NNME

NATIONAL NETWORK FOR MICROELECTRONICS EDUCATION

A National Strategy for Microelectronics Talent Development

Mobilizing Education, Industry, and Workforce Systems through the NNME

SEMI FOUNDATION

Contents

Executive Summary

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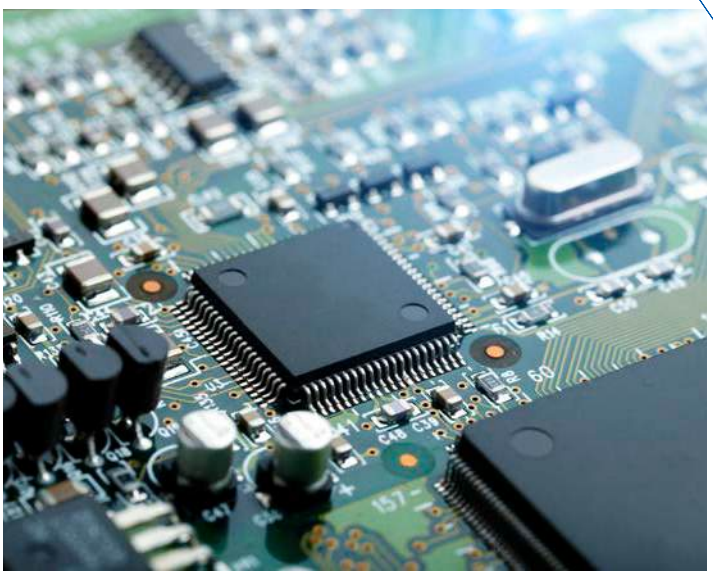
The National Network for Microelectronics Education (NNME) represents a bold, coordinated response to one of the most urgent challenges facing the United States in the 21st century: building a scalable, sustainable, and future-ready domestic workforce to support the resurgence of American semiconductor manufacturing and innovation.

Spurred by unprecedented federal investment under the CHIPS and Science Act, the NNME is designed to convert fragmented training programs, disconnected stakeholders, and inconsistent credentialing models into a unified national system with modernized and improved education and training activities and facilities. Through the leadership of the SEMI Foundation and a network of expert partners, the NNME will operationalize a strategy that is national in scope, regional in implementation, and transformational in ambition.



A National Infrastructure to Meet a National Challenge

The microelectronics industry is undergoing a generational realignment. Supply chain vulnerabilities, geopolitical instability, and rapid technological evolution have catalyzed the largest public investment in domestic semiconductor production in history. Yet this investment is threatened by a persistent and growing workforce shortage: over 115,000 new U.S. semiconductor jobs are projected by 2030, but current education and training systems are not equipped to meet this demand. Educational programs are often siloed, curriculum is outdated or misaligned, and jobseekers face unclear or inaccessible pathways into the industry.

At the same time, industry awareness remains low, and too many potential learners -especially those without traditional four-year degrees - do not see themselves in the future of microelectronics. To respond, the NNME must do more than build programs. It must build systems that will help move new workers into the industry. It must establish the infrastructure to train, credential, and connect tens of thousands of learners and potential workers, across ages, geographies, and educational levels, to careers that support national competitiveness and security, and individual economic mobility.

A Coordinated and Flexible Delivery System

The NNME is built on a federated model that balances centralized coordination with regional implementation. At its core is the NNME National Coordination Hub, operated by the SEMI Foundation, which will set national strategy, manage digital infrastructure, steward standardized industry-aligned learning outcomes, and support rigorous performance assessment.

To deliver programming on the ground, the Hub will competitively fund and support a network of Regional Nodes. These Nodes will bring together postsecondary institutions, employers, workforce systems, and economic development partners to deliver training aligned to local demand while remaining accountable to national goals. Recognizing the volatility of future funding, the NNME has designed the Node model to be modular, scalable, and capable of delivering value even with potential funding constraints. Through a phased implementation strategy, robust technical assistance, and milestone- based contracting, the NNME ensures that Regional Nodes have both the autonomy and accountability to drive successful outcomes in their communities while participating in a shared national vision.

Curriculum and Credentials for a Dynamic Industry

A core pillar of the NNME strategy is the modernization and deployment of high-quality, industry-aligned curriculum and training programs. Over six years, the NNME will develop and nationally disseminate standardized, industry-aligned learning outcomes leading to stackable credentials deployed at local and regional levels. These standards will reflect the evolving demands of semiconductor employers and the realities of how learners engage with postsecondary education today.

Curriculum content developed to meet these standards will be modular, interoperable, and co-developed with educators and industrial employers. Instructional assets will be made available through a centralized clearinghouse built on a Learning Content Management System (LCMS), ensuring that resources are shared, adapted, and

updated across institutions and platforms. These tools will support both technical instruction and experiential learning, including hands-on activities, industry exploration modules, machine learning (ML) and artificial intelligence (AI), and digital twin-enhanced simulations, where applicable.

This content will not remain static. Through ongoing assessment, employer feedback, and alignment with emerging frameworks (including those developed by the NSTC Workforce Center of Excellence), NNME will ensure that curriculum and credentials evolve alongside the industry they serve.

A National Digital Platform for Education and Workforce Development

The NNME digital platform will unify the initiative's activities, services, and technical functions – curriculum management, training capabilities, learner navigation, and job matching - under one national cohesively integrated and easy-to-navigate system. Built

on the SEMI Foundation's Salesforce ecosystem and enhanced with AI-enabled learner engagement tools, the platform will:

- Support learners with personalized career pathways, education and training recommendations, and verified career passports
- Connect employers to qualified candidates and talent pools aligned with their hiring needs
- Enable education and training providers to access, adopt, and contribute curriculum and learning materials
- Generate real-time data on system performance, standards adoption, and learner outcomes

This platform will also serve as a data backbone: powering system-wide assessment, informing regional strategy, and generating insights for federal agencies, philanthropic partners, and the public. It is designed to be interoperable with other national systems and is being structured to accommodate potential future integration with CHIPS-funded initiatives such as SMART USA, Microelectronics Commons, and the WCoE, as shared goals and protocols are established.

Assessments for Quality Learning, Not Just Reporting, Ensuring Constant Improvement, Relevance, and Successful Outcomes

To ensure that its efforts translate into successful outcomes, the NNME has implemented a dual-lane assessment strategy. New Growth Group will lead the assessment of curriculum and learning efficacy, examining how NNME-developed educational resources perform in real-world settings and ensuring they lead to better learning and employment outcomes.

Simultaneously, Jobs for the Future (JFF) will oversee network-wide performance management, tracking milestone achievement, institutional capacity, and regional delivery quality. These assessment partners will provide actionable insights, support strategic adaptation, and help the NNME identify and scale what works while correcting course as needed.

Together, these assessment systems reflect a core NNME principle: a commitment to being a learning system that is transparent, empowering, continuously improving and relevant, and driven by data.

Risk Awareness and Contingency Planning

The NNME is planning for success but is prepared for uncertainty. Recognizing that key risks - such as the non-appropriation of expected federal funding for Regional Nodes - may impact implementation, the Strategic Plan includes comprehensive contingency strategies. These include right-sizing the Node network, prioritizing platform and learning standards deployment, centralizing support functions, and leveraging philanthropic and institutional partnerships to fill resource gaps.

Additional contingency scenarios (ranging from digital infrastructure disruption to ecosystem confusion or policy misalignment) are mapped with detailed mitigation strategies. The NNME's modular design, contractual flexibility, and platform-based delivery model ensure that core functions can continue even under constrained conditions.

A National Asset, Not Just a Federal Program

Over six years, the NNME aims to engage more than 2,000 organizations and train at least 50,000 learners. But metrics alone will not define its impact. The NNME is building durable, publicly owned infrastructure that will outlast the Federal funding, outpace technological change, and support a resilient semiconductor workforce for decades to come.

Its success will depend not only on implementation excellence, but on continued collaboration - across industry, education, philanthropy, and government. As such, the SEMI Foundation invites partners to join in shaping, supporting, and sustaining this generational effort.

The stakes are high. The moment is now. And the NNME is ready to lead.

Statute Language: 42 U.S. Code § 18997 - Microelectronics workforce development activities

Para.	Sub.	Statute Text	Headline
1	In General:	The Director, in coordination with the Secretary of Commerce, shall on a competitive, merit-reviewed basis, make awards to institutions of higher education and non-profit organizations (or consortia of such institutions and organizations) to establish partnerships to enhance and broaden participation in microelectronics education.	1. Establishes NNME
2	Funded Activities	Awards made under this subsection shall be used for the following...	2. Awards Shall Be Used For:
2	A	To conduct training and education activities funded by awards under paragraph (1) and in coordination with the Network Coordination Hub established in paragraph (3), including curricula design, development, dissemination, and assessment, and the sharing of information and best practices across the network of awardees.	2. Awards Shall Be Used For:
2	B	To develop regional partnerships among associate-degree-granting colleges, bachelor-degree-granting institutions, workforce development programs, labor organizations, and industry to create a diverse national technical workforce trained in microelectronics and ensure education and training is meeting the evolving needs of industry.	2. Awards Shall Be Used For:
2	C	To develop local workforce pipelines that align with capacity investments made by industry and the Federal government, including vocational and high school training programs, community college degrees and certificates, veteran post service opportunities, and mentoring.	2. Awards Shall Be Used For:
2	D	To facilitate partnerships with employers, employer consortia or other private sector organizations that offer apprenticeships, internships, or applied learning experiences in the field of microelectronics.	2. Awards Shall Be Used For:
2	E	To develop shared infrastructure available to institutions of higher education, two-year colleges, and private organizations to enable experiential learning activities and provide physical or digital access to training facilities and industry-standard tools and processes.	2. Awards Shall Be Used For:
2	F	To create and disseminate public outreach to support awareness of microelectronics education and career opportunities, including through outreach to PreK–12 schools and STEM-related organizations.	2. Awards Shall Be Used For:
2	G	To collaborate and coordinate with industry and existing public and private organizations conducting microelectronics education and workforce development activities, as practicable.	2. Awards Shall Be Used For:

Para.	Sub.	Statute Text	Headline
3	Network Coordination Hub	The Director shall make an award on a competitive, merit-reviewed basis to an institution of higher education or nonprofit organization (or a consortium thereof) to establish a national network of partnerships (referred to in this section as the "National Network for Microelectronics Education") to coordinate activities, best practice sharing, and access to facilities across the partnerships established in accordance with paragraph (1).	3. Establish Coordinating Hub
4	Incentivizing Participation	To the extent practicable, the Director shall encourage participation in the National Network for Microelectronics Education through the coordination of activities and distribution of awards described in subsection (a).	4. Coordinated Network via Hub and Nodes Awards
5	Partnerships	The Director shall encourage the submission of proposals that are led by historically Black colleges and universities, Tribal Colleges or Universities, and minority-serving institutions or that include partnerships with or among such institutions to increase the recruitment of students from groups historically underrepresented in STEM to pursue graduate studies in microelectronics.	5. Required Partners
6	Outreach	In addition to any other requirements as determined appropriate by the Director, the Director shall require that proposals for awards under this section shall include a description of how the applicant will develop and implement outreach activities to increase the participation of women and other students from groups historically underrepresented in STEM.	6. Required Outreach
7	Coordination Across Foundation Programs	In carrying out the activities under this section, the Director shall ensure awardees coordinate with, and avoid unnecessary duplication of, the activities carried out under this Section 1 with the activities of the 21st Century Nanotechnology Research and Development Act (Public Law 108–153), the National Quantum Initiative Act (Public Law 115–368), and Division E of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, and other related programs, as appropriate.	7. Collaborate with NNI, NQI, NAII
8	Interagency Coordination	In carrying out activities under this section, the Director shall collaborate with the Subcommittee on Microelectronics Leadership of the National Science and Technology Council, established in subsection (a) of section 4656 of title 15 and the National Semiconductor Technology Center established in subsection (c) of section 4656 of title 15.	8. Collaborate with NSTC

Mission, Vision and Values

Mission, Vision and Values

Mission

The National Network for Microelectronics Education (NNME) is the premier resource committed to strengthening the United States' domestic semiconductor workforce. It provides access to high-quality education and training aligned with industry needs, setting the gold standard for opportunity, empowerment, and excellence. Through a nationally coordinated network of partners, the NNME prepares Americans from all regions and backgrounds for meaningful, high-growth careers in microelectronics – meeting employer needs and advancing economic opportunity, innovation, and national competitiveness.

