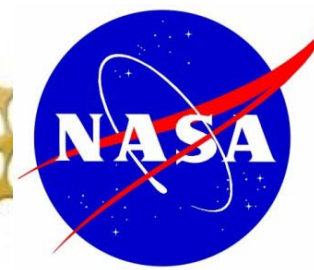


NAMII Priority Applied Research Needs

04 December 2012

A Pilot Institute for the National Network for Manufacturing Innovation (NNMI)

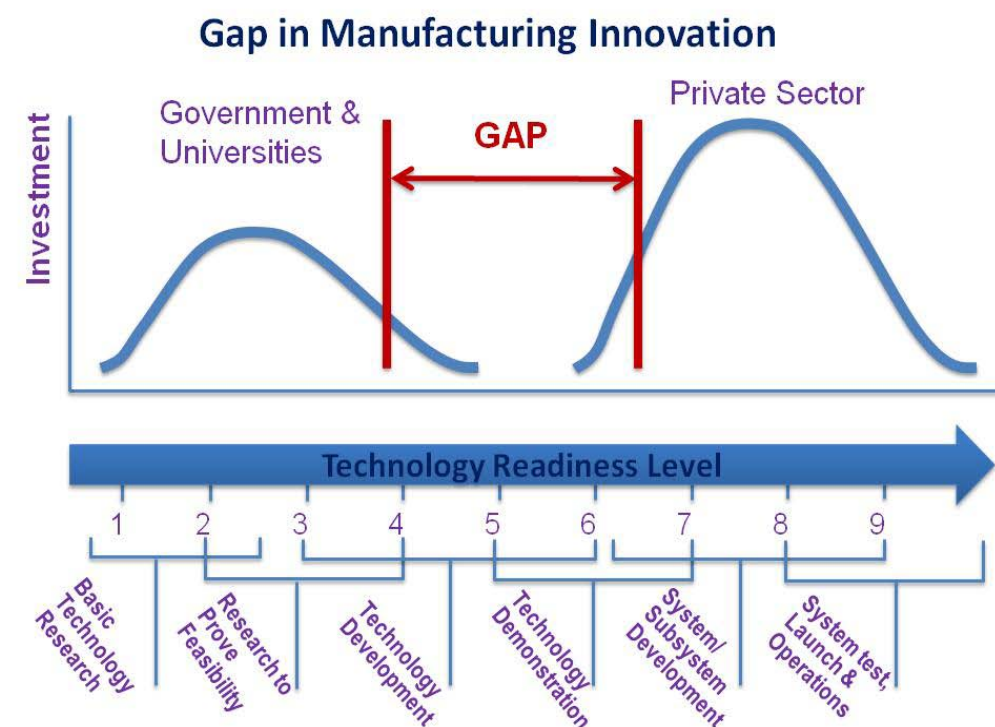
Gary Fleegle
NCDMM – Vice President & COO
NAMII – Acting Deputy Director
Technology Development
Gary.Fleegle@ncdmm.org



- *A Defense-wide Manufacturing S&T team-led, Multi-agency collaboration between industry, government and universities*
- *Public-private partnership*



- Shared facilities open to industry
 - Especially attractive to small businesses
- Enabling technology transition and commercialization
- Addressing Technology Readiness Level (TRL) / Manufacturing Readiness Level (MRL) 4-7
 - Bridge the gap in Manufacturing Innovation
- Educational plan to train the future workforce
- Sustainable within 3 years



A Model for Manufacturing Innovation Institutes within NNMI

Education Sector

Research universities
Community colleges
Secondary schools

Private Sector “Voice of the Customer”

Large Industry
Small Businesses
Entrepreneurs

Public Sector

Federal agencies
National labs
States

Innovators:

- Full time applied researchers
- Faculty/students in residence
- Engineers
- Entrepreneurs

Shared Infrastructure:

