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Agricultural Outlook Forum

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NEW TOOLS FOR THE ENGAGED 21ST CENTURY LAND GRANT UNIVERSITY

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New Tools for the Engaged 21st Century Land Grant University

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Background

Land Grant Universities have long embraced a three part mission of Learning, Discovery, and Engagement. Initially created as institutions dedicated to providing the highest quality educational opportunities for sons and daughters of working class Americans, these universities evolved, especially during the last half of the 20th century, into institutions renowned worldwide for research and discovery. Throughout their history, land grant universities have differentiated themselves by emphasizing the practical applications of learning and by using the knowledge gained through research and discovery to solve important societal problems.

The tripartite missions of teaching, research, and extension have been broadly embraced by agricultural colleges and by colleges of human and family sciences. These programs have spurred huge productivity gains across the entire food and agriculture system. In other disciplines, however, research and teaching have dominated and efforts to engage with business and industry to address practical economic and technology challenges have been somewhat limited. For land grant universities to achieve their fullest potential, and for their states to advance economically, every college in the university must become fully engaged in addressing the grand challenges facing society.

Universities continued to evolve and by the 1980s land grant universities were perceived to have shifted disproportionate efforts toward research and to undervalue the role of the university in helping people in their respective states improve their livelihood and quality of life. Curricula were also perceived to undervalue the importance of preparing graduates to be well-informed world citizens and community leaders.

A landmark study undertaken by the Kellogg Foundation in the 1990s recommended important new directions by which land grant universities could recapture their critical role in preparing society-ready graduates and better put their intellectual resources of knowledge and expertise to work on solving problems facing the communities and states they serve. The Foundation's report entitled "The Engaged Institution" identified seven key characteristics for successful institutional engagement:

- responsiveness,
- respect for partners,
- academic neutrality on public issues,
- accessibility,
- integration of scholarly engagement endeavors with learning and discovery missions,
- coordination of activities within the institution, and
- resource partnerships.

These seven characteristics are embodied in Purdue University's strategic plan for engagement. Purdue strives to align itself internally so as to be readily accessible, to leverage available resources through partnerships and collaborations so as to best use its expertise and knowledge to strengthen Indiana's economy and to advance the quality of life for its people in a responsive and professional manner.

Purdue University's Engagement Mission and Vision

Purdue's Engagement mission is to assist the State of Indiana in achieving economic prosperity and improving the quality of life for Indiana people. Purdue's specific engagement goals are to:

- Advance Indiana's economic prosperity, empowered by Purdue's expertise, knowledge, resources, and technology.
- Enhance P-12 Educational opportunities and quality.
- Enhance learning opportunities through expanded community service and leadership rendered by students, faculty, and staff.
- Continually improve Indiana's quality of life through life-long learning that improves skills, advances professionalism, and makes Indiana a place of choice.

In order to effectively carry out this mission and achieve these goals, the university is implementing several programmatic and management changes. The most important of these include approaches to:

- Engage all sectors of society, not just the food, agriculture and natural resource sector
- Include all disciplines of university in the engagement effort
- Develop broad interdisciplinary research efforts to underpin the engagement efforts and provide the know-how needed to address major societal challenges
- Develop new funding streams, including private sources and fees for services
- Link to a wide array of state and federal agencies, to support Indiana communities.
- Develop flexible and responsive fiscal and programmatic management systems.
- Involve students and student learning in the engagement mission
- Embrace partnerships with private and public entities, including other universities
- Develop linkages on a regional basis rather than county or city.

The balance of this discussion will focus on the first two of the above goals; economic development and P-12 educational enhancement.

Engagement Tools

Coordinated, multidisciplinary centers are being created which serve as powerful tools for engaging the state's business and industry, schools, various state and local agencies, and community organizations. These centers bring faculty together from across campus to focus on major challenges facing Indiana, the nation and the world.

Technical Assistance Program. The Technical Assistance Program (TAP) has been the primary outreach to business and industry to address technology and management problems. TAP works with more than 400 companies each year and provides consultation on a wide array of technology issues. This past year, TAP has added the Manufacturing Extension Partnership program to its portfolio. Also, TAP has partnered with the healthcare industry to create Healthcare TAP. Healthcare TAP is currently conducting 23 projects with 14 different healthcare organizations across Indiana. TAP regional offices have recently been opened at three sites, and more are likely. TAP is also engaging in workforce development programs, in partnership with Cooperative Extension and other universities and colleges.