Vision

We envision a future in which every American, regardless of where they live or how they start their journey, has the opportunity to pursue a rewarding, well-paying career in microelectronics. The NMME is instrumental in helping to build a robust and vibrant semiconductor industry by fueling it with a wide range of skilled workers needed by industry and creating a broad pipeline of future workers. The NNME will serve as the nation's premier resource for microelectronics education and training, connecting learners to employers, programs to successful outcomes, and empowerment to opportunity. Together, we will strengthen the talent pipeline that powers American leadership in semiconductors and advanced manufacturing.

Core Values

Our work is guided by foundational values that shape our strategy, partnerships, activities and delivery:

Opportunity for All

We believe in expanding access to microelectronics careers for Americans from every region and walk of life. NNME initiatives are designed to open doors to technical training and career exploration for high school students, veterans, people returning to work, college students, and others seeking high-quality jobs in this critical industry, as well as provide opportunities for current professionals looking to grow their careers.

Alignment with Industry

The NNME ensures that all educational programs, credentials, and learner supports are directly aligned with the knowledge, skills, and competencies identified by U.S. semiconductor employers. By integrating real-time labor market data and direct industry engagement, we ensure that training leads to quality jobs.

Responsiveness and Agility

The microelectronics field is constantly evolving, and so is our approach. The NNME is built for flexibility, enabling continuous improvement as new technologies, occupational needs, and regional priorities emerge. Our digital infrastructure and evaluation systems will ensure rapid feedback and adaptation.

Collaboration and Shared Success

No single organization can solve the semiconductor workforce challenge alone. The NNME is a collaborative initiative that brings together employers, educators, community organizations, and government partners to design and deliver shared solutions with broad impact.

Excellence and Accountability

We hold ourselves to the highest standards of program quality, integrity, and measurable impact. Every learner deserves a clear, supported pathway to success. Every taxpayer dollar must produce lasting value. Through rigorous evaluation and transparent reporting, we will demonstrate successful results.

Strategic Goals and Objectives

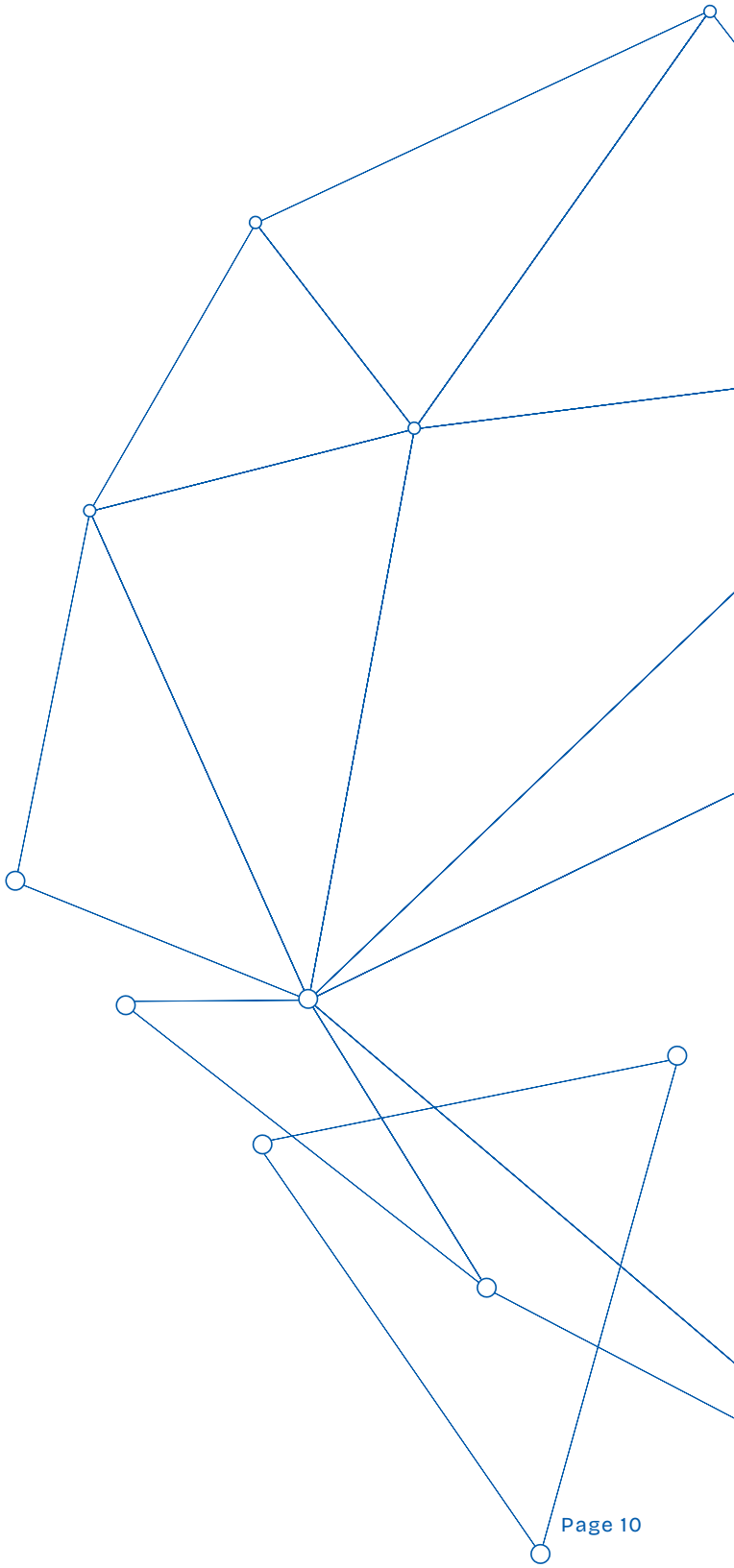
Strategic Goals and Objectives

The National Network for Microelectronics Education (NNME) is designed not as a series of isolated interventions, but as a cohesive, forward-looking national strategy.

Grounded in the realities of a high-growth industry and an underprepared workforce system, NNME's goals respond directly to the needs expressed by semiconductor employers, policymakers, educators, and learners.

Together, these goals articulate a comprehensive theory of action that translates the CHIPS and Science Act's vision into a durable workforce infrastructure capable of supporting long-term American competitiveness in microelectronics. Developed using the Chips and Science Act statutory language as a guide; the NNME goals and objectives can be clearly tied to US Code; citations tying goals and objectives to statute can be identified in (parathesis.)

Each goal represents a critical domain of system-level change. Taken together, they form an integrated agenda for national transformation: building new system where they do not exist, improving those that do, and connecting all of them into a coordinated national network. These goals are not just aspirational, they are actionable, measurable, and grounded in the implementation architecture laid out in this strategic plan.



Goal 1: Build and Operate a High-Performing National Hub and Regional Node Network (1, 2, 3, 4)

The foundation of NNME's approach is a distributed but coordinated system. While microelectronics workforce needs are national in scale, they are regional in character. Manufacturing capacity is expanding unevenly across the U.S., creating region-specific job demands and requiring place-based solutions. Yet, to date, no national structure has existed to connect those regional actors, align their activities, and accelerate progress toward shared goals. NNME fills that gap.

The national Hub, operated by the SEMI Foundation, will serve as the strategic and operational anchor of the system. It will coordinate resources, set national priorities, manage cross-network data and evaluation, and ensure cohesion among the program's many moving parts. Meanwhile, Regional Nodes, competitively selected and performance-managed, will serve as operational delivery arms, connecting with local employers, education systems, workforce boards, and community-based organizations to implement programs, gather data, and deliver impact.

Key Objectives:

- Fully staff and operationalize the NNME Hub, including leadership, governance, communications, evaluation, and digital infrastructure, within the first 12 months. (1, 2A, 3)
- Design and launch a transparent Regional Node competitive merit-review based selection process, leading to the selection and onboarding of the first 3-4 nodes by Q4 of Year 1, and pending funding, an additional 3-5 Nodes in Year 2. (2B, 4)
- Define and disseminate network-wide operating standards, shared metrics, and performance expectations for all funded nodes, with evaluation support and technical assistance TA structures in place by Year 2. (3, 4)
- Host the first annual NNME National Convening in Year 2 to build network identity, cross-pollinate strategies, and deepen inter-node collaboration. (2D)
- Over the course of the 5-year award period, support nationwide programming that results in 7,500-10,000 learners annually receiving credentials and supports their move into semiconductor careers. (2A, 2E)

Goal 2: Connect with other government semiconductor education and workforce initiatives to align efforts and leverage assets to meet industry workforce needs. (2G, 7, 8)

The federal government is making a number of important investments in semiconductor education, training, and workforce development. These include the Workforce Center of Excellence, the SMART USA Digital Twins investment, Microelectronics Commons, NSF Central Florida Semiconductor Engine, National Nanotechnology Coordination Infrastructure, NSF CHIPS Design Hub, and Workforce Agencies and Intermediaries. Further, state and local governments have also established a number of education and workforce development activities, workforce boards, economic development agencies, and other similar types of investments. These investments have never been connected or coordinated though a national strategy, leading to overlapping and duplicative efforts and a lack of resources sharing. The NNME will connect and partner with these programs, efforts, and agencies, creating memorandum of understandings (MoUs) where appropriate, to support the sharing of information, leveraging of capabilities and resources, and the propagation of best practices.

Key Objectives:

- Collaborate closely with the Workforce Center of Excellence on studies, analyses, programs, and other efforts to ensure the best and highest use of resources and implement a synergistic approach to national workforce development. Create agreements around roles and responsibilities and meet regularly to ensure alignment and coordination. (2G, 8)
- Provide and support a platform for SMART USA leadership and performers to collaborate and partner on workforce development efforts and identify collaborative, cost-savings partnerships between NNME and SMART USA. (2G, 7)
- Connect with Microelectronics Commons Regional Hubs to partner with the NNME as appropriate. Establish connections between state and local workforce boards and proximate NNME Nodes. (2G, 7)
- Participate in structured intermediary meetings and gatherings to promote the NNME and identify synergies and opportunities. Identify and address any areas of overlap. Formally and informally partner with agencies and intermediaries. (7)
- Ensure Regional Node coordination with economic development organizations to support supply/demand needs are met at both the overall national level, and within the regions as well. (2D)
- Establish connections with other Federal investments including: NSF Central Florida Semiconductor Engine, National Nanotechnology Coordination Infrastructure, NSF CHIPS Design Hub, etc. to adopt, leverage, and coordinate with NNME activities. (2G, 7)

Goal 3: Modernize Curriculum, Training Programs and Learning Pathways Aligned with Industry Demand (2A, 2B, 2C, 2D, 2E)

The U.S. semiconductor sector faces not only a worker shortage but a skills mismatch. Many programs, where they exist at all, use outdated curricula and withered training programs that do not reflect modern fabrication processes, design tools, or automation technologies. Courses often lack alignment with industry-required learning outcomes or real-world competencies. There is unclear portability across institutions, and many learners struggle to translate their education into industry jobs.

NNME's third strategic goal addresses this challenge through a national curriculum modernization platform. Anchored by deep employer engagement and coordinated with other CHIPS-funded efforts such as SMART USA, this effort will result in new or updated learning assets across the education continuum - from K–12 STEM exposure to postsecondary training to upskilling and reskilling for mid-career workers.