- Additive Mfg Equipment
- Design & Simulation
- Part Testing
- Demonstration

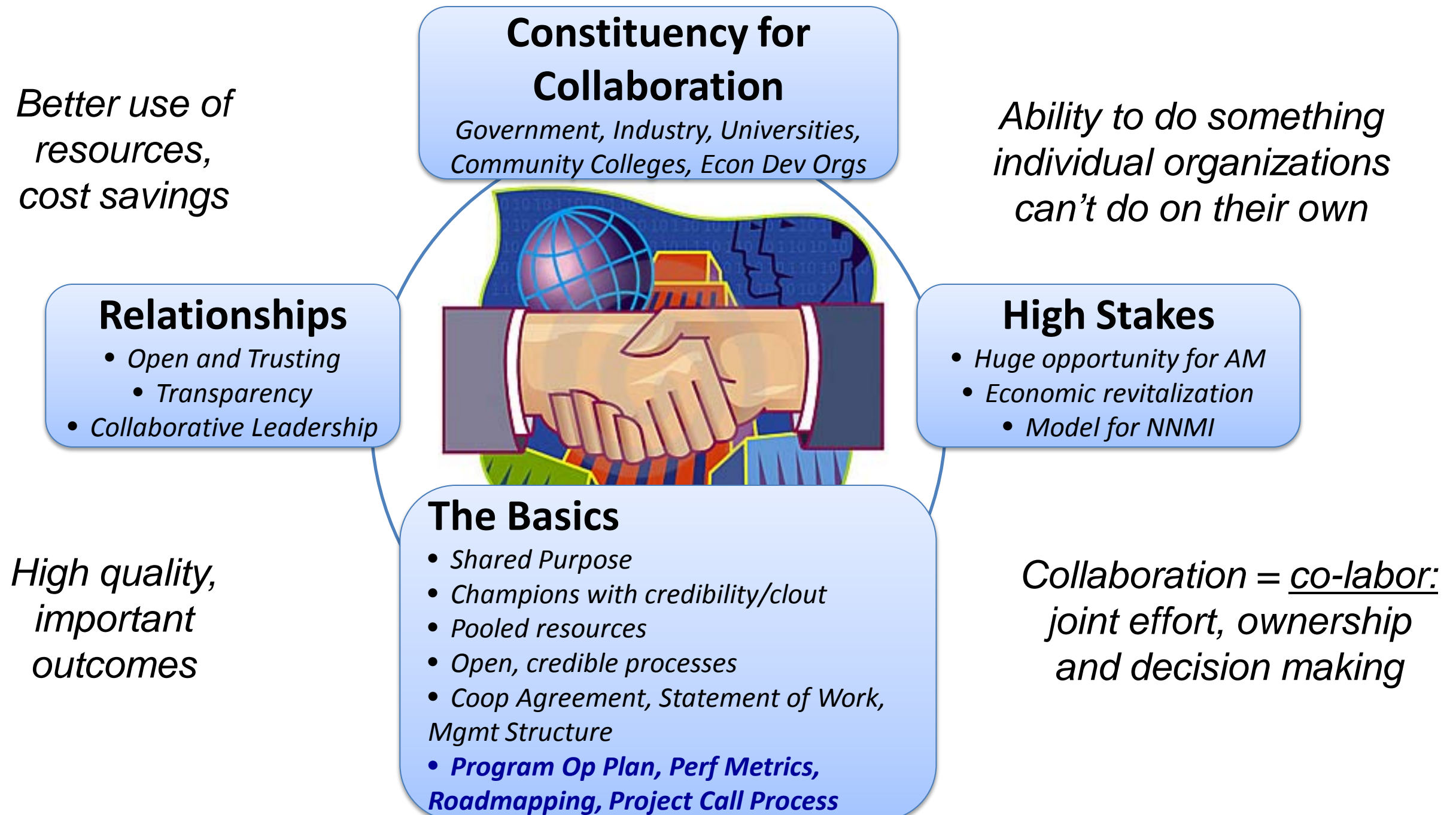
Links:

