Mitch Horowitz
Vice President & Managing Director
Battelle Technology Partnership Practice

Commission on Connecticut's Future: *Best Practices in Economic Development and Connecticut's Position*

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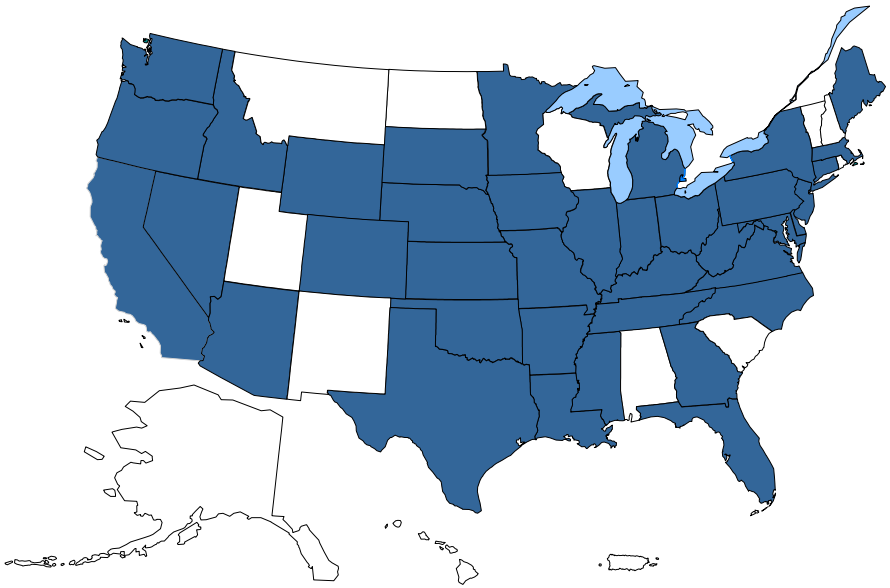
A Word on Battelle's Technology Partnership Practice

Battelle TPP is the economic development consulting arm of the world's largest independent, non-profit research and development organization.

Demonstrated track record of translating industry strengths into development strategies and initiatives

Broad breadth – TPP projects across the nation over the past 10 years



Examples of State Level Projects

- Ohio Third Frontier
- Georgia Research Alliance's Strategies in Life Sciences & Information Technology
- Arizona's Biosciences Roadmap
- Pennsylvania Ben Franklin Partners Commercialization Roadmap
- Iowa's Cluster Strategies … Life Sciences, Adv. Mfg., Information Technology
- Massachusetts Technology Roadmap
- Connecticut IT Workforce, Connecticut Career Choices, Nanotechnology & Core Competency Assessment, UConn Industry Partnerships

Today's Discussion

- ***The Context and Best Practices for 21st Century Economic Development***
- ***Where Connecticut is Positioned for Economic Growth***
- ***Implications for Economic Renewal of Connecticut***
  - **Restoration and growth of manufacturing**
  - **Diversification/Conversion of defense-related industries**

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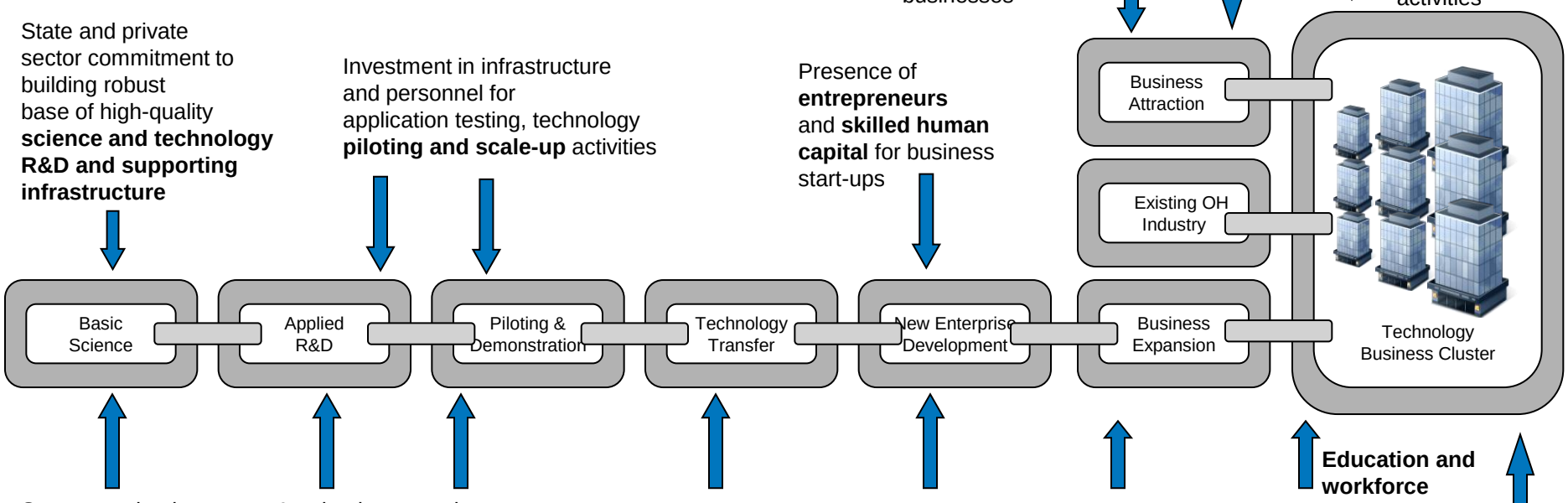
Practitioner's Lessons Learned on Growing High Performing Economy