Key Objectives:

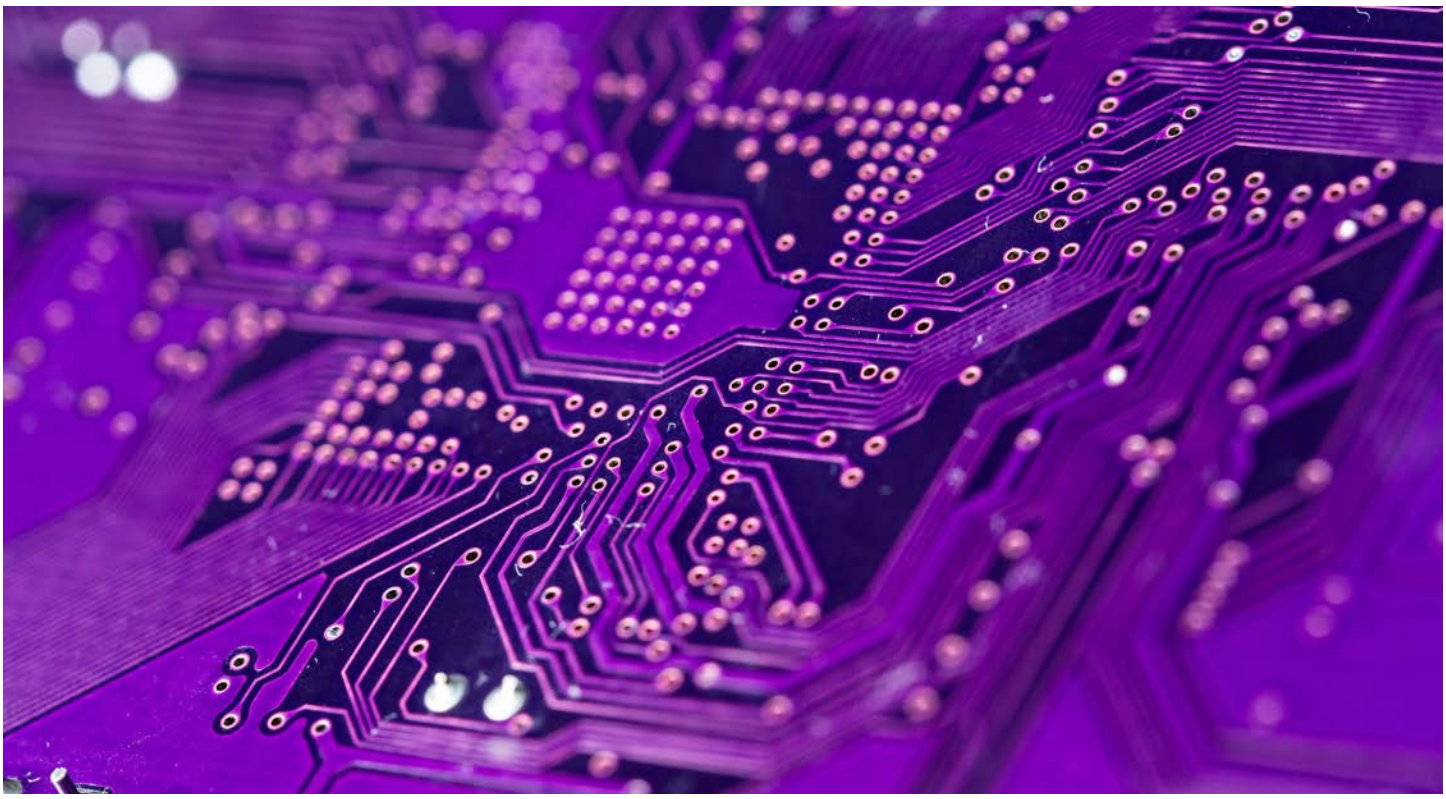
- Launch a digital Curriculum Clearinghouse through the NNME Portal in Year 2 to centralize access to vetted instructional resources, mapped to Knowledge, Skills, and Abilities (KSAs) and job qualifications. (2E)
- Facilitate the adoption of updated curricula and training programs at 200+ performer institutions and training providers across the network by Year 5, with accompanying instructor training and peer learning supports. These updated education and training programs will also be mapped to KSAs and job qualifications. (2A, 2B, 2C)

Goal 4: Expand Participation in Microelectronics Careers Through Awareness and Access (2A, 2B, 2C, 2E, 2F)

While the semiconductor sector offers high-wage, high-demand careers, most Americans remain unaware of the opportunities it holds, or unclear on how to pursue them. This is particularly true for students in under-resourced K–12 districts, adults outside of traditional STEM pathways, and transitioning military service members. Without broad, early, and repeated exposure to microelectronics, the talent pool remains narrow, and the sector struggles to meet its hiring needs.

NNME aims to change this through a nationally coordinated public awareness and outreach campaign, supported by community-based programming coupled with career navigation tools. These efforts are not simply about messaging; they are about expanding access. Through partnerships with veteran organizations, STEM programs, state workforce boards, and others, the NNME will open new onramps into the industry and reduce barriers to entry.

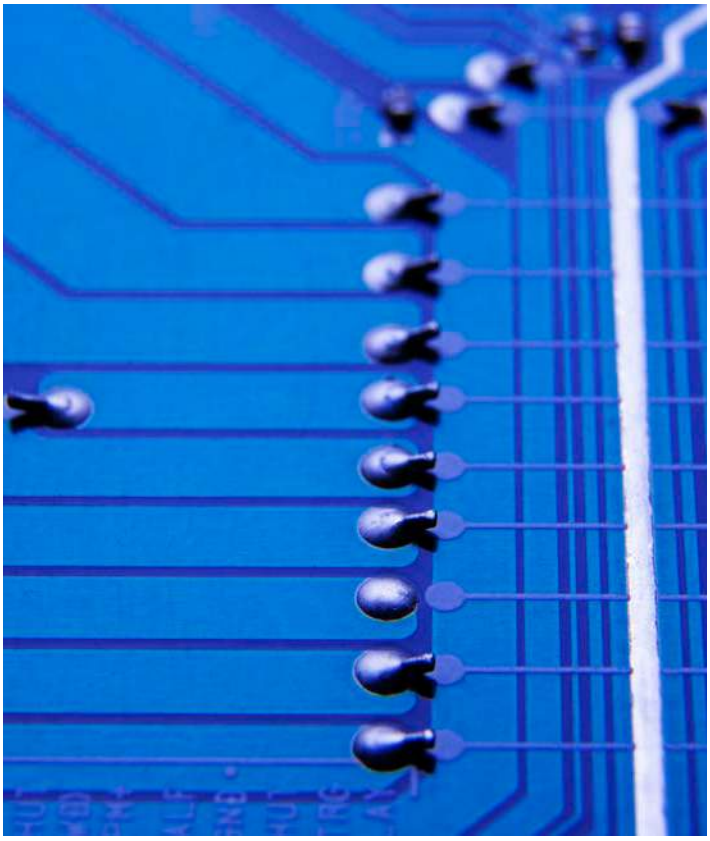
- Conduct a sustained national awareness campaign reaching at least 6 million Americans annually by Year 3, using multimedia content, school-based engagement, and employer-hosted events. (2F)
- Develop technical assistance guides and toolkits for Regional Nodes to implement outreach tailored to local audiences, including K–12, rural, veteran, and nontraditional populations. (2C, 2F, 4, 5)
- Support the development of regional and national Communities of Practice focused on improving awareness and access strategies by Year 2. (4, 6)



Goal 5: Drive Systemwide Performance, Continuous Improvement, and Long-Term Sustainability (1, 3, 4)

A complex and widely distributed network such as the NNME needs various mechanisms to measure its impact, improve performance, and sustain momentum. NNME will employ data transparency, third-party evaluation, and robust reporting at every level of the network. From learner satisfaction to placement outcomes, each program and partner will be evaluated and held accountable to clear goals and supported to meet them.

At the same time, long-term sustainability requires diversified funding. While federal investment through the NSF provides critical startup capital, NNME's structure is designed to attract industry investment, state co-funding, and philanthropic support. By Year 6, the network will operate with a mix of funding sources and a shared commitment to self-sustaining operations that will serve learners and industry for years into the future.



Key Objectives:

- Build and operationalize an integrated data infrastructure by the end of Year 1 to track key indicators across learners, institutions, employers, and regions. (3, 4)
- Establish network-wide Key Performance Indicators (KPIs) and a performance management framework that supports adequate reporting and continuous improvement of the NNME and the Regional Nodes. (1, 2A, 3, 4)
- Conduct annual third-party evaluations of Hub and Regional Node performance beginning in Year 2, with results used to guide strategic adjustments and investment decisions. (3, 4)
- Identify commitments covering post-grant operating costs by Year 6 through industry sponsorships, memberships, state grants, and earned income from credentials and consulting. Identify a streamlined approach for NNME activities to reduce operating capital needs. (1, 3, 4)

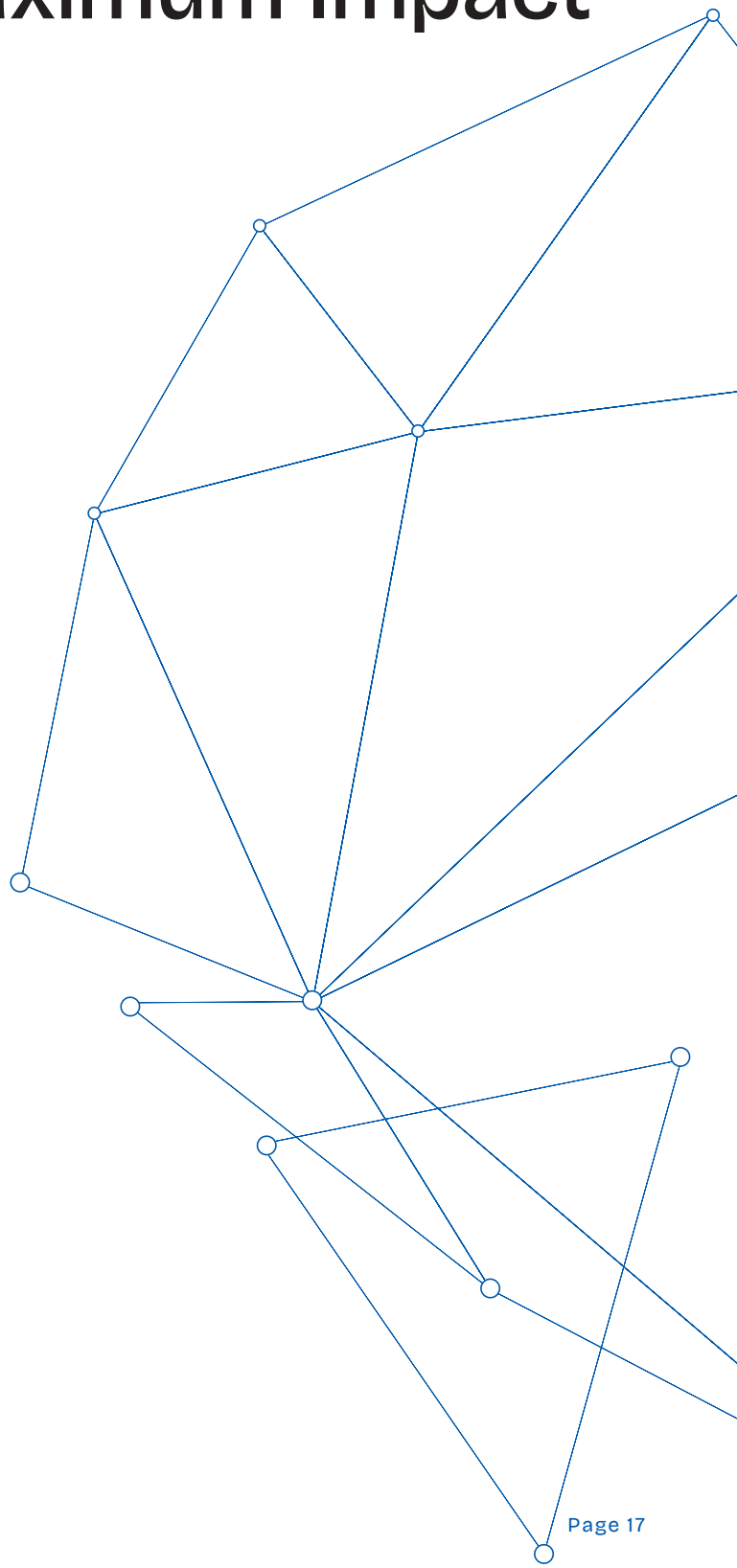
Strategic Analysis: Understanding the Challenge, Positioning for Maximum Impact

Strategic Analysis: Understanding the Challenge, Positioning for Maximum Impact

The National Network for Microelectronics Education (NNME) enters the national stage at a moment of historic investment and heightened urgency. In response to decades of offshoring and supply chain vulnerability, the United States (through bipartisan Congressional support and signature legislation such as the CHIPS and Science Act) is seeking to re-establish domestic leadership in semiconductor manufacturing, research, and innovation. Yet this renewed commitment comes with a critical constraint: the talent required to fuel it does not yet exist at sufficient scale or alignment.