- Manufacturing Extension Partnerships
- Other Mfg Innovation Institutes
- International community

Widespread Adoption
of Additive
Manufacturing and
Greater Economic
Competitiveness

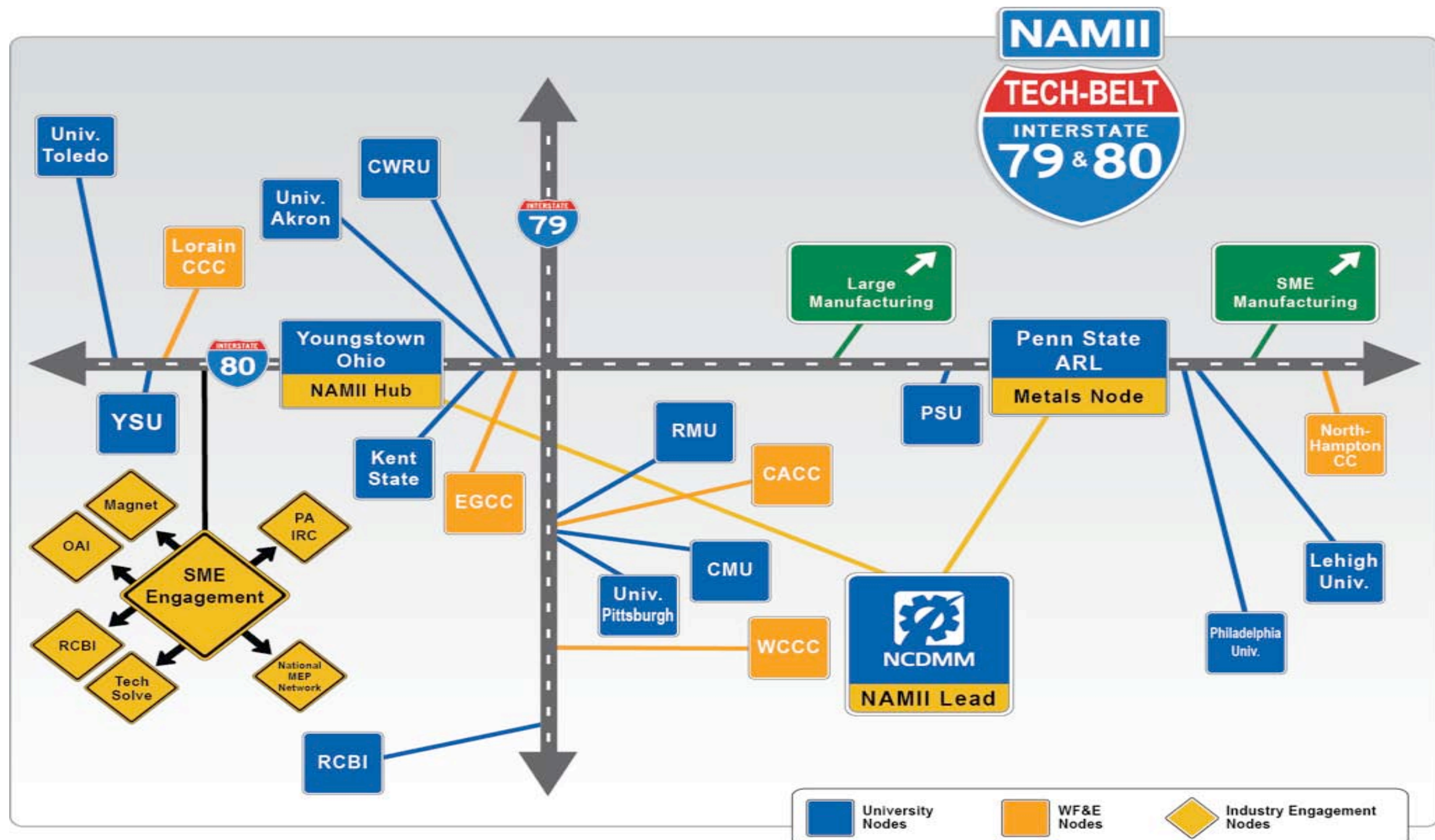
- New and better products and manufacturing technologies
- Spin-off Companies
- Highly Skilled Workforce

