



INDIANA UNIVERSITY—PURDUE UNIVERSITY FORT WAYNE

An Assessment of Technology Innovation and Commercialization of Northeast Indiana Region: Opportunities and Capacities

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Topics of Discussion

- ITTTES and GATTE
- Challenges of Technology Innovation and Commercialization
- Technology-based Companies: Northeast Indiana/Fort Wayne
- The Alliance Projects, Fort Wayne-Allen County Economic Development Alliance
- University R&D as External Sources of Corporate' Advanced Technology Development
- Indiana University-Purdue University Fort Wane: Northeast Indiana University Engagement
- ETCS College Assisted Technology Innovation and Commercialization
- Lesson Learned: College of ETCS's Technology Engagement Project Examples
- Opportunities and Capacity
- Innovation Park and Northeast Indiana Innovation Center and Entrepreneurs
- Summary





Challenges of Technology Innovation and Commercialization

- **Challenges**
 - Globalization
 - Time Compression
 - Technological Changes
 - New products
 - Value Chain
 - Rivalry
 - Technology Integration
- **Technological Characteristics of Competitiveness**
 - Technological Opportunity
 - Appropriability
 - Resource Requirements
 - Speed/Time
 - Process of Technology Change
 - Technology Strategy

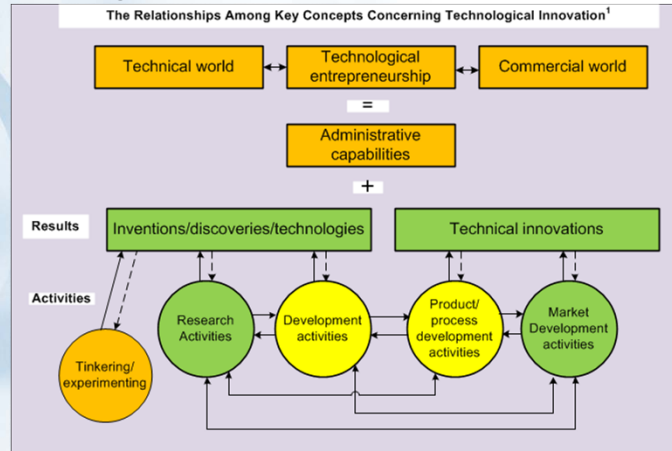


Challenges of Technology Innovation and Commercialization (cont.)

- **Innovative Technology and Commercialization – Entrant Start-Ups**
 - Market Need
 - One piece of a new product / one kind of a new service
 - Breakthrough technologies: plug-in compatibility with existing systems of use
 - Competitive advantages
 - Start-up Technology Improvement and Management
- **Possible Assistance for Start-ups with Valued Technology for Commercialization**
 - Regional
 - Needs and Markets Analysis
 - Intellectual Property Resources: Patents, copy rights, trademarks
 - Indiana State Government Level
 - Certified Technology Parks (Innovation Centers)
 - Technical Assistance Program
 - U.S. Federal Government Level



Interrelations Among Key Concepts Concerning Technological Innovation and Commercialization



¹Robert A. Burgelman, Clayton M. Christensen, and Steven C. Wheelwright, *Strategic Management of Technology and Innovation*, 5th edition, McGraw-Hill, 2009.

Northeast Indiana

Adams, Allen, DeKalb, Huntington, LaGrange, Noble, Steuben, Wabash, Wells, and Whitley Counties

Demographics:

