

Purdue University and Economic Development: Defining the 21st Century Land Grant University

Executive Summary

The **P**urdue **U**niversity **S**trategic **E**ntrepreneurship and **E**conomic **D**evelopment (PU-SEED) super project will help catalyze rapid growth of the Indiana economy and help define a next generation model for university driven economic development regions based upon Indiana and Purdue strengths. A Presidential-level partnership among the Vice President for Research Office/Discovery Park, the Vice Provost for Engagement Office, and the Purdue Research Park, working in a campus-wide partnership, will help galvanize Purdue and Indiana-wide economic development and entrepreneurship initiatives. The PU-SEED super project will be built upon the cornerstones of innovation, engagement, and learning. Simply stated, the primary objective of the PU-SEED super project is to design and execute strategies which will systematically lead to activities that catalyze economic growth based upon Purdue University and statewide opportunities. This will involve:

- making economic development an integral part of research and globalization strategy,
- aligning Purdue University efforts and those of State Government as much as possible,
- supporting an entrepreneurial culture throughout the state,
- increasing the impact of Purdue University's Intellectual Portfolio,
- ensuring a steady supply of highly educated new members of the Indiana workforce by taking a systematic approach that starts with P-12,
- providing transparent and coordinated access to Purdue resources so that they can be deployed for maximum possible impact,
- working in partnership with other Indiana Higher Education Institutions to provide a sophisticated continuing education environment for the Indiana workforce,
- identifying and mapping existing and potential asset bases for the various regions of Indiana and spurring action items for those regions,
- creating strategic alliances with technology parks, businesses, and other educational institutions, educating venture capitalists, and other early investors regarding the opportunities available in Indiana,
- ultimately increasing the amount of investment funds made available within the state,
- developing a next generation, proactive approach to recruiting companies to Indiana, and
- working with Indiana's diverse communities to foster development of a tremendous human talent pool.

Purdue wide coordination of resources in support of these strategic goals by the PU-SEED super project will create a national model for how to utilize university based assets to power entrepreneurship and economic growth. Purdue University has the assets, history, and connections to provide tremendous economic development leadership and the PU-SEED super project will be the lens to focus Purdue-wide resources to maximum effect.

The PU-SEED super project will serve as a proactive point of contact between Purdue and Indiana businesses, investors, educational institutions, and communities. This will be accomplished through an active and goal-oriented partnership among the Vice President for Research Office/Discovery Park, the Vice Provost for Engagement Office, and Purdue Research Park. A PU-SEED leader should be appointed and an active standing working group should be appointed with these units in the lead. The PU-SEED super project will maximize innovation by funding new seed projects and accelerating existing projects which show promise of economic development in areas that complement Indiana's economic development plans. Additional educational programs will be developed in order to increase entrepreneurial and economic development activity. The Discovery Learning Center and Kauffman Foundation Campus Initiative provides a starting point for this initiative. The PU-SEED super project will streamline and accelerate technology transfer by proactively connecting faculty, student, and staff inventors to Purdue Research Foundation (PRF), businesses, and investors. The Burton D. Morgan Center for Entrepreneurship, the Mann Institute, and award winning PRF programs are a starting point for this initiative. The PU-SEED super project will support a statewide culture of entrepreneurship by systematically building upon the existing networks of the Technical Assistance Program, Purdue Center for Regional Development, the statewide Extension system, and upon the educational programs already at Purdue. We believe that this deliberately multiple factorial approach will lead to a next generation entrepreneurial and economic development ecosystem.

As with other Purdue University strategic initiatives, the funding plan for PU-SEED is based upon leverage. Many existing economic development oriented capabilities are already in place, such as those mentioned above. In fact, making Economic Development a focal point of the Strategic Plan will facilitate campus wide identification of efforts and their coordination. In addition, the Indiana environment greatly favors Purdue leading an economic development initiative at this time based on accomplishments, substantial good will, and a confluence of receptive leadership in many organizations. With proper balance to the other portions of the Strategic Plan an ambitious fundraising program can be developed around the PU-SEED super project that will greatly enhance the impact relative to what campus-wide coordination alone can accomplish. Any PU-SEED super project funding development should be done in very close coordination with the development of the Strategic Initiatives for Large-Scale Research & Infrastructure and Globalization and to a somewhat lesser extent the other Strategic Initiatives. The statewide listening sessions conducted for the strategic planning process identified several recurring economic development themes including a need to focus on specific sectors such as the life sciences and defense, the need to provide transparent access to Purdue capabilities to facilitate action for the best ideas, and the need to involve Purdue as an appropriate partner in the entire education "supply chain" from P-12 to continuing workforce development.

Introduction

The 21st Century economy is driven by enormous opportunity, global reach, speed, and knowledge intensity. Regions that seek to thrive in this environment must be market driven, respond quickly, think and act strategically, possess an educated and well-trained workforce, and be able to organize sophisticated responses to complex opportunities and challenges. To provide leadership in this environment, the Purdue University Strategic Entrepreneurship and Economic Development (PU-SEED) super project will galvanize the many resources of Purdue to help catalyze further economic development. Governor Mitch Daniels has issued a broad call for action in “Accelerating Growth: Indiana’s Strategic Economic Development Plan 2006”. As part of the PU-SEED super project, Purdue seeks a broad-based partnership with the State of Indiana and the many distributed organizations with economic development interests. The goal of the PU-SEED super project is to help organize a next generation, Indiana-wide approach with the greatest impact possible. As a land grant university with a widely held reputation as an apolitical, highly capable, and interested “honest broker”, Purdue has unique capabilities to assume a leadership role in next generation economic development.

Within the global economy, world class research universities have great responsibilities and much to offer as part of regional and national economic “ecosystems”. From a system perspective cutting edge research continually renews faculty so that they have more to offer students. Over a large number of faculty this research builds a deep and broad knowledge base that is difficult to duplicate in any other setting. The knowledge resulting from this fundamental education-research cycle creates enormous potential for universities to power economic development and engage their communities in the multifaceted solution of complex problems.

The Role of Universities in the 21st Century Entrepreneurial Ecosystem

Globalization has influenced our country in profound ways. The old model of striving to be the low cost producer of homogeneous manufactured and natural resource-based products and commodities has given way to a new strategy for achieving a competitive advantage: focusing on strategies that support innovation and a knowledge-based economy. Almost by definition, universities have a huge role to play in a knowledge-based innovation economy. Another watershed observation is that enlightened economic development policy must augment emphasis on the attraction and recruitment of businesses and industry. Increasingly, emphasis must be placed on two interrelated strategies. The first is on creating an entrepreneurial culture and associated entrepreneurial systems and infrastructure. The result is a fertile entrepreneurial ecosystem or seedbed in which new businesses and companies germinate locally and grow in a continuous and organic fashion. The second strategy is to attract/retain people, not just firms. Machines and technology do not innovate, but people do. Attracting and retaining what some scholars refer to as “the creative class” is a crucial step in increasing the number of entrepreneurs and the probability that Indiana will have many more homegrown successes such as Eli Lilly and Company. Research indicates that members of the “creative class” are attracted to quality,

connected communities that are rich in cultural and public amenities and which are open, welcoming and embracing of all religions, lifestyles and racial and ethnic groups. In sum, universities have a huge role in this new economy: helping to support research and innovation on and off campus; helping to create systemic entrepreneurial public policy and support systems; and helping Indiana build communities that will meet the needs and expectations, and be attractive, to those with the creative mindsets that are essential for fostering innovation and entrepreneurship. The focus on creativity places great emphasis on the traditional role of universities with an urgency rooted in the speed of the 21st Century economy and the long time scales required for an advanced education from P-12 through post-graduate education. The combination of economic speed and the need for innovation-inducing long-gestating education means universities must be involved in a holistic approach to the entire educational supply chain to have the most effective impact on economic development. In fact regions with universities that marshal resources to best serve the entire education supply chain are likely to be the most successful over time.

Strategic Potential of Purdue University

Purdue University is one of the leading land grant public universities in the nation and is a comprehensive educational and research institution. Statewide, Purdue has more than 70,000 students; 18,000 employees, including faculty, professionals, and staff; a budget in excess of \$1.8 billion; and offers undergraduate, graduate, and professional degrees through its ten colleges/schools. Through its main campus in West Lafayette and its three regional campuses in Fort Wayne, Hammond, and Westville, Purdue has an ability to contribute to economic development in a geographically distributed fashion. As a land-grant university, Purdue has a strong history of partnering with the State of Indiana in economic matters of contemporary importance. In the 21st Century, meeting land grant responsibilities requires a fast moving and goal-oriented fusion of learning, discovery, and engagement capabilities.

Purdue University has just completed a \$1.7 billion fund raising campaign; developed a unique campus-wide research organization known as Discovery Park with new facilities and a capacity for seeding, nurturing, and executing large projects (see www.purdue.edu/DiscoveryPark); added 300 new faculty positions, successfully completed a strategic plan, and welcomed Dr. France A. Cordova as President. The University is poised for another set of initiatives as part of its next strategic plan. The PU-SEED super project will be one such initiative that allows Purdue to rally participation, complement other aspects of the strategic plan, and organize Purdue for even more ambitious undertakings.

The Office of Engagement: A Successful Organizational Evolution

The formation of the Office of Engagement in 2001 greatly enhanced Purdue's ability to coordinate resources for engaging in "extra-Purdue activities" to the benefit of the community and students. A key original motivation for the formation of the Office of Engagement was to

provide a “single door, or gateway, into the many aspects of Purdue”. As such the Office of Engagement evolved from fundamental forces. Purdue has always been involved in hundreds of activities with potential community benefit based on available capabilities, community needs, faculty personalities and interests, active research projects, etc. Prior to the Office of Engagement the ability to engage these activities with the community depended on persistence of individuals and a bit of luck to match need with capability. The Office of Engagement provides both an “indexing” of capabilities and its economies of scale in representing the whole organization allow dedicated Purdue people to strategically engage University resources where they can have the greatest impact. Beyond this intended purpose of the Office of Engagement there have been several other systematic benefits of the formation of the Office of Engagement. For example, the Office of Engagement has facilitated the growth of the Technical Assistance Program (TAP), not just in scale but also in qualitatively different ways. TAP qualitatively expanded with the formation of the Regenstrief Center for Healthcare Engineering (RCHE) to provide Healthcare TAP (HTAP). The relationship between traditional TAP and the Center for Advanced Manufacturing (CAM) has added to the synergy whereby research-developed expertise can be utilized by companies and engagement projects can lead to new research areas. A pilot Entrepreneurial TAP program sprouted as a result of Purdue winning a Kauffman Foundation Campus Initiative in the Burton Morgan Center for Entrepreneurship. In addition, an Energy TAP program emerged in parallel with the formation of the Energy Center and Pharmaceutical TAP, motivated by the experiences of HTAP, emerged when a \$25 million Lilly Endowment grant was awarded to support the pharmaceutical area.

The Purdue web site summarizes the tremendous impact of TAP “Since 1986 TAP programs and services have assisted over 8,300 organizations, trained over 4,600 employees, boosted sales by \$351 million, increased capital investments by \$66 million, contributed cost savings of \$39 million, and saved or added over 4,600 jobs in the state, according to the organizations that were assisted.” TAP has created a virtuous cycle for Purdue. In return for providing these benefits, TAP has grown in both people and revenue. TAP has a strategic impact on research because its programs allow faculty and students to gain practical experience, result in research contracts, and provide the citizens of Indiana with a strong sense of return on state investment in Purdue. A key indirect effect of TAP is that involved faculty see research opportunities sooner and are in position to realize them by writing proposals earlier or engaging companies immediately as research partners. Furthermore, TAP synergizes with the other elements of the Office of Engagement, such as the Center for Regional Development and the Extension Program. This is quite evident in Purdue’s close partnership with the Indiana Economic Development Corporation (IEDC) in areas such as workforce development and recruiting industry to Indiana. In short the formation of the Office of Engagement in response to recognizing strategic opportunity has been highly successful and allowed Purdue to respond with greater coordination, ambition, and impact. The Office of Engagement provides considerable capability for furthering economic development and its success illustrates the power of coordinating Purdue resources.