This reality is well documented. Reports from the Semiconductor Industry Association, the National Science Foundation, and multiple CHIPS-funded initiatives all confirm that a lack of trained workers is the single greatest barrier to achieving the national vision for microelectronics. The NNME is not a supplement to this vision, it is a prerequisite for its success. Understanding the context in which NNME is operating is therefore essential for understanding its strategy.

What follows is a detailed landscape analysis and embedded SWOT evaluation. It explains where the microelectronics workforce system stands today, where the NNME is positioned within it, and why the network's structure, scope, and priorities are essential to achieving near- and long-term national outcomes.



A Complex Ecosystem, Marked by Gaps

The semiconductor workforce development system in the United States is a patchwork. There are pockets of excellence, individual training programs, community colleges with high employer engagement, veteran upskilling pipelines, but these programs are few, fragmented, and geographically uneven. In many high-growth regions, no aligned microelectronics talent pipeline exists. Where programs do exist, they are often disconnected from real-time labor market intelligence and outdated in terms of equipment, curriculum, and learning outcomes.

This lack of alignment is compounded by low public awareness. Despite offering some of the best wages in American manufacturing, with technician roles averaging $60,000– $80,000 annually, often without a four-year degree, the semiconductor industry remains largely invisible to the American learner. There is little career visibility in K–12, sparse representation in career navigation tools, and minimal cultural representation in popular media. As a result, even well-resourced companies struggle to recruit domestically, and many resort to poaching from other high-tech fields or competing globally for a limited pool of advanced degree holders.

This problem is not isolated to technician-level education and roles. Training and output of students earning Bachelor's and higher degrees for the semiconductor industry has been declining for a variety of reasons. There is a shared issue of low public awareness, low visibility, and a less glamorous perception of the industry compared to consumer-facing software giants. In addition, industry cycles, job uncertainty, and limited academic marketing all play a role in this underinvestment.

Furthermore, most education institutions lack the flexibility to respond quickly to emerging occupational needs. The skills required in microelectronics, especially at the technician level, are increasingly interdisciplinary: mechatronics, automation, materials science, cleanroom protocols, and cybersecurity. Yet programs designed decades ago still dominate. Few offer stackable credentials, work-based learning, or modular pathways that enable rapid training, certification, and employment. And fewer still share resources or recognize each other's credentials, limiting transferability and undermining learner mobility.

Internal Strengths: NNME's Strategic Advantages

Despite these challenges, the NNME begins from a position of strength, benefiting from both the unique capabilities of the SEMI Foundation and the collective power of its national partners.

Institutional Infrastructure and Programmatic Readiness

Unlike many newly funded initiatives, NNME is not building from scratch. The SEMI Foundation has developed and scaled nationally recognized programs (e.g., SCAN, High Tech U, VetWorks), managed multi-million-dollar federal and philanthropic investments, and established long-standing partnerships with key stakeholders, including K–12 systems, community colleges, veterans' organizations, major chip manufacturers, and other CHIPS-funded initiatives. This maturity reduces startup risk and ensures early traction.

Proven Convening and Coordination Capability

SEMI serves as a neutral intermediary across sectors, with strong relationships in industry, education, and government. It is trusted by employers because it represents them. It is trusted by educators because it has invested in workforce outcomes. And it is trusted by federal partners, including NSF, NIST, DoD, and Commerce, because of its demonstrated stewardship of collaborative investments. These relationships provide a solid platform for NNME's coordinating Hub role.

Diverse, High-Capacity Partner Network

NNME's founding subawardee partners, Jobs for the Future, MNT-EC, HBCU CHIPS Network, and the Innovative Engineering Consortium, each bring distinct strengths in technical curriculum, educational fairness, regional implementation, and network development. These organizations extend NNME's capacity across a wide range of geographies, learner populations, and technical competencies, enabling the NNME to reach learners and providers far beyond what SEMI could do alone.

Integrated Digital Infrastructure

The NNME digital platform, under development, will provide a centralized portal for shared resources, standards alignment, performance tracking, and career navigation. This is not an afterthought; it is a central part of NNME's strategy to create durable national infrastructure and ensure transparency and accessibility across the network.

Internal Challenges: Structural and Operational Risks

The NNME is also realistic about the challenges it must overcome, both within the network and in the broader operating environment.

Variability in Regional Capacity

The Regional Node model is central to NNME's strategy, but not all regions will enter the network with equal infrastructure or experience. Some may lack industry partners or have little history of microelectronics training. Others may have internal misalignment among educational institutions or limited digital capacity. NNME will need to invest heavily in early-stage technical assistance and capacity building to bring all Nodes to an adequate baseline level of performance.

Complexity of Multi-Partner Governance

With multiple federal, philanthropic, and industry stakeholders, NNME will need to manage an evolving ecosystem of governance expectations, funding restrictions, and performance obligations. The risk is mission drift or administrative burden that dilutes programmatic impact. The Hub will need to maintain strong internal coordination, while also leading cross-initiative alignment with WCoE, SMART USA, and Microelectronics Commons.

External Opportunities: Timing, Investment, and Ecosystem Alignment

The NNME is launching at a uniquely favorable time. The CHIPS and Science Act has created a supportive environment for new workforce investments. Multiple agencies are coordinating their strategies. State governments are co-investing in regional training hubs. And the public narrative around domestic manufacturing is more favorable than it has been in a generation.

Federal Alignment and Complementarity

NSF, DoD, NIST, and Commerce are funding complementary efforts, across infrastructure, curriculum, R&D, and experiential learning. This alignment allows NNME to serve as a unifying workforce backbone. Rather than duplicating efforts, NNME offers a common platform where regional activity can connect to national outcomes.

High Employer Willingness to Engage

In interviews and planning sessions, SEMI member companies have expressed strong interest in participating, through strong commitments of support, co-designing curricula, and hosting work-based learning. Employers are seeking immediate pipelines for talent and are willing to collaborate once systems are aligned and responsive.

Cultural Shift Toward Alternative Pathways

The labor market and education system are both evolving. More learners are seeking short-term, job-relevant credentials. More institutions are exploring modular, noncredit, and online delivery. More companies are hiring for competencies over degrees. This cultural shift creates a strategic opening that will allow the NNME to bring together workforce partners in an unprecedented, coordinated system.

External Threats: Ecosystem Fragmentation and Competing Priorities

Although there are numerous factors that make this an excellent time to launch this work, the semiconductor workforce ecosystem can be crowded, fractured and uncoordinated. The proliferation of CHIPS-funded programs risks creating confusion among learners, institutions, and employers. There is also the risk of competing for the same limited instructional resources, equipment, instructors, and facilities. Finally, the cyclical nature of the industry and the reality that there can be layoffs even during a hiring shortage can undermine the industry's image and dissuade potential jobseekers from exploring opportunities.

Overlap Without Integration

Multiple initiatives are working toward similar goals, but with different timelines, scopes, and data systems. Without clear communication and shared infrastructure, stakeholders may face administrative fatigue or conflicting messages. NNME's role as a coordinator and communicator is essential to prevent inefficiency and duplication.

Instructor Shortage and Infrastructure Lag

Many institutions lack the lab space, cleanroom access, or skilled instructors required for modern semiconductor training. These constraints limit scalability, even when demand and interest is high. NNME will need to encourage faculty development, shared equipment access, and collaborative program delivery to mitigate this bottleneck.

Economic and Political Volatility

Macroeconomic trends and changes in federal priorities could affect the funding landscape or employer hiring behaviors. The NNME must build in financial and strategic resilience, including diversified funding models and contingency planning.

Strategic Conditions for National Success

This detailed landscape analysis confirms that the NNME is both necessary and well- positioned, but that success is not guaranteed. It will require disciplined strategy, nimble adaptation, and sustained coordination across sectors. NNME must move quickly to establish its role as a trusted integrator, responsive implementer, and builder of durable systems. Its strength will lie not only in delivering programs, but in shaping the infrastructure, standards, and culture that make lasting national progress possible.

Operating Models: Coordinating Hub, National Operations

Operating Models: Coordinating Hub, National Operations

The NNME is designed to function as a cohesive national system, but one built on two distinct operational models: the centralized model used by the **NNME Hub** and the distributed, implementation-focused model used across the **national NNME system,** which includes Regional Nodes and their partners. These two models are purpose-built to complement one another, one responsible for infrastructure, strategy, and oversight; the other for delivery, adaptation, and regional impact.

NNME Hub Operations: Centralized Coordination, Strategy, and Infrastructure

The **NNME Hub**, operated by the SEMI Foundation, functions as the **strategic and operational command center** for the entire national-level program. Please see **Addendum 1** for additional details on current staff and functions, and **Addendum 2** for the SEMI Foundation/NNME organizational chart. Hub core operational responsibilities include:

Program Governance and Management:

Leading the execution of the NNME's strategic plan; overseeing subaward administration, milestone tracking, risk mitigation, and conflict-of-interest protocols.

Infrastructure Development:

Building and maintaining centralized assets - such as the national credential repository, digital learning content management system, AI-enabled learner navigation and job matching platform, and technical assistance systems.

Standards and Alignment:

Coordinating curriculum standardization, credential endorsement processes, and assessment methodologies to ensure national consistency while preserving flexibility for regional variation.

Deployment of Industry Awareness Campaign:

Building and maintaining centralized assets for industry awareness and deploying a national program in partnership with the Regional Nodes.

Assessment and Continuous Improvement:

Managing both internal performance management (via Jobs for the Future) and impact assessment of educational resources (via New Growth Group).

National Partnerships and Federal Coordination:

Engaging in structured collaboration with other federally funded efforts (e.g., NSTC Workforce Center of Excellence, SMART USA), aligning where appropriate without duplicating or overstepping.

Hub operations are lean, centralized, and focused on strategy, coordination, and accountability, with the exception of the industry awareness campaign, which is its only true programmatic arm. The Hub does not deliver educational programming directly. Instead, it enables others to do so with quality and consistency by providing the digital, curricular, and governance scaffolding that makes national-scale workforce development possible.

NNME National Operations: Distributed Implementation, Adaptation, and Regional Engagement

By contrast, the operational model of the broader NNME initiative is designed for flexibility and regional responsiveness. It is implemented primarily through **Regional Nodes:** subawarded institutions or consortia charged with translating the NNME's national strategy into place-based programming and services that reflects local labor market needs, institutional assets, and community priorities.

Key characteristics of this model include:

Decentralized Delivery:	Regional Nodes adapt and implement credential- aligned training programs and industry awareness activities, manage employer partnerships, recruit and support learners, and engage with local educational systems.	**Regional Stakeholder Leadership:**	Each Node operates with its own governance, stakeholder engagement strategy, and institutional partnership network, coordinated by local leadership and staff.
Content Contribution and Field Testing:	Regional partners also pilot and iterate new curriculum modules, contribute to Communities of Practice, and generate feedback that informs content revision of educational and awareness assets.	**Operational Autonomy with Aligned Accountability:**	While each Node retains control over how to implement NNME-aligned activities, they must report on nationally defined KPIs as well as their unique set of metrics and demonstrate progress against contracted milestones.