Purdue Research Foundation. Purdue University's intellectual property is managed by the Purdue Research Foundation. The Foundation hosts the Office of Technology Commercialization, which is responsible for licensing discoveries and inventions and for commercializing know-how of various types. In addition, the Foundation manages a certified technology park, which includes a new business incubator center. The Purdue Technology Center has served as a model for others across Indiana. The Foundation has established sister technology centers at two other locations in the state.

Discovery Park. Interdisciplinary research is essential to address many of the grand challenges facing the nation today. In order to better facilitate such research, the university has created a special location, including buildings and infrastructure, in which faculty, staff and students from across campus can work together on major, large scale projects. Discovery Park's programs are delivered through a complement of interdisciplinary centers.

- The **Birck Nanotechnology Center** encompasses science, engineering, and technology directed towards understanding, designing and creating improved nanoscale materials, structures, devices, and systems that exploit valuable new nanoscale properties.
- **Bindley Bioscience Center** brings life scientists and engineers together to explore new technologies that can impact the broad boundaries of plant, animal, and human diseases. Technology development and basic research for large-scale analyses of proteins, metabolites, and cellular structures combine with advanced data management and mining systems to foster new understanding of biological systems for improving the quality of life.
- **Burton D. Morgan Center for Entrepreneurship** serves as a platform to launch new technology based enterprises from Purdue research endeavors. It is helping faculty, students, and Indiana businesses better understand technology transfer and commercialization.

- The **e-Enterprise Center** works to seed, nurture, and execute large multi-disciplinary research involving computing and information technology to address real-world problems and challenges.
- Industrial development is vital to the economic health of Indiana. The **Center for Advanced Manufacturing** bridges academic research with specific industrial needs to enhance both the understanding and application of manufacturing issues in Indiana.
- Projects in the **Discovery Learning Center** focus on design and assessment of educational initiatives, innovative learning spaces, and advanced technologies to enhance understanding of learning processes and educational practices.
- The **Center for the Environment** focuses on protecting the environment while sustaining economic productivity through scientific discovery, educational endeavors, and innovative entrepreneurship.
- Cyberinfrastructure consists of distributed computer, information, and communications technologies. The **Cyber Center** addresses issues of protecting, creating and disseminating scientific knowledge related to cyber systems and infrastructure.
- The **Energy Center** is an interactive community of 75 scientists, engineers, and economists working to create solutions across a wide array of energy issues.
- The **Oncological Sciences Center** focuses on research to address prevention, early detection and treatment services for all segments of the population related to cancer.
- The **Regenstrief Center for Healthcare Engineering** is dedicated to providing consumers with better and more efficiently delivered health care. Purdue's expertise in a variety of disciplines will help systematize several areas of healthcare to free doctors and nurses to spend more time with patients and to reduce the cost of healthcare to businesses.
- The **Center for Regional Development** is an interdisciplinary applied research and program management center that works with regional and statewide stakeholders to help them better understand the economic and social factors related to economic and community development. The center conducts applied research and provides support to state and regional leaders to create and implement innovative development strategies and practices.

Statewide Technology. The College of Technology offers associate and bachelors degrees in several fields of engineering technology and leadership and supervision at ten locations across Indiana. These programs are offered in partnership with other universities, in which general education courses and programs are provided by the host university. Purdue College of Technology provides the technical courses needed for the Purdue degree. These degree programs provide strong support for manufacturing and other local business and industry.

Certified Technology Parks. Indiana has created a network of 17 certified technology parks, each of which has a university partner. Purdue is the partner in 10 of these parks. These parks enjoy tax benefits and are designed to help spur development of an asset and knowledge based economy.

Partnerships. Purdue University is dedicated to partnering with the corporate sector, state and federal agencies, local community organizations, and other universities to help support and achieve economic and other development goals.

P-12 Education

The P-12 education system is critical to the economic, cultural and societal well-being of communities for two reasons. First, talented, well-educated youth are essential to sustaining the effective and flexible workforce needed by today's industry. Second, the most highly educated citizens want the very best educational opportunities for their children. If local schools don't measure up, they will choose to locate their business in other communities, or live in other communities and commute to work depriving the community of their considerable leadership and good citizenship potential.