Aspects of a Good Public-Private Partnership and a Framework for Success*

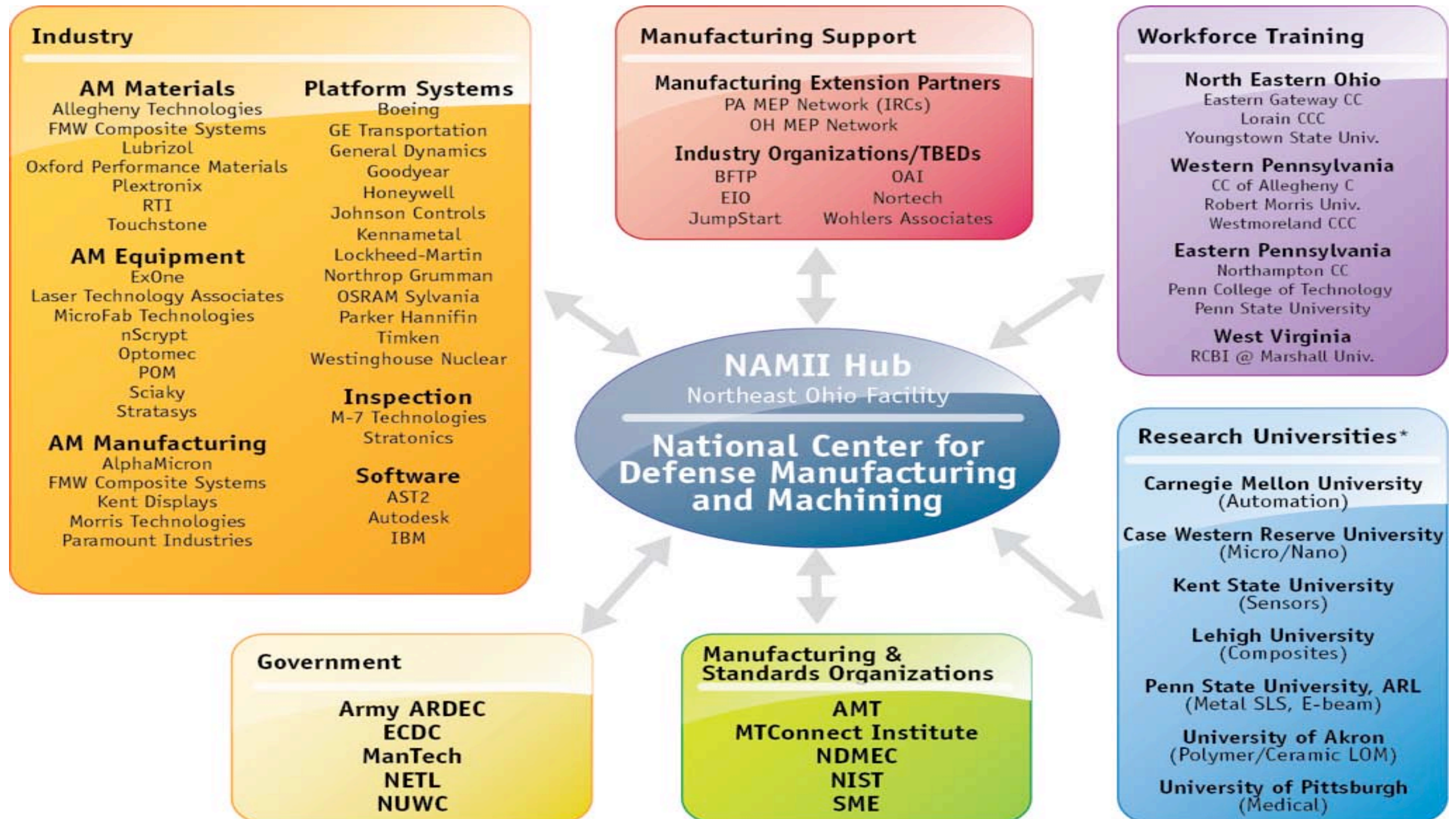


* Working Across Boundaries: Making Collaboration Work in Government and Non-profit Organizations (R. Linden, 2002)

