the-art equipment, provide access to experienced personnel, and familiarize a new workforce generation with the cutting-edge technologies needed by American companies.

Examples of some activities that may occur within the NNMI Institute Award during the Startup Phase are listed below. Completion of these activities will enable a selected Institute to progress swiftly through its Startup Phase so that it may begin its ongoing operations expeditiously.

- I. Finalize a range of agreements, including membership, data management, and intellectual property.
- II. Finalize the internal systems and controls needed to oversee and manage the technical, business, financial, informational, operational, conflict of interest, and enterprise risks functions of the Institute.
- III. Finalize the Institute's physical facility arrangements and take occupancy to prepare for full Institute operations.
- IV. Finalize hiring of the identified leadership team and key personnel for operating the Institute and its organization.
- V. Gather the committed known and anticipated cost-sharing from non-Federal sources for the Institute, which significantly exceeds the needed Federal financial assistance.
- VI. Finalize risk assessment and risk mitigation policies and procedures for the technical, economic, and operational aspects of the proposed Institute.

An Institute's activities during the Ongoing Operations Phase include:²⁶

- 1) Undertake a balanced Institute funded portfolio of projects and strategic investments using existing or Institute-developed technology roadmaps that will provide an effective national response to the challenges and opportunities in advanced manufacturing.
- 2) Perform research, development, and demonstration activities, including proof-of-concept development and prototyping, to reduce the cost, time, and risk of commercializing new technologies and improvements in existing technologies,

²⁶ See 15 U.S.C. § 278s (c)(2)

- processes, products, and research and development of materials to solve pre-competitive industrial problems with economic or national security implications.
- 3) Develop and implement education, training, and workforce recruitment courses and materials; and programs to build workforce skills at all levels and enhance manufacturing capabilities in companies large and small.
 - 4) Develop innovative methodologies and practices for supply chain integration and introduction of new technologies into supply chains.
 - 5) Outreach and engage with small and medium-sized manufacturing enterprises, including women and minority owned manufacturing enterprises, in addition to large manufacturing enterprises. The NIST Hollings Manufacturing Extension Partnership is a useful resource to help ensure that results reach small and medium-sized entities.

II. Federal Award Information

1. **Funding Instrument.** The funding instrument used in this program will be a cooperative agreement. The nature of NIST's "substantial involvement" will generally be NIST collaboration and involvement in the direction of the scope of work. Additional forms of substantial involvement that may arise are described in Chapter 5, Section C.2.a of the Department of Commerce Grants and Cooperative Agreements Manual, which is available at <http://go.usa.gov/SNJd>. Please note the Department of Commerce Grants and Cooperative Agreements Manual is expected to be updated after publication of this funding announcement and before awards are made under this FFO. Refer to Section VII. of this FFO, Federal Awarding Agency Contacts, if you seek the information at this link and it is no longer working or you need more information.
2. **Funding Availability.** Up to \$25 million in federal funds are available in FY 2016 for NIST to perform activities related to the National Network for Manufacturing Innovation. With FY 2016 appropriated funds, NIST will fund one Institute award, subject to the multi-year award funding policy (see Section II.3). NIST plans to make additional Institute award(s) from this competition, subject to the availability of funds. NIST anticipates funding approximately \$70 million for each Institute, distributed across five (5) fiscal years with the possibility of renewal for an additional two (2) years, subject to the availability of funds, required approval of spend plans and the subsequent apportionment to NIST.

NIST will determine the number of awards selected and whether those awards will be funded in whole or in part, taking into account the effective fulfillment of program objectives and in accordance with the review and selection process in Section V. of this FFO.

3. **Startup Phase.** The initial phase of any Institute award shall be considered the Startup Phase wherein the Institute is to formalize industrial partnerships, finalize various Institute plans and documentation, and secure the proposed resources and

infrastructure in preparation for commencing its ongoing operations. The Startup Phase is part of the initial five (5) year award period, is anticipated to take up to one (1) year, and will account for the first increment of funds provided under the award. Subsequent funding shall be awarded based on performance and availability of funding in accordance with the multi-year award policy.

- 4. Multi-Year Funding Policy.** When an application for a multi-year award is approved, funding will usually be made available to recipients for only the first year of the program, and incrementally thereafter. If an application is selected for funding, NIST has no obligation to provide any additional funding in connection with that award beyond that which is initially obligated/awarded to the recipient. Continued funding of an award to extend the period of performance is at the sole discretion of NIST. Continued funding will be contingent upon satisfactory performance, continued relevance to the mission and priorities of NIST, and the availability of funding.
- 5. Two (2) Year Renewal.** Awards issued pursuant to this FFO are expected to be for up to five (5) years with the possibility for NIST to renew the award, on a non-competitive basis, for an additional 2 years at the end of the initial award period. In considering renewal for an additional two-year, multi-year award term, NIST will evaluate the results of the annual reports, determine if the Institute's activities are still consistent with the long-term nature and purpose of the program, and assess the Institute's progress and impacts in advancing manufacturing within its specific field using agreed upon impact assessment methods. It is anticipated that processes for applying for renewal shall be provided 180 days in advance of the conclusion of the initial 5 year period. The full renewal decision process is expected to include programmatic, policy, financial, administrative, and responsibility assessments, subject to the availability of funds, consistent with Department of Commerce and NIST policies and procedures in effect at that time.
- 6. Kick-Off Conference.** Each awardee will be required to attend an one to two (1-2) day kick-off conference, which will be held at the beginning of the performance period, to help ensure that the NNMI Institute's leadership team has a clear understanding of the program and its components. The kick-off conference will take place at NIST (Gaithersburg, MD) if the applicant does not have a facility. It will take place at the applicant's site if they do have a facility.

Key personnel from the NNMI Institute should attend this meeting. Applicants should include travel and related costs for the kick-off conference as part of the budget for year one (1), and these costs should be reflected in the SF-424A covering the initial five (5) year award period. These costs must also be reflected in the budget narrative for year one (1) (see Section IV.3.a.(16)).

- 7. NNMI Network Meetings.** NIST generally organizes network meetings two times a year in an effort to share best practices, new and emerging trends, and additional topics of interest. These meetings are rotated throughout the United States and typically involve three to four (3-4) days of resource time and associated travel costs

for each meeting. The NNMI Institute Director must attend these meetings, along with up to three additional NNMI Institute employees.

Applicants must include travel and related costs for two semi-annual NNMI Network meetings in each of the five (5) performance years (2 meetings per year; 10 total meetings over five-year award period). These costs must be reflected in the SF-424A covering the initial five (5) year award period (see Section IV.3.a.(16)). These costs must also be reflected in the budget narrative.

8. **Indirect (F&A) Costs.** NIST will reimburse applicants for proposed indirect (F&A) costs in accordance with 2 C.F.R. § 200.414. Applicants proposing indirect (F&A) costs must follow the application requirements set forth in Section IV.3.a.(17) of this FFO.

III. Eligibility Information

1. **Eligible Applicants.** Eligible applicants are non-profit organizations; accredited institutions of higher education; State, local, and Tribal governments; and for-profit organizations that are organized and operated in the United States (including U.S. territories) with majority domestic ownership or control.²⁷ Federal agencies and Federally Funded Research and Development Centers (FFRDCs) are not eligible to apply for this funding opportunity.

An eligible applicant may work individually or include proposed subrecipients, contractors, and/or unfunded collaborators in its application, effectively proposing a team or consortium. In a team or consortium, subrecipients at the application phase must meet the applicant eligibility requirements stated above. Organizations that are ineligible to apply because they are majority foreign-owned or foreign-controlled may be included in a team or consortium as an unfunded collaborator, provided that they are organized and operated in the United States.

After an Institute award has been issued, on a case-by-case basis and subject to a determination by NIST, majority foreign-owned or foreign-controlled entities organized and operated in the United States may be allowed as subrecipients or contractors, based on the unique and specific needs of the Institute. NIST's determination of whether a specific foreign-owned or foreign-controlled entity will be allowed as a subrecipient or contractor will be based on information provided by the Institute and by other Federal agencies. NIST will approve participation by the foreign entity if it is in the best interest of the Institute and the United States, including the domestic economy generally, U.S. industry, and U.S. manufacturing competitiveness. In cases of proposed foreign subrecipients or contractors, the Institute must demonstrate that, among other items, adequate intellectual property and data protection protocols exist

²⁷ Any entity that is majority owned or controlled by non-U.S. individuals or organizations, or whose ultimate parent, if any, is incorporated outside of the United States (including U.S. territories), is considered foreign-owned or controlled.

between the proposed entity and its foreign parent organization(s). A suggested template for award recipients to use to provide information pertaining to a proposed post-award foreign subrecipient or contractor will be provided to recipients after awards are issued and posted on the NNMI website (www.nist.gov/amo/nnmi).

NIST will only consider one Pre-Application per applicant; however, an applicant entity may participate as a subrecipient, contractor, or unfunded collaborator within applications submitted by other entities.

- 2. Eligible Work Location.** While most work affiliated with the application is to be conducted within the United States by a recipient, subrecipient, contractor or unfunded collaborator, on a case-by-case basis, and subject to a determination by NIST, work outside of the United States may be allowed based on the unique and specific needs of the Institute after an award by NIST is issued. NIST's determination of whether specific work outside of the United States is allowed will be based on information provided by the recipient and by other Federal agencies.

NIST will only approve work outside of the United States if it is in the best interest of the Institute and the United States, including the domestic economy generally, U.S. industry, and U.S. manufacturing competitiveness. Institutes will be required to demonstrate that, among other items, adequate intellectual property and data protection protocols exist between the proposed entity performing the work and its foreign parent organization(s). A suggested template for providing information about proposed work outside of the United States will be posted on the NNMI website (<http://www.nist.gov/amo/nnmi>) and provided to recipients after awards are issued.

- 3. Federal Government Organizations and Federally Funded Research and Development Centers.** Federal Government organizations²⁸ and personnel may not participate in the preparation of any application in response to this funding opportunity. After an award is issued, the Institutes will be expected to interact with federal government organizations, as appropriate, in a number of manners consistent with those organizations' respective missions / purposes. Institutes are encouraged to utilize federal entities to support the program goals. Once an Institute award has been issued, federal government organizations, other than NIST, may be allowed as subrecipients or contractors, to the extent otherwise allowed by law, based on the unique and specific needs of the Institute.

At the time of application, a Federally Funded Research and Development Centers (FFRDCs)²⁹ may not be included as a funded subrecipient or contractor in response to this funding opportunity. After an award is issued, Institutes will be expected to interact with FFRDCs, as appropriate, in a number of manners consistent with those

²⁸ A full listing of all Federal Agencies, Departments, and Commissions is maintained on USA.gov (<https://www.usa.gov/federal-agencies/>).

organizations' respective missions / purposes. Institutes are encouraged to utilize federal entities to support the program goals. Once an Institute award has been issued, FFRDCs may be allowed as subrecipients or contractors, to the extent otherwise allowed by law, based on the unique and specific needs of the Institute, subject to the provisions of FAR 35.017-1.

- 4. Decreasing Federal Financial Assistance.** The amount of financial assistance being requested for the Institute shall decrease after the second year of funding for the Institute and shall continue to decrease thereafter in each year in which financial assistance is provided until the end of the 7-year permissible funding period.
- 5. Cost Sharing or Matching.** Cost sharing (financial support) of at least 50 percent of the total costs annually from non-federal sources over the lifetime of the award is required; in addition, the Federal financial assistance provided to the Institute shall decrease after the second year of funding for the Institute and continue to decrease thereafter in each year in which Federal financial assistance is provided. For purposes of this FFO, the term financial support includes all categories of cost sharing.

In a given year, the federal financial assistance awarded shall not exceed 50 percent of the total funding of the Institute in that year, except that NIST may make an exception in the case of large capital facilities³⁰ or equipment purchases,³¹ and only after an exception request is made to NIST by the applicant or Institute. The exception request must provide strong and compelling justification for the cost share ratio deviation for large capital facilities and/or equipment purchases based on: (1) the magnitude of the costs proposed; (2) the need for the capital facilities and/or equipment as set forth in the proposed or approved technical plan; and (3) the availability of known committed cost share for the year in which the large capital facilities and/or equipment purchase cost(s) are proposed. All exceptions must be approved in advance by the NIST Grants Officer.

Cost sharing is that portion of the costs not borne by the Federal Government. The applicant's share of the expenses may include cash, services, and third party in-kind contributions, as described at 2 C.F.R. § 200.306. The source and detailed rationale of the cost share, including cash, full- and part-time personnel, and in-kind donations must be documented in the budget tables and Budget Narratives submitted with the application and will be considered as part of the review under the evaluation criteria found in Sections V.1.a.3) and V.1.b.4).

³⁰ Eligible costs for the purchase of large capital facilities (\$500,000 or more) are limited to costs that are allowable under the OMB Uniform Guidance at 2 CFR Part 200, Subpart E - Cost Principles. As per 2 CFR 200.318(d), an analysis must be made of lease versus purchase alternatives, and any other appropriate analysis to determine the most economical approach.

³¹ Eligible equipment and their associated purchase costs must be allowable under the OMB Uniform Guidance at 2 CFR Part 200, Subpart E - Cost Principles. A large equipment purchase is the acquisition of any singular large piece of eligible equipment that cost \$500,000 or more. As per 2 CFR 200.318(d), an analysis must be made of lease versus purchase alternatives, and any other appropriate analysis to determine the most economical approach.

As with the Federal share, any proposed costs included as cost sharing must be an allowable/eligible cost under this program and under the Federal cost principles set forth in 2 C.F.R. part 200, Subpart E. Cost sharing incorporated into the budget of an award is subject to audit in the same general manner as Federal award funds. (See 2 C.F.R. part 200, Subpart F.)

As set forth in Section IV.3.a.(14) of this FFO, a letter of commitment is required from an authorized representative of the applicant, stating the total amount of cost share to be contributed by the applicant towards the proposed activity. Letters of commitment for all third-party sources of non-Federal cost sharing identified in an application are not required, but are strongly encouraged.

IV. Pre-Application / Full Application and Submission Information

- 1. Address to Request Application Package.** The application package for a Pre-Application and the application package for a Full Application are available on <http://www.grants.gov>. The application package for a Pre-Application consists of the standard form SF-424, SF-424A for a preliminary Rough Order of Magnitude (ROM) budget, and an Executive Summary and Abbreviated Application Narrative that is submitted by the applicant as an attachment on Grants.gov (see Section IV.2). The application package for a Full Application consists of the standard forms SF-424, SF-424A, SF-424B, SF-LLL, and the CD-511, and additional information submitted by the applicant as attachments on Grants.gov (see Section IV.3). The standard forms may be requested by contacting the NIST personnel listed below, but the standard forms and the attachments described in Section IV.2 for a Pre-Application and Section IV.3 for a Full Application must be submitted through www.grants.gov.