Purdue is attempting to engage with the pre-, elementary, and secondary school system via a number of programs to provide development opportunities for students, teachers, parents, and community leaders. The university sponsors student competitions, summer camps, science fairs, school enrichment programs and teacher development workshops. These programs engage hundreds of teachers and thousands of students each year.

Special programs include the: Science Outreach program, Gifted Education Resource Institute, Purdue Literacy Network, and the Center for Research and Engagement in Science and Mathematics Education.

Extension Linkages

As the university is developing a much broader array of connections across Indiana and engaging many more sectors of the university community, special attention is being given to protecting Cooperative Extension's linkages to its existing clientele. Attempts are made to link effectively with this system and to use the extension system to leverage the university's presence in local communities. Overall, the goal is to make more diverse university expertise available to extension educators so as to allow them to serve new clientele in their community and to serve traditional clientele more effectively in those situations where expertise is needed from beyond the traditional College of Agriculture expertise base. When resources are available to create a university level engagement presence in a local community, every attempt is made to co-locate this presence in extension offices.

Summary

The university's approach is to play an active role in economic development by forming partnerships with other public and private organizations. University faculty and staff are helping identify key asset areas in which Indiana can establish strategic advantage. Knowledge-based know-how and expertise are shared via commercialization of intellectual property and through

several technical assistance programs. Partnerships with Indiana's pre-, elementary and secondary schools are aimed at increasing educational aspirations and achievement across all disciplines, economic sectors and ethnic groups. Purdue University's engagement vision is to become an exemplary model for university engagement—across the entire university and to all sectors of the economy.

USDA Outlook Conference

**New Tools for the Engaged 21st
Century Land Grant University**

February 16, 2006

**Victor Lechtenberg
Vice Provost for Engagement
Office of Engagement**



Overview

- Background
- Landscape changes
- Transitions at Purdue University
 - An emerging model
 - New tools and capabilities
 - Partnership with Extension



Background

- Historic Land Grant University Missions
 - Teaching, Research, Extension
- Funding partnerships
- Extension focus on:
 - Agriculture and Food Technologies
 - Families and youth
 - Rural Communities (economies tied to agriculture)
 - Lower incomes
 - By-passed by industrial revolution



Landscape Changes

- Farm family income has increased
- Rural economies not sustainable by farms alone
- Rural sectors being left behind by current technology revolutions
- Rural communities need expertise beyond scope of Colleges of Agriculture and Family Sciences
 - Extension needs new tools and expertise
- Usual funding sources increasingly limited



“Engaged Institution” Report

Engaged institutions exhibit:

- Responsiveness
- Respect for partners
- Academic neutrality on public issues
- Accessibility
- Integrated mission with learning and discovery
- Coordination of activities within the institution
- Resource partnerships



Purdue Key Strategies

- Discovery through Research
- Learning through Teaching
- Engagement through Partnerships

Form basis for University Strategic Plan



Engagement

Mission:

Assist the State of Indiana in achieving economic prosperity and improving quality of life

Vision:

Be a model for university engagement—focused on partnerships advancing Indiana's economic prosperity and qualities as a place of choice



Engagement Goals:

- Advance economic prosperity empowered by Purdue's expertise, knowledge, resources, and technology
- Enhance P-12 education opportunities and quality
- Enhance learning opportunities through expanded community service and leadership by students, faculty and staff
- Continually improve Indiana through lifelong learning that renders the state as a place of choice



Economic Development Toolkit

- Technical Assistance Program
- Purdue Research Foundation-Office of Technology Commercialization
- Discovery Park
- Statewide Technology Program
- Certified Technology Parks
- Partnerships



Economic Development Tools

- **Technical Assistance Program**
 - Assistance to manufacturing and business
 - Healthcare TAP
 - Environmental assessments
 - Workforce development
 - Indianapolis Engagement Office
 - Fort Wayne Engagement office (in process)
 - Other locations (in process)



Economic Development Tools

- **Purdue Research Foundation**
 - Office of Technology Commercialization
 - Intellectual property management –Licenses & Start-ups
 - PRF Incubation Facilities
 - Purdue Technology Center
 - Merrillville (Northwest Indiana Technology Center)
 - Intech Park—Indianapolis
 - Others—on horizon



Purdue Named National Leader



Number 1
University incubator
program

Top 12 (unranked)
In support of state's
economic development



Economic Development Tools

- **Discovery Park**

- Birck Nano-Technology Center
- Morgan Entrepreneurship Center
- E-enterprise Center
- Bindley Biosciences Center
- Center for Advanced Manufacturing
- Discovery Learning Center
- Regenstrief Center for Healthcare Engineering
- Center for Regional Development