This operational model prioritizes adaptability, responsiveness, and local ownership. It is supported, but not directed, by the NNME Hub, which provides national tools and guidance without prescribing one-size-fits-all approaches to training delivery or employer engagement.

Operational Integration and Mutual Accountability

While structurally distinct, the Hub and national operational models are tightly integrated. The Hub exists to serve and scale the work of the Nodes and partners. At the same time, the success of the national initiative relies on Nodes fully leveraging and implementing Hub-developed tools, assets, and infrastructure. Key mechanisms that bridge these models include:

Subaward Agreements:	These define clear scopes, milestones, and expectations tailored to the operational responsibilities of each Node or partner.
Communities of Practice:	These are structured to allow bi-directional learning, surfacing regional challenges and opportunities that shape Hub decision- making.
Shared Digital Infrastructure:	From curriculum adoption tracking to learner navigation and resource-sharing, the Hub's systems are designed to serve both national consistency and local usability.
Feedback and Revision Loops:	The Hub uses data and feedback from the field to refine strategy, adjust technical assistance, and revise tools, ensuring that national coordination stays grounded in real-world needs.

This two-tiered operational model, **centralized coordination and decentralized delivery**, is a deliberate design choice. It allows the NNME to function at scale without sacrificing relevance, and to deliver on the CHIPS Act's dual mandate: creating a coherent national workforce strategy while empowering communities to meet the industry's needs in ways that make sense locally.

Experiential Learning and Shared Infrastructure Strategy

At the heart of the NNME's mission is the imperative to translate learning into earning and to ensure that every credentialed learner has a clear, visible, and navigable path to employment in the U.S. microelectronics industry. To that end, the NNME initiative is building a national-scale, employer-validated system of experiential learning that integrates three critical components: structured internships, registered apprenticeships, and shared training infrastructure. These pillars are not isolated activities, but part of a unified strategy supported by the NNME's digital platform and credentialing ecosystem—designed to connect talent, employers, and training providers more effectively than ever before.

Internships: National Templates, Local Delivery, Seamless Navigation

The NNME will scale a network of structured, work-based learning experiences through a system of internships embedded within credential-aligned pathways. Each Regional Node will be responsible for developing and maintaining relationships with local semiconductor employers, and for facilitating internship opportunities that expose learners to real-world tools, processes, and workplace expectations.

Perhaps most transformative is the role of the NNME's digital platform. Through the platform's AI-powered job-matching interface, learners will be able to:

- Create secure profiles linked to their credential progress
- Indicate interest in internship opportunities (filtered by region, occupation, or schedule)
- Receive tailored internship recommendations based on skills, coursework, and expressed goals
- Access employer background, internship timelines, and expectations in a centralized location

For employers, this same platform enables:

- Posting and managing internship opportunities
- Viewing learner profiles aligned with specific roles or projects
- Tracking intern engagement and collecting post-internship feedback for program improvement

In this way, internships are not a side activity—they are part of a connected, credentialed journey that begins with exposure and classroom learning and culminates in workplace immersion and, ideally, hiring.

Apprenticeships: Building Sustainable, Structured Employment Pipelines

The NNME Hub and SEMI Foundation will also accelerate the growth of registered apprenticeships in microelectronics—a proven earn-and-learn model that enables learners to build skills on the job while progressing through a formal training pathway.

Through its role as a federally recognized industry intermediary, the SEMI Foundation will work alongside the Hub to:

- Develop nationally portable apprenticeship frameworks in key microelectronics occupations
- Align related technical instruction (RTI) with NNME credentials and digital content
- Deliver technical assistance to Regional Nodes and employers on registering new programs, navigating DOL and state systems, and leveraging incentive funding

The NNME's digital infrastructure will be deeply embedded in this strategy. The same platform used for internship matching will be extended to include apprenticeship listings, and will integrate SEMI Foundation's existing application workflows, onboarding content, and credential tracking—ensuring learners can explore, apply for, and manage apprenticeship opportunities from a single digital entry point. Employers can use this infrastructure to identify candidates, review credential attainment, and monitor training progress.

This tight coupling between apprenticeship delivery and NNME's national infrastructure will reduce friction in scaling programs and support more efficient hiring and onboarding at the firm level.

Shared Infrastructure: Physical and Digital Training Resources at Scale

To ensure more learners can access meaningful, hands-on experience—regardless of location or institutional capacity—the NNME will promote and support the development of shared-use training infrastructure across the regional system.

Each Regional Node will be encouraged to develop or identify shared assets, such as:

- Semiconductor fabrication or electronics labs open to regional partners
- Mobile training units capable of serving multiple campuses or worksites
- Specialized instructional spaces supported by employer or philanthropic investment

The NNME Hub will support these efforts by:

- Mapping and cataloging shared-use infrastructure across the country
- Supporting capital investment proposals aligned with credential and curriculum frameworks
- Hosting virtual lab and simulation content in the national clearinghouse to extend access where physical labs are unavailable

In addition, all shared infrastructure—physical and digital—will be integrated with NNME's credentialing system and curriculum repository. Instructors across the network will be able to access shared learning modules, safety protocols, and equipment guides aligned with NNME credentials, enabling consistent training quality even across diverse delivery environments.

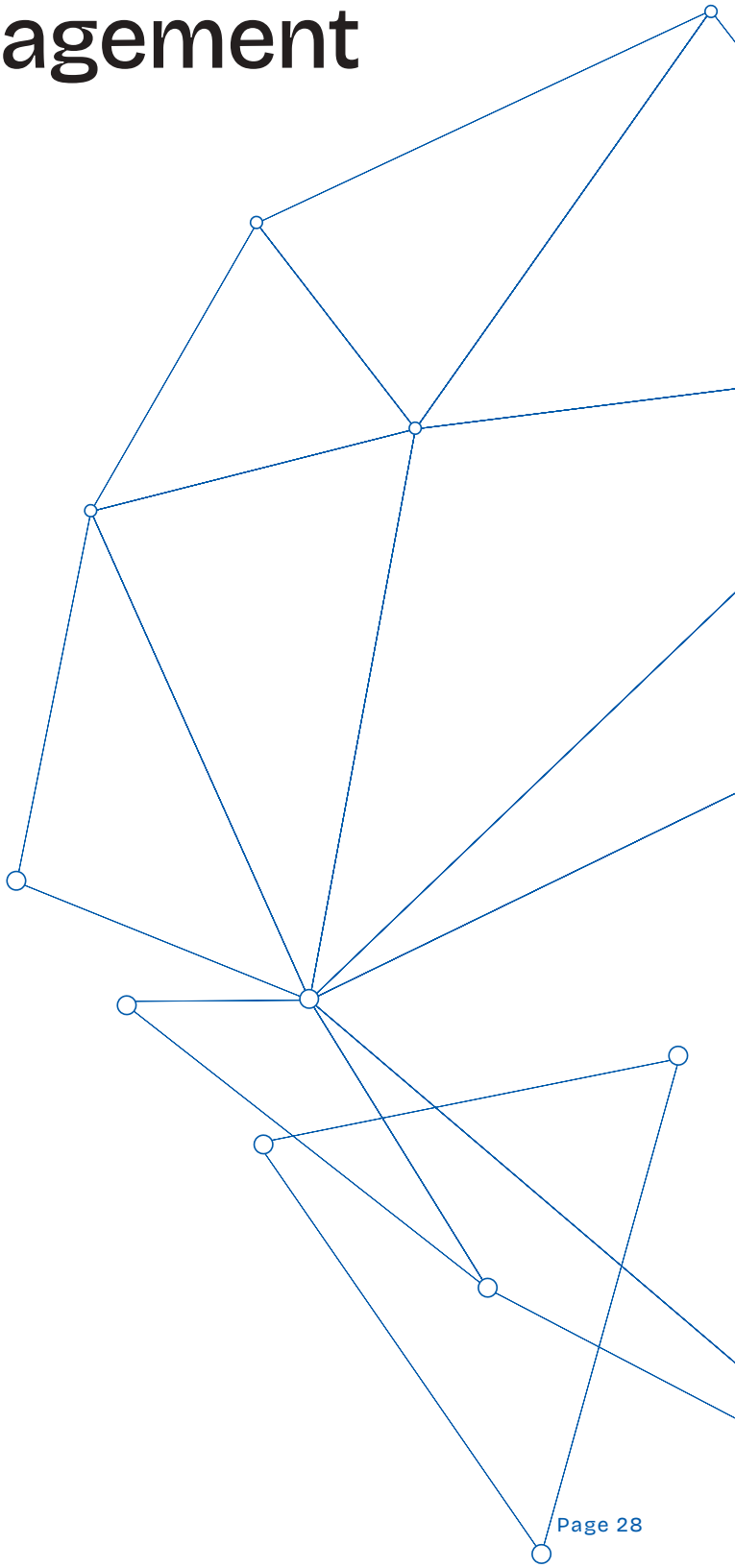
Regional Node Strategy: Selection, Structure, and Performance Management

Regional Node Strategy: Selection, Structure, and Performance Management

A core feature of the NNME model is the recognition that while semiconductor workforce needs are national in scope, they are deeply regional in character.

Manufacturing capacity is expanding across the United States, but unevenly: driven by localized investments, employer activities, state policies, and legacy infrastructure. To address these variations, the NNME is implementing a regionally distributed, nationally coordinated model built on a foundation of performance, shared accountability, and geographic relevance.

Through a structured network of Regional Nodes, the NNME will establish a system of place-based partnerships capable of addressing local workforce needs while contributing to shared national outcomes. These Nodes are selected competitively, supported through structured onboarding, and held accountable to common goals, ensuring consistency, transparency, and regional and national value.



Purpose and Function of Regional Nodes

Regional Nodes serve as the primary delivery arms of the NNME. While the Hub maintains strategic alignment, digital infrastructure, and program coordination, Regional Nodes are tasked with implementing specific programming and activities across education, workforce, and employer ecosystems.

Each Node will:

- Convene regional partners to deliver industry-aligned education and training programs
- Deploy industry-relevant curricula and credentialing models
- Coordinate with employers on job placement and work-based learning
- Support regional strategy execution and performance reporting
- Contribute to national resource sharing and peer collaboration

Regional Nodes operate as multi-organization consortia led by an anchor institution, the Hub, and supported by local and regional partners, including:

- Postsecondary institutions
- Employers and industry consortia
- Workforce development organizations
- State and regional economic agencies
- Community and technical partners

Competitive Selection Process

The SEMI Foundation will implement a two-stage competitive process designed to identify high-capacity, strategically located Regional Nodes. The process will emphasize readiness, industry alignment, partner experience and strength, and regional relevance. The full Node Selection Plan will be developed with subawardee Jobs for the Future. An initial version of this process is shared below as an example of what the process will entail.

Timeline:

- July 2025: LOI launch
- Mid August: LOIs due
- August/early September: RFP launch
- Early October: Full proposals due
- October-December: Independent review and final portfolio selection
- December-January: Public announcement of selected Nodes

Evaluation Framework

Gate 1: Letters of Interest (LOIs)

Applicants submit concise responses outlining:

- Geographic scope and lead institution
- Priority occupations and labor market indicators
- Core partners and early-stage commitments
- Initial implementation vision

Gate 2: Full Proposals

Invited applicants submit a detailed application including:

- A narrative, budget, and justification
- MOUs or letters of intent
- Evidence of institutional capacity and employer engagement and support

Evaluation Criteria:

- Demonstrated industry demand and occupational relevance as articulated in each node's proposal and the NNME Hub's ongoing landscape analysis of employer demand and programmatic availability.
- Operational readiness for immediate impact and future scale; nodes must be able to launch work toward deliverables at the time of award, with a clear strategy and demonstrated capabilities to expand partnerships and activities throughout the funding period.
- Partner structure and past collaboration
- Technical quality of education and training approaches
- Data collection and reporting capacity

Final selections will consider portfolio balance across geography, institutional types, and microelectronics subsectors.