~685,000 people 2010 Census
~3,960 sq. miles

Population growth this decade 2000-2009

4.1% regionally
2.8% Midwest US (IL, IN, KY, MI, and OH)
8.7% nation

Manufacturing employment Private, 2009

24.1% of Northeast Indiana jobs
11.0% nationally

Wages from manufacturing Private, 2009

31.8% Northeast Indiana
13.4% nationally

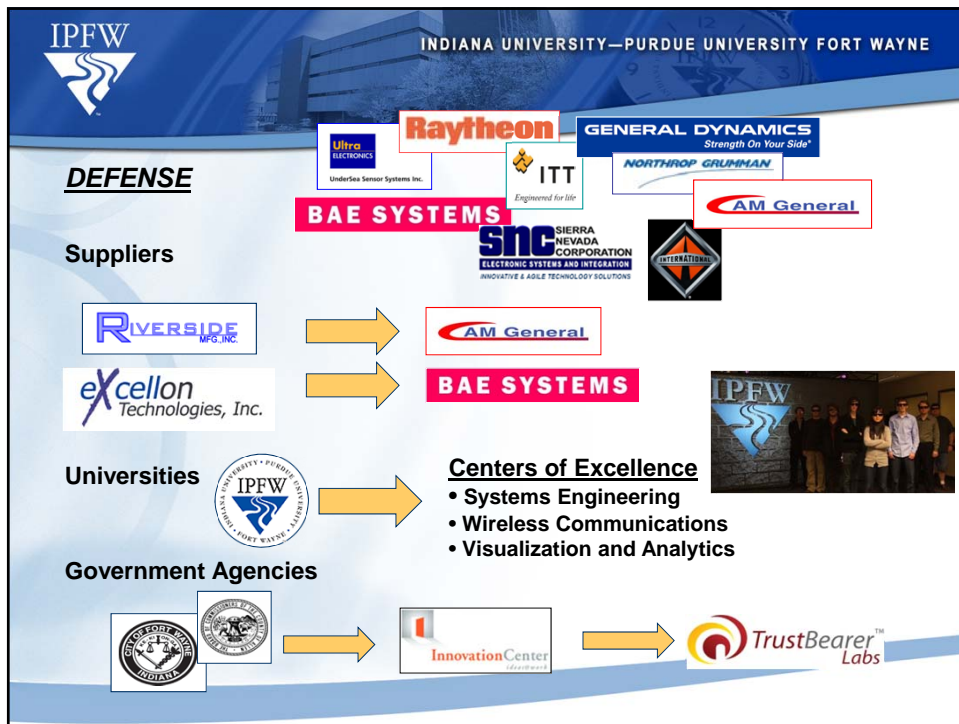
GDP from manufacturing Private, current \$, 2009

21.7% Fort Wayne MSA
12.3% nationally

Regional Industry Clusters:

- Advanced Manufacturing
- Defense
- Financial Services
- Food Processing
- Life Sciences
- Transportation and Logistics

Data from the Community Research Institute at IPFW





NE Indiana Top Employers

Company	FTE
Lutheran Health Network	4,156
Parkview Health System	3,933
General Motors	3,341
Steel Dynamics	2,435
Lincoln Financial Group	1,750
BF Goodrich Tire Manufacturing	1,584
ITT Corporation	1,581
Nucor	1,525
Raytheon	1,200

Company	FTE
Frontier Communication	1,200
Fleetwood RV	1,199
Navistar International	1,150
Norfolk Southern	942
BAE Systems	899
United Technologies	648
Fort Wayne Metals	491
Vera Bradley	407

** Data from the Northeast Indiana Regional Partnership and the Community Research Institute*



PARKVIEW
HEALTH



Lincoln
Financial Group



ITT

BF Goodrich
Tires



Lutheran
Health Network



Steel Dynamics, Inc.



The Alliance Project

(Allen County Economic Development Alliance)

- **SDI La Farga, LLC**, April 2011
 - Steel Dynamic Inc. invests \$39 million in new joint-venture
 - La Farga Group, Spanish Metals Manufacturer, headquartered in Barcelona, Spain
 - Advanced Manufacturing Technology to make copper wire
 - Created by La Farga Group
- **Franklin Electric**, \$25M, <http://www.franklin-electric.com/corporate/default.aspx>
 - The world's leading global provider of complete water and fueling systems
- **General Mills Inc.**, total investment \$34.6 M, May 2011, <http://www.generalmills.com/>
 - The 6th largest food company and market some of the world's best-loved brands: Cheerios, Green Giant, Betty Crocker, Pillsbury, Yoplait...