Economic Development Tools

- **Discovery Park (cont.)**

New Centers

- Energy Center
- Cyber Security
- Center for the Environment (C4E)
- Oncology

- **College of Technology Statewide**

- 8 locations
- Alternate pathways to Purdue degrees
- Contract educational programs with companies



Economic Development Tools

- **Certified Technology Parks**
 - Seventeen approved
 - Co-sponsored director's networking workshops
 - Hosted 4 technology showcases
 - Anderson
 - Fort Wayne
 - Lafayette
 - Indianapolis
 - 2 planned



Economic Development Tools

- **Corporate partnerships**
 - Sponsored research agreements
 - Memoranda of agreement
 - Internships and Interns
- **Agency partnerships**
 - Economic development corporation
 - Workforce development
 - Small Business Development Centers



Economic Development Tools

- **Community Partnerships**
- **Other University Partnerships**
 - Indiana University
 - Ball State
 - Anderson
 - Vincennes
 - Community Colleges



Entrepreneurship Center

New business ventures

- Business plan competitions
- Purdue based know-how to existing companies
- Start-ups
- Corporate spinouts
- New Ventures Team
- Innovation and Commercialization Center



Center for Regional Development

Vision:

To foster Indiana becoming the nation's leader in supporting creative, regional approaches to development, built upon three core values:

- a voluntary approach;
- the power of data, analysis, ideas and information;
- the importance of dialogue, social capital development, and collaborative partnerships



Mission: Center for Regional Development

- Conduct applied research and policy analysis; assist on regional policy issues and decisions
- Serve as a catalyst to convene, nurture, and facilitate difficult dialogue
- Foster and broker networks and partnerships
- Assist with strategic planning on regional basis
- Provide access to Purdue regional development expertise



Center for Regional Development

Customers

- Planning entities
- State and federal agencies (Commerce, Workforce, etc.)
- Local government units
- Business and industry councils
- Local economic development organizations
- Chambers of Commerce
- Private-sector consultants



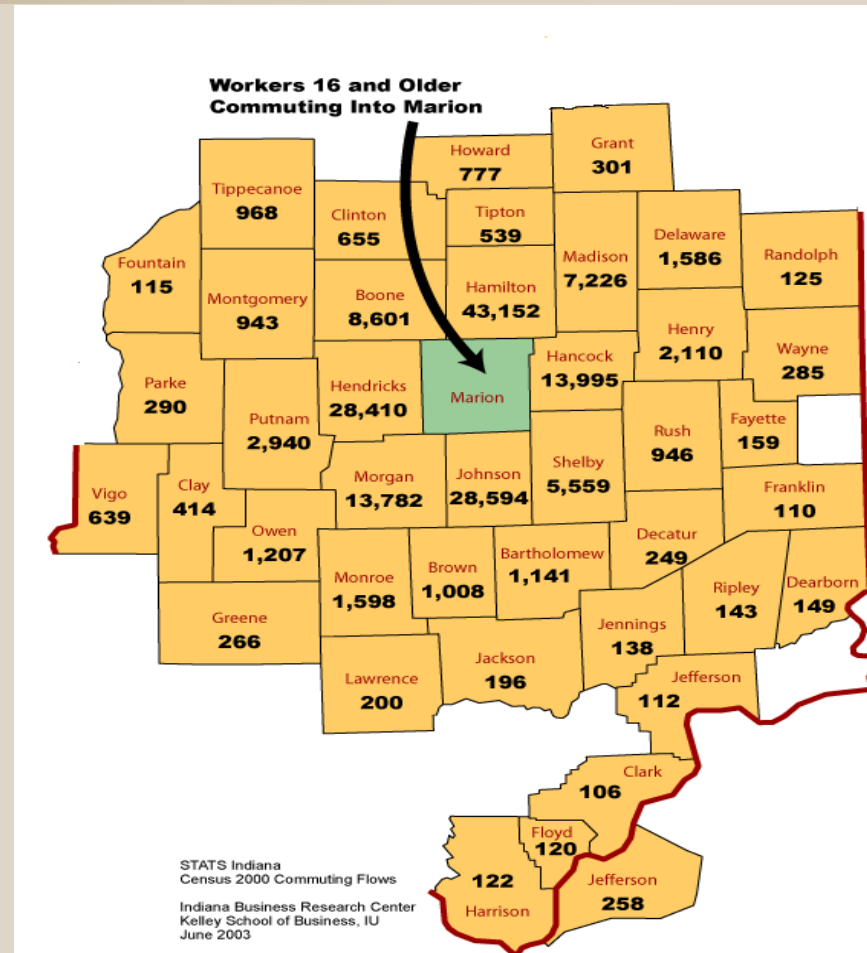
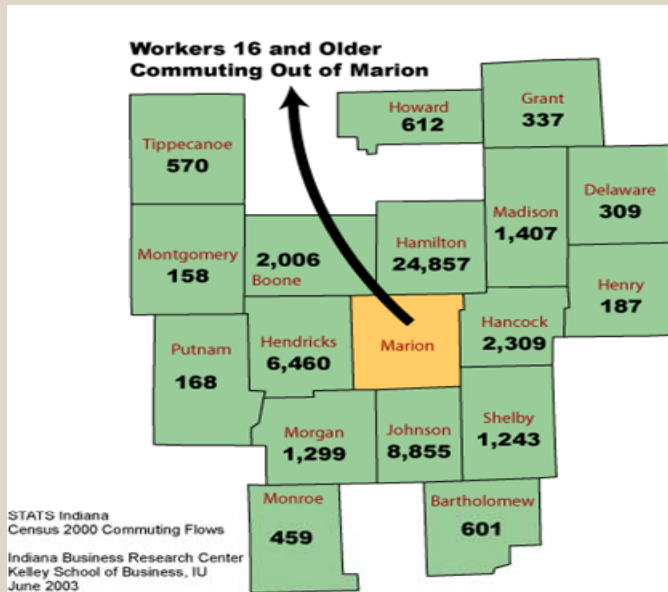
Center for Regional Development