Promoting Coordination Between Large Scale Research and Economic Development

The PU-SEED super project will focus Purdue's capabilities through a Presidential-level partnership among the Vice President for Research Office/Discovery Park, the Vice Provost for Engagement Office, and the Purdue Research Park, working in a campus-wide partnership. This partnership will build on the success and capabilities of each of the organizations with the objective of formulating and developing "big" opportunities that intersect large scale research, broad use of interdisciplinary capabilities, and economic development. Under the PU-SEED super project, the Economic Development Working Group proposes a system for seeding, nurturing, and executing market-driven, state-wide economic development projects and making economic development an integral part of large scale research and education. We anticipate proactive projects that will attract companies to Indiana using knowledge assets in combination with traditional incentives, help develop the Hoosier workforce, foster sophisticated entrepreneurship, work closely with other educational institutions to synergistically increase the collective research and knowledge base, and utilize organizations as living laboratories where research improves practice and practice helps drive research. The overall PU-SEED portfolio of activity will increase Federal funding to Indiana, increase economic activity, help provide solutions to difficult challenges facing the state, and provide a nationally unique, regional capability for conducting knowledge-based, dynamic, and persistent economic development. The PU-SEED super project will also provide a means to engage Purdue alumni – who include venture capitalists, executives, entrepreneurs, and business leaders – in mutually beneficial Indiana economic development.

The Economic Development Working Group proposes to follow a proven large-scale initiative funding model for the PU-SEED super project. Existing activities that are complementary and can be drawn together under the PU-SEED initiative provide a baseline of funding and capabilities and provide the framework for developing further activity. Targeted fundraising among alumni and smaller foundations can establish necessary student programs, faculty endowments, and facilities. Anchor catalytic funding by the Lilly Endowment and/or the State of Indiana can be sought to rapidly start the project, provide seed funding, achieve early success, and build momentum for activity throughout the strategic planning period. Federal funding, such as the existing WIRED grant, can be sought for many possible activities. In addition, Purdue's ability to compete for large-scale research funding should be greatly facilitated by the close community and industry partnerships fostered by the PU-SEED super project. In order to maximize the impact of resources, the component organizations will execute as many of the resulting activities as possible.

Economic Development Goals

To expand the economic development benefits of Purdue throughout Indiana we propose that the PU-SEED super project work to systematically achieve the following goals:

- Coordinate the PU-SEED super project to help double Purdue's research and development activity. Achieving this goal alone will dramatically increase the impact of Purdue on Indiana's economy and make Purdue a more significant partner for academic and industrial partnerships. Furthermore achieving this goal will greatly increase the number of startup companies and the potential for recruiting existing companies to Indiana. One route to achieving this doubling of research activity is for Purdue to partner with Indiana University and University of Notre Dame to increase the size and breadth of large scale research projects that can be pursued. Growth through these partnerships reflects the synergism that is possible by combining Purdue's science, engineering, technology, and management capacity with medical, legal, and public policy resources. Indeed, close inspection of the relative strengths of Indiana University, University of Notre Dame, and Purdue University suggests minimal areas of competition and many areas of synergy. This great potential for collaboration is a result of the nature of Indiana's universities and evolution, since national funding sources have tended to discourage duplicate capabilities within Indiana. Another way to view this synergy is to consider the "joint ranking" of the best coordinated capabilities. We are proposing that the PU-SEED super project machinery be used to help provide such effective coordination as has already been demonstrated by RCHE and the Regenstrief Institute and collaboration between the two complementary National Cancer Institutes at Indiana University and Purdue University.
- Partner with Ivy Tech and other Indiana colleges to provide advanced curriculum for workforce development. A knowledge based economy requires constantly updated curriculum. A new and tighter partnership must be developed among Indiana's institutions of higher education so that knowledge can quickly diffuse from the research base to the workforce as dictated by the marketplace. The Discovery Learning Center at Discovery Park has been created to forge such partnerships, understand learning in a 21st Century economy, and approach learning from a system based perspective. Upgrading and increasing the capacity of workforce development in the large variety of economic clusters and across the distribution of skill base can only be done by understanding the educational assets of Indiana from a system based perspective and evolving the system to leverage all existing educational assets. This includes reviewing and routinely updating Indiana's K-12 curriculum so that Indiana children have the needed training for 21st Century higher education.
- Inventory and expand Purdue's research portfolio according to Indiana's economic growth regions and develop research partnerships with willing organizations from the associated clusters. This will require deploying professional staff and faculty to further develop relationships among Purdue, other academic institutions, and Indiana companies for purposes increasing the number of SBIR and STTR awards made to Indiana and also allowing Indiana's many technology oriented companies to benefit from Federally funded research.
- Expand Purdue's capacity to provide value-proposition based work to industry. Purdue conducts a significant amount of industrially funded research, but in an era of extreme industrial competition, the research capital base of Purdue as represented by facilities such as the \$60 million Birck Nanotechnology Center offers the opportunity for large companies to avoid duplicative investment and for small companies to access a research capability that they

could never afford on their own. In order for Purdue to market and service expanded industrial interaction in a way that allows companies to be effective will require a startup investment in personnel that can develop and operate such Indiana research “IN-sourcing”. Over a short time scale this research “IN-sourcing” could be self-supporting and bring additional high tech activity to the Indiana economy. Most importantly this type of “IN-sourcing” is associated with exactly the kind of research that is most likely to lead to high tech startup companies and the recruiting of existing companies to Indiana.

- Combine Purdue University capability with economic region specific strengths and base this joint capability at regional campuses and Indiana-wide technology parks with a strong connection to the West Lafayette campus. For example Purdue is working with the Indiana Department of Homeland Security, the Indiana National Guard, Indiana University, and other partners to develop the Muscatatuck Urban Operations training center. Also, Purdue jointly employs an economic development oriented employee with Indiana University and IU-PU Fort Wayne.
- Serve as a super-cluster for entrepreneurship activities in the state. An awareness of various entrepreneurship activities throughout the state will help avoid duplication of capabilities, encourage synergism, and promote matching technical expertise to entrepreneurship activity.
- Promote mechanisms for matching expertise at Indiana’s research universities to the demand for such expertise in industry and government. Many such connections happen by chance, but Discovery Park has demonstrated that formal mechanisms can promote matching of demand and supply in an idea economy.
- Provide informed leadership to policy discussions. Consider the formation of a policy center or institute to contribute to energy, environmental, economic, etc. public policy. Also explore the formation of an economic development “think tank” among Great Lakes or Big Ten states so that they can coordinate economic development, based on common challenges and a strategic consideration of synergy and capabilities.
- Devote resources to developing rural assets. Rural communities lack the resources to address a rapidly changing economy, but have considerable assets in culture, natural resources, and talent. Develop mechanisms to take advantage of these assets and keep rural communities current in a rapidly changing environment. The Benton County wind farm is an example of rural participation in the 21st Century economy. A rural Indiana focused project is a great opportunity for collaboration among all Indiana higher education institutions.
- There are many ways to take advantage of Indiana’s diaspora. The “Hoosier Comeback” program, described in “Accelerating Growth” is one way, but the participation of Purdue in economic development activities offers others. For example Purdue alumni in the venture capital domain can be invited to serve on an advisory board for bringing new opportunities to Indiana. Purdue alumni in Asia can be invited to serve on a task force to encourage Indiana connections with Asian economies.

Although these goals are written using the Discovery-Learning-Engagement framework on which Purdue can act, the overarching goals in traditional economic development terms are making

Indiana a better place to start/be in business, increasing the quality of the workforce, and improving incomes of Indiana citizens.

Purdue offers the opportunity to leverage existing resources funded by alumni and Federal research grants to the tremendous benefit of Indiana economic development. Furthermore, Indiana can return the favor by, in turn, offering these partners greater capability and an evolving climate for high tech activity which they can utilize to everyone's benefit. In short Purdue University offers the opportunity to develop a 21st Century super cluster of the type that can benefit all the economic growth regions by systematizing innovation and cooperatively training workers with globally competitive skills, knowledge, and aspirations. A key part of the PU-SEED super project will be supporting a strong presence in key Indiana economic clusters, understanding their strategic needs, and devising a collection of synergistic projects that help meet these strategic needs.

When Discovery Park was founded in 2002, the first step for the leadership and staff was to develop action-oriented relationships across campus and a comprehensive inventory of Purdue capability in order to develop a systems engineering view whereby "components" could be organized for goal-oriented purposes. This process was facilitated by establishing a seed grant program that provided incentives for teams to be formed and propose attractive projects. After the initial phases of Discovery Park, less seed grant funding was necessary because existing success motivates ongoing collaboration and ongoing projects spin off new ideas. Likewise for the PU-SEED super project, the startup phase will establish the basis for success and refine the business model to be maximally effective.

Some "Big Ideas" for Purdue's Role in Economic Development From the Listening Sessions

As shown in Appendix, the Economic Development Working Group in partnership with the Office of Engagement solicited input from across Indiana with regard to the potential role Purdue could play in economic development. The following is a list of "Big Ideas" for economic development that resulted from the discussions.

- Develop a systematic industry sector and regional asset based strategy.
 - The life science area was identified by the listening sessions as perhaps the top area around which Purdue must have a comprehensive strategy that starts with large scale research and infrastructure, but which must be integrated with economic development. There is substantial groundwork which has already been laid to support Purdue proposing major initiatives in the life sciences, especially in partnership with Indiana University and others.
 - Build upon Indiana expertise in advanced manufacturing. Indiana has a rich manufacturing history and much expertise. Purdue capability in nanotechnology, engineering, technical assistance, and other areas should be continually focused on advanced manufacturing to keep Indiana competitive and continually explore ways to

- further Indiana based manufacturing. Invest heavily in the Center for Advanced Manufacturing as an entity that bridges fundamental research to practice.
- In a keynote address to the University Economic Development Association, Dr. Luis Proenza (former Vice President of Research at Purdue) pointed out that Universities account for \$36 billion of the \$276 billion in the United States Research and Development economy. As companies continue to outsource research and development, Universities are in position to greatly increase their share of the R&D services market. Defense and Homeland Security are one of the largest portions of this market. Purdue is particularly well-positioned to increase Defense and Homeland Security related R&D with substantial potential economic development impact. There are a number of possible activities that will further Purdue's involvement in Defense related R&D and economic development. For example, the Fort Wayne area is home to a number of defense contractors. A next generation strategic partnership with the Fort Wayne regional campus offers a number of possible ways to grow Defense-related activity. Developing a compelling program for innovation-oriented military officers to obtain their M. S. and Ph. D. degrees through Purdue is another. Just as Purdue had a program to educate astronauts in the early days of the space program, there is much room for innovation in the curriculum, research, and mechanics for advanced degrees for military personnel.
 - Purdue has a unique opportunity to provide leadership in the development of holistic approaches to evolving the energy economy while simultaneously addressing environmental and economic development. Such leadership would play to Purdue's technical and engineering strengths and provide a unique role for Purdue in the area of technical-based policy. There are many existing programs and much faculty expertise in this area. Establishing Purdue as a leader in energy-environmental-economic development systems analysis would galvanize Purdue's other activity in these areas. The potential amount of energy related economic development activity in Indiana could be staggering depending on the path of evolution of the world energy system. Having Purdue lead this analysis area would give Indiana a much more informed policy and the potential to exploit economic potential sooner.
 - The development of the Regenstrief Center for Healthcare Engineering (RCHE) has given Purdue a unique way to compete for life science research funding. In particular, national research leadership is aware of the urgent need to translate fundamental life science advances into tangible improvements into what is perceived to be a dysfunctional healthcare delivery system. The targeting of fundamental research and the translation of fundamental research into improvements is one of the reasons RCHE was created and is consistent with a more general theme of "Discovery to Delivery". Of course Purdue becoming a powerhouse in the translation of life science research to practice can have profound economic development consequences.
 - Aviation/Aerospace, Space Exploration/Development and Air Transportation are traditional areas of strength for Purdue and present several next generation opportunities. Unmanned aerial vehicles (UAVs) are revolutionizing military

intelligence and serve a number of civilian applications. UAVs present great opportunity for creativity and innovation in design. As such they are a potentially productive research area and one for which product development is possible. Furthering the entrepreneurship and the commercial development of Space is consistent with Purdue's history, its current focus, and for society achieving the next level of involvement in Space. Purdue has the capacity to become a thought leader in Space Entrepreneurship and Commercialization including needed technical developments, business models, and envisioning a viable trajectory of activity. Air Transportation offers many possible economic development activities for Purdue. For example a next generation air traffic control system is a potential research and economic development activity. The role of UPS in Louisville and Fed Ex in Indianapolis allows Purdue to develop specialized education and engagement programs centered around air cargo carrying. Educational and engagement opportunities for the Aviation Technology program in this area were mentioned at several of the listening sessions.