Jessica Strickler, National Institute of Standards and Technology, 100 Bureau Drive, Stop 4700, Gaithersburg MD 20899. Phone (301) 975-0404, e-mail: jessica.strickler@nist.gov.

2. Content and Format of Pre-Application Submission

a. Required Forms and Documents

- (1) SF-424 Application for Federal Assistance.** The SF-424 must be signed by an authorized representative of the applicant organization.

SF-424, Item 12, should list the FFO number 2016-NIST-NNMI-01.

SF-424, Item 18, should list the total budget information of the proposed Institute for the initial award period of up to five (5) years.

The list of certifications and assurances referenced in Item 21 of the SF-424 is contained in the SF-424B. The SF-424B is not submitted for the Pre-Application.

(2) SF-424A, Budget Information - Non-Construction Programs. A preliminary Rough Order of Magnitude (ROM) budget that reflects the anticipated expenses for an Institute initial award period of up to five (5) years, considering all potential cost increases, including cost of living adjustments.

(3) Executive Summary. (This does not contribute to the number of pages.) A concise summary/abstract of the proposed effort. The summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the director/principal investigator(s), the application title, the objectives of the proposed Institute, a description of the proposed Institute, methods to be employed, the potential impact of the proposed Institute (i.e., benefits, outcomes), and major participants (for collaborative Institute activities). This document must not include any proprietary or sensitive business information as NIST may make it available to the public after selection of Pre-Applications has been completed. The Executive Summary must not exceed one (1) single-sided page.

(4) Abbreviated Application Narrative. A word-processed document, written by the applicant, of no more than twenty (20) pages. The Abbreviated Application Narrative should describe the relevance of the proposed Institute to the program as described in Section I. of this FFO and address the following:

1. A description of the proposed NNMI Institute sufficient to permit evaluation of the Pre-Application in accordance with the Evaluation Criteria (see Section V.1.a).
2. The degree of alignment of the Pre-Application and proposed Institute to U.S. advanced manufacturing needs, and/or research programs and goals of NIST and the Department of Commerce advanced manufacturing programs, as described at <http://www.nist.gov/manufacturing-portal.cfm>.

Item IV.2.a.(1) and IV.2.a.(2) above are part of the standard application package in Grants.gov and can be completed through the download application process. **Items IV.2.a.(3) and IV.2.a.(4) must be completed and attached by clicking on the “Add Attachments” button found in Item 15 of the SF-424. This will create a zip file that allows for transmittal of the documents electronically via Grants.gov.**

Applicants should carefully follow specific Grants.gov instructions at www.grants.gov to ensure the attachments will be accepted by the Grants.gov system. **A receipt from Grants.gov does not provide details concerning whether all attachments (or how many attachments) transferred successfully.** Applicants will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency’s electronic system has received its application.

b. Pre-Application Format

- (1) **E-mail, Hard Copies, or Facsimile (fax) Submissions.** Will not be accepted.
- (2) **Figures, Graphs, Images, and Pictures.** Should be of a size that is easily readable or viewable and may be landscape orientation.
- (3) **Font.** Easy to read font (10-point minimum). Smaller type may be used in figures and tables but must be clearly legible.
- (4) **Line Spacing.** Single.
- (5) **Margins.** One (1) inch top, bottom, left, and right.
- (6) **Page layout.** Portrait orientation only except for figures, graphs, images, and pictures (see Section IV.2.b.(2)).
- (7) **Page Limit.** Twenty (20) pages, one-sided print for Pre-Applications.
- (8) **Page limit includes:** Abbreviated Application Narrative, including any Figures, Graphs, Images, and Pictures.
- (9) **Page limit excludes:** Executive Summary; SF-424 Application for Federal Assistance; SF-424A Budget Information – Non-Construction Programs.
- (10) **Page numbering.** Number all pages sequentially.
- (11) **Paper size.** 21.6 cm by 27.9 cm (8 ½ inches by 11 inches).
- (12) **Application language.** English.
- (13) **Typed document.** All applications, including forms, must be typed.

- c. Pre-Application Replacement Pages.** Applicants may not submit replacement pages and/or missing documents after a Pre-Application has been submitted. Any revisions must be made by submission of a new Pre-Application that must be received by NIST by the submission deadline. This does not apply to any additional documentation that may be requested by NIST as part of Pre-Application review or selection.

3. Content and Format of Full Application Submission

a. Required Forms and Documents

Only an applicant whose Pre-Application has been selected by NIST and who has been invited to submit a Full Application is permitted to submit a Full Application to NIST for this funding opportunity. Full Applications submitted by applicants who were

not selected by NIST within the Pre-Application phase, and Full Applications submitted by applicants who did not submit a Pre-Application, will be returned to the applicants without review. The Full Application must contain the following:

- (1) **SF-424 Application for Federal Assistance.** The SF-424 must be signed by an authorized representative of the applicant organization.

SF-424, Item 12, should list the FFO number provided in the application instructions sent to those invited to submit Full Applications.

SF-424 Item 18, should list the total budget information of the proposed Institute for the initial award period of up to five (5) years.

The list of certifications and assurances referenced in Item 21 of the SF-424 is contained in SF-424B.

- (2) **SF-424A, Budget Information - Non-Construction Programs.** The budget should reflect anticipated expenses for an Institute initial award period of up to five (5) years, considering all potential cost increases, including cost of living adjustments.

In Section A, in line 1, column (b), enter "11.619".

Refer to Instructions for Budget Information for Non-Construction Programs (SF-424A) found at <http://www.grants.gov/web/grants/form-instructions/sf-424a-instructions.html> for help when filling out the SF-424A.

- (3) **SF-424B, Assurances - Non-Construction Programs.**
- (4) **CD-511, Certification Regarding Lobbying.**
- (5) **SF-LLL, Disclosure of Lobbying Activities.** (if applicable)
- (6) **Project/Performance Site Location(s).** Submit a word-processed document.
- (7) **Technical Volume.** The Technical Volume is a word-processed document of no more than ninety (90) pages within a Full Application responsive to the applicable program description (see Section I) and the Evaluation Criteria (see Section V.1.b). The applicant should consider the weighting of each of the evaluation criteria (see Section V.1.b) when preparing the Technical Volume. Any information beyond the ninety (90) page limit will not be considered during the evaluation process. The Technical Volume should contain the following information:

- (a) **Executive Summary.** (This does not contribute to the number of pages.) A concise summary/abstract of the proposed effort. The summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the director/principal investigator(s), the application title, the objectives of the proposed Institute, a description of the proposed Institute, methods to be employed, the potential impact of the proposed Institute (i.e., benefits, outcomes), and major participants (for collaborative Institute activities). This document must not include any proprietary or sensitive business information as NIST may make it available to the public after awards are issued. The Executive Summary must not exceed one (1) single-sided page.
- (b) **Table of Contents.** (This does not contribute to the number of pages.)
- (c) **Application Narrative.** A description of the proposed NNMI Institute sufficient to permit evaluation of the application in accordance with the Evaluation Criteria (see Section V.1.b).
- (d) **Annual Institute Plan.** An example Annual Institute Plan (AIP) must be provided by the applicant using either the suggested AIP template that is available on the NIST NNMI website (www.nist.gov/amo/nnmi), or an alternative format of the applicant's choice so long as it provides the same information as is identified within the suggested AIP template. The example AIP will help the applicant think through the process of how the capabilities of the Institute and its members will be organized and used to generate and conduct Institute's technical projects. The example AIP will also help the government determine the applicant's ability to generate Institute technical projects with the necessary quality – e.g., depth, innovation, resources, potential for national benefits, etc. – expected by an Institute within the time frame envisioned for an award. The example AIP will consist, minimally, of the following elements:
1. Summary of the annual technical work to be performed and what is to be accomplished.
 2. An organized representation of the Institute's full scope of technical work, organized as follows:
 - a. Project Calls,³² listed as Sections 1.0 and beyond, that consist of Technical Initiatives.
 - b. Technical Thrusts, listed as sub-Sections 0.1 and beyond, consisting of Project Initiatives.
 - c. Technical Projects, listed as sub-Sections 0.0.01 and beyond.

³² Project Calls are the mechanism by which an Institute will solicit Technical Project proposals funded using Institute resources and address the technical work areas identified by the Institute.

3. Rough Order of Magnitude (ROM) Research & Related Budget for each Institute Technical Project. A suggested ROM budget template is available on the NIST NNMI website (www.nist.gov/amo/nnmi).
4. Integrated Technical Project-level schedule, milestones, and deliverables.

The example AIP should contain an example summary of the at least one example Project Call. The example AIP should consist of at least two example Technical Thrusts and at least two example Technical Projects per Technical Thrust (for a total of at least four example Technical Projects). At least two of the example Technical Projects should be for Institute research and development (R&D) projects.

- (e) **Gantt Chart/Timeline** (This does not contribute to the total number of pages.)
- (8) **Table of Abbreviations and Acronyms.** (This does not contribute to the total number of pages.) An alphabetical list of all abbreviations, acronyms and their meanings.
- (9) **Bibliographic List of References.** (This does not contribute to the total number of pages.) A complete bibliographic listing of all references used within the application.
- (10) **Compliance Matrix.** (This does not contribute to the total number of pages.) Applicants shall provide a compliance matrix in table format that explains how and where each merit review criterion is addressed in the Technical Volume or associated application documentation. The table's format is at the discretion of the applicant.
- (11) **Table of Funded Participants and Unfunded Collaborators.** (This does not contribute to the total number of pages.) A table that identifies all organizations that will participate in and collaborate with the awarded Institute, known at the time of the application submission. The table should consist of an alphabetically ordered list, by organization, of all Funded Participants,³³ all Unfunded Collaborators,³⁴ and indicate which participant or collaborator organizations will be Institute members.³⁵ The table should include the organization's name,

³³ A Funded Participant is an organization or person who receives funds (money) from an Institute as part of their participation. This includes all subrecipients and contractors. Depending on the organizational structure of an Institute, an Institute member may also be a subrecipient and/or contractor.

³⁴ An Unfunded Collaborator is any organization or person who will not receive funds (money) from an Institute as a part of their collaborative relationship with the Institute. Depending on the organizational structure of an Institute, there is a possibility that an Institute member may also be an unfunded collaborator.

³⁵The business model for Institutes relies on a group of persons and/or organizations coming together for a common purpose. This model generally results in a membership structure and its associated

address, Congressional District, the nationality of the majority of ownership, Dun and Bradstreet number, administrative role, organizational type,³⁶ scope of work (funded participants only) and proposed total funding amount to the participant (funded participants only). Administrative roles are: subrecipient or contractor for funded participants; or unfunded collaborator if they will not receive funding. A suggested template for this table is available on the NIST NNMI website (www.nist.gov/amo/nnmi).

- (12) Table of Cost Share Components and Contributors.** (This does not contribute to the total number of pages.) A table that provides details with regard to all contributing sources of cost share, both cash and in-kind, and associated detail is required, including the rationale for selection of the cost share contribution and the merits and risks associated with each known and anticipated cost share contribution. A suggested template for this table is available on the NIST NNMI website (www.nist.gov/amo/nnmi).
- (13) Resumes of Key Personnel.** (These do not contribute to the total number of pages.) Provide a two (2) page resume for each key person identified in the application. Information on any pages beyond the first two pages of each resume will not be considered.
- (14) Required Letters of Commitment.** (These do not contribute to the total number of pages.) Letters that commit specific resources or funding to the proposed Institute in the event that the application is funded are required from all of the following that apply:
- a) If the applicant's application includes subawards or contracts to known third parties, in some cases effectively forming a team, as described in Section III.1. of this FFO, a Letter of Commitment from an authorized organization representative of each known proposed subrecipient and contractor should be included. Each letter should indicate the submitting organization's willingness to participate as a contractor or subrecipient, as applicable, describe what work they will do in relation to the Technical Volume and specify the associated cost of the proposed subaward or contract to the applicant).
 - b) If key personnel who are willing to fill vacancies on the applicant's or a subrecipient's staff are identified by the applicant, a Letter of Commitment from each identified person should be included. The letter from each such individual, or group of individuals, should indicate the relationship of the writer to the applicant and how the writer will help fulfill the efforts described in the Funding Opportunity Description (see Section I).

agreement that formalizes the relationship between a stakeholder organization and the Institute entity itself. Stakeholder organizations that establish this type of relationship with an Institute are generally referred to as members.

³⁶ The organization type is selected from the list that is used to complete SF-424, Item 9.

c) Applicant and Third-Party Non-Federal Cost Sharing: With the exception of a commitment letter from the applicant, letters of commitment for all other third-party sources of non-Federal cost sharing identified in an application are not required, but are strongly encouraged. Applications without commitment letters for each item of third-party, non-Federal cost sharing may be considered less favorably during the application review process.

(i) Applicant Non-Federal Cost Sharing (Cash and In-kind): A letter of commitment is required from an authorized representative of the applicant, stating the total amount of cost share to be contributed by the applicant towards the proposed Institute. This letter includes a per year break-out of cash cost share and in-kind (non-cash) contributions for the duration of the award.

(ii) Third Party Cost Sharing (Cash and In-kind): The applicant is strongly encouraged to include in its application a letter of commitment from an authorized representative of each third-party organization providing cash or in-kind contributions that are to be used as cost share under the proposed Institute. Any such letter(s) should clearly state: whether the third-party contribution will consist of cash contributions, in-kind contributions, or a combination thereof; the total amount or value of the contribution, including a break-out of cash versus in-kind contributions (as applicable); the time period over which the third-party contribution will be made; any interim performance requirements for phased contributions; and all contingencies or pre-conditions to which the contribution is subject.

Letters of Commitment should not be letters submitted by non-proposing entities wishing to vouch for the applicant's (or entities associated with the applicant) knowledge, skills, and abilities or entities to conduct the proposed work. These letters should be in the form of a Letter of Interest (see Section IV.3.a.(15)).

(15) Letters of Interest. (These do not contribute to the total number of pages.) Optional letters that indicate willingness from any third party to support this proposed effort. Letters of Interest should outline the nature and importance of the collaboration or involvement being offered. Letters of Interest may also be from non-proposing entities wishing to vouch for the applicant's knowledge, skills, and abilities or entities to conduct the proposed work.