- ***Lesson #1: What it takes to put industry cluster development into practice***
- ***Lesson #2: Importance of identifying your development niches within leading clusters***
- ***Lesson #3: Addressing development pillars … best practices:***
  - Innovation
  - Talent
  - Industry-University Partnerships

The Starting Point: Best Practice in Economic Development Focuses on Competitive Industry Clusters

- **Industry cluster development reflects the fact that the emergence and growth of businesses do not occur in isolation, but within the context of broader industry presence**
  - **A leading economist on industry cluster analysis, Dr. Edward Feser, explains: "*Binding a cluster together are buyer supplier relationships, or common technologies, common buyers or distribution channels, or common labor pools.*"**
- **Of key importance are those industry clusters involving primarily "traded sector" activities**
  - **Traded sector industries generate economic growth by bringing new income into a state**
  - **In contrast, sheltered industries – like retail and community services – are important for quality of life, but depend upon income already in the state**

Industry Cluster Development Requires Attention to Every Link in the Development Chain



State and private sector commitment to building robust base of high-quality **science and technology R&D and supporting infrastructure**

Investment in infrastructure and personnel for application testing, technology **piloting and scale-up** activities

Presence of **entrepreneurs** and **skilled human capital** for business start-ups

Commitment to **targeted recruitment** (domestic and international) of cluster businesses and supporting businesses

Integration of existing businesses into the cluster, and support for additional business growth from these enterprises

Facilitation and coordination of **networking** and cluster support activities

Strong academic research community able to attract **competitive external grant funding**

Academic research community and key partners committed to **translating discovery into application** and moving it towards commercialization

Financial and personnel commitment to intellectual property protection**, technology transfer and in-state commercialization**

Public and private sector risk capital for pre-seed, seed and venture funding rounds

Infrastructure and facilities to house science and technology-based new and expanding business enterprise

Education and workforce development to support cluster personnel needs

Generation of **positive government, regulatory and business climate** to meet competitive cluster needs

Lesson #2: New Realities Driving Global Competition Place A Greater Emphasis on Finding Your Niche

New Realities

- Global competition for all traded industries
- Education and Skills now globally competitive
- Rapid technological change
- Open Innovation as a development engine
- Sustainability, a growing imperative

Recognition that not all states are built alike and it is the differences that can best guide development strategies

Ohio Approach: Preliminary Results From Line of Sight Assessments

Step 1: Assess

RESULTS

Leading Industry Sectors

- Materials
- Aerospace
- Biomedical
- Energy
- Information Technology
- Instruments and Controls

Step 2: Identify

RESULTS

Potential Focus Areas

- Advanced Polymer Materials
- Composites and Ceramics
- Specialty Metals and Alloys
- Unmanned Systems
- Sensors
- Advanced Materials
- Propulsion Power Management
- Human Effectiveness
- Medical Imaging
- Molecular and Other In-Vitro Diagnostics
- Advanced Surgical Instruments and Equipment
- Implant Medical Devices
- Contract Research and Manufacturing Resource Services
- Drug Delivery and Development
- Regenerative Medicine
- Health Informatics and Logistics
- Solar Photovoltaics
- Wind Energy
- Smart Grids
- Biofuels and Biobased Energy
- Fuel Cells
- Energy Storage/Batteries
- Business Software and Enterprise Computing
- Test and Measurement
- Sensors
- Automation/Robotics
- Electronics/Embedded Systems