- In short, Purdue should pursue a coordinated research and development and economic development program related to:
 - Life Sciences, especially the translation of research to practice
 - Advanced Manufacturing
 - Defense and Homeland Security
 - Energy, especially holistic analysis simultaneously considering the environment and economic development
 - Healthcare Delivery, especially Healthcare Engineering
 - Aviation, Space Sciences, and Aerospace, especially Unmanned Aerial Vehicles, Space Entrepreneurship/Commercialization, and Air Transportation
- Develop a systematic and nuanced strategy around each of the metropolitan areas, especially the cities with populations of a million or greater. Continuing the expansion of Purdue's presence in Indianapolis (metropolitan population 1.17 million) and other Indiana cities is critical, but because of Indiana's crossroads geography there are other opportunities. For example, the city of Chicago (metropolitan population 9.2 million) anchors one of the most vibrant economic regions in the world, contains a number of influential Purdue alumni and significant development activity is already spilling over into Northwest Indiana. There are many ways to incrementally increase Purdue's presence and over time a few "major" deals could be catalyzed based on opportunity and expertise that would help accelerate development in Northwest Indiana. Louisville (metropolitan population 1 million) offers a smaller but substantial opportunity in Southern Indiana. There is a significant opportunity to build on the existing partnership with Indiana University in New Albany. In the southeast, the city of Cincinnati (metropolitan population 1.6 million) provides great opportunity, but has the least Purdue geographic presence on which to build. One possibility is to develop a metropolitan strategy anchored around key major companies/organizations in each city. For example, Procter and Gamble in Cincinnati, UPS in Louisville, Rolls Royce-Lilly-and many others in Indianapolis, etc. Beyond economic development, increased presence in

metropolitan areas can have a positive impact on student recruiting, diversity, STEM, partnership between science/engineering and the liberal arts/social sciences, etc. A detailed action plan for each metropolitan region could be explored with key alumni, regional leaders, and existing Purdue personnel.

- Develop a rural economic development strategy to complement a metropolitan strategy. The discussion of the listening sessions repeatedly emphasized the importance of the rural environment in a holistic approach to economic development. Many participants suggested that more sophisticated approaches to rural-metropolitan synergy are possible. As such there is opportunity for multiple-faceted research, development, and engagement starting with inherent assets such as culture, human resources, environment, natural resources, and agriculture.
- Develop strategic partnerships with key Indiana organizations. Further developing Purdue partnerships with Indiana University and the University of Notre Dame were recurring discussion items in the listening sessions. The leadership at both Universities favors the development of partnerships. This is especially true in metropolitan areas to make the most of limited resources. Ivy Tech is a natural partner for workforce development. The College of Technology has a strong statewide reputation and several existing activities, which could be built upon. Notre Dame is a natural partner for economic development in Northwest Indiana and has announced a large scale research/economic development initiative. Perhaps Notre Dame could be invited to partner in the Northwest Technology Center much as Indiana University partners with Purdue in Fort Wayne. Indiana University is a natural partner in much of the state and existing joint activities can be strategically expanded.
- Further encourage Purdue involvement with Indiana Government. One possibility is to develop a “Purdue in Government Program” that encourages sabbatical or one or two semester fellowships serving key roles or for targeted tasks. For example Dr. Eric Dietz (Managing Director of the Purdue Homeland Security Institute) served as Executive Director of Indiana Department of Homeland Security (IDHS) from April 2005 to March 2008 with a key objective of merging four organizations into the IDHS. Clifford Wojtalewicz (former ROTC commander) has served as Director of Planning for IDHS since April 2005. Besides the important government service benefits, this involvement provides synergy in research, opens further possibilities for partnership, and can help develop new types of programs for students.
- Develop a seed grant program to rapidly catalyze interdisciplinary involvement with Liberal Arts and the Social Sciences around economic development. Many of the workforce development challenges present new opportunities for social science, business, and education research and engaging Liberal Arts/Social Sciences is critical to success. Furthermore, a theme of Liberal Arts and Entrepreneurship has been developed by Wake Forest (see Appendix 2). Such Liberal Arts/Social Science involvement in a way unique to Purdue has significant potential. Also, developing a template for engaging Indiana rural communities in economic development is a challenge worthy of a world class research university and Purdue has unique resources such as the extension offices to do so. One area of potential synergy is to view workforce development as a supply chain system (see the reference to Dr. Luis

Proenza's address in Appendix 2) and organize Purdue around a systems oriented economic development-education theme. The hiring of a P-12 specialist in the VPE Office will enable Purdue strategic activity in the educational "supply chain".

- Systematically recruit faculty with strong economic development interests, capabilities, and track records. Purdue has the opportunity to be a national leader by acting aggressively in building a concentration of faculty that excel in integrating research with economic development. Purdue has the capacity to put together unique start up packages and activities that will attract stellar faculty who have both interests.

Integrated Activity Resulting from the Strategic Plan

Every area covered by the Strategic Plan impacts Purdue's ability to define the 21st land grant university with respect to economic development. Certainly strategic actions taken to foster economic development will have substantial collateral benefit, especially in the areas of large scale research and globalization. However, the listening sessions undertaken for developing this white paper have pointed out many connections among all the areas. A sampling of these connections is as follows:

STUDENT SUCCESS AND THE STUDENT EXPERIENCE – Every graduate from Purdue is an ambassador for Purdue and Indiana. Students that leave West Lafayette after a positive experience are much more likely to be involved in activities with Purdue in the future. The type of activities made available and opportunities presented to students also have significant impact as to whether they stay in Indiana. Keeping a larger fraction of Purdue graduates in Indiana would contribute to economic development. In this regard there are tremendous opportunities in developing/adapting Purdue programs for experiential learning, service learning, and internships in Indiana.

LARGE SCALE RESEARCH & INFRASTRUCTURE – Growing Purdue's research portfolio and integrating economic development activities with large scale research efforts is a primary way Purdue can contribute to economic development (see below for more information).

QUALITY OF LIFE IN THE WORKPLACE – Purdue is consistently voted one of the best places to work in academia. This is an enormous advantage to recruitment and should be further leveraged. Perhaps certain staff positions should be encouraged to become involved in outside economic development projects as part of Technical Assistance Program teams, to provide further career development, and to enhance Purdue's ability to deliver economic development results on the fastest possible time scale.

GLOBALIZATION – According to a recent Kauffman Foundation study more than one-half of the immigrant founders of technology and engineering firms launched in the U. S. between 1995 and 2005 came to the U. S. to further their education; and 53% earned their highest degrees in the U. S. This is an example of why Purdue's long standing international character is an enormous asset

for economic development in a global market. Furthermore, Purdue can work with international alumni to help attract global business to Indiana and increased student involvement abroad can be coordinated with economic development projects. Purdue involvement with creating new universities in the Middle East and elsewhere can also result in permanent economic development ties.

CAMPUS DESIGN – Purdue facilities can serve as a model for what we wish to accomplish in society at large. For example, Purdue has the potential to develop enormous research activity in the energy area. However, most of Purdue’s facilities are not considered to be “green” or energy efficient. Treating Purdue facilities as a living laboratory for promoting societal change naturally supports economic development efforts. Perhaps Purdue can develop a certificate program in “green facility management”.

SYNERGIES BETWEEN SCIENCE/ENGINEERING & LIBERAL ARTS/SOCIAL SCIENCES – Partnerships across these disciplines are essential to economic development activities because challenges cut across a broad swath of domains. For example, Indiana workforce issues clearly have both a technical and non-technical component. Likewise, rural development must accommodate culture as well as technical challenges. Any seed grant program established for economic development should induce the formation of interdisciplinary teams. For example, the Regenstrief Center for Healthcare Engineering (RCHE) has developed a number of such cross-cutting teams from its seed grant efforts. The economic development literature shows that innovation is not synonymous with advanced technology. There is a substantial amount of innovation that is not high tech. Often, some fairly traditional business serving a local market becomes a national or international giant. For example, the original vision of what ultimately became Starbucks was nothing more than the simple desire to be a local coffee shop, but the company now has nearly \$8 billion in sales and isn’t high tech at all. A key point is that economic development depends on the preferences, culture, and aspirations of people. Advanced technology products are also subject to these considerations so that understanding all sides of economic development, and not just the technology portion, is critical to success. For example, the role for the social sciences and humanities in creating “welcoming and tolerant communities” that attract the progenitors of innovation is critical.

ATTRACTING STUDENTS TO STEM CAREERS – This is critical to Indiana’s economic future. Ideally, efforts to make a difference in this area must start before kindergarten and perhaps parents need to be influenced even before they have children. A recurring suggestion in the West Lafayette listening session was to get Purdue students and faculty much more involved in making West Lafayette and Lafayette School Districts model programs for STEM Career Development as a template for Indiana-wide deployment. In general, increasing Purdue presence in the West Lafayette-Lafayette “living laboratory” has great potential for local economic development and mutual benefits. However, special effort should be made to choose activities that can be deployed more widely across Indiana and the nation. In the industrial domain there has been a great benefit for organizations to work with their suppliers and customers to innovate

and greatly improve overall performance. There is a similar opportunity for universities to more deeply partner upstream and downstream in the education system.

Economic Development and Purdue University Values

Purdue University seeks to follow its core values in the execution of the strategic plan. Indeed these values are important to the success of economic development efforts as noted below.

TALENT ENHANCEMENT – Economic development centers on talent, its creation, attraction, and retention. In this regard, Purdue’s economic development impact will be greatly influenced by its success as a premier educational institution. In addition to its traditional educational activities, there is great opportunity for Purdue to expand its educational role through partnerships and research to continuing workforce development and continuing improvement of the talent supply chain beginning at P-12.

DIVERSITY – The first rule of risk mitigation/performance maximization in finance is that portfolios must be diverse and varied and that over-reliance on one sector leads to underperformance in the long term. The same is true in economic development. Indiana will realize the greatest possible economic returns by developing effective programs for ensuring that all its citizens participate in rapidly changing economic opportunities. The “metropolitan” and “rural” engagement ideas mentioned above provide Purdue a means of engaging a diverse set of communities and recruit members of those communities to Purdue. Some of the projects under the PU-SEED super project should be specifically designed to foster opportunities for diversity in economic development activities.

INTERNATIONAL AWARENESS – The United States represents a market of approximately 300 million people out of a world population of approximately 6 billion. As such only five percent of the market is in the United States. For this reason, Purdue’s economic development strategy and activities should take advantage of Purdue’s history as an international university with many international alumni. There are opportunities for partnership with organizations in developing countries, such as those in East Africa, and in building upon relationships in China, India, Europe, and the Middle East.

RESOURCE PARTNERSHIPS/DIVERSIFICATION – There are five sources of funding for Universities: Foundations, individuals, the Federal Government, the State Government, and industry. In executing a comprehensive economic development program, Purdue will have to develop resource partnerships with all five sources. There is no general formula for engaging each source and individual opportunities must be pursued as they arise, preferably well before an RFP is issued. However, Purdue should optimize its business processes so that it is the most nimble and fast moving partner possible.

FACILITIES ENHANCEMENT & REPAIR – Greatly increasing research interaction with industry provides opportunities for generating revenue for facility enhancement & repair while serving economic development. The recent development of an MRI center, InnerVision West, in the Purdue Research Park is an example of an innovative business model that serves both economic development and research interests. The facilities and equipment maintenance are underwritten by commercial operations, but are available for research a significant fraction of time.