Accomplishments to date:

- > \$1.5 million in research and engagement funding
- \$15 million DOL workforce innovation grant
- SBDC host
- DOE Brownfields program host
- 22 projects underway or completed
- 21 external partnerships/relationships established
- Partnered with Cooperative Extension and 6 other entities
- 20 papers and/or presentations on Center work



Projects: Indiana Humanities Council

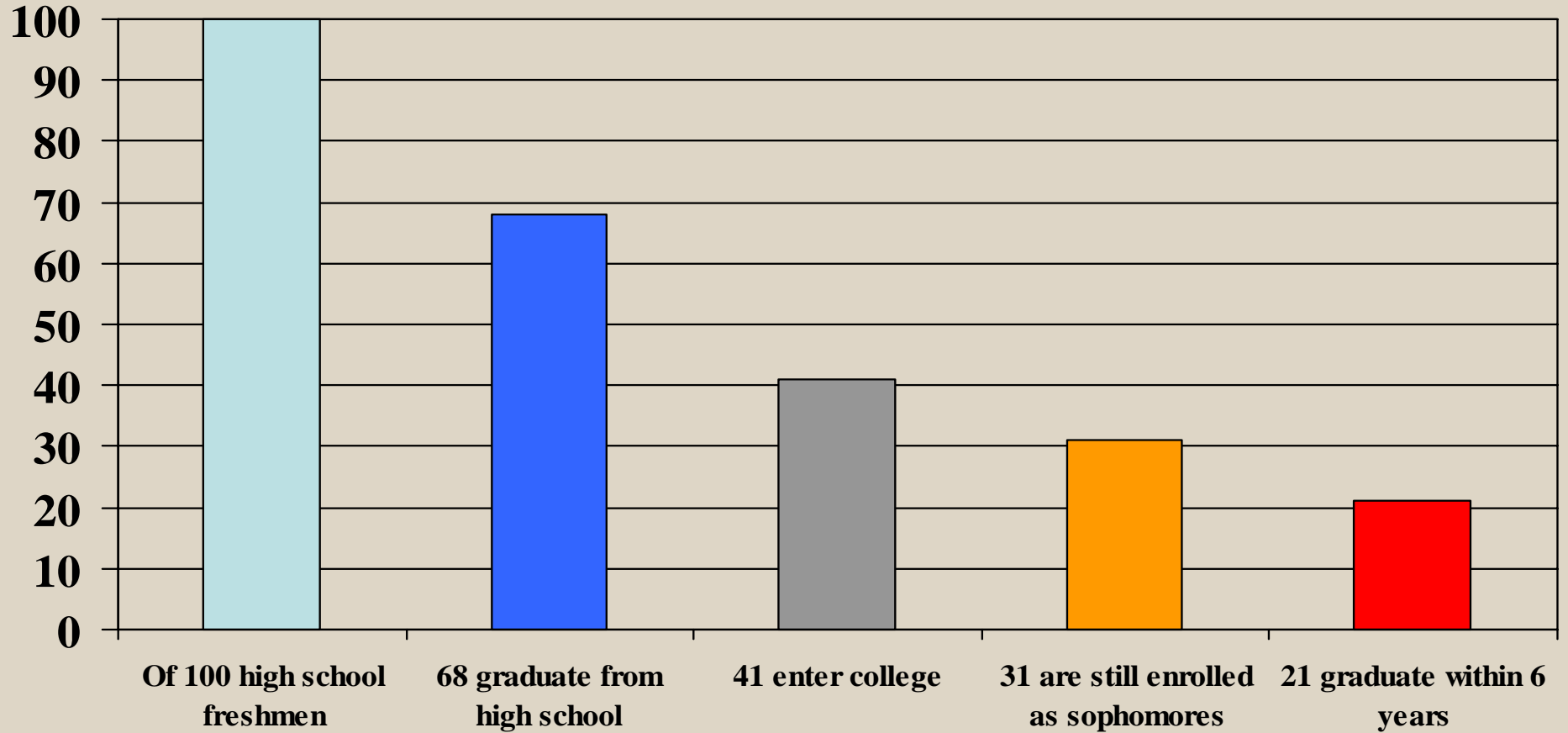


Goal 2: Enhance P-12 Education

- Students
- Teachers
- Curriculum
- Schools



Of every 100 Indiana 9th Graders, Only ...



Source: National Center for Public Policy and Higher Education April 2004



Enhance P-12 Education

- **Science Bound**

- Partnership with Indianapolis Public Schools, and the business community to increase number of IPS students attending Purdue in the fields of Engineering, Science, Technology, Agriculture, and Math-Science Education
- Mentoring of students, teachers, parents
- Business sponsorship



Enhance P-12 Education

- **Camps**
 - Science and Engineering
 - National Youth Sports Program
 - 4-H
- **Competitions**
 - Indiana Association of School Principals
 - FIRST Robotics
 - Science Fairs



Enhance P-12 Education

- Project Lead the Way
- Workforce Development
- Community Partnerships
- Other Opportunities
- State leadership forum
- Indiana Council of Economic Education



Enhance P-12 Education

- **Cooperative Extension Service**
 - 4-H Projects
 - School enhancement
 - Leadership development
- **Learning Centers**
 - Partnerships with Extension or other local entities to deliver educational products
 - Credit, non-credit, general education, non-degree



P-12 Teacher Engagement

- Science Outreach
- Gifted Education Resource Institute
- Purdue Literacy Network