(16) Estimated Funding by Work Breakdown Structure (WBS). (This does not contribute to the total number of pages.) The WBS is a tool to organize and describe the work to be performed as part of both the Institute Startup Phase and the subsequent Ongoing Institute Operations Phase. Each WBS divides the work into manageable segments to facilitate program management, schedule management, cost estimating and budgeting, and reporting for the Institute's operations. The WBS is composed of tasks, sub-tasks and task descriptions.

Estimated funding³⁷ should be listed by uniquely numbered Tasks (i.e., a high-level aggregation of the task's subtasks that have cost that can be easily updated as a group on an annual basis). The tasks named in the WBS should correspond to those listed in the Gantt Chart/Timeline (see Section IV.3.a.(7).(e)).

- (17) Budget Table and Budget Narrative.** (This does not contribute to the total number of pages.) The Budget Narrative for the award as a whole should provide a detailed breakdown of each of the object class categories as reflected on the SF-424A. A guide to the Budget Narrative is available on the NIST NNMI website (www.nist.gov/amo/nnmi) for your use.

Applicants must provide a detailed budget table³⁸ and budget narrative³⁹ for the Startup Phase and the first year (1st) of the Ongoing Institute Operations once the startup is complete, fully explaining and justifying all proposed expenditures in accordance with applicable federal cost principles. Applicants must also provide a budget table for the remaining years of the award; however, a budget narrative for these subsequent years is not required as part of the application.

In the budget narrative, the applicant should provide adequate information to support the costs identified in each budget category (personnel, fringe benefits, travel, equipment, supplies, other direct charges, and indirect charges). The written justification should include the necessity and the basis for the cost. Only costs that are allowable under the OMB Uniform Guidance at 2 CFR Part 200, Subpart E - Cost Principles, may be included in the budget. Information needed for each category is as follows:

- a. Personnel** - At a minimum, the budget justification for all personnel should include the following: name, job title, commitment of effort on the proposed award (in hours or effort level), salary rate, total direct charges, description of the role and responsibilities of the individuals, including the work they will perform.
- b. Fringe Benefits** - Fringe benefits should be identified separately from salaries and wages and based on rates determined by organizational policy. The items included in the fringe benefit rate (health insurance, parking) should not be charged under another cost category.
- c. Travel** - The budget justification for travel required by the recipient should include the following: destination; names/number of people traveling; dates

³⁷ Funding should reflect the total award costs and per year costs ((for the Startup Phase – up to one (1) year) and for any Ongoing Institute Operations Phase activities that are to occur during the remainder of the first year once Startup is complete) composed of both the Federal funds that will be requested and the cost-sharing or matching that is planned.

³⁸ A budget table shows accounting information broken out by SF-424A object class categories in rows and summarized by performance year(s) and federal award total in the columns.

³⁹ The budget should reflect the total costs, composed of both the Federal funds that will be requested and the cost-sharing or matching that is planned.

and/or duration; mode of transportation, lodging and subsistence rates; and explanation of how the travel is directly related to the proposed Institute's work. For travel that is yet to be determined, please provide best estimates based on prior experience. If a destination is not known, an approximate amount may be used with the assumptions given for the location of travel.

- d. Equipment** - Equipment is defined as an item of property that has an acquisition cost of \$5,000 or more (unless the organization has established lower levels) and an expected service life of more than one year. Any items that do not meet the threshold for equipment can be included under the supplies line item. The budget justification should list each piece of equipment, the cost, a description of how it will be used, and why it is necessary to the successful completion of the award. Please note that any general use equipment (computers, etc.) that is charged directly to the award, should be allocated to the award according to expected percentage of their use on the award.
- e. Supplies** - A list of each supply and the breakdown of the total costs by quantity or unit of cost. Include the necessity of the cost for the completion of the award.
- f. Contractual** - Each contract or subaward should be treated as a separate item. Describe the services provided and the necessity of the subaward or contract to the successful performance of the award.

Costs related to audits and certifications should be included in the budget and may be paid by Federal or cost-share funds. For awards that contain subawards or contracts to commercial organizations, audits by an external auditor (CPA or cognizant Federal agency) may be required, as specified in the award. In addition, if a recipient has never received Federal funding from any Federal agency, a certification may be required from a CPA to determine whether the applicant's financial management system meets the requirements of 2 CFR § 200.302 (Financial management) and § 200.303 (Internal controls), as applicable.

- g. Construction** – This budget category is not applicable to the 2016-NIST-NNMI-01 program.
 - h. Other** – For direct costs that do not easily fit into the other cost categories, please list the cost and the breakdown of the total costs by quantity or unit of cost. Include the necessity of the cost for the completion of the award. Only allowable costs can be charged to the award.
- (18) Indirect Cost Rate Agreement.** (This does not contribute to the total number of pages.) If indirect costs are included in the proposed budget, provide a copy of the approved negotiated agreement if this rate was negotiated with a cognizant

Federal audit agency. If the rate was not established by a cognizant Federal audit agency, provide a statement to this effect. If the successful applicant includes indirect costs in the budget and has not established an indirect cost rate with a cognizant Federal audit agency, the applicant will be required to obtain such a rate in accordance with the Department of Commerce Financial Assistance Standard Terms and Conditions available at: <http://go.usa.gov/hKbj>.

Alternatively, in accordance with 2 C.F.R. § 200.414(f), applicants that have never received a negotiated indirect cost rate may elect to charge indirect costs to an award pursuant to a de minimis rate of 10 percent of modified total direct costs (MTDC), in which case a negotiated indirect cost rate agreement is not required. Applicants proposing a 10 percent de minimis rate pursuant to 2 C.F.R. § 200.414(f) should note this election as part of the budget and budget narrative portion of the application.

- (19) Data Management Plan.** (This does not contribute to the total number of pages.) In accordance with the Office of Science and Technology Memorandum for the Heads of Executive Departments and Agencies of February 22, 2013,⁴⁰ *Increasing Access to the Results of Federally Funded Scientific Research*, and as implemented through NIST Policy 5700.00,⁴¹ *Managing Public Access to Results of Federally Funded Research*, and NIST Order 5701.00,⁴² *Managing Public Access to Results of Federally Funded Research*, NIST requires submission of a Data Management Plan (DMP).

The DMP is a supplementary document of not more than two pages that must include, at a minimum, a summary of activities that generate data, a summary of the types of data generated by the identified activities, a plan for storage and maintenance of the data generated by the identified activities, and a plan describing whether and how data generated by the identified activities will be reviewed and made available to the public. As long as the DMP meets these NIST requirements, it may take the form specified by the applicant's institution or some other entity (e.g., the National Science Foundation or the National Institutes of Health). Some organizations' templates are available on the Internet.

All applications for activities that will generate scientific data using NIST funding are required to adhere to a DMP or explain why data sharing and/or preservation are not within the scope of the award.

For the purposes of the DMP, NIST adopted the definition of "research data" at 2 C.F.R. § 200.315(e)(3) (available at <http://go.usa.gov/3sZvQ>)

⁴⁰ Holdren, J. (2013) Office of Science and Technology Policy. *"Increasing Access to the Results of Federally Funded Scientific Research"*.

https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

⁴¹ See <http://www.nist.gov/open/upload/Final-P-5700.pdf>. June 2015.

⁴² See http://www.nist.gov/open/upload/Final-O-5701_0.pdf. June 2015.

Reasonable costs for data preservation and access may be included in the application.

The sufficiency of the DMP will be considered as part of the administrative review (see Section V.3.a); however, the DMP will not be evaluated against any evaluation criteria.

Items IV.3.a.(1) through IV.3.a.(5) above are part of the standard application package in Grants.gov and can be completed through the download application process. **Items IV.3.a.(6) through IV.3.a.(19) must be completed and attached by clicking on the “Add Attachments” button in Item 15 of the SF-424. This will create a zip file that allows for transmittal of the documents electronically via Grants.gov.**

Applicants should carefully follow specific Grants.gov instructions at www.grants.gov to ensure the attachments will be accepted by the Grants.gov system. **A receipt from Grants.gov does not provide details concerning whether all attachments (or how many attachments) transferred successfully.** Applicants will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency’s electronic system has received its application.

The Grants.gov Online Users Guide available at the Grants.gov site (<http://go.usa.gov/cjaEh>) provides vital information on checking the status of applications. See especially the “Check My Application Status” option, found by clicking first on Applicants, and then by clicking on Applicant Actions.

Applicants can track their submission in the Grants.gov system by following the procedures at the Grants.gov site (<http://go.usa.gov/cjamz>). It can take up to two business days for an application to fully move through the Grants.gov system to NIST.

Checking the application status and tracking the submission are useful tools in the Abbreviated Application stage as well as in the Full Application stage.

NIST uses the Tracking Numbers assigned by Grants.gov, and does not issue Agency Tracking Numbers.

b. Application Format

- (1) E-mail, Hard Copies, or Facsimile (fax) Submissions.** Will not be accepted.
- (2) Figures, Graphs, Images, and Pictures.** Should be of a size that is easily readable or viewable and may be landscape orientation.
- (3) Font.** Easy to read font (10-point minimum). Smaller type may be used in figures and tables but must be clearly legible.

- (4) **Line Spacing.** Single.
 - (5) **Margins.** One (1) inch top, bottom, left, and right.
 - (6) **Page layout.** Portrait orientation only except for figures, graphs, images, and pictures (see Section IV.3.b.(2)).
 - (7) **Page Limit.** Ninety (90) pages, one-sided print for Full Applications.
 - (8) **Page limit includes:** Technical Volume, including any Figures, Graphs, Images, and Pictures.
 - (9) **Page limit excludes:** Executive Summary; Table of Contents; SF-424 Application for Federal Assistance; SF-424A Budget Information – Non-Construction Programs; SF-424B, Assurances – Non-Construction Programs; SF-LLL, Disclosure of Lobbying Activities; CD-511, Certification Regarding Lobbying; Project Performance/Site Location(s); Gantt Chart/Timeline; Table of Abbreviations and Acronyms; Bibliographic List of References; Table of Funded Participants and Unfunded Collaborators; Compliance Matrix; Table of Cost Share Components; Resumes of Key Personnel; Required Letters of Commitment; Letters of Interest (if applicable); Budget Narrative; Indirect Cost Rate Agreement (if applicable); Human and Animal Subjects material (if applicable); and the Data Management Plan.
 - (10) **Page numbering.** Number all pages sequentially.
 - (11) **Paper size.** 21.6 cm by 27.9 cm (8 ½ inches by 11 inches).
 - (12) **Application language.** English.
 - (13) **Typed document.** All applications, including forms, must be typed.
- c. **Application Replacement Pages.** Applicants may not submit replacement pages and/or missing documents after an application has been submitted. Any revisions must be made by submission of a new application that must be received by NIST by the submission deadline. This does not apply to any additional documentation that may be requested by NIST as part of application review or selection.
- d. **Pre-Applications.** NIST is requiring Pre-Applications under this FFO (see Section IV.2).
- e. **Certifications Regarding Federal Felony and Federal Criminal Tax Convictions, Unpaid Federal Tax Assessments and Delinquent Federal Tax Returns.** In accordance with Federal appropriations law, an authorized representative of the selected applicant(s) may be required to provide certain pre-award certifications

regarding Federal felony and Federal criminal tax convictions, unpaid Federal tax assessments, and delinquent Federal tax returns.

4. **Unique Entity Identifier and System for Award Management (SAM).** Pursuant to 2 C.F.R. part 25, each applicant and recipient (as the case may be) is required to: (i) be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency, unless otherwise excepted from these requirements pursuant to 2 C.F.R. § 25.110. **NIST will not make a Federal award to an applicant until the applicant has complied with all applicable unique entity identifier and SAM requirements. If an applicant has not fully complied with the requirements by the time NIST is ready to make a Federal award pursuant to this FFO, NIST may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.**

5. **Submission Dates and Times.** Required Pre-Applications must be received electronically through Grants.gov no later than 11:59 p.m. Eastern Time, April 20, 2016. Pre-Applications received after this date will not be reviewed or considered. NIST will consider the date and time recorded by www.grants.gov as the official submission time. Assessment of Pre-Applications, selection, and notification to applicants is expected to be complete on or about May 23, 2016. Selected applicants will then be invited to submit a Full Application. Full Applications must be received electronically through Grants.gov no later than 11:59 p.m. Eastern Time, July 22, 2016. Full Applications received after this deadline will not be reviewed or considered. NIST will consider the date and time recorded by www.grants.gov as the official submission time. The earliest anticipated start date for awards issued under this FFO is expected to be within the first calendar quarter of 2017.

Applicants should be aware, and factor in their application submission planning, that the Grants.gov system is expected to be closed for routine maintenance at these times:

From 12:01 a.m. Eastern Time Saturday	To 6:00 a.m. Eastern Time Monday
February 20, 2016	February 22, 2016
March 19, 2016	March 21, 2016
April 16, 2016	April 18, 2016
May 21, 2016	May 23, 2016
June 18, 2016	June 20, 2016
July 16, 2016	July 18, 2016

Applications cannot be submitted when Grants.gov is closed.

NIST strongly recommends that applicants do not wait until the last minute to submit an application. NIST will not make any allowances for late submissions, including but not limited to incomplete Grants.gov registration. To avoid any potential processing

backlogs due to last minute Grants.gov registrations, applicants are highly encouraged to start their Grants.gov registration process at least four (4) weeks prior to the application due date.