ENERGY/ENVIRONMENT AWARENESS – One suggestion from the economic development listening sessions is that Purdue model the future of energy/environmental sustainability in at least one of its buildings as a way of leading the rest of the Indiana economy in this area.

MANAGEMENT/STEWARDSHIP – The continual development of professional talent and leadership is considered one of the critical elements of a successful company. The university by its nature is well-suited for the training and education of its students, but the distributed environment of a university offers a different set of considerations for the development of entrepreneurial and management talent among faculty and staff. For example new department heads could greatly benefit from an intense training course on tips, challenges, and procedures. Such a course could include a component on university interests in economic development. The Entrepreneurial Leadership Academy in Discovery Park under the Kauffman Campus Initiative is another example of a professional development activity with potential economic development consequences in terms of increasing the capacity for large scale research leadership with its concomitant economic development impact.

COMMUNICATION/POSITIONING – One clear message from the statewide economic development listening sessions is that Purdue should more extensively publicize its activities. Furthermore, many individuals recommended that President Cordova make economic development a standard part of her message and be seen forming strategic partnerships with other leaders in the state to build on past successes and position Purdue for next generation efforts.

EVALUATION/METRICS – Purdue's overall research budget and the economic impact statistics collected by the Purdue Research Foundation provide two sets of metrics relevant to economic development. Furthermore, a recent report (see Appendix 2) cites the measurement of innovation to be a much needed research area. Developing leadership in this area is a scholarly opportunity, perhaps worthy of faculty recruitment, and will serve Purdue's economic development interests.

A Holistic Approach to Catalyzing Economic Development

Observation: All exemplary economic development regions contain world class research universities.

The importance of premier research universities as engines of economic activity is well known. Consider the role of Harvard, MIT and other Boston Universities to the Massachusetts economy;

the University of Texas to the Texas economy; The University of North Carolina, Duke University, and other universities to the Research Triangle; and Stanford and other California Universities to Silicon Valley. The hallmark of 21st Century societal challenges is their complexity and the fundamental need to organize multiple technologies and cultural elements to achieve solutions. In such an environment there is an even greater potential role for research universities as organizations capable of marshaling many diverse perspectives and that can organize knowledge-intensive activity in a value-oriented way where the marketplace can then pick successes. By the nature of its history, capabilities, and relationships, Purdue University has the opportunity to develop a next generation model for university driven economic development.

The raw material for the PU-SEED super project is a diverse and exciting set of existing activities. An initial goal of the PU-SEED super project is to obtain campus wide visibility of these activities in sufficient depth so that they can become building blocks for further efforts. Each of the components of the Presidential level partnership among the Vice President for Research (VPR) Office/Discovery Park, Vice Provost for Engagement (VPE), and Purdue Research Foundation (PRF) brings unique capabilities. Strategic Presidential involvement and awareness will bring the prestige of the President's Office to key fundraising and leadership opportunities. Almost every aspect of Purdue's growing research portfolio can have economic development implications and this is especially true as the VPR Office/Discovery Park develops further large-scale initiatives. For example, the drive by RCHE to improve healthcare delivery can have substantial economic development implications. Consider that almost all American industry is being pressured by healthcare costs. If the efforts of RCHE can confer some, even temporary, advantage on Indiana entities, then this becomes a significant retention/recruiting advantage for Indiana business. A concerted effort to develop a next generation industrial program at Discovery Park can greatly increase sponsored research, but could also have economic development benefits by providing state of the art facilities/talent to companies.

The enormous contact network of the VPE Office and the goodwill generated by activities such as the Technical Assistance Program bring the potential to strongly connect Purdue economic development efforts with those occurring around the State. For example, the defense industry is strong in the Fort Wayne area. At a strategic planning open forum in Fort Wayne several participants suggested that the defense sector could grow in Indiana and this might be facilitated by Purdue University-led efforts. One suggestion to support growth was to develop an advanced degree program that would partner Indiana University-Purdue University Fort Wayne campus with the West Lafayette campus to offer a shared program that could be pursued by defense industry employees as part of their work. Even a relatively small number of such advanced degree students would allow new research areas to be developed, offer companies a retention advantage, and further increase the skill base of Indiana workers. The proximity of IU-PU Fort Wayne to significant facilities of large defense companies is an attractive opportunity for targeted PU-SEED super project activity. In general, the VPE Office has already cultivated a strong relationship with many economic development entities, government agencies, and other Indiana organizations. This presents many opportunities for developing partnerships as part of economic

development oriented projects. In some cases this may result from Purdue initiated activity, but the VPE Office interactions also suggest that making Purdue be seen as a premier and willing economic development partner may result in many potential outside generated opportunities.

The Purdue Research Foundation has catalyzed enormous economic development in the West Lafayette community and statewide technology park partnerships show promise to replicate this success in other parts of the state. At the West Lafayette Research Park alone, PRF programs have helped to catalyze the existence of 2,800 employees in 146 companies with an average salary of over \$58,000 per year and \$121 million in venture capital funds. Furthermore, the activities required to reach this level of achievement has given PRF enormous insight into the needs of the Indiana business community with regard to taxes and regulations, quality of life, and support services. This experience and insight is invaluable to recruiting business to Indiana and helping Purdue to present its capabilities from a value-proposition perspective.

Along with the lead units, nearly all parts of the university can play a role in the PU-SEED super project. Some of the senior level project courses in the various academic units can focus on economic development oriented issues. For example, Engineering Education and the College of Education could develop senior level and graduate projects that utilize local community schools as living laboratories. The College of Engineering could focus some student activity at economic development issues such as planned community development, the development of the Waterfront area in West Lafayette, the development of the walking trails system in the Lafayette area, etc. In general the idea of Purdue University utilizing the local community as a “living laboratory” for as many activities as possible offers a type of engagement where all parties can benefit. The development of successful model activities locally then provides a template that can be copied elsewhere. Of course local living laboratories reduce logistics barriers and allow a critical mass of activities to develop.

PU-SEED Super Project Organizational Structure

From a practical point of view, the operations team of the PU-SEED super project should consist of 7-9 people, each representing a key function of Purdue with economic development interests. The VPR, VPE, PRF-COO, and high ranking business operations person should be core members. Ideally, the operations team leader should have project management experience, be goal-oriented, and work to maximize the synergy among the participants. Following the Discovery Park model for large-scale project execution, the operations team should be supported by a full-time “Managing Director” who manages projects, facilitates fund raising, and supports the obligations of a campus-wide effort. Using the RCHE start-up as a model, the operations team should be supported by an executive team of perhaps as many as 20 people that meets periodically and helps interface the PU-SEED super project with Purdue at large. This larger group would meet more frequently at first and then as needed.

The unit of activity of the PU-SEED super project is the individual project. An individual project will have its own leadership, funding, and goals. Because of the economic development focus, each project should have one or more outside partners and will typically involve multiple Purdue entities. The primary job of the operations team and staff of the PU-SEED super project is to gather/develop a list of potential projects and rank the potential projects in terms of impact, ease of implementation, required resources, available funding, and synergy with the project portfolio. With input from the executive team, the operations team should choose a subset of the potential projects to implement, and track the progression of projects to ensure their success and identify potential follow on projects. This project portfolio oriented view of economic development is goal oriented, allows each project to develop with a degree of independence, and the managed evolution of the portfolio allows the PU-SEED super project to adapt as new information is gathered.

Accelerating Growth: The Role of Purdue University

Much of Purdue's annual research expenditure is provided by the Federal government and other organizations outside of Indiana. Furthermore, Purdue attracts a substantial number of its students from outside Indiana. As such Purdue University represents a substantial engine for the Indiana economy. Each externally generated dollar has a multiplicative effect in the sense that these expenditures generate the need for support services such as retailing, restaurants, hotels, and other secondary purchases. More importantly, the foundation of university-based research and other activity becomes a draw to companies, startup businesses, investors, summer conferences, etc. For example, recently Purdue University and the Purdue Research Foundation teamed with Indiana and local government to recruit Butler Engineering to the Purdue Technology Park. This firm will ultimately produce as many as 200 high tech jobs and, much as in the development of a shopping mall, will help anchor further high tech tenants. Purdue University was cited as a significant reason to locate 1,000 high paying jobs by Toyota to Lafayette, Indiana. Indeed, Purdue University has a rich tradition of strongly contributing to Tippecanoe and surrounding county economies. Discovery Park has added to Purdue University's economic impact with over \$330 million of activity in its almost five year lifetime, including nearly \$100 million in state-of-the-art research buildings, much of it provided by alumni from outside Indiana. With the coordination of the PU-SEED super project, Purdue University proposes further expanding and disseminating the impact of these resources throughout Indiana by working through the certified technology parks, with partner universities, companies, and agencies to develop entrepreneurship, recruit companies and facilities to Indiana, provide a competitive advantage to existing businesses, and help keep Indiana's workforce well-prepared.

Because of Purdue activity reported in alumni publications and on campus visits, many non-Indiana residents are aware of Indiana activities. Purdue's more than 300,000 alumni can be found in every niche of today's economy, every state, and in the majority of countries. For example, Purdue alumni are venture capitalists on both the east and west coasts and Purdue has

trained a significant fraction of the engineering faculty in South Korea. As one of the premier research universities in the world, and one that has a long history of being among the most internationally-oriented, Purdue is already integrated into the world economy and its international-born faculty and alumni have strong sentimental ties to the Indiana economy. By the nature of its strength in engineering and technology, many of these alumni are CEO's, Vice Presidents, and well placed technology leaders in all of the economic clusters in which Indiana is strong. The coordinated efforts of the PU-SEED super project will provide many ways for this extremely talented group of people to contribute to the Indiana economy through participation in projects and providing strategic advice on economic development.

Because of Purdue's technical nature, international contacts, strong statewide presence, and the need for substantial levels of collaboration in a high tech economy, Purdue University offers significant capability for contributing to Indiana's economic development goals. Complementarily, Indiana economic development plans offers Purdue and its partners the opportunity to reach the next level of achievement to the benefit of Indiana residents. In general, Purdue University is a significant resource for achieving the vision of Indiana meeting the national average in per capita income and average annual wages by 2020 and the PU-SEED super project is a lens for focusing Purdue resources to achieve the goal of growing economic development activity.

Defining the 21st Century Land Grant University

A key strategy is to leverage the traditional activity of a research university to enable large-scale and non-traditional activity. When Vannevar Bush helped to architect the system on which the traditional research university was built there was a strong need to increase the scientific and basic technology inventory of the nation. This task was well suited to the classic research model that encouraged scientific reductionism, apprenticeship, and the accumulation of deep knowledge. Nearly fifty years after the Vannevar Bush inspired university-based research system was born our society faces complex problems that require synthesis and integration for their solution. For example consider the healthcare, energy, manufacturing, and education challenges and opportunities that society faces. No single set of ideas enables a dramatic leap forward, but rather the greatest progress will occur from a sophisticated system-based approach that considers the role of individual advances on the progress of the whole. In this environment the PU-SEED super project represents a reorganization of university based resources to coordinate and synthesize deep pockets of knowledge to achieve an overall goal. Land grant universities were born to organize knowledge resources in the service of societal needs. The PU-SEED super project will help organize Purdue in the 21st Century to meet its land grant mission, but at a higher level of sophistication and coordination.

Purdue University has a strong base of single investigator and small team-oriented research, as evidenced by its many National Science Foundation, Defense Department, National Institute of Health, and Foundation awards. This traditional research activity provides many deep pockets of

expertise in a broad number of areas across the colleges/schools and constituent departments. Each of the 1800+ faculty is encouraged to be a national and international leader in areas of intellectual inquiry spanning almost every conceivable field of knowledge, but especially concentrated in engineering, science, management, and technology. Like other world class universities, the breadth and depth of research is a resource that would be nearly impossible to duplicate in private and government settings. Furthermore, the culture of a research university rewards initiative, knowledge intensity, and transferring knowledge to bright, energetic, and soon-to-be far reaching young minds. Such an environment is a strong resource base on which to build more complex research activity and economic development activity. In fact, the whole purpose of the PU-SEED super project is to organize this talent in goal-oriented ways to address complex high value problems in areas such as entrepreneurship, workforce development, and as part of large-scale research initiatives with an economic development focus, such as in the areas of energy, environment, manufacturing, life sciences, nanotechnology, and application of information technology.

