

## **The Economic Development Function of Public Research Universities: An Overview of the Development of the Southern Illinois Research Park A Case Study**

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*This paper and the analysis conducted herein draws heavily on the work of many people associated with the development of the Southern Illinois Research Park, including members of the local and regional community and the staff at the university. Primary among them is Dr. Raymond C. Lenz, Associate Chancellor for Economic Development.*

### ABSTRACT

The purpose of this case study is to portray the development of the Southern Illinois Research Park and its relationship to the academic mission of Southern Illinois University Carbondale. The need for universities to be active participants in the regional economic development process is elaborated as a significant social/political responsibility for public higher education. This is reflected in the mission statements and practices of American Universities from coast-to-coast. The steps in the process of the development of the Southern Illinois Research Park are articulated. An overview of the decision-making process is presented to allow for an understanding of the steps in this process and the applicability and transferability of the effort to other universities. A synopsis of the current state of the Southern Illinois Research Park is provided.

## Overview

Universities provide many services and serve many functions. Providing educational opportunities to students so that they may obtain credentials and develop competencies to be able to perform in and meaningfully contribute to the workplace is certainly one of the more important ones. All universities are political organisms; however, public research universities in the United States are specifically chartered as such. With the passage of the Morrill Act in 1862, the importance of focusing public institutions of higher education on critical national problems was institutionalized when the federal government committed to providing resources of land and funding for this purpose<sup>1</sup>. The public service and outreach functions that are common to public research universities are almost uniformly expressed as a fundamental aspect of their mission.

*“Through the excellence of its academic programs, the strength of its support services, and the range of its student activities, the university provides opportunities for the fullest possible development of the potential of each student and each citizen served, and enhances the quality of life and the economic viability of Michigan.”* (Michigan State University)

*“Together, we will plan for the future in our approach to administration and adopt administrative practices that best support our mission of teaching, research, and public service.”* (University of California – Berkeley)

*“To effectively transfer University technologies to the market so as to generate benefits for the university, the community and the general public.”* (University of Michigan)

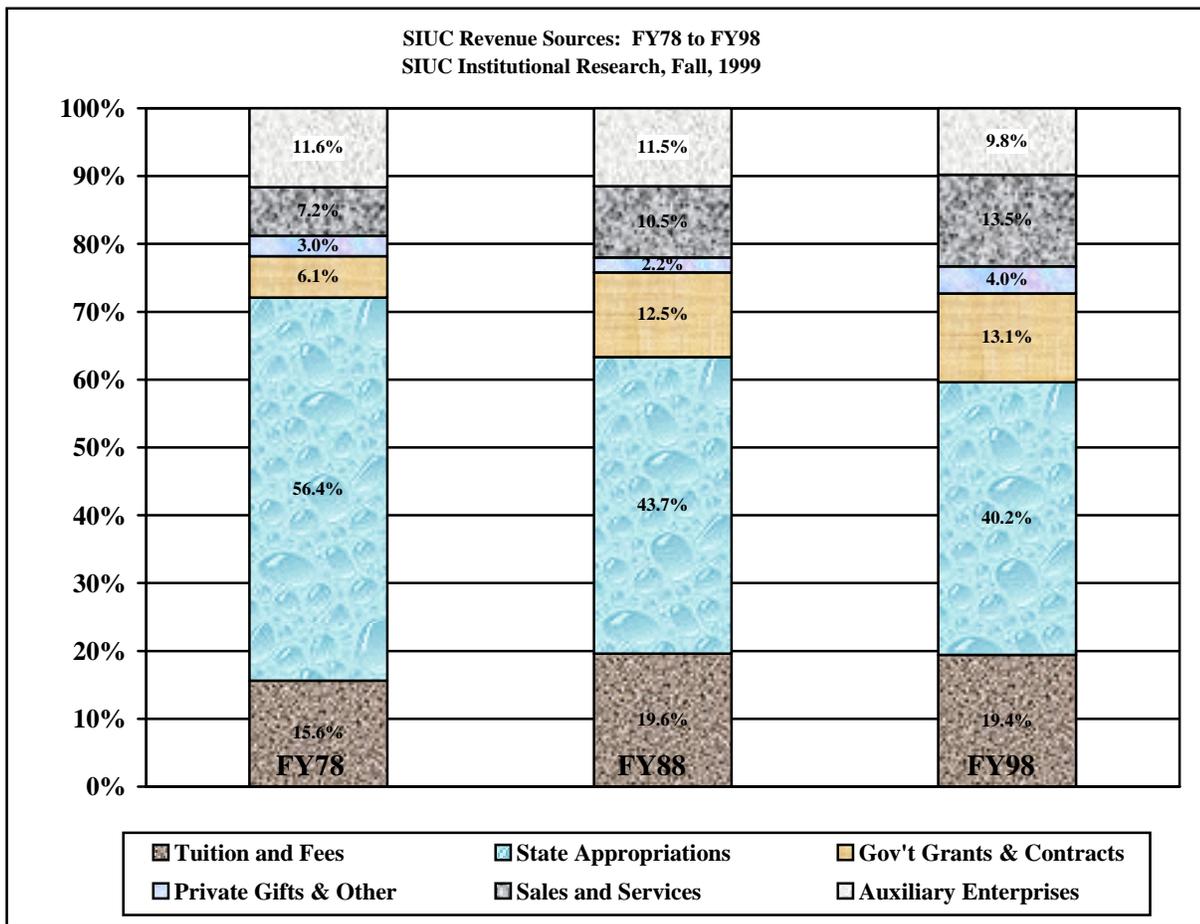
*“The mission of Innovation Park at Penn State is to provide space, access to Penn State researchers and facilities, and business support services that help companies transfer the knowledge within the University to the market place and to foster economic development.”* (Penn State University)