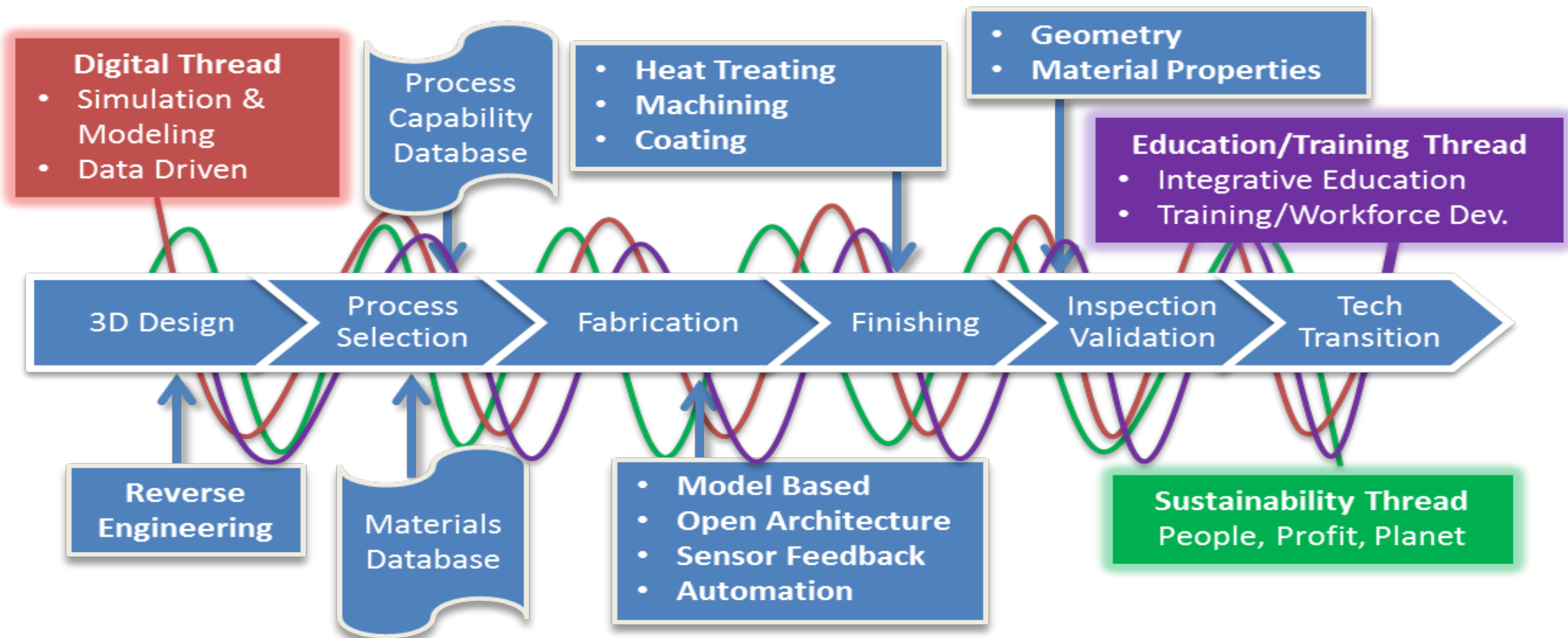
A REGIONAL Center of Excellence, with a vision for NATIONAL PRESENCE