Some Examples of PU-SEED Projects

Based on listening sessions held around the State of Indiana, meetings, and one on one discussions, example PU-SEED projects and activities could include:

- Inventory statewide capability and assess the greatest potential areas of growth for Federal research funding and associated entrepreneurial activity.
- Faculty and staff would benefit from and appreciate training in entrepreneurship directed inside Purdue, i.e. "Purdue intrapreneurship". The entrepreneurial training can address how to accomplish a difficult activity at Purdue, rather than why something cannot be accomplished. There is a great opportunity to develop Purdue as "The Entrepreneurial University" by modeling entrepreneurship throughout Purdue.
- Develop training to enhance engagement skills among willing students, staff, and faculty. This will increase Purdue's general level of sophistication in engagement situations.
- Recruit knowledge-intense companies to move to Indiana based on state knowledge resources in combination with specific cluster resources in Indiana economic growth regions.
- Increase the level of capability of statewide incubators and technology parks.
- Expand entrepreneurial training and extend Purdue's business plan competitions statewide at the certified technology parks.
- Provide expertise to fledging companies Indiana wide to compete for SBIR and STTR awards. Purdue affiliated companies have a proven track record of competing for these awards and expanding Purdue's influence statewide will dramatically increase the number of SBIR/STTR awards.
- Provide a coordinated response to national level research funding opportunities that bring resources to Indiana and lead to economic development activity. There is a great opportunity to increase the level of synergism between Indiana Universities and the State. With

cultivation and demonstration of success, this could lead to a permanent State fund to support large scale research and knowledge based economic development.

- Develop tighter interactions and a larger shared project portfolio with existing Indiana organizations such as the Central Indiana Corporate Partnership (CICP), BioCrossroads, etc.
- Expand the use of university expertise in ways that are the most helpful to Indiana industry competitiveness such as the Technical Assistance Program (TAP) and joint research projects.
- Utilize the Purdue Visualization and Analysis Center (PURVAC) to facilitate real time Indiana economic surveillance. PURVAC is working closely with the Indiana Department of Health and other organizations to develop a real time surveillance capability for pandemic influenza and this activity has shown the value of real time integration of Indiana data sources and the need to have university based experts assist with the data integration, cleaning, analysis, and novel visualization. PURVAC offers the opportunity to extend this real time capability to a variety of very valuable “intelligence initiatives”.
- Develop templates for electronic local government that can be deployed and localized statewide without a significant local technology capability. Design these templates to support economic development activity regionally and coordination statewide.
- Develop a strategic economic development program utilizing the statewide extension system and Purdue Center for Regional Development.
- Work with the State Department of Health and Family & Social Services Administration to become a federal demonstration state for innovations in healthcare.
- Work with the Indiana National Guard and Department of Homeland Security to further develop Muscatatuck – in fact Purdue has already established a collaborative project to do initial work in this area. Explore the basing of an Army Brigade at Muscatatuck to serve as a “Red Team Force” for training activities. Such an Indiana Red Team Brigade could result in an additional \$3 billion in direct economic activity.
- Work with the IEDC to recruit nanotechnology companies to use the world class facilities of the Birck Nanotechnology building and then relocate to Indiana to permanently build on successful initial projects.
- Work with state certified technology parks to recruit companies to different regions of Indiana based on local strengths and support by the PU-SEED efforts, in addition to traditional economic development incentives. The technical resources of Indiana, like Purdue, can be channeled through PU-SEED efforts in a long term and deep manner to support high-tech corporate relocations to different parts of the state.
- Work with IEDC and other partners (e.g. Ivy Tech Community College and university branch campuses) to provide entrepreneurial training and support and workforce development projects that give Indiana an advantage over competitors – in fact Purdue is already piloting such work as part of a \$15 million WIRED project.
- Work with IEDC, the Governors Office, Crane, and others to transfer high-tech Defense Department programs from BRAC locations to Indiana.
- Work with the Indiana National Guard, Raytheon, and other companies to establish a military (e.g. Army) research center in Indiana. Such a center would provide millions of dollars in

research funding and give Indiana companies a lead in bidding for commercialization contracts.

- Work with energy agencies to establish an Indiana “Independence Park” as a proving ground for new energy sources (e.g. coal based liquid fuels, etc.) in a way that allows Indiana to help define the energy economy of the future based on sound data and proven technology. The combination of pilot and commercial scale work at an “Independence Park” coupled with the research resources of Discovery Park and Indiana Universities will help to define Indiana as a leader in the next generation of energy. Coal gasification is a natural first area for such an effort.

The PU-SEED Super Project Business Case

The business case can be made from several perspectives. Importantly, the resulting level of activity at Purdue and partner organizations and its direct impact on the Indiana economy will offset investment. However, the longer term impact on the Indiana economy promises to be substantially greater including playing a decisive role in recruiting new companies to Indiana, increasing the competitiveness of existing Indiana businesses, impacting healthcare costs, partnering with the state for innovative approaches to complex challenges in energy, homeland security and other areas, and providing training and workforce development that keeps Hoosiers cutting edge. Over time the synergism and system resulting from PU-SEED activities will improve the Indiana economic growth rate and allow Indiana to exert national leadership in areas such as nanotechnology. In short the existing successes of Purdue provide strong evidence of the potential for the PU-SEED super project as a major tool for enhancing economic development throughout Indiana.

Appendix 1 – Members of the Economic Development Working Group

1. Joe Pekny, Chair (Chemical Engineering - Faculty)
2. Charlene Sullivan, Co-Chair (Management - Faculty)
3. Sam Cordes (Agricultural Economics - Faculty)
4. Greg Deason (Purdue Research Foundation - A/P)
5. Jesse Moore (EVPT/Supplier Diversity - A/P)
6. Maureen Huffer - (Management - APSAC member)
7. Joe Seaman (President/CEO L-WL Development Corp. - Community Member)
8. Melissa Markofski (Health & Kinesiology - Graduate Student)

Appendix 2 – Short Bibliography

In developing this White Paper the Economic Development Working Group used the following material to provide background. This material will also be useful at the beginning of the implementation phase of the Strategic Plan.

“Indiana’s Adult Education and Workforce Skills Performance Report: Preparing Adults for a Brighter Future”, A report from the Indiana Chamber of Commerce, Developed by the National Center for Higher Education Management Systems, February 2008, available at <http://www.indianachamber.com/adulteducation>

“Innovation Measurement: Tracking the State of Innovation in the American Economy”, A Report to the Secretary of Commerce by The Advisory Committee on Measuring Innovation in the 21st Century Economy, January 2008, available at <http://www.innovationmetrics.gov>

“Proof of Concept Centers: Accelerating the Commercialization of University Innovation”, Ewing Marion Kauffman Foundation, January 2008, available at <http://www.kauffman.org/items.cfm?itemID=980>

“Powering Economic Development: Challenges and Opportunities for the 21st Century University”, Keynote Address to the University Economic Development Association by Dr. Luis M. Proenza, President, The University of Akron, November 5, 2007, available at http://www.uakron.edu/president/speeches/sp_11_05_07.php

The Wake Forest website discusses their fusion of Entrepreneurship and Liberal Arts, <http://entrepreneurship.wfu.edu>

Representatives of the University of North Carolina System discuss issues related to the role universities can play in economic development “Building an Economic-Development Strategy: Universities and economic development”, available at the website <http://chronicle.com/live/2008/02/boney>

“Understanding the Regional Contributions of Higher Education Institutions: A Literature Review”, Peter Arbo, University of Tromso, and Peter Benneworth, CURDS, Available from Sam Cordes of the Purdue Center for Regional Development

Appendix 3
Purdue University Economic Development
Strategic Plan Listening Sessions
Organized by Jay T. Akridge, Interim Vice Provost for Engagement

Format:

- Purpose: to give business/community leaders an opportunity to provide input into the Economic Development theme of Purdue's next strategic plan
- Size: Smaller groups, max 20, invitation meetings
- Target Audience: key local business leaders, LEDOs, reps from regional campuses, local Purdue reps (Extension, Tap, COT, etc.). This list will vary site to site. Also, will need to be coordinated with individual interviews the Economic Development Tiger team is doing. Point here is to get people who will have thoughtful feedback into plan, or would be key contacts as plan is rolled out executed
- Timing: last week of January/first two weeks of February
- Format: Breakfast or lunch meetings likely best – 1.5 hours total length. If a different time fits a region better, this can be adjusted. Have budget for 'working breakfast/lunch' meal for target group of 20 – focus here is meeting, not meal.
- Structure: Meeting will begin with a very short stage-setting presentation by one of the Economic Development Tiger Team members. Audience will then react to a set of structured questions, with at least two Purdue participants, at least one from Tiger Team, one from VPE office. This is truly a listening session, not a presentation of what we intend to do.
- Recorder: If at all possible, we will have a person designated as note taker for every session – assistant, secretary, grad student, etc.

Fort Wayne – Sean Ryan, Director of Fort Wayne Engagement Office

- Date: Monday, January 28, 11:30-1:30
- Site: Cole Training Room, Northeast Indiana Innovation Center
- Number of External Participants: 15

West Lafayette/Lafayette – Jody Hamilton/Joe Seaman

- Date: Wednesday, January 30, 7:30-9:30 am
- Site: Purdue Technology Center
- Number of External Participants: 14

Indianapolis – Tom Carroll, Director of Indianapolis Engagement Office

- Date: Thursday, January 31, 11:30-1:30
- Site: Intech Park
- Number of External Participants: 29

Indianapolis Personal Interviews – Tom Carroll, Director of Indianapolis Engagement Office

- Date: Friday, February 8, 8:00-5:00 EST
- Site: Barnes and Thornburg, State Capital Buildings
- Number of External Participants: 13

Merrillville – John Hanak, Executive Director, Purdue Technology Center of Northwest Indiana

- Date: Monday, February 11, 11:00-1:00 CST
- Site: Purdue Technology Center of Northwest Indiana
- Number of External Participants: 19

New Albany – Tom Springstun, CED, Floyd County/Natalie Fowler, Southeast District Director

- Date: Wednesday, February 13, 7:30-9:30 am
- Site: Board Room, One Southern Indiana, 4100 Charlestown Road, New Albany, IN 47170
- Number of External Participants: 21

Columbus – Jay T. Akridge, Interim Vice Provost for Engagement

- Date: Friday, February 15
- Number of External Participants: 12

Evansville – Susan Plassmeyer, CED, Vanderburgh County/Janet Allen, Southwest District Director

- Date: Monday, March 3, 7:30-9:30 CST
- Site: Evansville
- Number of External Participants: 8

Appendix 4 – Additional Input to Economic Development Strategic Planning Process

West Lafayette Campus Open Forum

- Date: Tuesday, January 15, 6:30-8:00 EST
- Site: Lawson B155
- Number of Participants: Approximately 200

Appendix 5 – Notes from Fort Wayne Listening Session
Organized by Sean Ryan, Director of Fort Wayne Engagement Office
Fort Wayne, Indiana
January 28, 2008

Comments:

- 1) Advanced degree opportunities at Regional campus locations –
 - Example – PhD in Education and Engineering PhD for DOD businesses
 - General issue of how providing advanced degrees for working professionals can be used as a recruiting and retention tool
 - Important to focus on gaps where Regional campus can't meet needs, partner with Regional campus in appropriate way
 - Need business and education alignment, i.e., some processes may need to be modified to meet the special circumstances involved, on-site dissertation research, etc.
- 2) Six Regional Clusters - Sector Support Alignment
 - Advanced Materials
 - Defense
 - TD & L
 - Financial Services
 - Medical Devices
 - Food Processing
 - General issue of aligning Purdue support for a region by supporting in a targeted way the sectors of focus in that region
 - The 'Sean Ryan' model is one way to help assure such alignment, are there other models?
- 3) Large Scale Research
 - Incorporation of Regional Campuses and increase in private and corporate sponsorship
 - General point was that to double research dollars, can't do that with existing approaches. Regional partnerships between Purdue, regional campus, and industry cluster in region may be a strategy to tap very large contracts, especially in defense
- 4) Positioned to respond to collaborative research
 - How does Purdue-WL work to insure that they are prepared to respond to large-scale collaborative research opportunities.
- 5) Availability of qualified workforce
 - Incentives to get graduates to stay in Indiana
 - General issue is how can Purdue Economic Development plan support strategies to keep human capital 'at home' and also attract well trained alumni back to the state.
- 6) Partnership of all educational institutions in Indiana