*“Encourage and assist technology development at FSU and facilitate the transfer of intellectual property to business and industry to provide benefits to the university, the economy and to improve the overall quality of life.”* (Florida State University)

All sorts of university-initiated public service are important. Additionally, as the research capability and success of a public university grows and state expenditures underwriting research continue to shrink, and as the private sector competes for new products and ideas, the capitalization and transfer of technology become more critical to both the university and the region in which the university exists. Not only does the university stand to benefit economically by facilitating these activities<sup>2</sup>, but also as economies evolve, the university benefits by having access to working laboratories of enterprise that allow meaningful and practical training opportunities for students. This aspect of university sponsorship in research parks directly supports and enhances the university academic mission. Businesses involved with these initiatives also benefit from ready access to intellectual, research and human capital<sup>3</sup>.

Any dedicated research university is compelled to recognize and accept the social and political responsibility of economic development. Universities in rural or other isolated settings have an even more compelling interest in investing energy and capital in order to serve as an economic catalyst for the regions in which they exist (Jun, 2000). As public dollars to support post secondary education are pressed more thinly, there is increasing political pressure to justify the university as a legitimate and effective political organization that contributes to the economy in terms of the creation of new employment opportunities. By facilitating the transfer of promising intellectual property and establishing new industries capable of sustainable development and growth, the ability of the university to achieve its core academic mission by more effectively competing for resources in the contemporary political and social environments will be significantly improved. Table one shows the relative contributions of the various sources of current revenue to the total university budget. The relative doubling of grant and contract research activities from 6.1 percent in 1978 to 13.1 percent in 1998 supports the case for expansion of the research enterprise and its commercialization spinoffs.

**External Research Funding: As % of the Total Budget Area of Significant Budgetary Growth at SIUC Since the 70's.**



For much of their history universities stood by as passive, if not ambivalent, partners as faculty members developed research ideas and created intellectual property and then took that property, and ownership thereof, to the private sector. Over the past few decades it has become increasingly apparent that the university, the region and the faculty members benefit when all three constituencies work cooperatively to take intellectual property to markets in a coordinated, mutually supportive way. This fundamental shift in philosophy has provided the basis for the development of the research park as a means to assist faculty and scientists in taking their ideas to successful development in the market place, in corporations extracting the very best ideas for profitable development, and in regions in which universities are located to benefit from the intellectual power of the faculty coupled with the economic power of business and industry. As a means to demonstrate the importance of the research park as an effective tool for economic development in a region the case of the Southern Illinois Research Park will be described and its impact on the region and the university addressed.