When developing your submission timeline, please keep in mind that: (1) all applicants are required to have a current registration in the System for Award Management (SAM.gov); (2) the free annual registration process in SAM.gov (see Section IV.4 and Section IV.8.a.(2) of this FFO) may take between three and five business days or as long as more than two weeks; (3) applicants are required to have a current registration in Grants.gov; and (4) applicants will receive a series of e-mail messages from Grants.gov over a period of up to two business days before learning whether a Federal agency's electronic system has received its application. **Please note that a federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.**

Electronic applicants will find instructions on registering with SAM.gov as part of the Grants.gov process at:

<http://www.grants.gov/web/grants/applicants/organization-registration.html>

6. **Intergovernmental Review.** Applications under this FFO are not subject to Executive Order 12372.
7. **Funding Restrictions.** Profit or fee is not an allowable cost for applicants.
8. **Other Submission Requirements**
 - a. **Pre-Applications and Full Applications must be submitted electronically.** All Pre-Applications and Full Applications must be submitted electronically via Grants.gov at www.grants.gov, under announcement 2016-NIST-NNMI-01.
 - (1) Applicants should carefully follow specific Grants.gov instructions to ensure the attachments will be accepted by the Grants.gov system. A receipt from Grants.gov indicating an application is received does not provide information about whether attachments have been received. For further information or questions regarding applying electronically for the 2016-NIST-NNMI-01 announcement, contact Christopher Hunton by phone at (301) 975-5718 or by e-mail at grants@nist.gov.
 - (2) Applicants are strongly encouraged to start early and not wait until the approaching due date before logging on and reviewing the instructions for submitting an application through Grants.gov. The Grants.gov registration process must be completed before a new registrant can apply electronically. If all goes well, the registration process takes three (3) to five (5) business days. If problems are encountered, the registration process can take up to two (2) weeks or more. Applicants must have a valid unique entity identifier number

and must maintain a current registration in the Federal government's primary registrant database, the System for Award Management (<https://www.sam.gov/>), as explained on the Grants.gov Web site. See also Section IV.4. of this FFO. After registering, it may take several days or longer from the initial log-on before a new Grants.gov system user can submit an application. Only those individual(s) registered with Grants.gov as authorized representatives of the organization will be able to submit the application and the system may need time to process a submitted application. Applicants should save and print the proof of submission they receive from Grants.gov. If problems occur while using Grants.gov, the applicant is advised to (a) print any error message received and (b) call Grants.gov directly for immediate assistance. If calling from within the United States or from a U. S. territory, please call 800-518-4726. If calling from a place other than the United States or a U. S. territory, please call 606-545-5035. Assistance from the Grants.gov Help Desk will be available around the clock every day, with the exception of Federal holidays. Help Desk service will resume at 7:00 a.m. Eastern Time the day after Federal holidays. For assistance using Grants.gov, you may also contact support@grants.gov.

- (3) To find instructions on submitting an application on Grants.gov, Applicants should refer to the "Applicants" tab in the banner just below the top of the www.grants.gov home page. Clicking on the "Applicants" tab produces two exceptionally useful sources of information - Applicant Actions and Applicant Resources - which applicants are advised to review.

Applicants will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency's electronic system has received its application. Closely following the detailed information in these subcategories will increase the likelihood of acceptance of the application by the Federal agency's electronic system.

Applicants should pay close attention to the guidance under "Applicant FAQs," as it contains information important to successful submission on Grants.gov, including essential details on the naming conventions for attachments to Grants.gov applications.

All applicants should be aware that adequate time must be factored into applicants' schedules for delivery of their application. Applicants are advised that volume on Grants.gov may be extremely heavy leading up to the deadline date.

The application must be both received and validated by Grants.gov. The application is "received" when Grants.gov provides the applicant a confirmation of receipt and an application tracking number. If an applicant does not see this confirmation and tracking number, the application has not been received. After the application has been received, it must still be validated. During this

process, it may be “validated” or “rejected with errors.” To know whether the application was rejected with errors and the reasons why, the applicant must log in to Grants.gov, select “Applicants” from the top navigation and select “Track my application” from the drop-down list. If the status is “rejected with errors,” the applicant may still seek to correct the errors and resubmit your application before the deadline. If the applicant does not correct the errors, the application will not be forwarded to NIST by Grants.gov.

Applicants should refer to important information in Section IV.5. Submission Dates and Times to help ensure that an application is received on time.

- b. Amendments.** Any amendments to this FFO will be announced through Grants.gov. Applicants may sign up on Grants.gov to receive amendments by e-mail, or may request copies from Jessica Strickler by telephone at (301) 975-0404, or by e-mail to jessica.strickler@nist.gov.

V. Application Review Information

- 1. Evaluation Criteria.** The Evaluation Criteria that will be used in evaluating Pre-Applications and Full Applications, and assigned weights, are as follows:

a. Pre-Applications:

1) Potential to Fulfill a Recognized National Need with Substantial Broad Based Benefits and Demonstrated Industry Leadership (40 pts)

The Pre-Application will be evaluated for the technical and business merits associated with the scope and vision of the proposed Institute, including: the goal(s), objective(s), and national outcomes; the technical challenges in advanced manufacturing that need to be addressed; the importance and significance of the challenges within the context of U.S. advanced manufacturing national needs, existing capabilities, ongoing and existing efforts; the potential for substantive national impacts enabled as a result of the activities being proposed; and the evidence of industry commitment, involvement, and leadership towards creation of the proposed Institute. Specifically, the Pre-Application will be evaluated in the context of the following sub-criteria, which are weighted equally:

- a) Proposed Mission and Technical Scope.** The quality, innovativeness, and merit of the mission and technical scope of the proposed Institute, and its potential for meeting U.S. advanced manufacturing national need(s). This includes:
- Whether the predominant focus of the Institute is a manufacturing process, novel material, enabling technology, supply chain integration methodology, or other relevant aspect of advanced manufacturing that has not already been commercialized, marketed, distributed, or sold by another entity.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The nature and scope of a unique and well-defined focus area(s) in advanced manufacturing.
- The extent to which the proposed approach for the Institute addresses challenges in advanced manufacturing to: retain or expand industrial production in the United States; perform research and development to solve pre-competitive industrial problems with economic or national security implications; and facilitate the transition of innovative technologies into scalable, cost-effective, and high-performing manufacturing capabilities.
- The current state of the art in the relevant fields and relevant applications; what is technically possible; and the shortcomings, limitations, and challenges that warrant an Institute.
- The uniqueness and complementary nature of the proposed Institute's technical scope within the context of the Network for Manufacturing Innovation (Network), including both existing programs of federally funded Institutes that comprise the Network, and technical focus area(s) that are identified within any in-progress Institute funding opportunity announced by a federal agency.

b) National Impacts and Broad-based Benefits. The magnitude, quality, and likelihood of the envisioned national impacts and broad-based benefits that would arise from the proposed Institute and the proposed approach that extend beyond the direct return to participants. This includes:

- How the Institute will advance domestic manufacturing and the likelihood of economic impact, including the creation or preservation of jobs, in its predominant focus area(s).
- How the Institute will increase the non-Federal investment in advanced manufacturing research in the United States.
- How the Institute will engage with small and medium-sized manufacturing enterprises, to improve the capacity of such enterprises to commercialize new processes and technologies.
- How the Institute will advance economic competitiveness and generate substantial benefits to the Nation that extend beyond the direct return to participants in the Program.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- Engaging U.S. small- and medium-sized manufacturing enterprises (SMEs) and global supply-chains, including but not limited to the NIST Hollings Manufacturing Extension Partnership program and regional centers, to meet their needs and to ensure results reach small and medium-sized entities.
- Becoming a leading knowledge broker between users and manufacturers to shape U.S. participation in global supply chains (capabilities, equipment, personnel, etc.) based upon product needs and manufacturing capabilities. This also includes the vision for interfacing with industry associations, professional societies, and economic development entities.

c) Leadership and Involvement from Industry, Academia and Small-and Medium-sized Enterprises. The quality, magnitude, adequacy, and evidence of leadership and involvement from academia and especially industry, assembled to date, towards creating a sustainable Institute. This includes:

- The extent to which the proposal provides for ongoing advice, participation, leadership, and other contributions – excluding cost sharing – to the Institute from non-Federal sources, so as to provide leverage and resources necessary to promote a stable and sustainable Institute business model without the need for long-term Federal funding.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The involvement of industry and academia leadership as a positive force for realizing and sustaining the Institute, as reflected by the scope and magnitude of proposed engagements. This includes, but is not limited to, participation as a member of the Institute's leadership team, participation as an Institute member, and participation from all segments of the value-chain and innovation ecosystem.
- The consideration and involvement, where appropriate, of small- and medium-sized enterprises (SMEs) and the means by which their specific needs are proposed to be incorporated within the Institute's design and function to ensure that the results of the Institute reach small and medium-sized entities.

2) The Proposed Manufacturing Innovation Institute (30 pts)

The Pre-Application will be evaluated for the technical and business merits associated with the proposed strategy for establishing and operating the proposed Institute. The

proposed strategy should include well-founded plans for the Institute's startup (up to one (1) year) and ongoing operations periods. The strategy should discuss the organization - either the applicant or a separate entity - that will lead the proposed Institute and its merits. Teaming and partnerships are encouraged. Specifically, the Pre-Application will be evaluated in the context of the following sub-criteria, which are weighted equally:

a) Business Plan. The soundness and adequacy of the conceptual vision and plan for the proposed Institute's business structure, organization, management, and operations models. This includes:

- How the Institute and organization will be an independent, neutral, and non-biased entity able to coordinate and convene a broad range of stakeholders, including small and medium-sized enterprises (SMEs), and become a uniquely valued component of the Nation's innovation infrastructure.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The proposed organization and the operation of the Institute, including: the strategies and approach for the Institute's management, governance and membership; the level and role of academic institutions, multiple tiers of industry, end users and other network Institutes; and Federal and non-Federal government participation as appropriate.
- The characteristics of the proposed Institute's physical facility - including the facility's role, capabilities, inputs, outputs, and potential activities - that are needed to meet the needs of U.S. manufacturing, innovation infrastructure, and the nation.
- The strategy, scope, guiding principles, objectives, and work elements that would need to be accomplished for the proposed Institute to progress quickly through a Startup Phase and begin its ongoing operations expeditiously.

b) Integrated Education, Workforce Development and Technology Transfer.

The quality, soundness, and appropriateness of the conceptual vision and plan for the proposed Institute's integrated education, workforce development and technology transfer models. This includes:

- How the Institute will carry out educational and workforce activities that meet industrial needs related to its predominant focus area(s).
- How the Institute will strengthen and leverage the assets of a region.

- How the Institute will encourage the education and training of veterans and individuals with disabilities.
- The purpose, roles, and characteristics of the collaborative and shared-use applied R&D capabilities in the context of U.S. advanced manufacturing national needs and the methods that will be used to identify and to stand up capabilities, including Startup Phase activities.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- How the Institute will integrate educational and workforce/professional development, training, and employment opportunities (such as internships) that are effective and efficient as part of the Institute's technical programs, including efforts that will strengthen the involvement of under-represented groups in advanced manufacturing.
- How the Institute will integrate its education, training, and workforce development programs and collaborate with other key stakeholders, including Federal government agencies and organizations (e.g., the U.S. Departments of Education and Labor, National Science Foundation), state agencies, other Manufacturing Innovation Institutes, and relevant industry associations and consortiums.
- How the Institute will strengthen and leverage national (including Federal) assets to assist with workforce development.
- The strategy for management and protection of Intellectual Property (IP) and for realizing an Institute IP plan that will incentivize broad-based U.S. private sector involvement that translates to economic benefit within the context of the global environment.

3) Resources, Qualifications and Experience for the Proposed Institute (30 pts)

Pre-Applications will be evaluated for the adequacy and reasonableness of the proposed preliminary resources and rough order of magnitude (ROM) multi-year budget to establish, startup, and operate the proposed Institute. (Please note: The budget should reflect the total costs and per year costs, composed of both the Federal funds that will be requested and the cost-sharing or matching that is planned.) The Pre-Application will be evaluated for the source and amount of cost-sharing from non-Federal sources assembled to date, and whether the non-Federal financial support will significantly exceed the Federal financial assistance requested. The qualifications and experience of the preliminary collection of key personnel and participating organizations who will be assigned to lead or participate in the proposed Institute will be evaluated. Teaming and partnerships are encouraged and will be evaluated.

Specifically, the Pre-Application will be evaluated in the context of the following sub-criteria, which are weighted equally:

a) ROM Budget. The appropriateness and cost-effectiveness of the proposed ROM Budget with respect to carrying out the work and objectives of the Technical Volume. This includes:

- How the proposed ROM cost for the work is appropriate for the work to be performed, per year, over the initial five (5) year award period, which includes: 1) the Institute establishment and Startup Phase, and 2) the Ongoing Institute Operations phase.
- The degree to which the ROM Budget reflects a clear understanding of the requirements of the Funding Opportunity.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as example, to further illustrate its approach to this sub-criterion:

- The degree to which the ROM Budget is consistent with the proposed Institute performance and the material described within the applicant's Abbreviated Application Narrative.

b) Cost Sharing or Matching. The evidence, quality, and reasonableness of industry's financial commitment, assembled to date, for establishing the proposed Institute. This includes:

- Whether the non-Federal financial support provided to the Institute from non-Federal sources will significantly exceed the requested Federal financial assistance for the proposed Institute.
- Evidence of the potential to leverage non-Federal sources of financial support to promote a stable and sustainable business model without the need for long-term Federal funding.

When preparing its Pre-Application, the applicant may want to consider addressing the following topics, as example, to further illustrate its approach to this sub-criterion:

- The magnitude, nature, and source, of the committed cost-share from specific, known and anticipated, non-Federal sources.

c) Qualifications. The quality, degree, and appropriateness of the qualifications of the lead organization(s), organization director, key personnel, and of other key participating organizations and key personnel assembled to date.

When preparing its Pre-Application, the applicant may address the following consideration(s), as examples, within this sub-criterion:

- Documented and successful track record, experience and performance leading programs or entities similar in nature to the purpose, scope, and/or work activities as those described in this FFO for the proposed lead organization(s), organization director, and key personnel.
- Teaming and partnerships for quality and appropriateness for the intended mission and scope of the proposed Institute.

b. Full Applications:

1) Potential to Fulfill a Recognized National Need with Substantial National Impacts and Broad Based Benefits (20 pts)

Full Applications will be evaluated for the technical and business merits associated with the scope and vision of the proposed NNMI Institute, including: the goal(s), objective(s) and national outcomes; the technical challenges in advanced manufacturing that need to be addressed; the importance and significance of the challenges within the context of U.S. advanced manufacturing national needs, existing capabilities, and ongoing and existing efforts; and the potential for substantive national impacts and broad-based benefits enabled as a result of the Institute and activities being proposed. Specifically, the application will be evaluated in the context of the following sub-criteria, which are weighted equally:

- a) Proposed National Needs and Scope.** The quality, innovativeness, and merit of the mission and technical scope of the proposed Institute and its potential for meeting U.S. advanced manufacturing national need(s). This includes:
- Whether the predominant focus of the Institute is a manufacturing process, novel material, enabling technology, supply chain integration methodology, or other relevant aspect of advanced manufacturing that has not already been commercialized, marketed, distributed, or sold by another entity.
 - The extent to which the proposed Institute’s solution addresses challenges and national need(s) in advanced manufacturing and assist manufacturers so as to: retain or expand industrial production in the United States; perform research and development to solve pre-competitive industrial problems with economic or national security implications; and facilitate the transition of innovative technologies into scalable, cost-effective, and high-performing manufacturing capabilities.
 - The uniqueness and complementary nature of the proposed Institute's technical scope within the context of: the Network for Manufacturing Innovation (Network), including both existing program of federally funded Institutes that

comprise the Network, and technical focus area(s) that are identified within any in-progress Institute funding opportunity announced by a federal agency.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The nature and scope of the unique and well-defined predominant focus area(s) in advanced manufacturing.
- The extent to which the application specifically and convincingly explains how the proposed Institute will advance the state of the art in the Institute's focus area and demonstrates the depth of the applicant's technical understanding of industry.
- The degree to which the current state of the technology and the proposed advancements to be realized due to the Institute's activities are clearly, accurately, and convincingly provided.
- The sufficiency of the technical detail offered to assess whether the proposed work is scientifically and technically meritorious and innovative, including relevant data, calculations or discussion of prior work in the literature with analyses that supports the viability of the proposed work.

b) National Impacts and Broad-based Benefits. The magnitude, quality, and reasonableness of the national impacts and broad-based benefits arising from the proposed Institute that extend beyond the direct return to participants. This includes:

- How the Institute will estimate the magnitude and scope of the impacts and benefits that are anticipated within the first ten years following the Institute's establishment.
- How the Institute will advance domestic manufacturing and the likelihood of economic impact, including the creation or preservation of jobs, in its predominant focus area(s).
- How the Institute will increase the non-Federal investment in advanced manufacturing research in the U.S.
- How the Institute will engage with small and medium-sized manufacturing enterprises, to improve the capacity of such enterprises to commercialize new processes and technologies.