- 7) Bundling educational programs and align to Industry Cluster TD&L
- 8) On campus undergraduate technology / management links
 - Facilitate link - student to student; and student to firm
 - On the WL campus, how do we build even more immersive programs that give management and engineering/science/technical students opportunities to work together on entrepreneurial/commercial projects.
- 9) Agriculture Business and Entrepreneurship
 - New businesses and workforce development
 - Alternative energy crop production & technology
 - Food processing / test kitchens – focus on regional competency across state
 - Substantial opportunities in region for relationship building/sector support between College of Agriculture and region firms in agriculture, with a special focus on processing.
- 10) Opportunities with available facilities
 - Examples - Central Soya building, UAV Aircraft, NE Indiana Businesses, Airport (runways and warehouse space), Etc.
 - When firms exit state and leave specialized facilities, are there opportunities for Purdue to utilize these facilities to expand capability
 - Raises question of strategically thinking about physical facility requirements outside of WL to support economic development/broader campus initiatives
- 11) Government Role:
 - Design structure for competitiveness and responsiveness
 - Communication between state and local governments
 - Alignment of state support, in the form of incentives, to targeted industries
 - Incentivize incumbent workforce skills development
- 12) How Purdue can be a better partner
 - Direct link between business and Purdue
 - NIIC link to PRF
 - Engagement Office – funding as example
 - Purdue Center for Regional Development – better connections
 - Remove structural impediments to partnership—example Notre Dame, K-12, Ivy Tech linkages
 - General issue one of how to get easier to do business with. What people are required, what structures are required, what business processes are required
 - One idea: entrepreneurial training for administrative professionals. How do we get from a mindset of ‘that can’t be done’ to ‘let’s see how we might be able to do that’?
- 13) Incentives to attract Purdue Alumni back to Indiana for business start-ups
 - Mentioned above, how do we intentionally pursue alumni, while not damaging relationships with Purdue employers who recruit students for national and international jobs

- 14) One of the comments leads to the idea of developing a program to provide advanced degrees for military officers. Military personnel with advanced degrees are technology leaders and great partners for approaching large scale challenges.

Appendix 6 – Notes from West Lafayette/Lafayette Listening Session
Organized by Jody Hamilton/Joe Seaman
West Lafayette, Indiana
January 30, 2008

- Purdue has a role as an honest broker
 - Facilitate discussion on “specific issues”
 - encourage economic development
 - raise standard of living
 - to be seen as judicious and honest
 - the local community looks to someone to help with this development
- Access
 - Communication portal needs work
 - Purdue doesn’t catalog resources very well
 - need to get information in front of the public and have accessible
 - website to find/approach Purdue is very hard to figure out and navigate
- Success, Impact: What measures should Purdue use to measure the success and impact of its economic development strategy?
- Be a Model/Model Behavior
 - Certified Energy Manager
 - Certified Green Manager
 - how does Purdue show the public they are being conscientious of energy savings?
 - certified energy program – are there training/education opportunities in this area
- Coordination of Campus Activities-Tech Transfer
 - next level of entrepreneurial activity
 - needs coordination of all institutions and allow folks to find these available technology opportunities for commercialization
 - combine resources to be efficient and accessible
- Extension
 - Real need for education on local economic development strategies
 - Big range of capabilities with LEDOs
 - Regional Focus:
 - Extension offices are valuable to entry into Purdue
 - not much economic development in small rural counties
 - each county needs to see a bigger picture as a regional development
 - the Purdue regional development initiatives need to help communities understand economic development better

- politics-local economy, development regional
- how to integrate package for deals of economic development
- new ways organizing/coordinating activities across regions

- Tech Park Model
 - Replicate/Assist: How do we take this very successful model to other parts of the state?

- Better Coordination Across Entities: How can Purdue assure better coordination across internal units to better deliver on economic development strategies?

- Unhealthy Workforce
 - How can Purdue partner with employers, hospitals, etc. to address this issue?

- STEM/P-12 Education
 - critical for workforce development
 - bring this down to PK/early childhood development
 - important to kids to go to college or some kind of trade school
 - find a way to help promote parents to encourage students to pursue higher education
 - improve skill set of Indiana workers

- Target Industries
 - Definition: what are target industries in Lafayette/West Lafayette? How can Purdue best support these targets?

- Strategy to Attract Alumni/Investments
 - have successful Purdue alumni return to area to encourage investment
 - how do we retain more graduates? How do we attract graduates back to leave the state?

- Lafayette
 - Physical Presence
 - can Purdue take a greater physical presence in Lafayette to extend educational values?
 - Purdue's presence is not felt in all of Lafayette
 - can Purdue partner more with Ivy Tech?
 - how to help Lafayette connect more to Purdue?

- Living Laboratory Idea
 - make Indiana the friendliest state for economic development
 - quality of life in area – enhance to help with attraction
 - entertainment – culture an important part of economic development

- continue cooperation with Lafayette/West Lafayette
 - are we a friendly place to do business? if not, how do we become a friendly place to do business?
 - Hispanic population – how does Purdue encourage better understanding of/relations with this growing group?
- Riverfront Development
 - River as Asset: how can Purdue help LWL best position the Wabash River as a community asset?
 - Trails / Parks:
 - engage more on riverfront – make more attractive area – river front development – what is Purdue’s role here?
- Explore Life Long Learning Offerings
 - Engineering – Civil ‘Certification’
 - MBA program weekend lifelong learning
 - What other lifelong learning opportunities should Purdue offer the local community?
- ‘Mindset’: Solution Looking for Problem
 - Training
 - Purdue should be more humble when trying to help – too much solution looking for a problem
 - there is a disconnect between Purdue and community
 - should help train faculty to engage community, how can Purdue be a better partner?
- Student / Faculty Projects
 - Local Collaboration / Sponsored Research
 - local folks help with sponsorship of research: is there some way to link local businesses/individuals with Purdue research?
- Rural Development: what role can Purdue play in helping bridge the economic development gap between rural and urban areas?
- Sprawl – Downtowns
 - School, crime, etc.
 - ‘Healthy Environment’
 - Energy/Development
 - What role can Purdue play in thinking through these problems?

Small Town Values / Asset?

- take advantage of small towns
- values of families
- values of small towns
- Rural development and the role that Purdue should play?

Libraries / Access

- As resource
 - can't access Purdue libraries without being a student, faculty or staff – open up to the community
 - what can be done in this area to provide more access?

Appendix 7 – Notes from Indianapolis Listening Session
Organized by Tom Carroll, Director of Indianapolis Engagement Office
Indianapolis Intech Park
January 31, 2008

Make sure rural Indiana is included in the plan

- Is there a focus on rural Indiana and rural America. If so, what part is concentrated on Agriculture?
- Tiger Teams have wrestled with this issue of economic development in rural areas and how to get rural communities involved and participating. The Benton County wind farms are a potential opportunity to promote and replicate.
- The Purdue Center for Rural Development and the Indiana Venture Center's efforts in developing a template for business plans were mentioned as an assistance tool for smaller, rural businesses.
- The WIRED Workforce Development program's entrepreneurship program for high school students to help them with training and development and also the similar STEM program, which is hopefully to become a statewide program, was highlighted.

Importance of a regional focus

- What are the assets on a regional basis, how should the regional centers interact, how to marry everything with Purdue, and the regional centers need to help the areas find their assets to be highlighted.
- There needs to be cooperation with the others already involved. For example consider Tech Point's boot camps as an example.

Don't forget agriculture

- The bridge between agriculture and agricultural development needs to be gapped. What is the best way to do it.
- There is a definite need to respond to all 92 counties to create interaction to help bridge the gaps of what is being developed in one county that needs to be known by another.
- There is an opportunity for Purdue to bridge the "tug-of-war" between economic development and agriculture and that any conversations would not have to be exclusive because Purdue is well-positioned on this issue.
- Regarding agriculture, Purdue has done an outstanding job during its first 100 years researching better agricultural production techniques and aggressively reaching out to producers to communicate the new information. As a result, agriculture has changed so much that many people no longer recognize it as agriculture. We can only continue to grow this important sector of our economy if the general public is supportive of our industry. One of Purdue's strategic goals relative to agriculture should be to proactively communicate with the general public about the nature of modern agriculture – its environmental benefits, its animal health benefits, its food safety benefits, and its economic benefits to the non-farm public. If we don't pursue that message aggressively,

there will be little reason to teach farmers how to be more efficient because they won't be allowed to implement what you teach. There is a need for increased public understanding exists relative to other industry segments as well. (Recall the comment, "We don't need more companies, we need more jobs.")

Access to Purdue economic development resources is critical

- How can Allison create research ties with Purdue now that it is independent of General Motors.
- The question arose as to how to strengthen Purdue ties to big companies like Allison and Rolls Royce – since these big companies tend to face BIG challenges, could they become part of the Big Science Tiger Team. Purdue would have a stronger case for big science funding if allied with these companies around big challenges (like conversion to hybrid vehicles).
- There needs be a better job done of educating people through more dialogue about all that Purdue has to offer, and bringing it all into a forum.
- Purdue needs to make its assets, its areas of strength and excellence, and world-class expertise better known. The PURE data base can be used for this. It is all a matter of connectivity of the right people, the right facility, etc. and that the IEDC is progressing on a website that will be live by May that will attempt to connect all of these areas and subjects including the issue of intellectual property. The PURE website would be widely populated throughout Indiana.

How does Purdue help entrepreneurs address the funding issue?

- The 21st Century Fund has funds available for research and development and it emphasizes working with smaller companies with all awards being given to Indiana companies.
- One issue Indiana faces is losing entrepreneurial companies to other states. The 21st Century Fund made 51 investments in the past year, the Fund's focus is not likely to change, and only 15% of the proposals received are approved. The 21st Century Fund expects up to 30 more awards to be made this year. What is considered economic development to some people is not the same to others. There is a concentration of startups in Indiana and existing companies want to grow here while other companies are being pursued to locate in Indiana.
- Indiana only gets 1.5% of the venture capital funds in the entire nation.
- Consider directing the PRF investment committee to look first at local funds/companies with their existing private equity allocations (without lowering their investment standards.) Would tap a source of investment capital that's being put out anyway and give back both returns (\$) and economic development.

Don't ignore mid-size firms in the plan

- Purdue's Technical Assistance Program focuses mostly on the smaller to medium-sized companies with its assistance.

Look at mechanisms for identifying technology with commercial potential

- There is a need to identify assets in the various Indiana companies to explore the opportunities for spinoffs. There is a need for focus on the lower levels of a company where there may be latent technologies or products to market or even to get patented.

Make sure the plan is inclusive

- There are different cultural experiences in the various counties of Indiana due to the diversity of the population. There is an ongoing process of getting newcomers to an area acquainted with the current more established residents. Purdue is the lifeline to bringing about education equalization for all Indiana residents, consider the Science Bound Program. What part can newcomers play in coming to an area? There is a need to identify assets and what they might be able to contribute to the area.
- The Catalyst program was highlighted as a resource for Asian-American professionals in Indiana to get established and progress from the lower level of employment within their companies to higher leadership roles.

Focus should be an important part of the plan

- There should be a better way to showcase the assets of Indiana companies and that Purdue could help to bring more specificity. What does Indiana want to be known for and once that is established more collaboration between the industries and educational institutions should happen. The BioCrossroads Initiative has a concentration on energy and alternative energy resources. Purdue can help get the research and development entities connected with an agricultural engine within the State and specify a roadmap of its findings.

Make sure the plan has some specific metrics/is outcome focused

- What is Purdue's role in economic development, how is it measured, and what is the outcome. He felt that the measurement criteria should be a large part of the role. He commented on the net brain power added to Indiana and to its economic development.