## History

The first university related research parks included the Stanford Industrial Park in California, the Research Triangle Park in North Carolina and Philadelphia's University City Science Center. These three parks established the framework for the research park models today. Collectively, they established the prototype whereby research-linked development could provide the foundation for local economic development, while establishing linkages between corporate and university knowledge bases to simulate innovation, attract corporate research and development, and create new university revenue.<sup>4</sup>

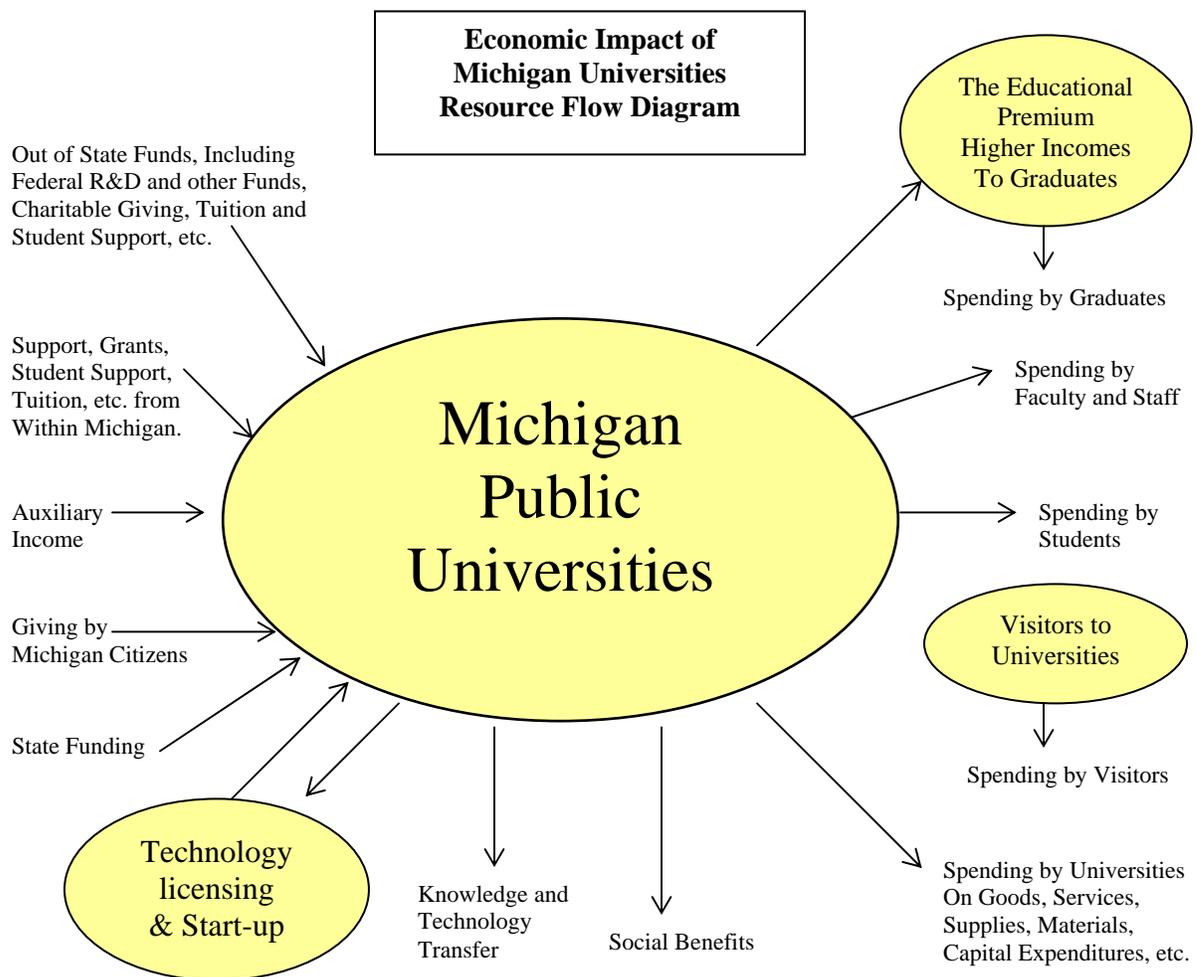
For the past four decades Southern Illinois University and the region of southern Illinois have recognized the importance of the university as the primary means to develop the regional economy. Many past presidents of the university have enthusiastically embraced the concept that economic growth for southern Illinois could be accomplished as the scope of the University research mission expanded. As a means to encourage the dyad of research and economic growth, a research incubator was established. The incubator, known as the Dunn- Richmond Center, was built with an initial investment of \$6.5 million, primarily with funds from the state of Illinois. From its inception, the parties promoting the Dunn Richmond Economic Development Center had the foresight to recognize that eventually this modest incubator would lead to the development of a full-scale research park.