INDIANA UNIVERSITY—PURDUE UNIVERSITY FORT WAYNE

About IPFW



- Largest and most comprehensive public university in Northeast Indiana
- Opened in 1964 as a combined campus of Indiana and Purdue universities
- Indiana University and Purdue University degree programs
- IPFW has grown into a multi-campus community with over 20 buildings
- Graduates over 1,700 students per year at all degree levels

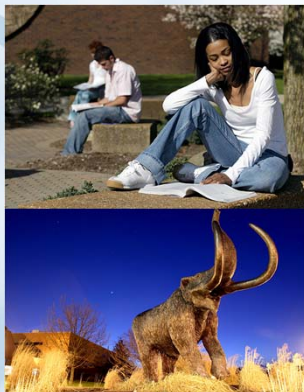


INDIANA UNIVERSITY



INDIANA UNIVERSITY—PURDUE UNIVERSITY FORT WAYNE

About IPFW



- Over 14,000 students
- Diversity of students with 45 states and more than 67 countries represented
- Additional 24,000 students pursue non-credit opportunities through Continuing Studies
- Nine academic units offer more than 200 academic degree programs
- Students can earn Associate, Bachelor, and Master's degrees, undergraduate and graduate-level certificates



INDIANA UNIVERSITY





IPFW Office of Engagement

- Key contact for access to IPFW, Purdue and Indiana University programs for businesses, government and community partnerships
- Facilitate access to:
 - **Research capabilities (Government Grants & Industry Research)**
 - **Technical expertise (Faculty and Student Projects)**
 - **Intellectual property (Purdue, Indiana University and NSWC Crane)**
 - **Educational services & training opportunities**
 - **Internship/co-op/student hiring programs**
- Provide representation for regional businesses to the universities in the development and enhancement of programs.



INDIANA UNIVERSITY



Concept

- **The Engagement Office was created as a partnership between the regional business community and three universities**
 - Indiana University – Purdue University Fort Wayne
 - Purdue University, West Lafayette
 - Indiana University, Bloomington
 - Northeast Indiana Corporate Council
 - Northeast Indiana Innovation Center
 - Work One Northeast
- **Community partner in key regional initiatives**
 - Economic development
 - Workforce development
 - Strategic planning



INDIANA UNIVERSITY





- Engagement Office
 - **Serves to focus the resources of multiple complementary institutions to a single geographic region**
 - Launched in January 2006

Relationships & Results (through 06/11)

- 418 businesses & organizations
- 172 businesses with completed engagements
- 41% completion rate



Engagement Office Projects

- **Business Plan Competition (5 years)**
 - Program to educate entrepreneurs and support writing of business plans
 - Entrants competed for \$50,000 in prizes to fund their business venture
- **IU – Purdue Technology Showcase (5 years)**
 - Presentations of university IP ready for commercialization
 - Showcase technologies for businesses, entrepreneurs and investors
- **Work One Economic Growth Summit (4 years)**
 - Program to connect industry and K-12 educators to enhance student outcomes
- **Defense Industry Association – NIDIA (3 years)**
 - Lilly Endowment Talent Initiative(\$20M grant)
 - Networking and educational programs with regional business and federal labs



INDIANA UNIVERSITY




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Engagement Examples

- **Large Defense Contractor**
 - IPFW RF Communications Research Project (in partnership with the City of Fort Wayne)
 - IPFW Industrial Design, Computer Science and Engineering Student Projects
 - Department of Workforce Development Training Grant (Wireless Communications)
- **Hospitality Management – Resort and Hotel Project**
 - Faculty Sponsored Applied Research and Student MBA Projects
 - On-site program at Palm Island Resort (FL) with classroom and work experience (8 students)
- **Large Automotive Manufacturer** * *opened technical center in Indiana*
 - Faculty Technical Assistance, Student and Research projects
 - Co-op student placements – one full-time hire
- **Mid-Size Orthopedics Manufacturer**
 - Purdue Intellectual Property Technology Licensing (new company start-up)
 - State Research Grant Partnership (successful application for \$2M funding)