Node Composition and Roles

Each Regional Node must be a multi-stakeholder partnership. Required partners include:

- Postsecondary education providers and/or training providers
- K-12 educational institutions
- Industry partners with documented workforce needs
- Community-based organizations that provide support services to workers
- Local, regional, and/or state government agencies
- A workforce intermediary or public workforce board
- A coordinating organization to manage implementation

Nodes are expected to manage internal coordination, participate in national activities, submit data and reports, and align training to NNME-wide learning outcome bframeworks and employer priorities.

Onboarding and Statement of Work (SOW) Development

Selected Nodes will engage in a structured onboarding period focused on:

- Clarifying roles, deliverables, and reporting systems
- Finalizing a negotiated, milestone-based SOW
- Setting up access to NNME's digital tools and reporting dashboards
- Aligning data systems and evaluation participation
- Receiving technical guidance on standards adoption and employer engagement

Onboarding is supported by Hub staff and technical assistance partners and concludes with contract execution.

Contract Structure and Performance Management

Each Node enters into a milestone-based agreement with the NNME Hub. Contracts include:

- Annual SOW with quarterly milestones
- Required KPIs and outcomes reporting
- Participation in NNME convenings and learning communities
- Reallocation or reassignment provisions in cases of sustained non-performance

Examples of contractual deliverables may include:

- Curriculum modernization and adoption of NNME platforms
- Employer hiring partnership documentation
- Learner participation data and outcome metrics
- Digital platform content contributions and peer session attendance
- Extensive and appropriate industry awareness activities

Oversight, Monitoring, and Support

Regional Node Coordinators embedded within the Hub serve as the primary contact points for ongoing performance monitoring and support. They:

- Track progress on milestone completion and data reporting
- Provide real-time guidance and operational troubleshooting
- Convene peer sessions and facilitate Communities of Practice
- Flag implementation risks to the Hub Manager and Leadership Council

Performance challenges are addressed first through technical assistance. If necessary, contract amendments or reallocation decisions are escalated within the governance structure.

Future Scaling Strategy

The initial cohort of 3-4 Regional Nodes will serve as the foundation for national scale.

NNME anticipates:

- Lessons learned during Cohort 1 will inform improved TA, review processes, and onboarding tools
- Possible addition of new Nodes selected or existing Nodes expanded through future RFP rounds
- Up to 8 total Nodes in place by Year 4, with additional "associate" or "emerging" Node models under exploration

This phased scaling approach balances national reach with quality control and responsiveness to regional needs.

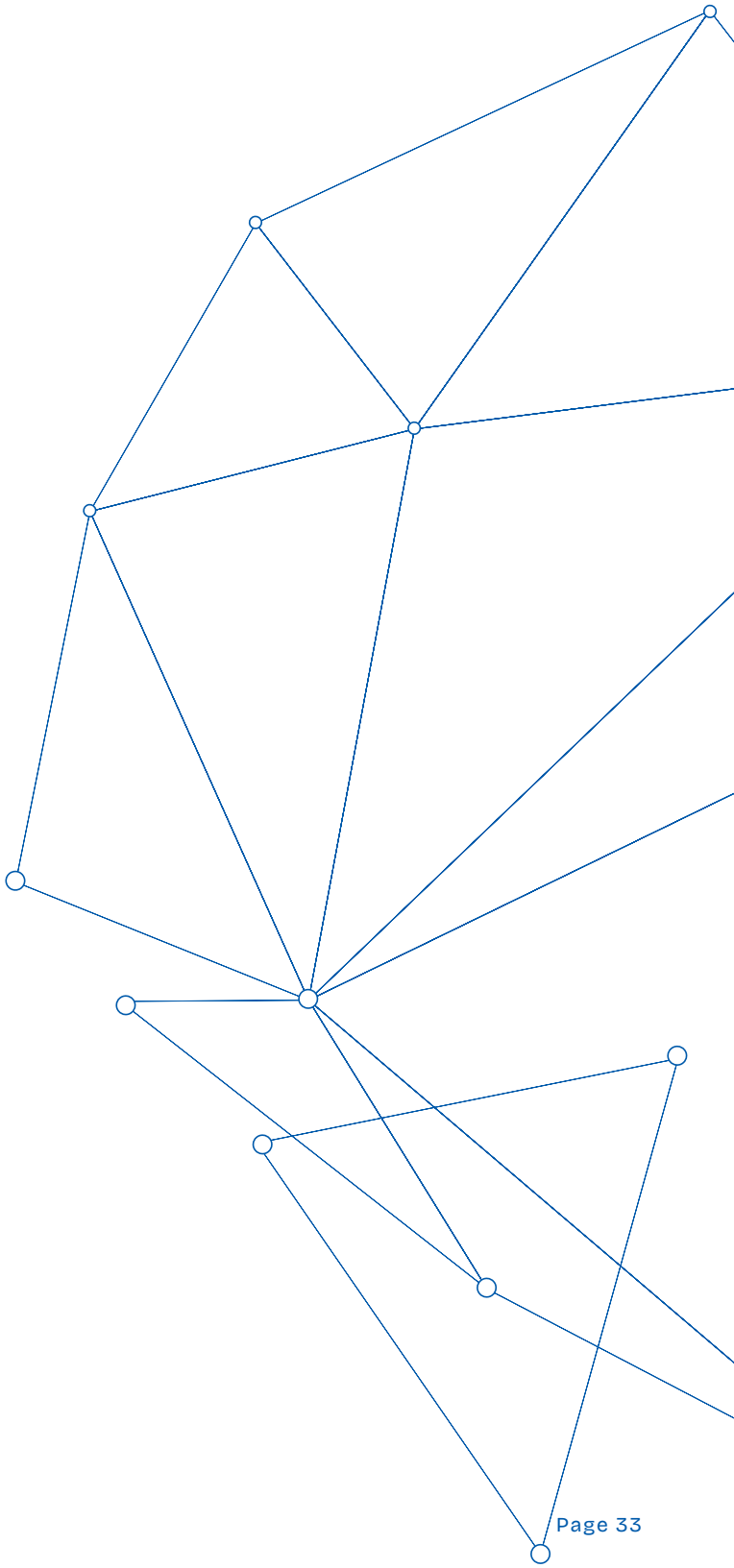
The Regional Node strategy is the engine of the NNME's national workforce model. By identifying and supporting strong regional partnerships, each accountable to clear metrics, contracts, and national goals, the NNME will ensure that training is delivered where it is needed most, by those best equipped to lead. This structure reflects the rigor, flexibility, and responsiveness necessary to meet the U.S. semiconductor industry's workforce demand at scale.

Curriculum, Validation, and Scaling Strategy

Curriculum, Validation, and Scaling Strategy

At the heart of the NNME's strategy is a commitment to translating employer-defined knowledge and skills into high-quality education and training programs that can lead to portable, recognized credentials. However, to address the speed and complexity of innovation in the microelectronics industry, curriculum development must not only be accurate and industry-aligned, it must also be agile, modular, and shareable at scale.

To meet these demands, the NNME is implementing a multi-tiered national curriculum and validation system built around modern instructional design, stakeholder co-development, and a robust digital infrastructure. This system is aided by a robust Learning Content Management System (LCMS) to ensure it can be accessible to a wide audience, scale effectively, integrate with national platforms, and support long-term reuse and regional customization.



Curriculum Development and Modernization

NNME's curriculum development process emphasizes modularity, relevance, and alignment with industry standards. Rather than producing static course packages that may have to enter burdensome curriculum approval processes, the NNME will support the creation of flexible learning objects, outcomes, and resources that can be adapted into various instructional formats and pathways.

Key Development Domains:

- Semiconductor manufacturing processes
- Fab and cleanroom operations
- Advanced packaging, assembly, and testing
- Integrated circuit (IC) design, simulation, and layout
- Equipment maintenance and automation systems
- Workforce readiness, technical communication, and critical thinking skills

Instructional Design Approach:

- **Modular, stackable** resources that align with industry-validated KSAs
- **Flexible delivery formats**, including units that can be incorporated into existing cornerstone curricula and training programs
- **Interoperable standards,** using SCORM/xAPI-compatible tools to support integration with various LMSs, Digital Twin simulations (via SMART USA), and DoD/Commons lab facilities
- **Metadata tagging and version control**, enabled through the LCMS for streamlined user experience, ease of search, and adaptation across users

Curriculum development will be carried out by faculty through coordination with NNME staff, subject matter experts, Regional Nodes, and subawardees, with ongoing feedback from employers and alignment to WCoE national standards.

Curriculum Alignment and Validation Strategy

To help the U.S. education system better modernize and align semiconductor learning to modern industry needs, the NNME will create and maintain a national portfolio of stackable, portable, and industry-aligned microelectronics credentials designed to:

- Standardize learning outcomes that help educators build appropriate curriculum aligned to industry needs
- Signal learners' workforce readiness across a range of job roles
- Facilitate horizontal and vertical mobility across occupations
- Support learner progression from K–12 through adult reskilling pathways

The NNME will also provide technical assistance and "train the trainer" programs to support teacher knowledge and delivery of modernized, updated curriculum.

Curriculum Validation Targets:

- NNME, through the industry association, regularly convenes industry leaders across sectors to inform knowledge, skills, and abilities needed by the industry
- The industry standards that validate curriculum will provide coverage across entry-level, mid-level technician, and cross-functional roles
- Standardization process will align with WCoE efforts, vetted through advisory processes, and supported with instructional assets hosted on the NNME Portal

Potential Credential Types from Curriculum Alignment:

- Digital microcredentials and badges
- Certificates of completion
- Industry-recognized certifications (via SEMI or other industry-recognized bodies)
- Credit-bearing certificates stackable into associate or bachelor's degrees

Credential frameworks will include detailed performance indicators, instructional guidance, and embedded assessment models, fully mapped to KSAs and job competencies identified by the WCoE.

The Hub will also work with regions to implement stackable credentials and credit for prior learning. There is not currently a national education infrastructure to streamline efforts such as Associate Degrees or credits for transfer, and in the absence of that infrastructure, regional nodes will be asked to coordinate that within their networks.

Scaling through NNME LCMS Content Architecture

Central to NNME's curriculum strategy is its Learning Content Management System (LCMS) that allows digital resource management. This framework enables the NNME to function as a national clearinghouse for semiconductor instructional content while maintaining:

- **Version control and content integrity** across regions and partners
- **Reusable learning objects** that can be assembled, reassembled, and adapted into multiple training contexts for various learning outcomes
- **Content metadata tagging** (e.g., target audience, outcome-alignment, occupation, skill level, delivery mode, etc.)
- **Authoring and collaboration tools** to support multi-institutional content creation and review
- **API integration with third-party LMS systems**, allowing instructors to easily port learning materials into their respective institutions' LMS systems

This LCMS ensures that the NNME's resources are not only high-quality, but structured for long-term use, portability, and institutional adoption at scale. It will also allow NNME to maintain a living library of evolving resources that reflect ongoing changes in technology, industry needs, and learner engagement strategies.