- How the Institute will advance economic competitiveness and generate substantial benefits to the Nation that extend beyond the direct return to participants in the Program.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- Engaging U.S. small- and medium-sized manufacturing enterprises (SMEs) and global supply-chains, including but not limited to the NIST Hollings Manufacturing Extension Partnership program and regional centers, to meet their needs and to ensure results reach small and medium-sized entities.
- Becoming a leading knowledge broker between users and manufacturers to shape U.S. participation in global supply chains (capabilities, equipment, personnel, etc.) based upon product needs and manufacturing capabilities. This also includes the vision for interfacing with industry associations, professional societies, and economic development entities.

2) Institute Operations and Management (25 pts)

Full Applications will be evaluated for the technical and business merits of the associated Institute operations and management models and plans being proposed. The proposed models and plans should be well-founded and suited for the organization and focus area(s) being proposed and should span the entire life cycle of a NNMI Institute Award. Teaming and partnerships are encouraged. Specifically, the application will be evaluated in the context of the following sub-criteria, which are weighted equally:

a) Business Structure, Organization, and Management. The soundness, innovativeness and adequacy of the proposed Institute's business structure, organization, and management models. This includes:

- How the proposed Institute and organization will operate as an independent, neutral and non-biased entity able to coordinate and convene a broad range of stakeholders, including small and medium-sized enterprises (SMEs) and become a unique component of the Nation's innovation infrastructure, including:
 - I. The organization and the operation of the Institute, including: the strategies and approach for the Institute's management, governance and membership; stakeholder engagement approach; the level and role of academic institutions, multiple tiers of industry, end users, networked Institutes; and Federal and non-Federal government participation after an award is issued, as appropriate.

- II. The proposed participation structure (i.e. tiered membership structure, pay-for-use arrangements, etc.), including the benefits and restrictions associated with each level of participation and Intellectual Property rights.
 - III. The organizational structure, to include management structure, Institute Director/Executive, key management staff, as well as technical advisory and strategic governance boards.
 - IV. The proposed governance structure, how decisions will be made and disputes will be resolved, and how any governing entities/advisory boards will function and the authority(ies) they will have.
 - V. How NIST and other Federal agencies identified by NIST will participate within the Institute's decision-making bodies (e.g. boards, committees, etc.) at both a strategic and technical level and how the Institute will shepherd partnerships and technical programs with Federal agencies after an Institute award is established. (Please note: NIST expects usage of a Cooperative Agreement award for this public-private partnership.)
- The characteristics of the Institute's physical facility, including the facility's role, capabilities, inputs, outputs, and potential activities to meet the needs of U.S. manufacturing, innovation infrastructure, and the nation.
 - The vision within the AIP for how Project Calls will be conducted that also includes: (a) how Project Calls will engage the Institute members and others to advance the state-of-the-art within the Institute's advanced manufacturing focus area(s); and (b) a description of the proposed rationale and approach for utilizing both Institute and non-Institute facilities for conducting Institute funded projects. (Please note: Project Calls are the mechanism by which an Institute will solicit Technical Project proposals funded using Institute resources and address the technical work areas identified by the Institute.)

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- How the business and management plan and structure will integrate the individual Institute elements (e.g., shared R&D facilities, R&D activities, stakeholder engagement, road-mapping, technical education and workforce development, technology transfer, and/or commercialization activities, etc.) to provide the greatest value to the nation.
- How the Institute will seek participants and/or members across its life-cycle of Federal funding and how it will encourage participation by small and medium sized enterprises (SMEs), including evidence of their engagement, leadership and involvement.

- How the Applicant proposes to conduct Project Management of the Institute's activities and of the R&D work undertaken using the Institute's shared-use facilities, including the following:
 - I. The overall approach and organization for managing the work of the various team members and their roles.
 - II. The technical and management aspects of the management plan, including systems and practices, such as financial and Project Management practices, tracking and assessing progress, and management of critical interdependencies, and/or handoffs across teams and members.
 - III. The approach to project-level risk management and change management.
 - IV. How communications will be maintained among team members.
 - V. The approach to quality assurance/control.

b) Institute Startup. The quality, innovativeness, soundness, adequacy and completeness of the proposed Institute Startup Phase work plan and the likelihood that it will effectively and efficiently assemble sufficient capabilities, resources, and controls to accomplish the Institute's mission and scope of work. This includes:

- A detailed work plan for the Institute Startup Phase that is capable of accomplishing the establishment and startup of the proposed Institute, and for the Institute to progress quickly through startup so that it may begin its ongoing operations expeditiously.
- A work plan for the Institute Startup Phase that includes strategies for identifying, designing and developing, creating, establishing or assembling the following:
 - I. Needed Institute plans and agreements, including its technology focus, governance, membership, data management, export control and management, and intellectual property.
 - II. Internal management and financial systems and controls that will be needed to oversee and administer the technical, business, financial, informational, operational, conflict of interest, and enterprise risks functions of the Institute.
 - III. A risk assessment and risk mitigation plan for the technical, economic and operational aspects of the proposed Institute including Intellectual Property management and securing U.S. manufacturing competitiveness.
 - IV. The Institute's physical facility(ies) requirements for conducting the Institute's proposed work, including the identification of prospective facility sites that meet the requirements.
 - V. A world-class leadership team with key personnel for launching and operating the Institute and its organization.
 - VI. Industry road-mapping to identify technical and non-technical challenges that should be addressed by the Institute, including quantified targets associated with roadmap goals as well as the plan to update the roadmap periodically (annual or bi-annual).

- A Work Breakdown Structure (WBS) for the Institute Startup Phase, composed of tasks, sub-tasks and task descriptions that describes the work plan to be accomplished, that is well organized to reflect the scope of the work that needs to be accomplished, identifies the entities that will have responsibility to lead the work's completion, and explains how the applicant will achieve the milestones and deliverables presented. The WBS may be summarized within a Gantt Chart/Timeline that contains the major tasks and sub-tasks, responsible leads, milestones, and deliverables, as needed. Each task and subtask should have a unique number and title, an indication of the duration of the task or sub-task in months and indicate the relationship of the task or sub-task to Institute deliverables or expected results. The tasks named in the WBS should correspond to those listed in the Gantt Chart/Timeline (see Section IV.3.a.(7).(e).
- How the Institute's performance will be tracked and evaluated by the Institute and the plans for within-Institute program reviews, e.g., nature, scope, frequency or methodology for how they will be conducted.
- Clear and appropriate milestones and deliverables for the Institute Startup Phase, including those for final agreements and plans, assigned throughout the Institute startup performance period, that allows for assessment of award progress and demonstrates success, where success is defined as a technical achievement rather than simply completing a task. Proposed milestones are specific, measureable, achievable, relevant, and timely.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- A clear and well-founded description of the applicant's strategy, guiding principles, objectives, and work-plan for what will need to be accomplished during the proposed Institute's Startup Phase (up to one (1) year) and for ensuring the leadership and viewpoints of stakeholders, including small and medium-sized enterprises (SMEs), are included.
- If a new not-for-profit entity is or will be established for the management and operation of the Institute, a clear plan and timeline for establishing the not-for-profit Institute as a new legal entity.
- How well the WBS is summarized within a corresponding logically organized schedule, or Gantt Chart/Timeline, that contains the major tasks and sub-tasks, responsible leads, milestones, and deliverables, as needed.
- Institute-wide Startup Phase go/no-go decision points at appropriate points in the startup work plan. (Please note: Go/No-go decision points are points in

which successes for ongoing efforts are assessed and decisions for future phases or periods of performance are evaluated and made, prior to actually beginning the future phase work.)

- c) Ongoing Institute Operations.** The quality, innovativeness, soundness, adequacy, and completeness of the proposed Ongoing Institute Operations work plan that has sufficient ongoing capabilities, resources, and controls to accomplish the Institute's mission, scope of work, and self-sufficiency. This includes:
- A detailed work plan for the Ongoing Institute Operations that is capable of accomplishing the complete technical (research and development, facilities, educational, technology transfer) and business operations of the proposed Institute and includes a description of the work to be performed after completion of the Startup Phase and within the first year of the Institute's ongoing operations, including the following:
 - I. The Institute technical and management work scope divided by performance periods that are each separated by discrete, approximately annual decision points and specific expected end result(s).
 - II. An Annual Institute Plan (AIP) that exemplifies how the advanced manufacturing focus area(s) state-of-the-art will be advanced by the Institute. (Please note: The AIP (see Section IV.3.a.(7)(d)) is the annual statement of technical work of the Institute that consists of one or more individual Project Calls, Technical Thrusts, and Technical Projects. The AIP captures the complete scope of an Institute's annual technical work plan, including R&D, share-use facilities, education and training, and other forms of technology transfer.)
 - III. Two (2) example Project Calls with at least two (2) example Technical Projects for each Project Call (see Section IV.3.a.(7)(d)) that illustrate the applicant's knowledge of industry's technical needs and market priorities as well as provide a framework for the proposed Institute lead to initiate efforts for how the Institute and partners will develop Technical Projects as part of an Institute award. (Please note: Project Calls are the mechanism by which an Institute will solicit Technical Project proposals funded using Institute resources and address the technical work areas identified by the Institute.) To be responsive, example Project Calls and Technical Projects must adequately address at least the following: technical approach and justification; relevance and knowledge of the Technical Project's importance relative to industry needs; the schedule and milestones; outcomes and deliverables; and management approach.
 - IV. An annual strategic planning and review/assessment process for the Institute that will set forth the process by which industry roadmap(s) and lessons learned will inform and establish priorities for the Institute's strategic plan, how the Institute will strengthen its national impacts and broad-based benefits, and explain how the Institute will encourage new ideas and participants within its activities.

- A Work Breakdown Structure (WBS) for the Institute’s technical and business operations throughout the complete Ongoing Institute Operations performance period, composed of tasks, sub-tasks and task descriptions that describes the work plan to be accomplished, that is well organized to reflect the scope of the work that needs to be accomplished, identifies the entities that will have responsibility to lead the work’s completion, and explains how the applicant will achieve the milestones and deliverables presented. The WBS may be summarized within a Gantt Chart/Timeline that contains the major tasks and sub-tasks, responsible leads, milestones, and deliverables, as needed. Each task and subtask should have a unique number and title, an indication of the duration of the task or sub-task in months and indicates the relationship of the task or sub-task to Institute deliverables or expected results. The tasks named in the WBS should correspond to those listed in the Gantt Chart/Timeline (see Section IV.3.a.(7).(e).
- How the Institute’s ongoing operations, performance, impacts and benefits will be tracked and evaluated by the Institute, and the plans for within-Institute program reviews, e.g., nature, scope, frequency or methodology for how they will be conducted.
- Clear and appropriate milestones and deliverables, assigned throughout the complete Ongoing Institute Operations performance period, that allows for assessment of the Institute’s progress and demonstrates success, where success is defined as a technical achievement rather than simply completing a task. Proposed milestones are specific, measureable, achievable, relevant, and timely.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- A clear and convincing description of the technical work to be addressed by the Institute, what the applicant seeks to accomplish and the strategy and approach that will be used to accomplish the objective(s) and proposed work plan.
- The proposed process for making decisions on scientific/technical direction including how R&D and technical work in the proposed R&D facilities will be prioritized, relate to roadmapping efforts and how conflicts will be resolved.
- How well the WBS is summarized within a corresponding logically organized schedule, or Gantt Chart/Timeline, that contains the major tasks and sub-tasks, responsible leads, milestones, and deliverables, as needed.
- Institute-wide go/no-go decision points at appropriate points in the work plan. (Please note: Go/No-go decision points are points in which successes for

ongoing efforts are assessed and decisions for future phases or periods of performance is evaluated, prior to actually beginning the future phase work.) Each major Institute function (e.g. operations and management, shared use facilities, R&D activity, stakeholder engagement, road-mapping efforts, technical education and workforce development, technology transfer, etc.) should have at least one decision point for each performance year (12-month period).

3) Integrated Education, Workforce Development and Technology Transfer (15 pts)

Full Applications will be evaluated for the technical and business merits associated with the proposed Institute's education, workforce development and technology transfer models and plans. The proposed models and plans should be well-founded and suited for the organization and focus area(s) being proposed and should span the full life cycle of a NNMI Institute Award. Teaming and partnerships are encouraged. Specifically, the application will be evaluated in the context of the following sub-criteria, which are weighted equally:

a) Education and Workforce Development. The quality, soundness, and appropriateness of the proposed Institute's integrated education workforce development plans and models. This includes:

- How the Institute will carry out educational and workforce activities that meet industrial needs related to its predominant focus area(s).
- How the Institute will encourage the education and training of veterans and individuals with disabilities.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- How the Institute will integrate educational and workforce/professional development, training, and employment opportunities (such as internships) that are effective and efficient as part of its technical programs.
- How the Institute will coordinate its education, training, and workforce development programs and collaborate with other key stakeholders, including Federal government agencies and organizations (e.g., the U.S. Departments of Education and Labor, National Science Foundation), state agencies, other Manufacturing Innovation Institutes, and relevant industry associations and consortiums.
- How the Institute will remain relevant to industry's education workforce needs and how manufacturing professionals will be recruited and trained over time to support the Institute.

b) Technology Transfer. The quality, soundness, and appropriateness of the proposed Institute's integrated technology transfer plans and models. This includes:

- How the Institute will strengthen and leverage the assets of a region.
- A strategy and framework to establish an Institute Intellectual Property (IP) Management Plan that will protect IP, incentivize broad-based U.S. private sector economic involvement, and translate to U.S. economic benefit within the global economy, consistent with the principles set forth in *Guidance on Intellectual Property, National Network for Manufacturing Innovation*, Advanced Manufacturing National Program Office, March 2015 (<http://manufacturing.gov/docs/NNMI-IP-Principles-Approved-Final.pdf>)
- The purpose, roles, and characteristics of the collaborative and shared-use applied R&D capabilities in the context of U.S. advanced manufacturing national needs, and the methods that will be used to identify and to stand up capabilities.
- How the Institute will strengthen and utilize national (including Federal) assets, including the prioritized set of associated entities with which the Institute will engage after it has been funded.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The proposed establishment of research partnerships and the transition of research from the laboratory into products and services that enter the economy and in ways that benefit the Nation.
- Tools and techniques that facilitate the potential commercialization of inventions and innovations produced from Institute activities or facilities.
- The plan to coordinate and communicate the dissemination of knowledge with external stakeholders and other NNMI Institutes, as they are established, and to contribute to the network of NNMI Institutes.
- The performance goals, metrics, evaluation methods, and implementation plans for technology transfer activities.