INDIANA UNIVERSITY—PURDUE UNIVERSITY FORT WAYNE

Engagement Partners

- **Purdue Technical Assistance Program**
 - Faculty and graduate student short-term assistance projects on a broad range of business and technical issues.
 - Up to five days of no-cost assistance available.
- **Purdue Research Foundation – Office of Technology Commercialization (OTC)**
 - In 2010, Purdue Research Foundation's Office of Technology Commercialization reported 257 invention disclosures, 99 deals finalized, 52 issued U.S. patents, and gross royalty income at \$3.93 million.
 - The foundation also reported the creation of 11 startup companies in 2010 founded on Purdue University innovations.
- **Indiana University Research and Technology Corporation (IURTC)**
 - Facilitates Indiana University affiliated research and technology collaborations.
 - Technology commercialization, business development, funding in support of innovation.
 - In 2010, the IURTC reported 154 invention disclosures, 27 license agreements, 15 new issued U.S. patents.
- **Northeast Indiana Innovation Park / Northeast Indiana Innovation Center**
 - Business Incubator and Certified Technology Park adjacent to the IPFW campus.
 - Provides support for entrepreneurs and start-up business ventures.





University R&D as External Source of Corporate' Advanced Technology Development

- **Comprehensive University-based R&D**
 - Applied Research
 - Capturing the Returns from Research
 - Capability Development
 - Value Added
- **Strategies to Profit from Investment in Research and Technology**
 - Technology Centers
 - Joint R&D
 - IP Strategy
 - Funding the Technology Startup

