

Department of Defense Manufacturing USA Institutes Strategy

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INTRODUCTION

A core tenet of the U.S. Department of Defense (DoD) strategy is combat overmatch, ensuring there is never a "fair fight" between our Service members and any potential adversary. The Department supports this tenet through the continuous pursuit of innovative, next generation defense systems and concepts to deter and prevail in conflict. To effectively mature and transition DoD science and technology advances into production, the Department must have access to a robust and responsive U.S. industrial base armed with advanced manufacturing technologies that deliver critical products and systems affordably and rapidly. This requires strong collaboration across the Department's \$12B Science and Technology portfolio with an emphasis on concurrent development of the new manufacturing technologies that will enable transition of science and technology advances.

To better support these requirements, the DoD has established eight Manufacturing USA innovation institutes through its Defense-wide Manufacturing Science and Technology (DMS&T) program element within the DoD Manufacturing Technology (ManTech) program. This program connects multiple federal organizations, programs and activities to better enable the affordable and rapid transition and delivery of defense-essential technologies. Manufacturing USA—a strong complement to the DoD ManTech program—is a bipartisan, whole-of-government national initiative comprised of 14 advanced manufacturing institutes with a strategic focus on strengthening U.S. competitiveness as well as economic and national security. These institutes are designed as long-term, self-sustaining public-private partnerships between government and industry/academia solving important, mostly pre-competitive advanced manufacturing challenges. The eight DoD-established institutes within the Manufacturing USA initiative address both commercial and defense manufacturing needs within specific, defense-relevant technology areas and receive active participation and support from the military departments and defense agencies. The institutes' flexible business models and strong focus on enabling highly collaborative R&D are catalyzing important new organizational relationships across government, industry and academia. This is bringing together both traditional defense and non-traditional sectors, accelerating key innovation cycles and expanding U.S. industrial capability.

The Department's commitment of over \$600 million in start-up funding for these eight institutes demands a coherent and effective strategy to guide their establishment, sustainment, and ultimately ensure their value to the Department and nation. The strategy outlined below is the DoD/U.S. Government perspective, recognizing that for this initiative to be fully successful, the DoD strategy and its associated goals require clear understanding, buy-in and support from the institutes themselves. Hence, several of the strategic goals contain components that must be primarily addressed or delivered by the institutes, with the DoD serving an enabling role.

VISION

A highly competitive, capable and innovative U.S. manufacturing ecosystem, deeply connected to the Department of Defense, ensuring lasting U.S. technological dominance.

The institutes are considered crucial and game-changing catalysts and the connective tissue that bring together innovative industrial ecosystems in various technology and market sectors in the U.S., enabling their vibrancy and robustness. The DoD Manufacturing USA institutes are industry-led, with dual, public-private benefit, carrying large commercial market potential while meeting key U.S. defense industrial preparedness and operational needs.

MISSION

Catalyze the establishment, effective operation and integration of industry-led public-private research partnerships that connect and develop people, ideas and technology in ways that accelerate the transition of new capabilities into defense products and systems.

The mission recognizes the industry-led nature of the institutes' design while concentrating on DoD's roles to ensure the institutes' effective establishment and integration across the DoD. This focus serves to enable long-term value delivery to the Department, embodied by new solutions to defense-essential advanced manufacturing challenges. Establishing these defense-relevant Manufacturing USA Institutes leverages the full versatility of the Department's Manufacturing Technology Program as prescribed in public law (10 U.S.C. Section 2521).

STRATEGIC GOALS

Achieving the following five strategic goals is necessary to effectively carry out the Mission and fully achieve the Vision of this strategy.

Goal 1: Drive Impactful Advanced Manufacturing R&D. *Drive and Influence highly relevant advanced manufacturing research and development (R&D) activity within the collaborative context of an institute, enabling significant transition of new manufacturing technologies to U.S. industrial users, with substantial and strategic benefits to the DoD.*

Ultimately, the Department's Manufacturing USA public-private partnerships must connect DoD and its needs to the U.S. industrial base in new ways, driving intensely collaborative applied research and development (R&D) activity to yield accelerated delivery of high-value advanced processing and fabrication technologies for the warfighter and nation. This includes helping to better connect similar R&D investment interests across the DoD and other federal agencies. The resulting faster innovation cycles, reduced times-to-market, broader technology deployment, and more affordable manufacturing solutions delivered in support of this goal combine to represent the institutes' primary value proposition to the DoD.

