



# **“Tech Transfer and Commercialization Strategies Contributing to U.S. Clusters”**

## **An Assessment of the Promise of Technology Related Growth**

**Chicago Federal Reserve, 26 April 2005**

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# **IA Tech Transfer Strategies Contributing to Clusters**

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## **Clusters in Emerging S&T Fields Have Grown in Numerous U.S. Cities**

- ❖ Information Technology/Software
  - Pittsburgh
  - Atlanta
  
- ❖ Biotechnology/Pharmaceuticals
  - San Diego
  - Research Triangle
  - Pittsburgh
  - St. Louis



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## **Universities Often Provide a Research Base Upon Which Clusters Are Built**

- ❖ Pittsburgh -- Univ. of Pittsburgh & Carnegie Mellon Univ.
- ❖ Atlanta -- Georgia Inst. of Tech, Emory Univ. & Georgia State Univ.
- ❖ San Diego -- University of California, San Diego
- ❖ Research Triangle -- Univ. of North Carolina
- ❖ St. Louis -- Washington Univ. & Univ. of MO, St. Louis



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## **How do Universities Successfully Transfer and Commercialize Technologies that Lead to Economic Development?**

- ❖ University technology transfer is a complex process. It operates as part of the university's internal culture and environment and as part of the external environment in the community and state.
- ❖ Internally, the "culture" of a university is one of the strongest and most pervasive influences on its technology transfer and commercialization performance. This includes incentives, rewards, and leadership from Presidents/Chancellors. Examples include UCSD, MIT, UPenn and Washington University.



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## **How do Universities Successfully Transfer and Commercialize Technologies that Lead to Economic Development?**

- ❖ Successful universities in tech transfer often receive a greater share of federal research dollars, particularly from DOD and NIH. This can result from analysis and strategic targeting of core competencies. Examples include MIT, Stanford & CMU.
- ❖ Successful universities often facilitate access to seed capital and management services to build capacity in start-ups. Examples include Georgia Tech's VentureLab, UCSD's CONNECT, and MIT's and Stanford's linkages to private VC's.



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## **How do Universities Successfully Transfer and Commercialize Technologies that Lead to Economic Development?**

- ❖ Incubators and research parks can help create an “entrepreneurial mystique”. Examples include Purdue Research Park, UWisc.-Madison University Research Park and Georgia Tech’s ATDC.
- ❖ Entrepreneurial programs such as business plan competitions, mentoring programs, CEOs-in-residence and practicum also are important in building the “entrepreneurial culture”. Examples include MIT’s Entrepreneurship Center and its \$50K Competition, Stanford’s Technology Venture Program, and Purdue’s Gateway Program.



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## **How Do Cities & States Leverage University Resources?**

- ❖ In most communities in which there is successful technology transfer and commercialization from universities, we see champions. Examples include San Diego and St. Louis.
- ❖ Coordinated strategic efforts aimed at increasing federal and state funding and building university-centered initiatives can be effective. Examples include San Diego and St. Louis.
- ❖ Private industries and foundations in some communities have played a major role in promoting and funding science and technology initiatives. Examples include Pittsburgh and St. Louis.



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## **How Do Cities & States Leverage University Resources?**

- ❖ In most communities where there are significant numbers of start-ups, private and/or public seed capital funds and often angel networks are present. Examples include private funds in Silicon Valley and Boston, and state “fund-to-funds” in Pittsburgh, St. Louis, and Central Indiana.
- ❖ Successful communities provide abundant opportunities for entrepreneurs to network with each other, investors, clients, and service providers. Technology councils and cluster groups often are central. Examples include Boston and San Diego.





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## How Do Cities & States Leverage University Resources?

- ❖ Innovation Centers that combine multiple components – collaborative R&D, technology “scouting”, seed capital, CEO’s-in-Residence, mentoring, networking, etc. – provide a central focus for university-based community activities. Examples include Pittsburgh’s Digital and Life Sciences Greenhouse.
- ❖ “Technology R Us” – Communities need to celebrate and publicize entrepreneurial successes to provide momentum and increase national visibility and credibility. Examples include San Diego and Philadelphia.