Factors for Successful Academic R&D – Tech Transfer

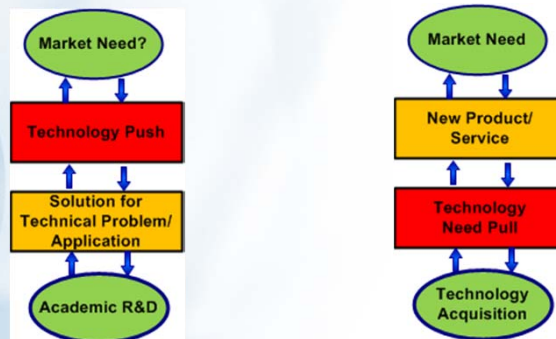


College of ETCS: Centers of Excellence



ETCS R&D Strategy: Crafted Cross-Multifunctional Teams

College of ETCS: R&D Service Models





Technology Push Model Example - ITTTES

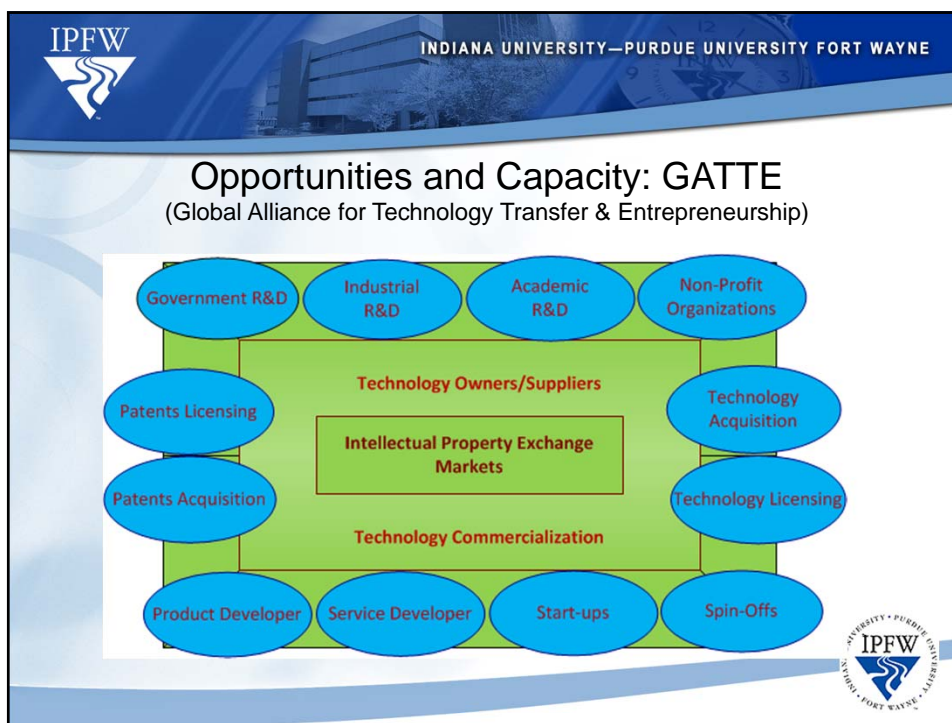
- Indiana-Taiwan Technology Transfer & Entrepreneurship Summit (ITTTES), Sept. 27-30, 2011, hosted by IPFW
 - Indiana Partners: Indiana University-Purdue University Fort Wayne, Purdue University, Indiana University, U of Southern Indiana, NSWC Crane
 - Taiwan Partners (from North to South)
 - National Taipei University of Technology
 - Chung Yuan Christian University
 - Feng Chia University
 - National Formosa University
 - National Cheng Kung University



ITTTES – Technology Presentations

- Track 1: Nano-Scale, Electronics and Thermoelectric Material technologies
- Track 2: Renewable Energy, Environmental and Water Management Technology
- Track 3: Wireless Sensors, Data Acquisition, and Monitoring Technology
- Track 4: Novel Instrumentation and Detection
- Poster Presentations: NSWC Crane (17), Purdue Research Foundation (6), Taiwan Research Partners (5)





IPFW
INDIANA UNIVERSITY—PURDUE UNIVERSITY FORT WAYNE

INNOVATION PARK PROFILE

ISO^{9001:2008} CERTIFIED

INDIANA
CERTIFIED TECHNOLOGY PARK

HUBZone
Historically Underutilized Business Zone

nbia
National Business Incubation Association

Emerging Growth Center
Our new home for NIIC graduates & 2nd-stage ventures

Cole Foundation
Conference & Training Center
In the
Emerging Growth Center

Founded..... December 1999
Temporary Incubator Operational August 2001
Innovation Center Occupied / Innovation Park Established September 2005
Park Total Square Footage 73,403 (2009)
Park Site..... 55-Acre Greenfield Campus
Organization Type..... Community Non-Profit
Organization Focus..... Higher quality, higher paying jobs/companies
Host Institution Indiana University / Purdue University Fort Wayne (IPFW)
Full-Time Employees (FTEs) 10
Number of On-Campus Client Companies 39
Indiana CTP Certifications 2004 / 2009
Outreach..... 11-County Region

Northeast Indiana
Innovation Center
High Technology
Business Incubator



The Innovation Park's **VISION** is to:

- Be a dynamic campus for growth, research, and commercialization
- Create, attract, and retain high quality, high paying jobs
- Enhance learning at all levels of education, and
- Contribute to the vitality and competitiveness of our community



The Innovation Center's **MISSION** is to:

- Create jobs and grow companies throughout northeast Indiana by accelerating innovation and energizing entrepreneurship



NORTHEAST INDIANA INNOVATION PARK

A synergy of Northeast Indiana's assets generating innovation, entrepreneurship, technology, and knowledge

Growth of Existing Companies

Creation of New Companies

Commercialization of New Ideas & Intellectual Property

Increases In
Technology Cluster Jobs & Companies
Average County Wage Rates
Innovation Park Payroll Base