NAMII Initial Partners

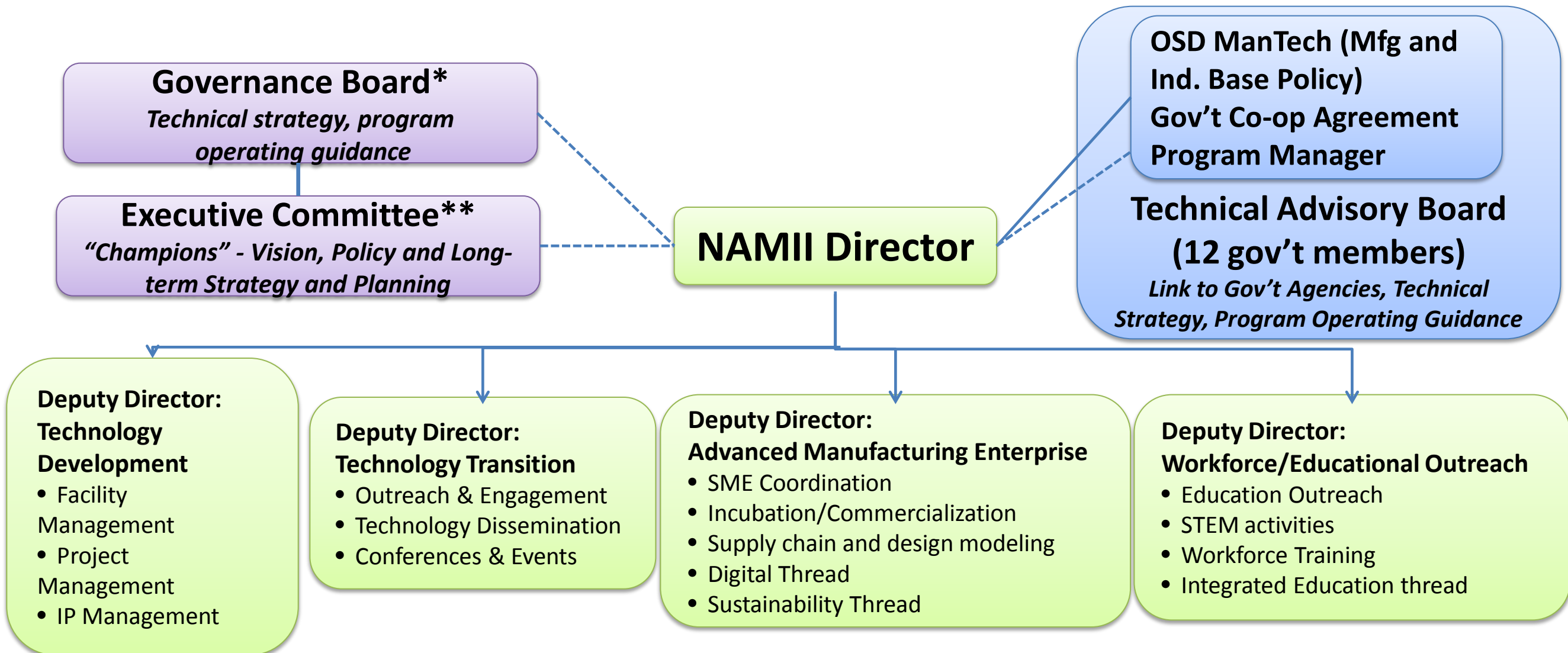


Strong, Holistic, Integrated Technology Plan



- Process development: metals, polymers, ceramics, electronics, hybrid
- Digital thread / AME
- Specialized, portable AM systems
- Open Architecture
- Process planning
- Process Control
- Material Development
- Component Design

NAMII Governance – *Shared Leadership*



***Governance Board:** All 1st and 2nd Tier Members, small business members, MEPs & Econ Development Groups, States Ex-officio