4) Leadership, Cost-Sharing and Sustainability (20 pts)

Full Applications will be evaluated for the technical and business merits associated with the models and plans being proposed for: industry's leadership and involvement in the Institute; the specific sources and amounts of known and anticipated committed cost-sharing for the initial 5 year Institute award; achieving Institute sustainability

beyond the initial Federal funding; and for whether non-Federal financial support will significantly exceed the Federal financial assistance requested. The proposed models and plans should be well-founded and suited for the organization and focus area(s) being proposed. Specifically, the application will be evaluated in the context of the following sub-criteria, which are weighted equally:

a) Leadership and Involvement from Industry, Academia and Small- and Medium-sized Enterprises. The quality, magnitude, adequacy, and evidence of industry's leadership and involvement, assembled to date, in creating a sustainable Institute. This includes:

- The commitment of anticipated continued advice, participation, and other contributions – excluding cost share – to the Institute from non-Federal sources to provide leverage and resources to promote a stable and sustainable Institute business model without the need for long-term Federal funding that are supported by individual letters of interest and/or other evidence.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The proposed leadership and involvement of industry and academia – across the value-chain and innovation ecosystem – for realizing the Institute, including but not limited to the participation within the Institute's leadership team and membership, and evidence of their support.
- The consideration and involvement, where appropriate, of small- and medium-sized enterprises (SMEs) and the means by which their specific needs may be incorporated within the Institute's design and function to ensure that the results of the Institute reach small and medium-sized entities.

b) Cost-Sharing or Matching. The magnitude, appropriateness, nature, source, merits, reasonableness, practicality, uncertainties, and/or risks of the committed mix of cost-sharing plan from specific, known and anticipated, non-Federal sources for the proposed Institute. This includes:

- The commitment of continued financial support from non-Federal sources to provide leverage and resources to promote a stable and sustainable business model without the need for long-term Federal funding that are supported by individual letters of interest and/or other evidence.
- Whether the financial cost sharing support provided to the Institute from non-Federal sources significantly exceeds the requested Federal financial assistance.

- The specific, known and anticipated, sources, types, and amounts of committed cost-sharing for all years that financial support is sought for the proposed Institute and evidence of its availability to the Institute. (Please note: The known committed cost-sharing must be sufficient to complete no less than the Institute’s first year of technical work. The anticipated committed cost-sharing and amounts from specific non-Federal sources should be sufficient to complete the Institute’s technical work beyond the first year of the award and cover all remaining years of the initial five (5) year award period.)
- The analysis offered by the applicant of the merits, uncertainties, and/or risks associated with the varying types and sources of the known and anticipated cash and in-kind cost sharing contributions to allow the Institute to achieve its programmatic objectives and manage any cost sharing risks.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The total level and mix of known and anticipated committed cost-sharing and the detailed rationale of the cost-sharing needed to accomplish the purpose, mission, and activities of the Institute, including cash and in-kind, as part of the proposed budget.
- Commitments for cost-sharing are documented within Letters of Commitment from the applicant, proposed sub-recipients and any other contributors identified in the application as providing cost sharing funds (see Section IV.3.a.(14)). (Please note: All commitments for cost sharing must meet the basic matching requirements, as described at 2 C.F.R. § 200.306.)

c) Self-Sufficiency. The quality, adequacy, and reasonableness of the applicant’s transition strategy and sustainability plan towards attaining self-sufficiency. This includes:

- How the Institute proposes to become a financially self-sustaining, world-leading innovation hub within seven (7) years that brings together stakeholders to develop and accelerate adoption of innovative next generation manufacturing technologies and has significant and enduring impact on the U.S. manufacturing sector, e.g., increased domestic production capacity, measurable commercialization success, or address U.S. advanced manufacturing national needs.
- Models, methods, and milestones to increase funding/revenue throughout the award period to support Institute operations and ensure financial self-sufficiency beyond the award period, and incorporate the requirement that the Federal financial assistance provided to the Institute shall decrease after the second

year of funding for the Institute and continue to decrease thereafter in each year in which Federal financial assistance is provided.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- How the Institute proposes to engage State and local governments to assist it to become self-sustaining and leverage other Federal funding resources, e.g., MRL 1-4 or technology readiness level (TRL) 1-4 programs and opportunities.
- How the Institute and its work areas and functions will remain relevant during the award period, incorporate change management, and accommodate strategic changes that may be needed to align with industry roadmapping or other business developments.
- Letters of Interest and/or other evidence of the potential to leverage non-Federal sources of support to promote a stable and sustainable business model without the need for long-term Federal funding.

5) Resources, Capabilities, Qualifications, and Experience (20 pts)

Full Applications will be evaluated for the reasonableness, appropriateness, and cost-effectiveness of the proposed resources and budget for carrying out the work and objectives of the Technical Volume. (Please note: The budget and the Budget Narrative should reflect the total costs and per year award costs, composed of both the Federal funds being requested and the cost-sharing or matching that is proposed.) The application will be evaluated for the internal controls, systems, and capabilities for managing the NIST-funded NNMI Institute Award. The qualifications, experience, and commitments of key personnel and participating organizations who will work for the proposed Institute will be evaluated. Teaming and partnerships are encouraged and will be evaluated. Specifically, the application will be evaluated in the context of the following sub-criteria, which are weighted equally:

- a) Budget and Resources.** The reasonableness, appropriateness, and cost-effectiveness of the proposed budget and resources with respect to carrying out the work and objectives of the Technical Volume. This includes:
- The proposed cost for the work to be performed, including the proposed cost, per year, over the initial five (5) year award period, for the Institute establishment and Startup Phase (up to one 1 year) and the subsequent Ongoing Institute Operations Phase.
 - The degree to which the budget reflects a clear understanding of the requirements of the Funding Opportunity and is consistent with the performance and material described within the applicant's Application Narrative.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- An overall budget and financial plan that is sufficiently robust and diversified so as to support the long term sustainability of the Institute throughout the initial five (5) year award period.
- Identification, description, and explanation of equipment and facilities that will support the successful establishment and/or technical operation of the Institute, clearly differentiating between existing physical resources, equipment or facilities and any such resources that the Institute will need to obtain.

b) Award Management. The completeness, adequacy, and quality of the systems and capabilities for managing the NIST-funded NNMI Institute Award, including the operational and program management methods and systems that will be used to oversee the Award and key administrative functions.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The financial and administrative program management capabilities that will execute, track, and report against the obligation and spending allowed by NIST.
- The role of any key subrecipient or contractors that will provide needed Institute support, what each brings to and provides for the Institute, and how progress will be monitored and redirected as appropriate.

c) Qualifications and Engagement. The quality, degree, and appropriateness of the qualifications and commitment of the lead organization(s) and key personnel, assembled to date.

When preparing its Full Application, the applicant may want to consider addressing the following topics, as examples, to further illustrate its approach to this sub-criterion:

- The qualifications of the recipient organization that will run the Institute, the leadership and key technical and operations personnel, and of other key participating subrecipient organizations.
- The quality and appropriateness of all proposed teaming and partnerships.
- The time commitment of the key team members to support the Institute's performance during both the Startup and the Operational Phases, including the

expected Institute Director, Deputy Director(s), Chief Technology Officer (CTO), associated Executives and key administrative and management staff. (Please note: The Institute management is expected to be primarily focused on the operation and management of the proposed Institute. The Institute Director is expected to be a full time position and key management staff (e.g., Deputy Director(s), CTO) are expected to provide greater than 75% time commitment to the Institute.)

- Documented and relevant previous work experience, track record, and performance of the lead organization(s), senior leadership, and key personnel in successfully leading programs or organizations similar in nature to the purpose, scope, and/or activities of an Institute, as described in this FFO.
- The technical background and capacity of the organization(s), senior leadership, and key personnel, including their history, successes, and current research and development, relevant to the Institute technical focus area(s) being proposed.

2. Selection Factors. Selection of Full Applications for award will be performed by the Selecting Official, the Director of NIST, or his designee, as described in Section V.3.c.(4) of this FFO. The selection factors for Full Applications are:

- (1) The merit reviewers' evaluations and scores.
- (2) The Evaluation Panel's evaluations and adjectival rankings.
- (3) The availability of funds.
- (4) The degree to which the proposed Institute complements and does not duplicate the technical scope and programs of an Institute within the National Network for Manufacturing Innovation (NNMI), or the technical focus area(s) that are identified within any in-progress Institute funding opportunity announced by a federal agency.
- (5) The degree to which the proposed Institute optimizes the use of available NIST funding to achieve programmatic objectives, with weighted preference to applications seeking less than the maximum Federal share of funds; that is, weighted preference will be given to applications that provide greater than 1:1 cost share of funds in the proposed budget.
- (6) The degree of alignment of the application to U.S. advanced manufacturing national needs, and/or its complementarity to the research programs and goals of NIST and the Department of Commerce advanced manufacturing programs, as described at <http://www.nist.gov/manufacturing-portal.cfm>.

3. Review and Selection Process

- a. Review of Pre-Applications and Selection of Applicants to Submit Full Applications.** All Pre-Applications will undergo an initial screening to determine whether or not they are eligible, complete, and responsive to this FFO (see Section I). Any Pre-Application determined to be ineligible, incomplete, and/or non-responsive may be eliminated from further review. However, NIST, in its sole

discretion, may continue the review process for a Pre-Application that is missing non-substantive information which may easily be rectified or cured in a Full Application.

Pre-Applications will be reviewed by an Evaluation Team composed of five (5) or more independent, objective Federal employees with relevant professional and technical expertise from both the private and public sectors, who are knowledgeable in the subject matter of this FFO, and are able to review based on the following criteria:

- (1) How well the Abbreviated Application Narrative meets the definition, goals, and mission of an Institute and the technical scope of this funding opportunity.
- (2) How well the Abbreviated Application Narrative meets the Pre-Application Evaluation Criteria (see Section V.1.a), which include:
 - i. Potential to Fulfill a Recognized National Need with Substantial Broad Based Benefits and Demonstrated Industry Leadership;
 - ii. The Proposed Manufacturing Innovation Institute; and
 - iii. Resources, Qualifications, and Experience for the Proposed Institute.
- (3) The degree of alignment of the Pre-Application and proposed Institute to U.S. advanced manufacturing national needs, and/or its complementarity to the research programs and goals of NIST and the Department of Commerce advanced manufacturing programs, as described at <http://www.nist.gov/manufacturing-portal.cfm>.

The Evaluation Team shall select Applicants with merit to submit a Full Application, using a simple pass/fail majority vote by the Evaluation Team.

- b. Initial Screening of All Full Applications.** All Full Applications received in response to this FFO will be reviewed to determine whether or not they are eligible, complete, and responsive to this FFO (see Section I). Any Full Application determined to be ineligible, incomplete, and/or non-responsive may be eliminated from further review. However, NIST, in its sole discretion, may continue the review process for an application that is missing non-substantive information which may easily be rectified or cured. Only Full Applications submitted by an applicant whose Pre-Application was selected and who was invited to submit a Full Application will be reviewed.
- c. Review, Selection, and Funding of Full Applications.** Full Applications that pass the Initial Screening described above will follow the review, ranking, and selection process described below using a diverse group of individuals with relevant expertise from both the private and public sectors. No political appointee may participate on a peer review panel.

- (1) **Merit Review.** Each Full Application will be reviewed by at least three (3) independent, objective individuals with appropriate professional and technical expertise relating to the topics covered in this FFO. Reviews will be limited to technical and cost matters, based on the Evaluation Criteria (see Section V.1.b). Any mix of Federal and non-Federal reviewers may be used. If non-Federal reviewers are used, the reviewers may discuss the applications with each other, but scores will be determined on an individual basis, not as a consensus. Reviewers will assess the merits of each application against the Evaluation Criteria by providing an analytical assessment of the merit of the application in narrative form and assigning a score, based on the application's responsiveness to the Evaluation Criteria, with a maximum score of 100.
- (2) **Program Review.** Following the merit review an Evaluation Panel will conduct a programmatic review of the applications, consider the results of the merit review, and determine the strengths and weaknesses of the applications based on the Evaluation Criteria. The Evaluation Panel will consist of at least five (5) persons and will be comprised of any mix of NIST staff and other Federal agency employees, with relevant professional and technical expertise from both the private and public sectors. Some Full Applicants may be requested to participate in Pre-Selection interviews during the program review phase, either at NIST, the applicant's site, or a mutually agreed upon location, or via conference call or webinar. The interviews will allow the applicant to provide clarifications on the contents of the Full Application and to provide NIST an opportunity to ask questions. Information provided during the interview will contribute to NIST's evaluation of the applications.
- (3) **Ranking.** The Evaluation Panel will prepare and provide written evaluations and a final adjectival ranking of the applications to the Selecting Official for further consideration, taking into consideration the relevance of an application to the program goals and objectives described in Section I. of this FFO, the results of the merit reviewers' evaluations, including scores and written analytic assessments, public information, and any additional information obtained from the applicant by the Evaluation Panel. The adjectival rankings are:

Fundable, Outstanding;
Fundable, Very Good;
Fundable; or
Unfundable.

For decision-making purposes, Full Applications receiving the same adjectival ranking will be considered to have an equivalent ranking, although their technical review scores, while comparable, may not necessarily be the same.