The incubator formally began operations in 1990 with 55,000 square feet of space for offices, laboratories, and light manufacturing available to start up companies. Much of this enterprise was the result of intellectual property developed by faculty and scientists at Southern Illinois University Carbondale. The impact of the incubator on the local economy has been significant. Presently there are 170 employees housed in the Dunn Richmond Center with an annual payroll of \$7.5 million and there is no space left for additional tenants. In 1997 a task force was established by then Chancellor Donald Beggs to study the feasibility for the development of a full-scale research park as envisioned when the Dunn Richmond Center was initially conceptualized. The task force consisted of over 40 people representing the university, the

community, and private sector interests from the southern Illinois region. A proposal developed by the task force was jointly submitted by the City of Carbondale and Southern Illinois University Carbondale to the United States Department of Agriculture, and was approved. In 1998 external funds to produce a full-scale feasibility study were secured and the process of determining the role, scope and mission of the Southern Illinois Research Park was initiated.

### Example of Areas of Economic Impact of a Research Park

The following resource flow diagram of the Michigan Universities is a prime example of the economic impact of any given research park:



Source: *Economic Impact of Michigan's State Universities*  
 SRI Project#: PDH 02-019, SRI International  
 May 2002

## **Early Definition of the Southern Illinois Research Park**

The desired characteristics of the research park were investigated. The task force convened for this purpose, determined that the park should be affiliated with the university, but the specific nature of the relationship was not defined. Technology transfer was identified as the primary goal of the research park and the anticipated tenants would be businesses and industries committed to the development of clean, technologically advanced enterprises, usually bringing to market intellectual property developed by researchers and scientists at the university. It was determined the park and its campus should be attractive and complement the natural setting in southern Illinois. The success of the new research park would be determined by how well it fulfilled its economic development function. Lastly, the research park would have to have a strong impact on the academic quality of the university. In other words, the park was to be an extension of the first function of the university, providing educational opportunities for its students.

## **The Market**

A study of the market and the characteristics of southern Illinois that would make a research park successful was conducted. This market analysis included a study of the demographics of the region, economic and social trends that could bring prospects to the area, who those prospects might be, local construction opportunities and trends, an assessment of similar research parks in comparable geographic/demographic settings, small business and employment potential for the region, and the university research environment that would be the foundation for the success of the park.

Carbondale is a small mid-western city with a population of about 27,000 people. Its history is rooted in higher education and coal mining. Over the past few decades the coal industry has provided less economic growth than at any time in the past century. The regional population is almost 300,000 people. The university has over 20,000 students; about 17% in graduate programs, in a diverse array of fields including agriculture, applied arts and sciences, business, communications, education, engineering, law, liberal arts, and medicine.