The NNME LCMS will also provide the opportunity to support faculty development through housing:

Faculty-facing toolkits for curriculum integration, program alignment, and instructional best practices

- **Peer learning networks** for instructors working with shared curriculum packages or within similar occupational domains
- **Community component** allowing technical assistance to institutions adopting new curriculum, including guidance on articulation, credit conversion, and program design

Long-Term Goals and National Impact

By the conclusion of the six-year strategic horizon, the NNME will have:

- Industry-defined learning outcomes that drive the modernization and alignment of curriculum
- Enabled adoption of modernized curriculum in 200+ training institutions
- Launched a LCMS digital clearinghouse with thousands of downloadable and interoperable learning assets
- Facilitated widespread adoption of alternative learning tools for students, including simulation-enhanced training using SMART USA tools
- Created a durable ecosystem of institutions, instructors, and employers capable of maintaining relevance and responsiveness over time

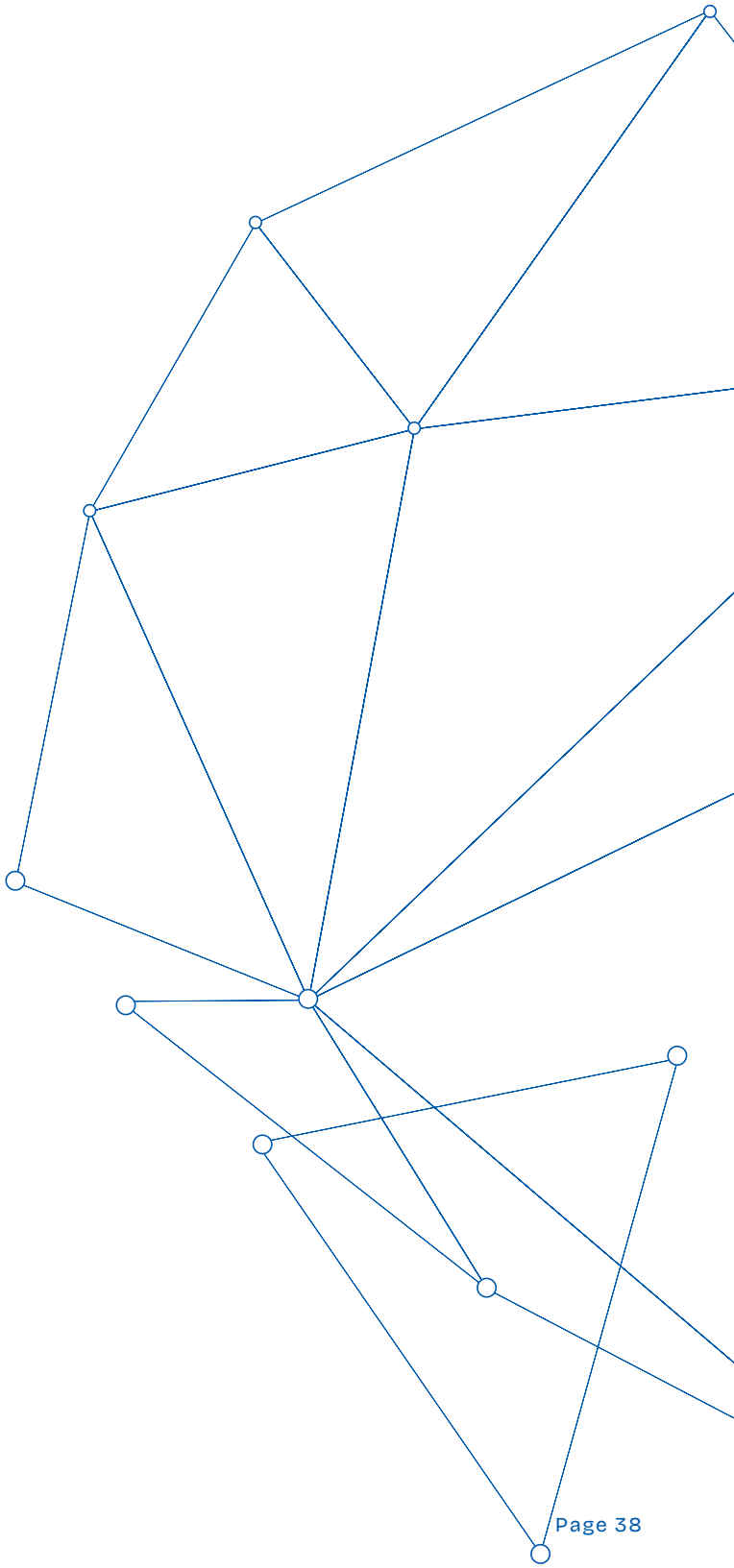
This system will not end with the initial federal investment. It will serve as a permanent national training infrastructure, owned and governed by trusted institutions, sustained by diverse funding, and positioned to adapt as the semiconductor industry continues to evolve.

Digital Infrastructure and National Clearinghouse

Digital Infrastructure and National Clearinghouse

As the central coordinating Hub of a national workforce initiative, the NNME must operate with a digital infrastructure capable of serving learners, educators, employers, Regional Nodes, and federal partners, efficiently, equitably, and at scale. The NNME platform is being developed to fulfill this role, combining the functionality of a Learning Content Management System (LCMS) with a national curriculum and learning resource clearinghouse, a career navigation and job-matching system, and a real-time performance analytics engine.

This infrastructure will not only support national delivery of curriculum and learning resources - it will also actively enable innovation in instructional practice, educator support, and regional system-building. It is designed to create a seamless interface between national strategy and local implementation - ensuring that resources are not just accessible, but actionable.



Strategic Purpose and Capabilities

The NNME platform will serve as a unified system that enables:

Curriculum Management and Sharing (LCMS Functionality)

Built to serve a broad audience of educators, the LCMS system will allow the NNME to:

- Develop and distribute modular learning content with version control and standardized metadata
- Support co-authorship and multi-institutional curriculum collaboration
- Tag resources to curriculum, competencies, and occupational roles
- Update content across the network in real time to reflect changing technologies or standards

This foundation ensures that training content is both technically robust and pedagogically adaptable, empowering educators and institutions to use, remix, and refine materials for their learners.

National Curriculum and Learning Resource Clearinghouse

The clearinghouse will serve as the official library of:

- Curriculum and learning resources aligned to nationally validated competencies and learner outcome frameworks
- Credential guides, instructional rubrics, and adoption toolkits
- Templates for program design, course articulation, and employer-aligned learning pathways
- Case studies, peer-contributed resources, and implementation success stories

Critically, this clearinghouse will also house a robust set of educator resources focused on applied learning and career-connected instruction. These include:

- Project-based learning modules, simulations, and classroom challenges designed to bridge advanced technical concepts to real-world application
- Career awareness toolkits, including industry case studies, employer video content, and interactive guides for high school and postsecondary faculty
- Templates and guides for experiential learning, including job shadowing frameworks, site visit planning tools, and industry engagement playbooks

This approach ensures that educators have everything they need to deliver engaging, hands-on learning experiences that not only build technical competence, but spark curiosity and expand awareness of career possibilities in the semiconductor field. The NNME curriculum platform is a structure that will build internal and educator capacity to deliver these learning experiences, making strong and engaging current semiconductor content accessible and scalable for NNME partners.

Learner and Employer Engagement Tools

Beyond content delivery, the platform includes a learner-facing experience designed to support:

- Skills assessments and personalized training recommendations
- Exploration of microelectronics career pathways and learning options
- AI-enabled job matching based on verified credentials and user profiles
- Resume and application tools to support transitions into employment

Employers will have access to:

- Skills-based candidate matching dashboards
- Hiring pipeline tracking and performance analytics
- Tools to define in-demand roles, preferred credentials, and regional workforce

Needs

These features will not only enhance labor market efficiency, but also ensure that the curriculum and learning delivered through the NNME system connect directly to real hiring demand.

Data Architecture and Salesforce Integration

The NNME platform will extend and integrate with the SEMI Foundation's existing Salesforce-based infrastructure, which already supports:

- Stakeholder relationship management
- Program tracking and partner engagement history
- Communications and convening logistics

This integration will enable:

- Unified learner records, learner tracking, and job outcomes data
- Regional Node dashboards with drill-down capabilities
- Real-time performance monitoring for use in NSF reporting and third-party Evaluation
- Secure, role-based access for partners, evaluators, and federal agencies

Over time, this infrastructure will support one of the most comprehensive data environments ever developed for the semiconductor workforce, enabling not just reporting, but strategic learning and system optimization.

Staffing and Capacity to Deliver

The NNME Hub is resourcing this effort with a focused, high-capacity team designed to build and manage the system for the long term.

Digital Systems & Data Manager (New Hire)

- Leads the technical architecture, Salesforce integration, and long-term platform

Evolution

- Designs the LCMS strategy, metadata taxonomy, and tagging model
- Manages access control, content review workflows, and governance policies

Data Integration & Platforms Specialist (New Hire)

- Supports backend system operation, user setup, and data uploads
- Maintains dashboards, builds reports, and monitors system performance
- Acts as primary support contact for educators, Node staff, and employer users

In addition, the NNME will leverage an existing in-house curriculum specialist, who will coordinate the validation, structuring, and instructional integration of industry input. This individual also liaises with curriculum developers and Regional Node faculty teams to ensure technical consistency and pedagogical effectiveness.

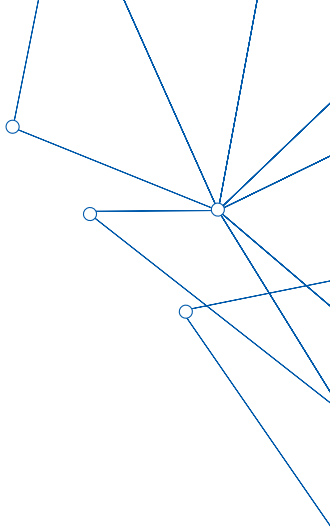
Together, this team forms the operational core of NNME's digital infrastructure, equipped to deliver and sustain a national platform that is both functional and transformative.

Future Alignment with CHIPS Ecosystem Initiatives (Exploratory)

The NNME platform is being intentionally designed to allow for potential future integration with related federal efforts. Although no formal arrangements have been made, potential alignments include:

- **WCoE:** Frameworks, recognitions, and KSAs developed by the Workforce Center of Excellence could be embedded directly into NNME's LCMS tagging and design systems.
- **SMART USA:** Simulation tools and digital twin-based instruction models developed through SMART USA's Digital Innovation and Simulation Centers (DISCs) may be incorporated into curriculum packages within the clearinghouse.
- **Microelectronics Commons:** Technician training curricula aligned to Commons- affiliated lab environments and prototyping pathways could be hosted in the NNME clearinghouse and featured in career navigation pathways.

While these integrations remain prospective, the NNME platform's architecture ensures that such collaboration can proceed efficiently if and when the opportunity arises, without disrupting existing operations or compromising quality.



Long-Term Vision

NNME's digital infrastructure is being built not only to deliver content and curriculum, but to enable a more intelligent, agile, and learner-centered national workforce system. Over time, this platform will:

- Ensure that every faculty member in the country can access high-quality, vetted instructional materials aligned to in-demand roles
- Support learners with intelligent, personalized tools that guide them from exploration to employment
- Empower employers to engage directly in the workforce system, shaping curriculum, finding talent, and analyzing outcomes
- Provide the federal government and other funders with real-time insight into what's working, where gaps exist, and how strategy needs to evolve

Above all, the NNME platform will make national workforce investment visible, usable, and valuable to the institutions and individuals that make the system work.