- Center for Research and Engagement in Science and Mathematics Education



Extension Relationships

- Protecting Extension's linkage to existing clientele
- Make more university expertise available
 - To serve traditional clientele
 - To serve new clientele
- Engagement mission is the whole university—
Extension is a critical component and partner



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Editorial

PU's Extension takes its vision to next level

With its roots firmly planted across Indiana, Purdue Extension for more than a century has been tied to agriculture and 4-H concerns.

Now, a key component of how Purdue is linking

Editorial

Opportunities await at PU's Discovery Park

The vision that emanates from Purdue University's Discovery Park is one that could help you and millions of Americans live longer and be healthier.

Among the projects or goals of the Bindley Bioscience Center, a \$15 million facility that opened this past weekend, are the following:

- Developing tiny sensors that could be implanted in your body, where they could detect diseases or alert your doctor of irregular blood chemistry.
- Using genes and proteins from plants and animals to create new medicines.



Lessons Learned

- “Need to answer the phone”
- Communications and information is critical
- Ownership by colleges is essential
 - Requires a change in mindset
- Presidential level commitment needed
- Appropriate incentives on campus are essential
- Interdisciplinary, team attitude
- “We can do it” attitude



Key Challenges

- Recognize engagement as a scholarly endeavor of faculty
 - Publications
 - Presentations
 - Awards
- Ownership by colleges
- Funding



PURDUE UNIVERSITY
“ENGAGING INDIANA”

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