Work to keep Purdue graduates in the state and also to attract Purdue alumni back to the state

- Should Purdue be clearer on the issue of impact to the feeder system and to actually measure where its graduates go. More pre-college integration should be done. The regional campuses have a big role to play. There are 300,000 Purdue alumni scattered throughout the United States and world. How to entice some of them back to Indiana.

Consider an I-STEM Network for Economic Development

- How do small companies find out about the various programs Purdue offers. Someone interjected that Purdue's Office of Engagement should be the "gold"

standard of outreach. Purdue's I-STEM network shares resources all in one place at all campuses.

- The I-STEM model for Purdue to create and run THE web clearinghouse for all IN economic development programs and resources is a powerful idea.
- There was some discussion during yesterday's meeting about partnering with ED organizations, companies, and government agencies. The only reference to partnering with other universities was the I-STEM project, which apparently exists by virtue of a grant from Lilly. Would collaboration have occurred absent the grant?

The plan should focus on partnering with other higher education institutions across the state

- Indiana has a number of excellent schools and on many fronts they operate duplicative, competing projects. Why not pool those resources, including the very valuable human resources, into collaborative state-wide efforts? We could have even better programs delivered more efficiently and effectively if we were more concerned about getting results and less concerned about getting credit. The rising economic tide should raise each of the academic ships, so it is not contrary to a school's self-interest to collaborate. This is really nothing more than the Discovery Park model, which subordinates parochial departmental interests to the broader multi-disciplinary opportunity.

Consider the international dimensions of economic development in the plan

- The Purdue globalization Tiger Team should do more to promote Indiana to foreign markets. He further elaborated on the lack of knowledge by foreign companies about Indiana and its assets.
- Big companies wanting to expand into foreign markets need a resource for locating Purdue graduates with foreign contacts.
- Purdue's charter mission should be more focused on statewide, regional, and global partnering. He reported on the international BIO 2008 conference for the discovery, development, and delivery of the life sciences and that Purdue should definitely be involved.

Consider mechanisms to promote and support local economic development activities

- There are various "shovel-ready construction sites" throughout the State that are unknown or at least not readily known as available to companies looking to expand or locate in Indiana and the need for a resource to solve this matter. Companies should be informed of various resources for their patents to be applied.

Better support local LEDOs

- Most people work with what is familiar regarding resources. There is a need for more regional focus on the relationship with LEDO's, but the staff is stretched thin in some locations. There is a need for LEDO's and Extension Staff to interact to get information needed to communicate to their partners.

- How can Extension work more effectively with LEDOs? Are there training opportunities? Is the current ECD structure appropriate given changing state needs?
- How can Purdue do a better job of helping local communities identify their assets and develop an economic development plan?
- Purdue has been active in the state and regionally, how do they work better locally with LEDOs?

Appendix 8 – Notes from Indianapolis Interview Session
Organized by Tom Carroll, Director of Indianapolis Engagement Office
February 8, 2008

Interview #1

- Utilize Regional campuses for economic development
- Conexus started in 2007
- Battelle Study catalyst
- Work force development is critical issue – major opportunities for continuing education/non-degree programming
- R&D help to small & medium size companies
- Joint agreement with Conexus & Purdue a positive move
- Logistics could use support
- Develop Regional Strategy between Conexus and Purdue
- Conexus is under CICP, headed by Cummins, Rolls Royce, FedEx, Bright Point,...
- Conexus does strategy
- Need massive influx at Associate Degree Level
- 900,000 Hoosiers w/o degree, 350,000 at high school level, big opportunity
- 90 percent of people work in small companies
- Southern States are beating Indiana with Economic Development: climate, right to work, policies, need ED kit for companies, can we benchmark these states?
- Purdue College of Technology has big opportunity
- Purdue has too academic an approach, cumbersome, slow, theoretical, regional campuses don't have resources
- Who worries about manufacturing companies? Lots of focus on life sciences – don't forget manufacturing.
- Network regional ED resources: local economic development groups need help.
- Great potential for Purdue if they want role.
- Energy & Defense are key sectors for Economic Development

Interview #2

- Defense is a real growth opportunity.
- Recruit more defense companies to Purdue
- Working with WIRED on power systems, batteries
- Need electrochemistry people at Purdue
- Need systems engineers, project management mentality at Purdue
- Talent is most important asset.
- Innovation & Entrepreneurship, action oriented
- Interests in healthcare
- Take advantage of extensive worked in state on economic development
- Even in mature areas need to go to high value part of value chain
- Where do we want to be in each sector, what is trajectory action plan for each sector

- What is the new learning center model? How do you provide proximity and access to those who need education?
- Work force development is Purdue opportunity
- Must do more than Federal programs
- Bring talent back to Indiana
- Help Hoosiers fit in to technical future
- Existing workers, future workers, Purdue is at high end, need help at low end.
- Opportunity to attract companies to Indiana for production.
- Purdue can help companies do production after R&D.
- Lots of Partnership in education possible
- Learning centers are an opportunity, Purdue brand is valuable to these
- Purdue has an opportunity all over the state, what is template? Business communities would pay.
- Focus on needed skill sets, partnerships should focus on system performance.
- 30-50 year olds don't know community college structure. Ivy Tech stronger in some places relative to others.
- Develop an Ivy Tech partnership – there is much opportunity for workforce development here. Work with strong partners, model success.
- Put Project Lead the Way in every high school. Look for leverageable opportunities – need things that scale.
- P12 experiential learning is an opportunity
- Research Park & Extension Offices are Purdue subsidiaries that are key.
- Organization & management structure changes are an opportunity
- Need regional action plan for ED, local culture, listen
- Leadership management, board development
- ED is more than buffalo hunting
- Link with dynamic leaders in each region.
- Major opportunities to use Purdue resources to enhance economic development in rural areas. Is the structure the right one to facilitate regional economic development thinking?
- Does the notion of a Purdue Certified LEDO make any sense?

Interview #3

- Work force development
- Retention of high tech workers
- Help keep or bring people back to Indiana
- Hoosier come back program
- IN-sourcing
- Alumni program focused on ED
- Are more co-op programs possible in Indiana?
- Project lead the way courses should be for course credit - I already have 6 Purdue credits, I will just go there. This is a STEM issue.
- Match making function between students and companies

- 40,000 engineer target in California, can we do this in IN at lower level?
- Ivy Tech is good at corporate curriculum
- DWD is revamping rapid response program
- Many companies are willing to hire workers with certain skills
- Niche markets for Purdue in higher tech areas.
- Adult education is an issue that must be solved.
- Business is often a missing partner in work force development issues.
- Bio-regulatory courses were a niche need
- Advanced manufacturing education council under Conexus (Rolls Royce, Cummins, Sony, represented)
- TAP has the opportunity to target industry groups
- Internship opportunities are critical
- Key transition points in education are intervention opportunities.
- Internships are very valuable for small companies
- Can Purdue grow its internship programs?
- Can high school students intern at Purdue?

Interview #4

- Keep doing what you are doing – do not lose momentum!
- Do more statewide
- Work force is the #1 issue
- Small to mid-size companies services, state chamber has data.
- Smaller community assistance is a big opportunity - need action plans, connect faculty with rural interests, instill hope. Big opportunity for Purdue in rural areas.
- Northwest Indiana is primed for growth, Governor Daniels has been a force, maybe a great first step to yield low hanging fruit, Congressman Visclosky, some forces moving towards integration
- Gary-Chicago Airport
- Louisville is a potential growth area
- Evansville is a great potential area
- Duke energy plant, energy summit, Vectren
- Fort Wayne potential
- Notre Dame is a prime opportunity for collaboration.
- Work force is of huge importance. Cannot get enough talented people in some sectors.
- ED leadership program for community leaders, connect in community, huge potential leverage, asset identification, networking, action plan development, connect to Purdue
- IEDC has been a big help.
- Legislative audience education could pay off.
- ND-IN-PU combination has incredible potential!!

Interview #5

- Need regional action plans

- CICP has been only regional organization
- CICP - sell region, strategy, data gathering
- CICP is umbrella effort, Indy partnership is another component
- Motor sports is a target niche
- How can Shelbyville be a better home to Toyota suppliers?
- Work force training is a key issue.
- Medco chose to locate in Indiana because of work force
- Customer contact center provides many semi-skilled jobs
- Purdue getting outside West Lafayette has been a plus. Must keep this up. Jischke was a master – Purdue must stay connected to the state.
- Retain Purdue graduates in Indiana. Internship programs, get Purdue students connected to community.
- "Internet" exists to foster interns in Indiana
- Alumni network is tremendous ED resource
- Grandmother effect to recruit people to state
- Indiana is 12th in terms of state climate for business taxes. Taxfoundation.org. Indianapolis is in top 10 places to start business.
- University partnerships in post degree education is a big opportunity.
- Work force & work force development is key to recruiting companies. Not as much incentives.
- Purdue website needs to be a lot more accessible. In general, accessibility to resources is a major issue.

Interview #6

- Develop collaboration with IU in life sciences.
- I65 corridor
- Discovery, pre-clinical trials, clinical trials, contract manufacturing, critical mass in life sciences
- Potential complement to Chao Center
- Academic collaboration around country
- Know more about personalized medicine to capture market
- Purdue is in perfect position to drive life sciences
- Scale Purdue's activity and be on the lookout for next steps
- Look for other peoples money for capital
- Form early alliances in life sciences
- Health Information Technology & omics are key future technologies
- Life science is a great sector to grow
- Emphasize critical mass, Purdue must focus
- Need public, cordial collaboration with IU, biomedical engineering, RCHE-RI collaboration

- Notre Dame has enormous commitment to technology transfer, cancer research, and infectious diseases (Gates Foundation). Dow Agrosiences could be good partner in plant vaccines.

Interview #7

- Engage business!!
- Develop new model for large scale business work.
- Hire an independent company to assess university processes.
- Six sigma improvement of university processes.
- Put someone on business side, Jim Almond, on PU-SEED leadership team.
- Better customer service at Purdue
- Issue: people at top want to partner, have good intentions, can fall apart at lower levels.
- Figure out IP issue, that is key.
- Develop some IP templates and "do deals"
- Make Discovery Park a center piece of collaboration.
- Build relationship with IU Medical School
- President needs to be public about economic development – must keep this front and center in the state.
- Need to manage relationships for long term.
- Need single point of contact for doing business with Purdue
- Foster entrepreneurship outside university
- Foster moving successful programs outside

Interview #8

- Purdue has been great partner
- IN lacks mid-level management expertise
- Hoosier come back program
- Alumni network to recruit back to IN
- Issue of keeping talent here, bringing talent back a very big deal
- Need to solve international visa issue – keep international talent here.
- Future of Indiana are research universities
- Marketing of IN, effective outreach outside IN
- Indianapolis is second best city to retire
- PURE statewide faculty database
- State will partner with Purdue to recruit large scale research
- State would be happy to be member of PU-SEED super project team.

Appendix 9 – Notes from Merrillville Listening Session
Organized by John Hanak, Executive Director of Purdue Technology Center of Northwest
Indiana
Merrillville, Indiana
February 11, 2008

- Evaluation of possibilities: how do we evaluate the impact of economic development activities, what metrics are appropriate?
- Focused approach: how do we adjust our approach to fit regions and sectors?
Assets > Problems > Possibilities: how can Purdue help communities understand just what is possible based on the community's assets? The key point is that in many cases communities just don't understand what they have to work with, nor do they understand what might be possible.
- Hammond Incubator = positive development: While not a Purdue West Lafayette project, the Hammond incubator was viewed as a very positive development. Maybe an example for other such incubators?
- Business Plan Competitions / Interns for Indiana: Find a way to continue these programs. They are considered very valuable.
- Public controversy > Defendable info: The point here is that economic development can involve difficult conversations about inevitable trade-offs. What role can Purdue play to provide research-based data/information to conversations that can be emotionally charged?
- Helping prepare for growth: How can we help communities prepare for growth? As they develop strategic plans, what insight can Purdue provide to help them be proactive and not reactive?
- Statistical insights on region / partner opportunity: Point here was a perceived lack of data on how a region is doing, good data on current situation, data on comparisons against other regions, analyses that provide insights on strategies that have worked, data that could be shared with potential partners. Point was to develop more penetrating insights than 'chamber data' provide. Maybe some type of health of region index could be developed and tracked over time.
- Web Presence > Local delivery: How can we take advantage of technology and local partners to boost the efficiency and impact of workforce development projects, with workforce development broadly defined?
- Human Capital - Retention: What can Purdue do to help retain graduates in state? What can Purdue do to attract graduates to return to the state after leaving? How can intern programs be levered to help in this area?
- Addressing Connectivity: In some area, Internet access is a major problem. What can Purdue do to assist in helping communities connect to high speed Internet?