Goal 2: Encourage the Creation of Viable and Sustainable Institute Business Plans. *Promote the creation and execution of truly viable individual institute business plans maximizing long-term sustainability, benefitting U.S. competitiveness and national security. Monitor and assess progress using appropriate metrics.*

The Department's intent is to actively utilize and derive maximum benefit from each of its Manufacturing USA institutes. To that end, it is important that the institutes become sustainable beyond the period of the initial federal assistance agreement. At the most basic level, an institute must be financially viable in order to grow and deliver value to the Department and its other stakeholders. Each institute is responsible for creating and executing a viable and sustainable business plan. The DoD provides oversight and has support responsibilities in the public-private partnership model. Recurring sustainability reviews between the institute and the DoD team during the period of the initial/start-up assistance agreement (cooperative agreement, technology investment agreement, etc.) should be incorporated in the joint schedule of performance review activities. An important, continuous focus of these reviews should be in how the institute will be sustainable after the cessation of federal start-up funding provided during the initial 5-7 year assistance agreement period.

Goal 3: Maintain an Optimal Program Design to Maximize Value Delivery. *Design, and adjust as necessary, a flexible program framework that achieves meaningful results in the near-term and maximizes long-term value delivery to DoD and the nation.*

The dynamic complexities, the associated risks, the committed resources, and the high value potential of the Manufacturing USA initiative for the DoD and nation are all key reasons that its overall design must be continuously and critically examined—and adjusted if necessary—to maximize value delivery over time.

This includes continued review and improvement of assistance agreement structures, network governance models, regional clustering and associated collaborative strategies, intellectual property management, government use rights, foreign involvement in institutes, institute sustainability assumptions, and federal funding commitments. Applying and synthesizing these multiple perspectives in conjunction with prevailing forecasts of the industrial economy—and acting on the findings—are the key aspects of successfully meeting this goal.

Goal 4: Maximize Stakeholder Understanding of DoD's Manufacturing USA Institutes. *Ensure all key stakeholder groups have sufficient awareness of DoD's Manufacturing USA institutes and their value proposition, leading to their robust utilization and integration.*

Integrating the Manufacturing USA institutes into the DoD and national research, development, acquisition, production and sustainment infrastructures requires well designed, robust/multi-faceted and well executed communication, education, outreach and deployment strategies managed by both the Department and the individual institutes, in close coordination with the Manufacturing USA program and other supporting organizations.

Goal 5: Effectively Support a Capable Workforce. *Grow and safeguard a highly capable and sufficiently sized U.S. advanced manufacturing workforce to better support existing and emerging domestic manufacturing capabilities.*

Leading edge manufacturing technology advancements and their production scale-up benefits require a well-trained and appropriately sized advanced manufacturing workforce (e.g., trades, technicians, engineers, scientists, etc.) to fully realize them. This goal underscores the standing mandate that the DoD's ManTech program and its Manufacturing USA institutes devote operational effort to supporting advanced manufacturing education and workforce development, with each institute focused on the needs associated with its particular technology space. Realization of this goal increases industrial capacity and supports national defense, economic growth, and the creation of high-value jobs and careers for U.S. citizens. The institutes' efforts apply to both the commercial manufacturing workforce as well as the defense-organic workforce comprised of depots, shipyards, air logistics centers, engineering centers, system program/acquisition organizations and defense laboratories.

ACTING ON THE GOALS

The DoD shall develop a separate, detailed Action Plan that supports this strategy and attainment of its strategic goals.

ASSESSING PERFORMANCE RELATIVE TO THE GOALS

The DoD shall develop processes and measures to assess program and institute performance and value delivery relative to each of the strategy's goals at regular intervals throughout the period of the initial cooperative agreement or technology investment agreement and appropriately adjust its Action Plan as determined by those assessments.

ADJUSTING THIS STRATEGY

As the institutes continue progressing through their initial federal assistance agreement periods, the Department shall assess its changing roles and responsibilities and adjust this strategy as appropriate.

STRATEGIC GOALS DECOMPOSITION FOR NMMB STUDY

IV. STRATEGIC GOALS

Achieving the following five strategic goals is necessary to effectively carry out the Mission and fully achieve the Vision of this strategy.

Goal 1: Drive Impactful Advanced Manufacturing R&D.

- A. *Drive and Influence highly relevant advanced manufacturing research and development (R&D) activity within the collaborative context of an institute,*
- B. *enabling significant transition of new manufacturing technologies to U.S. industrial users,*
- C. *with substantial and strategic benefits to the DoD.*

Ultimately, the Department's Manufacturing USA public-private partnerships must:

- a. connect DoD and its needs to the U.S. industrial base in new ways,
- b. *driving intensely collaborative applied research and development (R&D) activity*
- c. to yield accelerated delivery of high-value advanced processing and fabrication technologies for the warfighter and nation.
- d. This includes helping to better connect similar R&D investment interests across the DoD and other federal agencies.