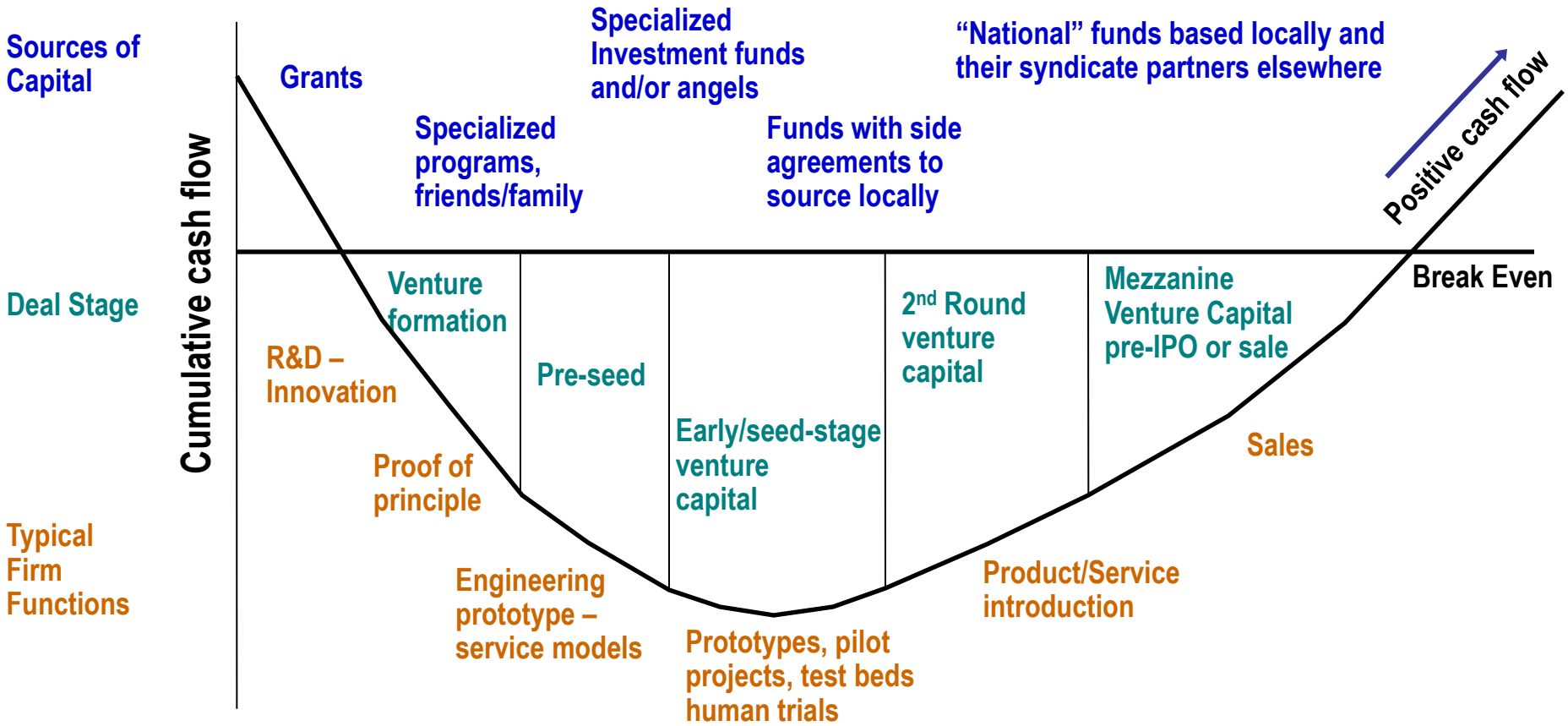
Step 3: Validate

RESULTS

Leading and Emerging Areas

- Advanced Materials
- Business Software and Enterprise Computing
- Energy Storage
- Fuel Cells
- Health Information Technology
- Medical Technology
- Propulsion Power Management
- Sensing and Automation Technologies
- Situational Awareness and Surveillance Systems
- Solar Photovoltaics