- (4) **Selection.** The Selecting Official, who is the Director of NIST, or his designee, will make Full Application selections and provide final recommendations for an award to the NIST Grants Officer. The Selecting Official shall be provided all

selected Pre-Applications, all Full Applications, all information obtained from the Full Applicants during the review and selection process, the scores and analytic assessments of the merit reviewers, and the adjectival rankings and evaluations of the Evaluation Panel.

The Selecting Official shall generally select and recommend the most meritorious Full Application(s) for an award based on the final adjectival rankings prepared by the Evaluation Panel and one or more of the six (6) selection factors described in Section V.2. of this FFO. The Selecting Official retains the discretion to select and recommend a Full Application out of rank order (i.e., from a lower adjectival category) based on one or more of the selection factors, or to select and recommend no applications for funding. The Selecting Official's recommendation to the Grants Officer shall set forth the bases for the selection decision.

Negotiations with selected applicant(s) will precede an Institute award. NIST reserves the right to negotiate the budget costs with any applicant selected to receive an award, which may include requesting that the applicant remove certain costs. Additionally, NIST may request that the selected applicant(s) modify objectives or work plans and provide supplemental information required by the agency prior to award. NIST also reserves the right to reject an application where information is uncovered that raises a reasonable doubt as to the present responsibility of the applicant. NIST may select some, all, or none of the applications, or part(s) of any particular application. NIST may request that fundable applicants consider working together in a single combined award if this approach might more effectively advance the program mission. The final approval of selected applications and issuance of awards will be by the NIST Grants Officer. The award decisions of the NIST Grants Officer are final.

- d. Federal Awarding Agency Review of Risk Posed by Applicants.** After applications are proposed for funding by the Selecting Official, the NIST Grants Management Division (GMD) performs pre-award risk assessments in accordance with 2 C.F.R. § 200.205, which may include a review of the financial stability of an applicant, the quality of the applicant's management systems, the history of performance, and/or the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

In addition, prior to making an award where the total Federal share is expected to exceed the simplified acquisition threshold (currently \$150,000), NIST GMD will review and consider the publicly available information about that applicant in the Federal Awardee Performance and Integrity Information System (FAPIIS). An applicant may, at its option, review and comment on information about itself previously entered into FAPIIS by a Federal awarding agency. As part of its review of risk posed by applicants, NIST GMD will consider any comments made by the applicant in FAPIIS in making its determination about the applicant's integrity, business ethics, and record of performance under Federal awards.

Upon completion of the pre-award risk assessment, the Grants Officer will make a responsibility determination concerning whether the applicant is qualified to receive the subject award and, if so, whether appropriate special conditions that correspond to the degree of risk posed by the applicant should be applied to an award.

4. **Anticipated Announcement and Award Dates.** Review of Pre-Applications and invitations to submit a Full Application are expected to be completed on or about May 23, 2016. Review of Full Applications, selection of successful applicants, and award processing is expected to be completed within the first calendar quarter of 2017. The earliest anticipated start date for awards under this FFO is expected to be within the first calendar quarter of 2017.

5. Additional Information

- a. **Notification to Unsuccessful Applicants.** Applicants whose Pre-Application or Full Application are not selected for further consideration by NIST will be notified in writing.
- b. **Notification to Selected Applicants.** Applicants whose Pre-Application is selected by NIST will be notified in writing and invited by NIST to submit a Full Application.
- c. **Retention of Unsuccessful Applications.** An electronic copy of each non-selected application will be retained for three (3) years for record keeping purposes. After three (3) years, it will be destroyed.
- d. **Protection of Proprietary Information.** When an application includes trade secrets or information that is commercial or financial, or information that is confidential or privileged, it is furnished to the Government in confidence with the understanding that the information shall be used or disclosed only for evaluation of the application. Such information will be withheld from public disclosure to the extent permitted by law, including the Freedom of Information Act. Applicants should clearly mark as “proprietary” any information contained in their applications that they believe is a trade secret or otherwise protected proprietary business information. Without assuming any liability for inadvertent disclosure, NIST will seek to limit disclosure of such information to its employees and to outside reviewers when necessary for merit review of the application or as otherwise authorized by law. This restriction does not limit the Government’s right to use the information if it is obtained from another source.
- e. **Changes in Applicant and Reteaming.** A successful Pre-Applicant may change the lead entity to another eligible entity prior to submission of its Full Application. A successful Pre-Applicant may also revise the requested budget amount within its Full Application prior to submission of the Full Application or reteam by adding new participants or collaborators. The applicant must provide written notice of its intent

to change the proposed lead entity or revise its requested budget amount in advance of the Full Application due date to Jessica Strickler, National Institute of Standards and Technology, 100 Bureau Drive, Stop 4700, Gaithersburg MD 20899, or by e-mail to jessica.strickler@nist.gov. After submission of a Full Application and merit review, further revisions may occur during the negotiation process as described in Section V.3.c.(4) of this FFO.

VI. Federal Award Administration Information

- 1. Federal Award Notices.** Successful applicants will receive an award from the NIST Grants Officer. The award cover page, i.e., CD-450, Financial Assistance Award is available at <http://go.usa.gov/SNMR>.
- 2. Administrative and National Policy Requirements**
 - a. Uniform Administrative Requirements, Cost Principles and Audit Requirements.** Through 2 C.F.R. § 1327.101, the Department of Commerce adopted Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program. Refer to <http://go.usa.gov/SBYh> and <http://go.usa.gov/SBg4>.
 - b. Department of Commerce Financial Assistance Standard Terms and Conditions.** The Department of Commerce will apply the Financial Assistance Standard Terms and Conditions dated December 26, 2014, accessible at <http://go.usa.gov/hKbj>, to this award. If the Department of Commerce publishes revised Standard Terms and Conditions prior to issuance of awards under this FFO, the revised Standard Terms and Conditions will apply. Refer to Section VII. of this FFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you need more information.
 - c. Department of Commerce Pre-Award Notification Requirements.** The Department of Commerce will apply the Pre-Award Notification Requirements for Grants and Cooperative Agreements, dated December 30, 2014, (79 FR 78390). If the Department of Commerce publishes revised Pre-Award Notification Requirements prior to issuance of awards under this FFO, the revised Pre-Award Notification Requirements will apply. Refer to Section VII. of this FFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you need more information.
 - d. Funding Availability and Limitation of Liability.** Funding for the program listed in this FFO is contingent upon the availability of appropriations. In no event will NIST or the Department of Commerce be responsible for application preparation costs if this program fails to receive funding or is cancelled because of agency priorities. Publication of this FFO does not oblige NIST or the Department of Commerce to issue any specific award or to obligate any available funds.

- e. Collaborations with NIST Employees.** NIST employees may not participate in the preparation of any application in response to this funding opportunity. After award, the Institute is anticipated to interact with federal government organizations and FFRDCs, as appropriate, in a number of manners consistent with their respective missions/purposes. The Institute is encouraged to utilize federal entities to support the program goals (see Section III.2).
- f. Use of NIST Intellectual Property.** If the applicant anticipates using any NIST-owned intellectual property to carry out the work proposed, the applicant should identify such intellectual property. This information will be used to ensure that no NIST employee involved in the development of the intellectual property will participate in the review process for that competition. In addition, if the applicant intends to use NIST-owned intellectual property, the applicant must comply with all statutes and regulations governing the licensing of Federal government patents and inventions, described in 35 U.S.C. §§ 200-212, 37 C.F.R. Part 401, 2 C.F.R. § 200.315, and in Section D.03 of the DoC Financial Assistance Terms and Conditions dated December 26, 2014, found at <http://go.usa.gov/hKbj>. Questions about these requirements may be directed to Chief Counsel for NIST, (301) 975-2803, nistcounsel@nist.gov.

Any use of NIST-owned intellectual property by an applicant is subject to the applicant's obtaining a license from NIST. Licensing of NIST inventions is at the sole discretion of NIST and will be negotiated on a case-by-case basis. The applicant should indicate within the statement of work whether it already has a license to use such intellectual property or whether it intends to seek one.

If any inventions are made in whole or in part by a NIST employee during the course of an award made pursuant to this FFO, the United States government may retain its ownership rights in any such invention. Licensing or other disposition of NIST's rights in such inventions will be determined solely by NIST, and include the possibility of NIST not seeking patent protection and NIST putting its ownership interest in the intellectual property into the public domain.

- g. Export Controls.** Some activities within an Institute may require access to export-controlled items and therefore be subject to export control laws and regulations. Under no circumstances may foreign entities (organizations, companies, or persons) obtain access to export-controlled items unless proper procedures have been satisfied and such access is authorized pursuant to law or regulation. Institutes will address participation by foreign entities on a case-by-case basis, and must develop measures to properly protect export-controlled information, as appropriate.

If an Applicant is selected for award negotiations, the Applicant agrees to comply with United States export laws and regulations, including, but not limited to, the

International Traffic in Arms Regulations and the Department of Commerce Export Regulations.

- h. Research Activities Involving Human Subjects, Human Tissue, Data or Recordings Involving Human Subjects Including Software Testing.** Any application that includes research activities involving human subjects, human tissue/cells, or data or recordings from or about human subjects, must satisfy the requirements of the Common Rule for the Protection of Human Subjects (“Common Rule”), codified for the Department of Commerce at 15 C.F.R. Part 27. Research activities involving human subjects who fall within one or more of the classes of vulnerable subjects found in 45 C.F.R. Part 46, Subparts B, C and D must satisfy the requirements of the applicable subpart(s). In addition, any such application that includes research activities on these subjects must be in compliance with all applicable statutory requirements imposed upon the Department of Health and Human Services (DHHS) and other Federal agencies, all regulations, policies and guidance adopted by DHHS, the Food and Drug Administration, and other Federal agencies on these topics, and all Executive Orders and Presidential statements of policy on applicable topics. (Regulatory Resources: <http://www.hhs.gov/ohrp/humansubjects/index.html> which includes links to FDA regulations, but may not include all applicable regulations and policies).

NIST uses the following Common Rule definitions for research and human subjects research:

Research: A systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities which meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program which is considered research for other purposes. For example, some demonstration and service programs may include research activity.

Human Subject: A living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention or interaction with the individual or identifiable private information.

- (1) *Intervention* includes both physical procedures by which data are gathered and manipulations of the subject or the subject's environment that are performed for research purposes.
- (2) *Interaction* includes communication or interpersonal contact between investigator and subject.
- (3) *Private information* includes information about behavior that occurs in a context in which an individual can reasonably expect that no observation or recording is taking place, and information which has been provided for specific purposes by an individual and which the individual can reasonably

expect will not be made public (for example, a medical record). Private information must be individually identifiable (i.e., the identity of the subject is or may readily be ascertained by the investigator associated with the information) in order for obtaining the information to constitute research involving human subjects.

See 15 C.F.R. § 27.102 Definitions.

- 1) **Requirement for Federalwide Assurance.** If the application is accepted for [or awarded] funding, organizations that have an IRB are required to follow the procedures of their organization for approval of exempt and non-exempt research activities that involve human subjects. Both domestic and foreign organizations performing non-exempt research activities involving human subjects will be required to have protocols approved by a cognizant, active IRB currently registered with the Office for Human Research Protections (OHRP) within the DHHS that is linked to the engaged organizations. All engaged organizations must possess a currently valid Federalwide Assurance (FWA) on file from OHRP. Information regarding how to apply for an FWA and register an IRB with OHRP can be found at <http://www.hhs.gov/ohrp/assurances/index.html>. NIST relies only on OHRP-issued FWAs and IRB Registrations for both domestic and foreign organizations for NIST supported research involving human subjects. NIST will not issue its own FWAs or IRB Registrations for domestic or foreign organizations.
- 2) **Administrative Review.** NIST reserves the right to make an independent determination of whether an applicant's activities include research involving human subjects. NIST will conduct an independent administrative review of all applications accepted for funding that include research involving human subjects that were approved by a non-NIST Institutional Review Board (IRB). Research may not start until the NIST Human Subjects Protection Office (HSPO) issues institutional review approval for final action by the NIST Grants Officer. (15 C.F.R. § 27.112 Review by Institution.) If NIST determines that an application includes research activities which involve human subjects, the applicant will be required to provide additional information for review and approval. The documents required for funded proposals are listed in each section below. Most such documents will need to be produced during the proposal review process; however, the Grants Officer may allow final versions of certain required documents to be produced at an appropriate designated time post-award. If an award is issued, no research activities involving human subjects shall be initiated or costs incurred for those activities under the award until the NIST Grants Officer issues written approval. Retroactive approvals are not permitted.
- 3) **Required documents for proposal review. All applications involving human subject research must clearly indicate, by separable task, all research activities believed to be exempt or non-exempt research**

involving human subjects, the expected institution(s) where the research activities involving human subjects may be conducted, and the institution(s) expected to be engaged in the research activities.

a. Not research determination. If an activity/task involves human subjects as defined in the Common Rule, but the applicant participant(s) indicates to NIST that the activity/task is not research as defined in the Common Rule, the following information may be requested for that activity/task:

- (1) Justification, including the rationale for the determination and such additional documentation as may be deemed necessary by NIST to review and/or support a determination that the activity/task in the application is not research as defined in the Common Rule.
- (2) If the applicant participant(s) used a cognizant IRB that provided a determination that the activity/task is not research, a copy of that determination documentation must be provided to NIST. The applicant participant(s) is not required to establish a relationship with a cognizant IRB if they do not have one.

NIST will review the information submitted and may coordinate further with the applicant before determining whether the activity/task will be defined as research under the Common Rule.

b. Exempt research determination with no IRB. If the application appears to NIST to include exempt research activities, and the performer of the activity or the supplier and/or the receiver of the biological materials or data from human subjects **does not** have a cognizant IRB to provide an exemption determination, the following information may be requested during the review process so that NIST can evaluate whether an exemption under the Common Rule applies (see 15 C.F.R. § 27.101(b), (c) and (d)).

- (1) The name(s) of the institution(s) where the exempt research will be conducted.
- (2) The name(s) of the institution(s) providing the biological materials or data from human subjects will be provided.
- (3) A copy of the protocol for the research to be conducted; and/or the biological materials or data from human subjects to be collected/provided, not pre-existing samples (*i.e.*, will proposed research collect only information without personal identifiable information, will biological materials or data be de-identified and when and by whom was the de-identification performed, how were the materials or data originally collected).
- (4) For pre-existing biological materials or data from human subjects, provide copies of the consent forms used for collection and a description of how the materials or data were originally collected and stripped of personal identifiers. If copies of consent forms are not available, explain.