Increasing Awareness of Semiconductor Career Pathways

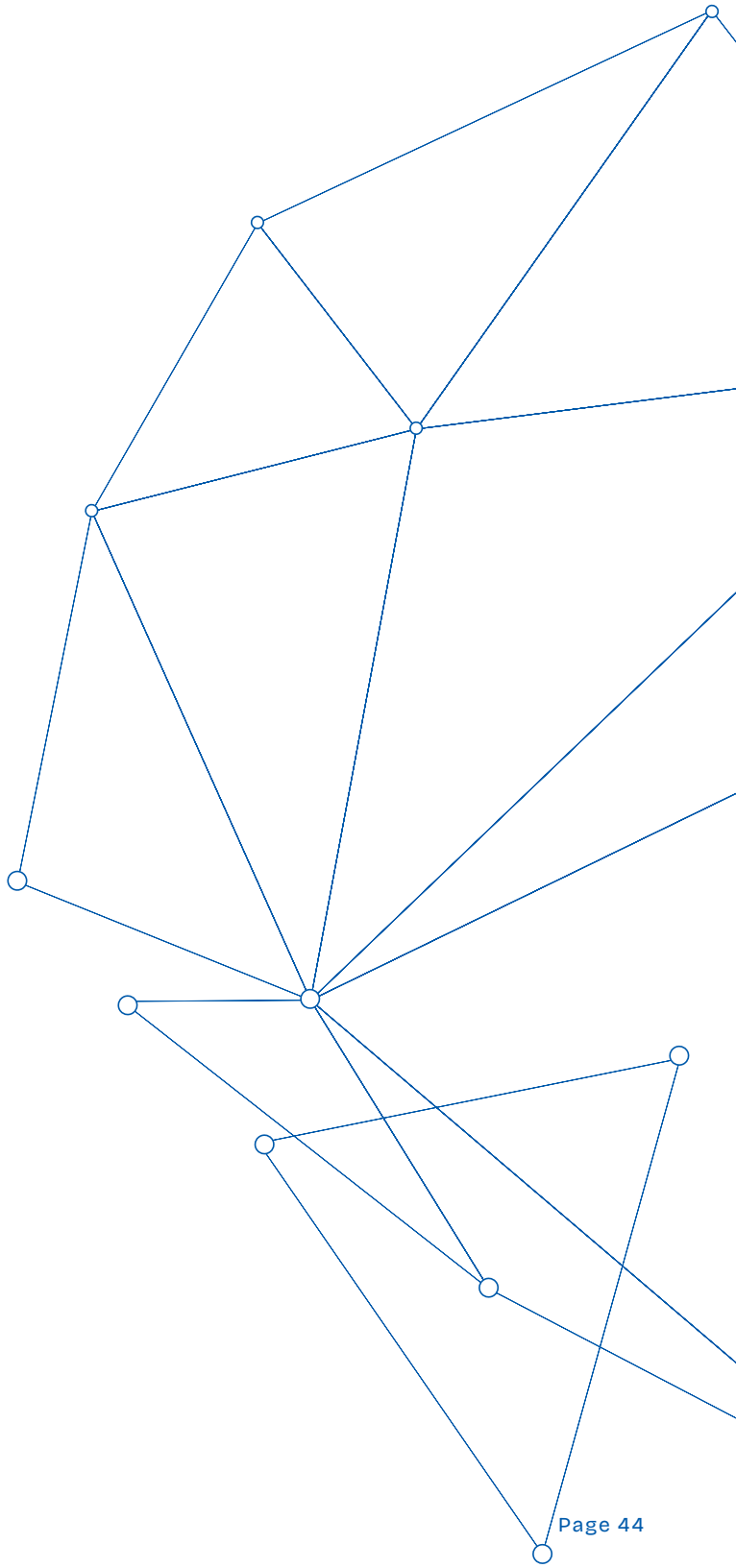
Increasing Awareness of Semiconductor Career Pathways

Industry awareness is a critical function of the NNME. Although semiconductors are essential in virtually all technology that make our modern lives possible, the hardware that enables these technologies are largely invisible – and so are the careers within the industry. The NNME will support a national industry awareness campaign that illuminates the critical nature of semiconductors to our modern society, the exciting, fulfilling, varied and family-sustaining jobs within the industry, and the enormous positive impact people can make on the world by joining its workforce.

The NNME's audience includes a wide array of potential workers, including veterans, people returning to work after an absence, people interested in upskilling or reskilling, and any American who would benefit from these stable, well-paid jobs. However, given the significant investments in chip manufacturing that will result in numerous new fabs in the coming years, a particular focus of the NNME is on today's K-12 students who will be tomorrow's workforce.

The NNME has many tools to employ for this work. The foundation of the industry and career awareness campaign includes the extensive, high-quality assets of the SEMI Foundation, with new assets currently in development. The Regional Nodes will also develop and share assets. The most effective and promising programs and initiatives will be woven together with a powerful media campaign to drive industry awareness nationwide, and illuminate clear pathways to education, training, and careers. Regional Nodes will be encouraged to bring their proven regional awareness practices to national conversations, while also being armed with templated activities from the Hub that can help accelerate program adoption.

The SEMI Foundation recently invested in a Marketing Strategy with the NNME in mind. The NNME will adapt that strategy's innovative ideas and frameworks to ensure the campaign has the capacity to reach all Americans and to provide continuous engagement. Excerpts from the Marketing Strategy are attached as **Addendum 3.**



Representative current NNME Industry Awareness Assets and Programs

More information on each of these can be found in **Addendum 4.**

SEMI Stories: interactive video events featuring industry professionals shown in high school districts across the U.S. reaching 4+ million students annually

SEMI's High-Tech U: kit-based learning that introduce students to the industry through hands-on projects. Educators are provided appropriate and flexible curriculum to implement the projects.

Career Exploration Website (careers.semi.org): site to expose job seekers, students, members of the military to learn about various careers and map out their career roadmap. Interest and Skills assessments and connection to National Labor Exchange job boards. This website will be expanded greatly under NNME

SEMI VetWorks: military engagement events at military installations, toolkits for employers to build or expand their military recruitment programs, resume sharing

Semiconductor Days: events held on college/university campuses with "Day in the Life" presentations, flash mentoring, resume reviews and opportunities to meet one on one with employers

K-12 Events: from teacher trainings to documentary viewings to tabling activities, the NNME Hub will have sample programs and activities from previous events that SEMI Foundation has implemented with partners

"Chip In": PBS documentary series created by RoadTrip Nation follows three young students as they travel around the country, interviewing people of all walks of life in the industry, and what they learn about themselves.

Social Media Channels: LinkedIn, Facebook, Instagram, and others being explored to leverage in our marketing campaigns to reach students and job seekers wherever they are in their career journey

Representative future NNME Industry Awareness Assets and Programs

More information on each of these can be found as attachments to this document.

Chips in Motion Mobile Semiconductor Exhibit: Chips in Motion is a digital-first, data-driven industry awareness initiative designed to spark interest in the semiconductor industry. It is fun, relatable, scalable, and modern, delivered in ways that are mobile, immersive and highly engaging. Housed in a retrofitted 53- foot semi-trailer, this 1000-square-foot traveling exhibit connects students and communities with the technology that powers our world. It will be on the road 40 weeks annually across the U.S. See **Addendum 5.**

SEMIQuest Experience and Pop-Up Exhibition: SEMIQuest Experience (Oct 7–8, 2025) is a hands-on career exploration event for students, educators, and industry, featuring workshops, industry engagement, and a field trip to SEMICON West. Running concurrently, the Pop-Up Exhibition (Sept–Dec 2025) will showcase semiconductor innovations through interactive displays, mock cleanrooms, and local industry highlights, engaging the public across Arizona and beyond. These pilot programs are designed to scale and can be implemented in each Node. See **Addendum 6.**

Addenda

Regional Node Performance Assessment: Jobs For the Future

This framework is structured around eight domains of performance, each with clear criteria, indicators, and potential data sources. It integrates the following:

- Collective impact principles grounded in work by FSG[1]
- A JFF scaling framework for practice change informed by theory and practice[2]
- NSF's expected outcomes for nodes from the RFP[3]
- SEMI's Year 1–6 performance metrics[4]

Domain 1: Strategic Alwignment & Common Agenda

Key Question: Is the node advancing a shared vision in coordination with the Hub?

Indicators:

- Co-developed goals and plans with Hub and partners
- Alignment with CHIPS Act and NNME mission
- Contribution to shared strategies across regional stakeholders

Evidence Sources: Strategic plans, meeting records, joint activities, quarterly report

Scoring: 1 (Disconnected) → 4 (Fully aligned and co-creating)

Domain 2: Participation in Shared Measurement Systems

Key Question: Is the node consistently collecting and sharing data aligned with NNME metrics?

Indicators:

- Adoption of common indicators (e.g., # of learners served, credentials earned)
- Timeliness and completeness of reporting
- Use of data for continuous improvement

Evidence Sources: Quarterly reports, platform analytics, evaluation dashboards

Scoring: 1 (No shared metrics) → 4 (Leads with real-time data use)

Domain 3: Implementation of Mutually Reinforcing Activities

Key Question: Is the node delivering and coordinating activities aligned with NNME pillars – network engagement, curriculum and pathways, broadening participation?

Indicators:

- Access to microelectronics infrastructure
- Curriculum and training module delivery
- Work-based learning facilitation
- K-12 outreach and wraparound services

Evidence Sources: Program rosters, module use data, work-based learning placement logs, quarterly reports

Scoring: 1 (Isolated activities) → 4 (Integrated, coordinated programming)

1 Informed by the five core conditions of collective impact as articulated by Kania & Kramer, 2011 - https://ssir.org/articles/entry/collective_impact
2 JFF Assessment Framework for Scaling Practice Change (Appendix B)
3 NSF NNME RFP -https://sam.gov/api/prod/opps/v3/opportunities/resources/files/71e3e2f81bdb4bbfb9dd884797fbe649/download?&status=archived&t oken=
4 Data framework based on proposal KPIs (Appendix A)

Domain 4: Scaling Practice Change

Sub-Dimensions (from scaling framework):

- Spread: Number of programs, learners, partners reached
- Depth: Integration into institutional policies/ practices
- Ownership: Node-led leadership, resource contributions
- Evolution: Adaptations to local needs, continuous improvement

Sustainability: Planning for long-term resourcing

Evidence Sources: Annual implementation review, surveys/ interviews, internal strategy memos

Scoring: 1 (Shallow/short-term) → 4 (Deep/institutionalized)

Domain 5: Opportunity Provision

Key Question: Is the node advancing access and representation ensuring that all groups are included?

Indicators:

- % increase in learners from all backgrounds with particular attention to partnerships with MSIs, HBCUs, CBOs
- Accessibility supports (e.g., childcare, transportation, translation)

Evidence Sources: Participant data, partnership MOUs, opportunity engagement plans, quarterly reports

Scoring: 1 (Minimal opportunity lens) → 4 (Opportunity embedded throughout)

Domain 6: Communication & Stakeholder Engagement

Key Question: How does the node build trust, communicate progress, and foster collaboration?

Indicators:

- Frequency and quality of communication with Hub and local partners
- Participation in NNME-wide convenings, CoPs
- Stakeholder satisfaction with communication and responsiveness

Evidence Sources: Communications logs, surveys, CoP attendance records

Scoring: 1 (Fragmented) → 4 (Transparent, trust-based)

Domain 7: Adaptative Leadership & Innovation

Key Question: Is the Node demonstrating a willingness to test, adapt, and model new approaches in response to data, opportunities, and emerging needs of partners?

- Evidence of piloting new strategies, models, or technologies aligned with NNME goals
- Iterative use of data and stakeholder feedback to inform mid-course corrections
- Engagement in sensemaking and scenario planning with Hub and regional partners
- Documented innovations that are shared and/or scaled across the network

Evidence Sources: Pilot project documentation, meeting minutes reflecting adaptive decisions, revised implementation plans, innovation showcase participation, peer learning spotlights, qualitative data from partner interviews, surveys and narrative reports

Scoring: 1 (Static – rarely test new ideas) → 3 (Proactive – regularly integrates new learning and alternative approaches) → 4 (Leader - Node leads with testing, co-design, and field-wide sharing of new practices)

Domain 8: Performance & Outcomes (NSF-Aligned KPIs)

Key Metrics (Year 1 – Year 6): Examples include:

- of active states, programs, and regional partners
- of individuals earning credentials
- Media mentions, digital content dissemination
- Youth and adult learner engagement especially from target groups

Scoring: Benchmark-based progress toward targets

Reporting Template

- Each node would be expected to submit:
- A narrative report addressing domains 1–6 (quarterly)
- A data table aligned with SEMI/NSF KPIs (domain 7) (quarterly)
- Evidence artifacts: curriculum materials, MOU copies, portal analytics, project plans, meeting notes, etc.
- Self-assessment rating and reflections per domain

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