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## Technology Transfer Metrics Selected Exemplary Universities FY 2003

Metrics	CMU	Georgia Tech	MIT	Penn	Purdue	Stanford	U Wisc - Madison	Wash Univ.
U.S. Patent Apps.	85	67	238	442	154	334	204	62
U.S. Patent Issued	81	41	152	112	92	117	87	54
New Licenses	48	30	90	83	80	128	156	41
License Income (\$ M)	2.3	2.3	31.7	77	4.4	45.4	32.0	12.8
Start-ups	1	12	17	12	3	17	4	3
R&D Expend (\$ M)	238.0	386.4	472.0	704.5	347.0	639.9	662.1	474.0

*Source:* Innovation Associates Inc., September 2004.



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## **Fed Labs can be a Source for Technology-Based Economic Development**

- ❖ The federal laboratory system is composed of over 700 laboratories with a combined federal R&D budget of more than \$100 billion per year.
- ❖ In addition to technology transfer activities conducted with local business and industry, some federal labs provide other economic development programs including affiliated incubators and research parks, technical assistance, mentoring, manufacturing upgrading, and educational outreach.

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## **Fed Labs can be a Source for Technology-Based Economic Development**

- ❖ Incubators and research parks – Some incubators such as the Tri-Cities Enterprise Center associated with Pacific Northwest National Lab help enterprises commercialize technologies originating in PNNL. Research parks include Oak Ridge, TN and Sandia, NM.
- ❖ Small Business Assistance Programs – Since 2000 Sandia National Lab has conducted over 650 projects for New Mexico firms; this includes a Mentor Protégé Program. NASA Glen assists SBIR applicants and PNNL uses MBA students to help entrepreneurs.
- ❖ Venture Capital Forums – The National Renewable Energy Lab in Colorado sponsors the largest VC forum on clean energy technologies in the world. Sandia and Oak Ridge also sponsor major VC forums.



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## **Fed Labs can be a Source for Technology-Based Economic Development**

- ❖ Entrepreneurial Leave Programs – Sandia National Lab (New Mexico) has helped start or expand almost 100 technology enterprises through their leave program.
- ❖ Commercialization Incentives – In Maryland, the Patuxent Partnership help small technology companies work with the Naval Air Warfare Center Aircraft Division through grants, introductions and liaison activities.



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## **Fed Labs can be a Source for Technology-Based Economic Development**

- ❖ Educational Outreach – Programs such as the Science, Engineering, Mathematics, and Aerospace Academy sponsored by NASA Glenn provide academic enrichment and career awareness that encourage K-12 students to pursue math and science careers.
- ❖ Information Dissemination – Most labs provide excellent R&D information available to firms. PNNL provides special services to thousands of SBIR firms.



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## **Fed Labs can be a Source for Technology-Based Economic Development**

- ❖ Organizations can provide brokering and liaison services between firms in the community and federal labs.
- ❖ TeckLink in Montana identifies technologies in 30 labs for firms in a 9 state region.
- ❖ MEPMSI in Maine works with states to use federal labs to help manufacturing companies use the federal technology.
- ❖ Economic development organizations such as Ben Franklin Partnership of Southeastern Pennsylvania also provide services to help small firms work with fed labs.



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## **Myths and Realities in Technology-Based Economic Development**

- If you build it they will come ...
- If it works in Silicon Valley ...
- Initiatives can be all things to all people ...
- We can do it for little or no money ...
- The project will be self-sustaining in two years ...





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## **Building A Sustainable Future**

- Target local and state priorities
- Build on existing resources and strengths
- Identify and utilize champions
- Attract federal and private dollars by leveraging local/state funds
- Get political buy-in early and cultivate a constituency to insure on-going political support
- Create and communicate realistic expectations
- Celebrate and publicize successes



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## Download From IA's Website:

- ❖ *Accelerating Economic Development Through University Technology Transfer and Commercialization*
- ❖ *Partners on a Mission: Federal Laboratory Practices Contributing to Economic Development*
- ❖ *Developing High-Tech Communities: San Diego*



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