Lesson #3 – Best Practices in Innovation Address Valley of Death



2 yrs. for IT-comm. services… 5–7 yrs. for devices & equipment…yrs. for drugs

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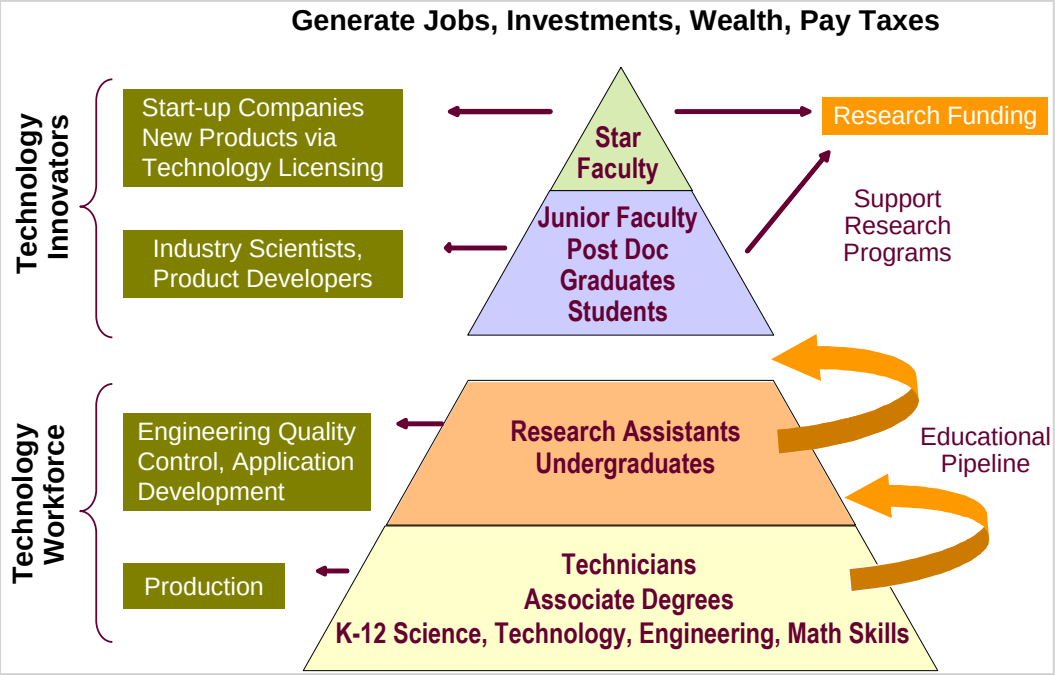
Lesson #3 Best Practice: Growing Importance of Industry-University Partnerships & the Role of Talent