****Executive Committee:** Elected by Governance Board & Tech Advisory Board, 1 year rotating positions

Executive Committee

- Jim Williams, 3D Systems
- Eric Barnes, Northrop Grumman
- Gary Fedder, Carnegie Mellon University
- Jim McGuffin-Cawley, Case Western Reserve University
- Tim Shinbara, Association for Manufacturing Technology
- Mark Tomlinson, Society of Manufacturing Engineers
- Bill Macy, Stratasys
- Tom Stimson, The Timken Company
- John Russell, Air Force Research Laboratory, (DMS&T Program Manager)
- Rob Ivester, Department of Energy
- Bruce Kramer, National Science Foundation

Leveraging America's VOICe



- Establishing Additive Manufacturing EcoSystem
- Developed AM Ontology
- **Cataloging member capabilities in company profiles**
- Capability search
- Opportunity posting and sourcing
- Virtual collaboration & partnering

First Iteration Key Topics

- **Equipment Capability and Capacity**
- **Process Capability and Characterization**
- **Product Quality**
- **Materials Understanding and Performance**
- **Workforce Preparation and Readiness**
- **Qualification, and Certification**
- **Design and Engineering Toolset**
- **Outcome-Based Optimization of Product, Materials, and Processes**
- **Process Control**
- **Alliance of National Resources**
- **Modeling and Simulation**
- **Sustainability**
- **Standards and Specifications**
- **Affordability**
- **Extended Product and Materials Applications**
- **Data Access**
- **Post Processing**
- **Additive Manufacturing Growth and Application**
- **New, Better, and Available Materials**
- **Capabilities Integration and Management**

Project Call #1 Topic Areas

- **Qualification & Certification**
 - Rapid qualification and certification methods
 - Leverage modeling and simulation
 - Quantification of process variability
 - Variability reduction to increase reliability, process optimization, rate increases
 - Certification of suppliers

NAMII project efforts focus on TRL/MRL 4-7 *Not Basic Research*

Project Call #1 Topic Areas

- **Materials Understanding and Performance**
 - Materials database designs
 - Design allowable properties for materials
 - Data access and sharing
 - Materials variability and management
 - Material requirements/gaps identification

NAMII project efforts focus on TRL/MRL 4-7 *Not Basic Research*

Project Call #1 Topic Areas

- **Process Capability and Characterization**
 - Process repeatability and throughput improvement
 - Develop algorithms for modeling expected outcomes
 - Improved part quality
 - In-situ adaptive control systems

NAMII project efforts focus on TRL/MRL 4-7 *Not Basic Research*

Project Call Key Criteria

- Project Lead must be NAMII Consortium Member
- Project teams – SME involvement stressed
- Diverse team expertise (technical, business development, education)
- 50/50 Cost share
- Strong technical approach
- Sound transition plan
- Advanced Mfg. Enterprise & Workforce/Education elements
- Reasonableness and realism of the proposed cost, proposed cost share, and schedule

NAMII Project Call #1

Key Dates:

- Request for Proposal Launched: November 27, 2013
- Proposal due date: January 31, 2013
- Proposals reviewed: February 2013
- Announcement and awards: March 2013

More info at: namii.org/projects

Membership is Open

- **Lead Member***

More info at: namii.org

- A seat on the NAMII Governance Board
- Royalty free non-exclusive rights for commercial development for all NAMII IP
- Ability to embed one Lead Member employee into the NAMII facility free
- Supporting Membership for SME supplier of the Lead Member's choice

- **Full Member***

- A seat on the NAMII Governance Board
- Ability to embed Full Member employees into the NAMII facility after paying an additional overhead fee per employee
- Non-royalty free Non-exclusive rights for commercial development for all NAMII IP

- **Supporting Member***

- Ability to schedule R&D and first-article production access of the NAMII infrastructure on a fee-for-service basis at the time of use

*** Sampling of Member Benefits**

Summary

- NAMII shows an unprecedented level of collaboration on manufacturing technology across government, industry and universities
- Huge opportunity and high stakes
- Establishing the framework for continued success
- Capturing Best Practices and Lessons Learned
 - Model for the NNMI



driven by