Innovation Center Performance through 12/31/2009:

AVERAGE PARK WAGE = \$52,875

TOTAL PARK PAYROLL = \$8.1 MM

\$71 MM OF INVESTMENT

458 JOBS CREATED

99.1% OF PARK CLIENTS STAY IN OUR REGION

91.8% OF PARK CLIENTS ARE STILL IN BUSINESS AFTER 5 YEARS



Key Focus Areas

Some of the areas that NIIC focuses on are:

- Life Sciences/Healthcare
- Clean Energy/Alternative Energy
- Defense Applications
- Material substrates
 - Composites
 - Biomaterials, or other Material Science Applications
- Mobile Computing Applications
- Areas that have significant national or global reach.



Clients

Established companies:

- American Axle - leading companies in the automobile industry,
- IPFW

Emerging Companies

- 'Bee Mobile' - Enabling customers to advertise via the mobile channel,
- 'Mesco' - focused on the development commercialization, manufacturing, and sales of the Cardiac Guardian System

On-Campus: Clients who have leases spaced at NIIC at Stelhorn, Fort Wayne, IN

Off-Campus: Clients who are not leasing space at the center but are NIIC clients





NIIC's Current Tenant Profile

- Information Technology Companies – 23
 - Cirrus ABS – a web technology company
 - GooRoo LLC – a NIIC student venture Lab company
 - Guild Press LLC – a NIIC student venture Lab company
 - Honor Education – a NIIC student venture Lab company
 - IntelliTek Systems – a Cloud-based integrated CRM, Sales Force Automation, etc.
 - BBK Group, Inc – corporation telecommunication management and cost control
 - Scadata Scientific, LLC – communication and data transfer technologies
- Biomedical Companies – 5
 - BioDuct LLC – developing patent protected avascular tissue repair platform technology
 - BioPoly RS LLC – developing a joint resurface biomaterial
 - Schwartz Biomedical – Tissue engineering research
 - Solistice Medical - a medical device asset lifecycle management company



NIIC's Current Tenant Profile (cont.)

- Advanced Manufacturing Companies – 3
 - Digital Hydraulic LLC
 - Phoenix Consulting, LLC
 - American Axle - leading companies in the automobile industry
 - Systemental Inc – Lean manufacturing/enterprise methods technical services and software
- Entrepreneurial Service and Support and Other Companies – 18
 - Siemens Industries, Inc
 - Stahl Engineering & Failure Analysis, LLC





ACHIEVEMENTS in the SPOTLIGHT



In State FY 2009/2010 ...

• Total Park Payroll	\$8.1 Million
• Total Park Client Revenue	\$10.3 Million
• Average Annual Wage (Park)	\$52,875 (39% better than Benchmark Average)
• Average Annual Wage (All)	\$60,975 (60% better than Benchmark Average)
• Non-revenue-producing companies	34% (38% in 2009)

Since Inception ...

• Patents (granted or pending)	90
• New products launched	229
• Jobs created (cumulative)	458
• Percentage of clients staying within 30 miles of our service area	99.1%
• Survivability rate	91.8%
• Payroll CAGR Rate	81.5%
• Client Employment CAGR rate	55.5%
• Client Revenue CAGR Rate	79.0%
• Total Payroll Taxes (clients & graduates)	\$2.5 MM

Local jobs created for each job created in a research park: 2.57

— Battelle Study, 10/07



NIIC SWOT Analysis

Strengths

- High quality customer services.
- International Recognition
- Compiles with NBIA Benchmark
- Provides capital access.
- Growing company
- R&D

Weakness

- Working with critical employees.
- A large number and variety of customers
- Investment issues

Opportunities

- Exponential growth
- Enhance the City role as a partner and catalyst
- Affiliated with big universities

Threats

- Lack of funding
- Recession effects
- Harder to compete in Bio –Life Sciences





Summary

Q/A