Growing Importance of Universities

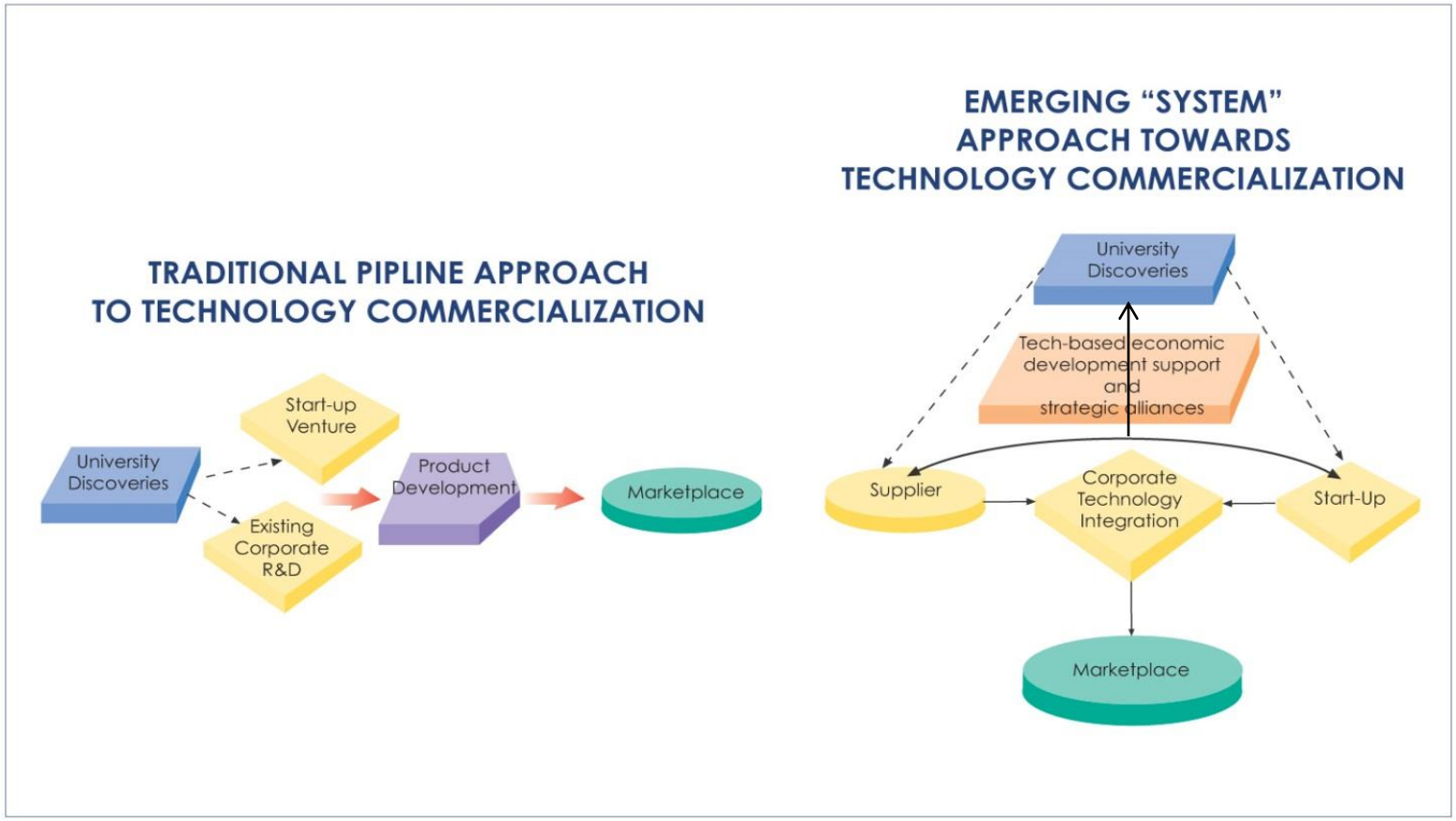
- Build research excellence in strategic areas of importance to the region/state/global economy
- Attract and retain world-class faculty
- Invest in physical infrastructure
- Link academic researchers with industry
- Capture IP developed within the university to create new companies, products and processes.

Leading edge research universities are doing all five of these approaches.

How Talent Connects Higher Education and Industry



How to Create More "Open Innovation" Approaches to Industry-University Collaborations



Big Impact Idea: *"How Can We Systematically Advance Industry-University Collaborations in the Era of Open Innovation?"*