- Purdue Lab School (P-12) - science / math academy: The idea of a lab/charter school was discussed. Evidently, Purdue Calumet has worked on an initiative in this area. Some frustration about current status.
- Regionals - Impact on retention strategy/partnering with regionals: How can Purdue West Lafayette best partner with the Regional campuses to address the human capital attraction/retention issues?
- Perception of Indiana support of IEDC promo; “Role in Attraction”: How can Purdue best partner with IEDC to play an active role in making the state an attractive location for new firms/firms looking for a site to locate?
- Regional Strategy / Cooperation / Data: What role can Purdue play in encouraging regional cooperation? What role can Purdue play in helping groups who tend not to work together, to sit down and pursue a broader agenda?
- Data-finer lens: Back to the data point raised earlier, there is a perceived need for better data at a local or regional level which would allow for better assessment of activity and better comparisons against peers.
- Honest broker - PNC example: PNC has provided the role of an honest broker on some local/regional conversations. Maybe a good example for West Lafayette
- Leadership: Need Purdue to take a leadership stand on economic development issues
- Business decision-makers: Make sure that discussions/planning includes decision makers who are running companies/trying to start companies. Don’t just focus on LEDOs, political leaders, Purdue staff, etc.
- Education of elected officials / policy makers: How can Purdue help elected officials/policy makers better understand economic development? There was a perceived need for training in this area.
- Industry focus - Existing businesses: Do not forget existing firms as economic development plans are developed. It cannot all be about start-ups and entrepreneurs.
- P-12 / high schools: Workforce issues are inherently P-12 issues. Any strategy must consider the P-12 community and what Purdue can do to improve school performance, broadly defined.
- Health Care: Health care costs are a fundamental industry problem. What can Purdue do to help organizations lower health care costs/provide better care for employees?
- Making commitment known: How can Purdue best communicate the resources that it has available to the state? Some needs were raised, that Purdue has new programs to address, but the availability was not known to participants.
- Focus on problems: Just keep the problems facing organizations front and center as this economic development plan comes together.
- South Shore Extension / Education Community: An example of an economic development project where Purdue might be able to provide objective insight/analysis into the discussion.

- Be more than Think Tank: Make sure the plan is action-oriented. It can't be something that makes Purdue simply a think tank. Lots of ideas and concepts, need to be action-focused, get something done.
- P-12 early focus/education thrust on tech side /education: Help P-12 community position manufacturing and STEM areas as career opportunities.
- State higher ed - Partner with Purdue: Make sure plan works with other higher education partners in the state.
- Link to existing programs: Lots of existing things out there, don't recreate these.

Appendix 10 – Notes from New Albany Listening Session
Organized by Tom Springstun, CED, Floyd County/Natalie Fowler, Southeast District Director
New Albany, Indiana - ISI Board Room
February 13, 2008

- The “LEGO” program on robotics could be extended/enhanced in local schools. This program has been well received.
- TAP could also be promoted more to strengthen local businesses. The TAP program is also well received -- how do we make the services more visible/available to regional businesses.
- The Department of Forestry greatly helps our area with “value-added” assistance. Some additional opportunities to partner here.
- There could be more assistance from government in developing our roads, waterways and infrastructure. Infrastructure is a major issue: not clear exactly what role Purdue would play here.
- Expanding Purdue University College of Technology offerings at IUS has been great, but could more be done to add other programs like Aviation? What can be done to better include students from Louisville? How does that factor into COT offerings longer term.
- The IU/PU partnership is good, but could be better to do more work with CEO’s, do more entrepreneurs training, etc. There are likely more opportunities to partner with IU than have been exploited to date.
- Business plan competitions may be another way to support/encourage entrepreneurs.
- Current CEO round table could be expanded to include managers of larger organizations running local facilities. They would be equivalent to CEOs of mid-size companies who are locally based.
- Since we are a part of the larger Louisville metropolitan region, we need to be able to “show up better” in southern Indiana by being more attentive to our strengths; we could use help from IU and PU to do this.
- We need to do more “regional thinking” with our bordering communities; be more proactive; have reciprocity agreements so students can go to either PU classes at IUS or the main campus at IU or PU. More broadly, how does Louisville factor into our southeast regional strategy? Firms like UPS could become a more important part of our logistics effort.
- The general idea of a ‘border community strategy’ was discussed. How might we approach areas like New Albany/Louisville, Cincinnati, Gary/Chicago? Are there elements of strategy that might make sense which would apply to all these types of areas?
- SBIR Grant Program is good and can use more of it. What can Purdue do to expand SBIR applications/increase success, etc.
- Are there any financial resources for entrepreneurs? What can Purdue do to help managers of start-ups find capital?
- Someone asked for an explanation of the local Purdue Technology/Research Park, and what assistance the director there could offer us. Some discussion about how the park

would be communicated to the local community. Also, how would the director be chosen? The group in attendance was very interested in this director position. Who will be the new Director at the PU Tech Center Park? Two-way communications will be important. UK and U of L folks also need to meet the new PU Director at the Tech Center Park when they are here in place.

- Workforce development was greatly discussed, and how we had to work more with middle and high schools to assist students and encourage their further education at a trade school or college; this would also give us a “feeder system” for the new Technology Center jobs.
- Major discussion about P-12 schools, improving schools, enhancing graduation rates, turning students onto careers and pathways to higher education. Recognized as a major issue in the region.
- We have Ivy Tech and Prosser Vocational Schools nearby in addition to IU and PU, so take advantage of this and partner together more.
- Workforce education is the big key here. Where does Purdue fit in this broader regional need for workforce development.
- SIRDP (Southern Indiana Rural Development Project) has been active for 15 years in 40 counties, but they need to explore how to partner more with Purdue. Sounds like this would be a natural network to work with on economic development activities in Southern Indiana.
- Adult education is important, as we have almost 100,000 “underemployed workers” from downsizings at GE, Ford, International Harvester, Army Ammunitions Plant, etc.
- SBDC is trying to get a stronger presence here too. Perhaps there is a role for Purdue here.
- Long-term energy issues in Indiana and the US, so can Purdue assist here? What role can Purdue play in addressing this ‘grand challenge’. More specifically, what is the engagement role here?
- Need more marketing of PU with IU in this region so folks know we are here. Lots and lots of universities in the area. How do we help people in the region understand that Purdue and IU have a significant footprint in the area. This may be especially an issue in Louisville.
- We need to partner more with the US Dept. of Economic Development and the State of Indiana to get more financial support for our area. What role could Purdue play here?
- Some discussion about building plans at IU-Southeast and the construction of a facility on the IU-SE campus for the Purdue College of Technology.

Appendix 11 – Notes from Columbus Listening Session
Organized by Jay T. Akridge, Interim Vice Provost for Engagement
Columbus, Indiana
February 15, 2008

- Emphasis on expanding existing services: TAP, COT. Idea of regionalized services aligned with Columbus manufacturing clusters. Love TAP and COT initiatives in place now, want more.
- Strong support for TAP, look to grow this in Columbus.
- Eco15 has set the table for Columbus and Southeast Indiana over the next 15 years. Purdue will need to align itself with the Eco15 plan. Major focus on advanced manufacturing, health care, some on hospitality and tourism management.
- Workforce development is a major issue, preparing people for careers in advanced manufacturing. Jobs are there with Cummins and Honda moves. Dream It, Do It is supported heavily, how do we bring Project Lead the Way into the Region. They want it in every school.
- Big on ideas of learning pathways. Where will Purdue fit in? Does not mean everyone must pursue a BS degree. How do they get the drop out to finish? The high school graduate to get an associate degree, the associate degree holder to get a BS, etc. Pathways to learning, and helping students see alternative pathways was a major point of discussion.
- Felt there were good opportunities for the College of Technology MS degree.
- Additional comments about getting Purdue engineering into the area: is this an opportunity for EPE? Also, want to see EET program back in Columbus.
- What continuing education/certificate/non-degree needs can Purdue serve in the region? There seemed to be a major appetite for these kinds of non-degree activities.
- Major interest in dual-credit courses, preparing students for college – finding a way to make the senior year useful.
- Education not valued in region. What can Purdue do to change the attitudes around education? Many, many first generation kids.
- What can Purdue do to get parents involved in education?
- Some view Purdue as unattainable – too hard to get into. Either write off college or attend a different school. Is this the perception we want to cultivate?
- Good relationships across Ivy Tech-IUPUC-Purdue. A place for a regional model of collaboration?

Appendix 12 – Notes from Evansville Listening Session
Organized by Susan Plassmeyer, CED, Vanderburgh County/Janet Allen, Southwest District
Director
Evansville, Indiana – Cambridge Golf Club
March 3, 2008

- Infrastructure development seems to be a key element of economic development. How can Purdue help with assessment of infrastructure gaps, how can Purdue provide a more organized approach to infrastructure planning?
- Human capital development and education levels of workforce are major issues. Population growth is slow – how do we insure we have an adequate supply of skilled labor? Making sure the workforce has adequate technical skills is a major issue. Basic preparation in science and mathematics is an issue. In addition, region needs employees with BS and MS degrees in STEM areas.
- Very difficult to recruit people to region. Energy, nuclear areas continue to grow – need skilled people. How does region build a workforce that is capable of serving broader requirements of advanced manufacturing? Maybe hard for Purdue West Lafayette to get involved directly with regional human capital attraction, but perhaps creative ideas could be pursued.
- Can Purdue structure a formal program to provide interns to region? May be possible to utilize Indiana InternNet for this purpose. Point: if they intern into the region, they may take a full-time position there. Perhaps the TAP program could be some sort of catalyst for this program.
- New and small firms have a need for market research. Can Purdue utilize students in some way for market research? Also, how can Purdue make databases available to small firms throughout the state through the Extension network? Local Community Decision Maker may provide useful data to public sector officials for the same purpose. Also, TAP might consider taking these types of market research projects on.
- Can Purdue assist with asset mapping, isolating a region's strengths with respect to technology? Perhaps helping them focus on the key technology sectors they might need to focus on?
- There was a major point of discussion about access. The training available is not worthwhile if not available when an employee needs it. This may mean more night courses for working students, Internet courses for rural residents, training readily available when an employee has been laid off and is still eligible for training support, etc.
- Part of the access issue is broadband access in rural areas.

- A key point here was also training with a credential – a certificate, something that certified preparation. This credential would have meaning to employers and be something with broader recognition. Also a part of this idea was pathways so that students could continue to move through an educational ladder if so motivated.
- How to help diversify the economy so that the region is not so vulnerable to outsourcing/slowdowns. For example, parts of the region are very focused on the automotive and wood products industries. Any role Purdue could play here, maybe in the planning area?
- Need to support Purdue MS and Ph.D. programs in the area. This is not an area that local universities can serve, and is a need for on-going talent development. Especially valued would be programs structured around people working in the region. The IU Med School was held up as a model.
- A PRF Research Park in South West Indiana was suggested – developed in partnership with Purdue – possible task force with local representatives to get something started, at least exploring the idea for an Innovation 65 type park.
- Is there any way Purdue/the region can get involved in these ‘problem-solving ‘web-sites’ – sites by companies that post problems to be addressed. Proctor and Gamble’s Connect and Develop idea and somehow linking with this is the general notion.
- How can Purdue contribute to the idea of a ‘creative community’ – a place where creative people will locate? How would Purdue help attract creative talents, create wonderful communities with the arts etc., entrepreneurship culture; create the “Affinity Community”. The region is lacking the presence of Influential Public Speakers, national noted or international, which excite the community. Perhaps some type of Heartland Lecture series where a notable speaker is shared between Purdue and the local universities/region.