Primary value proposition to the DoD:

- a. The resulting faster innovation cycles,
- b. reduced times-to-market,
- c. broader technology deployment,
- d. and more affordable manufacturing solutions delivered in support of this goal combine to represent the institutes'

Goal 2: Encourage the Creation of Viable and Sustainable Institute Business Plans.

- A. *Promote the creation and execution of truly viable individual institute business plans*
- B. *maximizing long-term sustainability,*
- C. *benefitting U.S. competitiveness and national security.*
- D. *Monitor and assess progress using appropriate metrics.*

The Department's intent is to actively utilize and derive maximum benefit from each of its Manufacturing USA institutes. To that end, it is important that:

- a. the institutes become sustainable beyond the period of the initial federal assistance agreement.
- b. At the most basic level, an institute must be *financially viable* in order to grow and deliver value to the Department and its other stakeholders.
- c. Each institute is responsible for creating and executing a viable and sustainable business plan.
- d. The DoD provides oversight and has support responsibilities in the public-private partnership model.
- e. Recurring sustainability reviews between the institute and the DoD team during the period of the initial/start-up assistance agreement (cooperative agreement, technology investment agreement, etc.) should be incorporated in the joint schedule of performance review activities.
- f. An important, continuous focus of these reviews should be in how the institute will be sustainable after the cessation of federal start-up funding provided during the initial 5-7 year assistance agreement period.

Goal 3: Maintain an Optimal Program Design to Maximize Value Delivery.

- A. *Design, and adjust as necessary, a flexible program framework that achieves meaningful results in the near-term and*
- B. *maximizes long-term value delivery to DoD and the nation.*

The dynamic complexities, the associated risks, the committed resources, and the high value potential of the Manufacturing USA initiative for the DoD and nation are all key reasons that its overall design:

- a. must be continuously and critically examined—and adjusted if necessary—to maximize value delivery over time. This includes continued review and improvement of:
 - i. assistance agreement structures,
 - ii. network governance models,
 - iii. regional clustering and associated collaborative strategies,
 - iv. intellectual property management,
 - v. government use rights,
 - vi. foreign involvement in institutes,
 - vii. institute sustainability assumptions, and
 - viii. federal funding commitments.
- b. Applying and synthesizing these multiple perspectives in conjunction with prevailing forecasts of the industrial economy—and acting on the findings—are the key aspects of successfully meeting this goal.

Goal 4: Maximize Stakeholder Understanding of DoD’s Manufacturing USA Institutes.

- A. *Ensure all key stakeholder groups have sufficient awareness of DoD’s Manufacturing USA institutes and their value proposition,*
- B. *leading to their robust utilization and integration.*

Integrating the Manufacturing USA institutes into:

- a. the DoD and
- b. national research,
- c. national development,
- d. national acquisition,
- e. national production and
- f. national sustainment infrastructures

requires well designed, robust/multi-faceted and well executed:

- a. communication,
- b. education,
- c. outreach and
- d. deployment strategies
- e. managed by both the Department and the individual institutes,
- f. in close coordination with the Manufacturing USA program and other supporting organizations.

Goal 5: Effectively Support a Capable Workforce.

- A. *Grow and safeguard a highly capable and sufficiently sized U.S. advanced manufacturing workforce*
- B. *to better support existing and emerging domestic manufacturing capabilities.*

Leading edge manufacturing technology advancements and their production scale-up benefits require:

- a. a well-trained and appropriately sized advanced manufacturing workforce, e.g.,
 - i. trades,
 - ii. technicians,
 - iii. engineers,
 - iv. scientists,
 - v. etc. to fully realize them.
- a. This goal underscores the standing mandate that the DoD’s ManTech program and its Manufacturing USA institutes devote operational effort to supporting advanced manufacturing education and workforce development, with each institute focused on the needs associated with its particular technology space.

Realization of this goal:

- a. increases industrial capacity and
- b. supports national defense,
- c. supports economic growth, and
- d. supports the creation of high-value jobs and careers for U.S. citizens.

The institutes' efforts apply to both:

- a. the commercial manufacturing workforce as well as
- b. the defense-organic workforce comprised of:
 - i. depots,
 - ii. shipyards,
 - iii. air logistics centers,
 - iv. engineering centers,
 - v. system program/acquisition organizations and
 - vi. defense laboratories.