Demand Side:
Market Pull

Alignment to Advance "Line of Sight" to Market Opportunities

Supply Side:
Technology Push

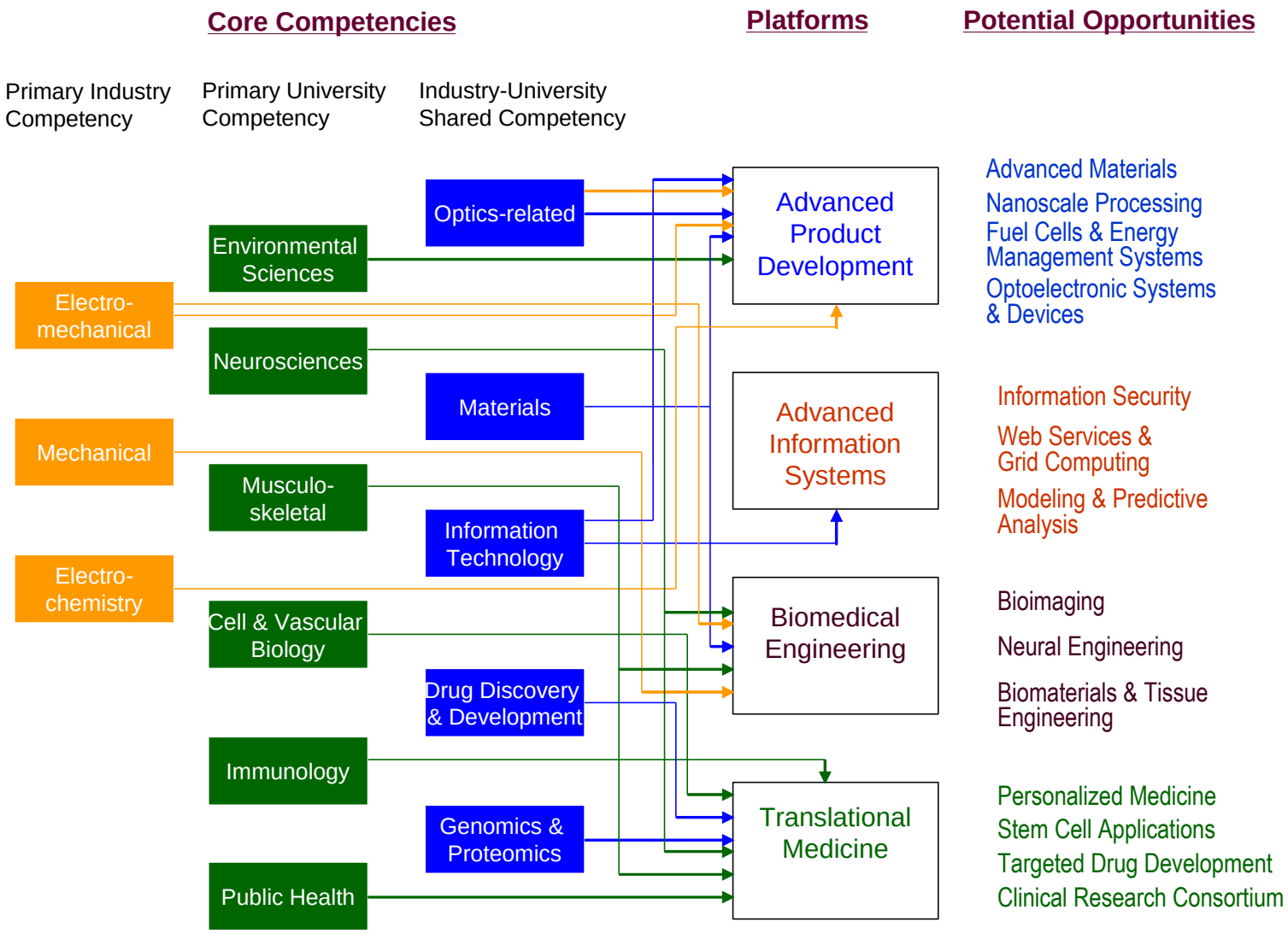
Identify the industry requirements in targeted areas from university assets (research, talent, facilities, connecting activities)

Promote areas of alignment that feature more holistic approach to engaging industry and universities ***as each market opportunity requires*** across:

- Use-Inspired Research
- Commercialization
- Shared Use Facilities
- Talent Development

Identify the university assets that align with industry requirements in targeted areas

Detailed Mid-2000s Connecticut Core Competency Assessment



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Implications for Manufacturing in Connecticut's Future?

- **Many of Connecticut's economic growth opportunities remain in advanced manufacturing technologies**
- **While often overlooked the challenge of innovation for advanced manufacturing is critical**
  - As the *National Strategic Plan for Advanced Manufacturing* explains: ***"The acceleration of innovation for advanced manufacturing requires bridging a number of gaps in the present U.S. innovation system, particularly the gap between research and development activities and the deployment of technological innovation in domestic production of goods."***
- **Commercialization pathways for advanced manufacturing differs substantially from biotech and IT**
  - Not the same access to venture capital
  - More capital intensive
  - Open innovation models are critical
- **Talent is also a challenge**
  - Lack of technicians and engineers a national challenge
  - Graying of CT's workforce calls for major push for engaging youth/recent grads
  - But quality careers found in advanced manufacturing in Connecticut is a key advantage
  - Look to major campaign and incentives for workers

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Implications for Diversification in Connecticut's Future?

- **Many of the core defense-related competencies have commercial applications**
- **Key question is how to assist SMEs to reposition their competencies** – look to experience from past federal TRP effort in early 1990s
- Larger OEMs are more capable of making shifts to commercial markets ... but some incentives for diversification might be helpful.
- **Yet, must realize the *key technology innovation advantages* of maintaining presence in defense-related activities** – often "first mover" on advanced technologies and a source of R&D funding, especially for advanced manufacturing.

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Thank you ... Questions?

Mitch Horowitz
VP & Managing Director
Technology Partnership Practice
Battelle
240.462.5456
horowitzm@battelle.org

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