(5) Any additional clarifying documentation that NIST may deem necessary in order to make a determination whether the activity/task or use of biological materials or data from human subjects is exempt under the Common Rule.

c. Research review with an IRB. If the application appears to NIST to include research activities (exempt or non-exempt) involving human subjects, and the proposed performer of the activity has a cognizant IRB registered with OHRP, and linked to their Federalwide Assurance, the following information may be requested during the review process:

- (1) The name(s) of the institution(s) where the research will be conducted;
- (2) The name(s) and institution(s) of the cognizant IRB(s), and the IRB registration number(s);
- (3) The FWA number of the applicant linked to the cognizant IRB(s);
- (4) The FWAs associated with all organizations engaged in the planned research activity/task, linked to the cognizant IRB;
- (5) If the IRB review(s) is pending, the estimated start date for research involving human subjects;
- (6) The IRB approval date (if currently approved for exempt or non-exempt research);
- (7) If any of the engaged organizations has applied for or will apply for an FWA or IRB registration, those details should be clearly provided for each engaged organization.

If the application includes research activities involving human subjects to be performed in the first year of an award, additional documentation may be requested by NIST during pre-award review for those performers, and may include the following for those research activities:

- (1) A signed (by the study principal investigator) copy of each applicable final IRB-approved protocol;
- (2) A signed and dated approval letter from the cognizant IRB(s) that includes the name of the institution housing each applicable IRB, provides the start and end dates for the approval of the research activities, and any IRB-required interim reporting or continuing review requirements;
- (3) A copy of any IRB-required application information, such as documentation of approval of special clearances (*i.e.*, biohazard, HIPAA, etc.) conflict-of-interest letters, or special training requirements;
- (4) A brief description of what portions of the IRB submitted protocol are specifically included in the application submitted to NIST, if the protocol includes tasks not included in the application, or if the protocol is supported by multiple funding sources. For protocols with multiple funding sources, NIST will not approve the study without a non-duplication-of-funding letter indicating that no other federal funds will be

used to support the tasks proposed under the proposed research or under an ongoing award;

- (5) If a new protocol will only be submitted to an IRB if an award from NIST is issued, a draft of the proposed protocol;
- (6) Any additional clarifying documentation that NIST may request during the review process to perform the NIST administrative review of research involving human subjects. (See 15 C.F.R. § 27.112 Review by Institution.)

This clause reflects the existing NIST policy and requirements for Research Involving Human Subjects. Should the policy be revised prior to award, a clause reflecting the policy current at time of award may be incorporated into the award.

If the policy is revised after award, a clause reflecting the updated policy may be incorporated into the award.

For more information regarding research involving human subjects, contact Anne Andrews, Director, NIST Human Subjects Protection Office (e-mail: anne.andrews@nist.gov; phone: (301) 975-5445).

- i. **Research Applications Involving Live Vertebrate Animals. Research Activities Involving Live Vertebrate Animals.** Any application that includes research activities involving live vertebrate animals, that are being cared for, euthanized, or used by participants in the application to accomplish research goals, teaching, or testing, must meet the requirements of the Animal Welfare Act (AWA) (7 U.S.C. § 2131 et seq.), and the AWA final rules (9 C.F.R. Parts 1, 2, and 3), and if appropriate, the Good Laboratory Practice for Non-clinical Laboratory Studies (21 C.F.R. Part 58). In addition, such applications should be in compliance with the *“U.S. Government Principles for Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training.”* The Principles and guidance on these Principles are available in the National Research Council's "Guide for the Care and Use of Laboratory Animals," which can be obtained from National Academy Press, 500 5th Street, N.W., Department 285, Washington, DC 20055, or as a free PDF online at <http://www.nap.edu/catalog/12910/guide-for-the-care-and-use-of-laboratory-animals-eighth>.

The following requirements do not apply to proposed research using preexisting images of animals or to research plans that do not include live animals. These regulations also do not apply to obtaining stock items from animal material suppliers (e.g., tissue banks), such as cell lines and tissue samples, or from commercial food processors, where the vertebrate animal was euthanized for food purposes and not for the purpose of sample collection.

Custom Collections Harvested from Live Vertebrate Animals: NIST requires documentation for obtaining custom samples from live vertebrate animals from animal material suppliers and other organizations (i.e., universities, companies, and

government laboratories, etc.). Custom samples includes samples from animal material suppliers, such as when a catalog item indicates that the researcher is to specify the characteristics of the live vertebrate animal to be used, or how a sample is to be collected from the live vertebrate animal.

Field Studies of Animals: Some field studies of animals may be exempt under the Animal Welfare Act from full review and approval by an animal care and use committee, as determined by each institution. Field study is defined as “...a study conducted on free-living wild animals in their natural habitat.” However, this term excludes any study that involves an invasive procedure or that harms or materially alters the behavior of an animal under study. Field studies, with or without invasive procedures, may also require obtaining appropriate federal or local government permits (e.g., marine mammals, endangered species etc.). If the applicant’s institution requires review and approval by an animal care and use committee, NIST will require that documentation to be provided as described below.

- 1) Requirement for Assurance.** An applicable assurance for the care and use of the live vertebrate animal(s) to be used in the proposed research is required. NIST accepts three types of assurances, as may be applicable. NIST may request documentation to confirm an assurance, if adequate confirmation is not available through an assuring organization’s website. The cognizant Institutional Animal Care and Use Committee (IACUC) where the research activity is located may hold one or more applicable assurance, including:
 - Animal Welfare Assurance from the Office of Laboratory Animal Welfare (OLAW) indicated by the OLAW assurance number, *i.e.*, A-1234;
 - USDA Animal Welfare Act certification indicated by the certification number, *i.e.*, 12-R-3456;
 - Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) indicated by providing the organization name accredited by AAALAC as listed in the AAALAC Directory of Accredited Organizations.

- 2) Administrative Review.** NIST reserves the right to make an independent determination of whether an applicant’s research activities involve live vertebrate animals or custom samples from, or field studies with live vertebrate animals. If NIST determines that the application includes research activities, field studies, or custom samples involving live vertebrate animals, the applicant will be required to provide additional information for review and approval. The documents required for funded proposals are listed in each section below. Some may be requested for a pre-review during the proposal review process; however, the Grants Officer may allow final versions of certain required documents to be produced at an appropriate designated time post-award. If an award is issued, no research activities involving live vertebrate animals subjects shall be initiated or costs incurred for those activities under the award until the NIST Grants Officer issues written approval.

- 3) **Required documents for proposal review. *The applicant should clearly indicate in the application, by separable task, all research activities believed to include research involving live vertebrate animals and the institution(s) where the research activities involving live vertebrate animals may be conducted.***

Documentation of Research Review by an IACUC: If the applicant's application appears to include research activities, field studies, or custom sample collections involving live vertebrate animals the following information regarding review by an applicable IACUC may be requested during the application review process:

- (1) The name(s) of the institution(s) where the research involving live vertebrate animals will be conducted and/or custom samples collected;
- (2) The assurance type and number, as applicable, for the cognizant Institutional Animal Care and Use Committee (IACUC) where the research activity is located. [For example: Animal Welfare Assurance from the Office of Laboratory Animal Welfare (OLAW) should be indicated by the OLAW assurance number, i.e. A-1234; an USDA Animal Welfare Act certification should be indicated by the certification number i.e. 12-R-3456; and an Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) should be indicated by AAALAC.]
- (3) The IACUC approval date for the Animal Study Protocol (ASP) (if currently approved);
- (4) If the review by the cognizant IACUC is pending, the estimated start date for research involving vertebrate animals;
- (5) If any assurances or IACUCs need to be obtained or established, that should be clearly stated.
- (6) If any special permits are required for field studies, those details should be clearly provided for each instance, or indicated as pending.

If the application includes research activities involving vertebrate animals to be performed in the first year of an award, additional documentation may be requested by NIST during pre-award review for those performers, and may include the following for those research activities, which may also include field studies, custom sample collections involving live vertebrate animals:

- (1) A signed (by the Principal Investigator) copy of the IACUC approved ASP.
- (2) Documentation of the IACUC approval indicating the approval and expiration dates of the ASP.
- (3) If applicable, a non-duplication-of-funding letter if the ASP is funded from several sources.
- (4) If a new ASP will only be submitted to an IACUC if an award from NIST is issued, a draft of the proposed ASP may be requested.

- (5) Any additional clarifying documentation that NIST may request during review of applications to perform the NIST administrative review of research involving live vertebrate animals.

This clause reflects the existing NIST policy for Research Involving Live Vertebrate Animals. Should the policy be revised prior to award, a clause reflecting the policy current at time of award may be incorporated into the award.

If the policy is revised after award, a clause reflecting the updated policy may be incorporated into the award.

For more information regarding research projects involving live vertebrate animals, contact Linda Beth Schilling, Senior Analyst (e-mail: linda.schilling@nist.gov; phone: 301-975-2887).

3. Reporting

- a. **Reporting Requirements.** The following reporting requirements described in Sections A.01 Performance (Technical) Reports and B.02 Financial Reports of the Department of Commerce Financial Assistance Standard Terms and Conditions dated December 26, 2014, <http://go.usa.gov/hKbj>, apply to awards in this program:

(1) Financial Reports. Each award recipient will be required to submit an SF-425, Federal Financial Report on a quarterly basis for the periods ending March 31, June 30, September 30 and December 31 of each year. Reports will be due within 30 days after the end of the reporting period to the NIST Grants Officer and Grants Specialist named in the award documents. A final financial report is due within 90 days after the end of the project period.

(2) Performance (Technical) Reports. Each award recipient will be required to submit a technical progress report to the NIST Grants Officer and the Federal Program Officer on a quarterly basis for the periods ending March 31, June 30, September 30 and December 31 of each year. Technical progress reports shall contain information as prescribed in 2 C.F.R. § 200.328. Reports will be due within 30 days after the end of the reporting period. A final technical report shall be submitted within 90 days after the expiration date of the award, and publication citation information as well as links to publicly available data shall be submitted as soon as they become available.

If a recipient's Data Management Plan (DMP) has changed since their last submission of a technical progress report, the recipient must include their revised DMP in the next technical progress report following the revision to the DMP. The revised DMP must include all of the requirements described in Section IV.2.a.(9) of this FFO.

(3) Patent and Property Reports. From time to time, and in accordance with the Uniform Administrative Requirements (see Section VI.2.a) and other terms and conditions governing the award, the recipient may be required to submit property and patent reports.

(4) Recipient Integrity and Performance Matters. In accordance with section 872 of Public Law 110-417 (as amended; see 41 U.S.C. 2313), if the total value of a recipient's currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds \$10,000,000 for any period of time during the period of performance of an award made under this FFO, then the recipient shall be subject to the requirements specified in Appendix XII to 2 C.F.R. Part 200 (<http://go.usa.gov/cTBwC>), for maintaining the currency of information reported to SAM that is made available in FAPIIS about certain civil, criminal, or administrative proceedings involving the recipient.

b. Audit Requirements. 2 C.F.R. Part 200, Subpart F, adopted by the Department of Commerce through 2 C.F.R. § 1327.101 requires any non-Federal entity (*i.e.*, including non-profit institutions of higher education and other non-profit organizations) that expends Federal awards of \$750,000 or more in the recipient's fiscal year to conduct a single or program-specific audit in accordance with the requirements set out in the Subpart. Applicants are reminded that NIST, the Department of Commerce Office of Inspector General, or another authorized Federal agency may conduct an audit of an award at any time. Additionally, for-profit entities must comply the audit requirements specified in the Department of Commerce Financial Assistance Standard Terms and Conditions, dated December 26, 2014. These terms and conditions are accessible at <http://go.usa.gov/hKbj>.

c. Federal Funding Accountability and Transparency Act of 2006. In accordance with 2 C.F.R. Part 170, all recipients of a Federal award made on or after October 1, 2010, are required to comply with reporting requirements under the Federal Funding Accountability and Transparency Act of 2006 (Pub. L. No. 109-282). In general, all recipients are responsible for reporting sub-awards of \$25,000 or more. In addition, recipients that meet certain criteria are responsible for reporting executive compensation. Applicants must ensure they have the necessary processes and systems in place to comply with the reporting requirements should they receive funding. Also see the *Federal Register* notice published September 14, 2010, at 75 FR 55663 available here <http://go.usa.gov/hKnQ>.

VII. Federal Awarding Agency Contact(s)

Questions should be directed to the following contact persons:

Subject Area	Point of Contact
Programmatic and Technical Questions	Frank Gayle Phone: (301) 975-0404 E-mail: frank.gayle@nist.gov Or Jessica Strickler Phone: (301) 975-0404 E-mail: jessica.strickler@nist.gov
Technical Assistance with Grants.gov Submissions	Christopher Hunton Phone: (301) 975-5718 or (301) 975-0404 Fax: (301) 975-8884 E-mail: grants@nist.gov Or www.grants.gov Phone: (800) 518-4726 E-mail: support@grants.gov
Grant Rules and Regulations	Husai Rahman Phone: (301) 975-0404 Fax: (301) 975-8884 E-mail: husai.rahman@nist.gov

VIII. Other Information

Public Website, Frequently Asked Questions (FAQs) and Webinars: The NNMI public website (<http://www.nist.gov/amo>) provides information pertaining to this Funding Opportunity. NIST anticipates that a “Frequently Asked Questions” section will be maintained and updated as needed to provide additional guidance and clarifying information related to this Funding Opportunity. Any amendments to this FFO will be announced through Grants.gov.

Applicants must submit all such questions in writing to nnmifund@nist.gov. Questions submitted to NIST may be posted on the NIST NNMI website (<http://www.nist.gov/amo/nnmi>) as part of a FAQ document.

NIST plans to hold one or more public events and informational webinars on the NIST-funded NNMI Institute Awards competition. The event(s) and webinar(s) schedule will be posted and maintained on the NIST NNMI website (<http://www.nist.gov/amo/nnmi>). The public event(s) and webinar(s) will provide information on the NNMI Program, this NNMI Institute Awards FFO, general guidance on preparing applications, and offer opportunities for the public to ask questions about the program. Proprietary technical discussions about specific Institute ideas will not be permitted, and NIST will not critique or provide feedback on any ideas brought forth during the event(s), webinar(s) or at any time before submission of an application to NIST (see the previous paragraph above). There is no cost to attend either the public event(s) or webinar(s), but participants must register for each in advance. Participation in either the public event(s) or the webinar(s) is not required for the submission of a Pre-Application or a Full Application and attendance / participation will not be considered as part of the application review process. The webinar(s) will be recorded and a link to the recordings will be available for public access on the NIST NNMI website (<http://www.nist.gov/amo/nnmi>). Additional information concerning the public event(s), webinar(s), and advance registration is available at: <http://www.nist.gov/amo/nnmi>.