Research productivity in many fields within these academic areas is strong, and in some cases nationally recognized. The development of areas of research strength and prowess relative to the research park was an important consideration as the concept for the park gained clarity.

The Dunn Richmond Center has created a number of potential tenants for the Southern Illinois Research Park, and should continue to do so. Existing tenants were queried regarding their interest in locating within the research park. In addition, public and private enterprise was studied and the prospects for the Southern Illinois Research Park appeared strong. In the incubator (Dunn Richmond) a limit of a three-year lease for space is typical, with the expectation that tenants would graduate into the research park after this incubation period.

New construction in the southern Illinois region is growing modestly. When the feasibility study was conducted in 1998 the annual increase in construction was about four percent, while increases in construction statewide were closer to 15%. The same proportionality holds true for today although the economy is softer now than it was in 1998. This difference between regional and statewide economic indicators, strongly underscores the importance of the research park as a powerful catalyst for economic development. The rural area of southern Illinois has the potential to support more economic development than it presently does, and the research park should provide the foundation for industrial growth by coupling the strength of the university with various appealing characteristics of the locale.

A number of university sponsored research parks in the Midwest were visited when the initial proposal was being developed. The visits provided a good opportunity to better understand the relationship between these universities and their communities. The Association of University Research Parks (AURP) was consulted to understand which parks might be most similar to the one being considered in southern Illinois. Of the hundreds of institutional members located in more than thirty countries, one right here in Taiwan (Science Park Administration, Hsinchu), it was felt that the University of Wisconsin-Stout was the most similar to the southern Illinois situation and was studied in great depth.

### COMPARISON OF MIDWESTERN UNIVERSITY RESEARCH PARKS

Research Park	Carnegie Research Institute	# of Students	CMSA Population	Years Established	Acreage	# of Companies	# of Employees	Ownership	Management	# of Buildings	Business Incubator?
SIUE	MI	11,263	2,585,667	1989	335	11	140	University	University	6	N
Northwestern Univ.	RI	12,450	3,600,000	1985	24	74	900	JT Venture	JT Venture	5	Y
Iowa State	RII	25,112	74,638	1987	235	30	780	Not for Profit	Not for Profit	6	Y
University of Iowa	R1	27,688	101,291	1989	173	8	141	University	University	5	Y
Univ. of Nebraska	R1	24,695	228,638	1995	130	1	97	For Profit	University	2	Y
Univ. of Oklahoma	R11	21,689	191,059	1957	1,700	38	1,034	University	University	6	N
Mississippi State	R11	14,000	20,800	1984	222	17	445	JT Venture	JT Venture	4	Y
Univ. of Missouri (Columbia)	R1	22,700	79,082	1972	60	5	50	University	University	5	N
Univ. of Missouri (St. Louis)	D11	11,868	2,585,667	1986	750	12	1,500	University	University	12	N
Univ. of Wisconsin-Madison	R1	40,924	393,296	1984	251	57	1,500	JT Venture	University	20	Y
Univ. of Wisconsin-Stout	M1	7,400	13,320	1989	113	4	85	JT Venture	University	5	N
Average		19,981	897,587	1983	363	31	606			6.3	

Source: Association of University Related Research Parks.  
1998 Research and Science Park Statistics and site visits to selected Research and Technology Parks.

An internal analysis of university research at Southern Illinois University Carbondale was conducted. There has been steady growth in the research enterprise at the university over the past decade. Externally funded grants now exceed \$20 million and research expenditures total well over \$50 million. In certain fields there is intellectual strength to build significant programs that could compete in national and global markets. These include; but are not limited to, Soybean research, transgenic corn, turf grass, food safety and reforestation. In addition, materials technology, friction studies and applied engineering work are well represented. Basic science areas in microbiology, analytical chemical and related sensor technology, aquaculture and pharmaceutical compounds all represent disciplines with significant intellectual depth and have a documented history of performance. Lastly, the Coal Research Center, in the areas of mining, energy, and coal utilization represent promising potential. The task force determined that there is extensive research strength at the university that might provide the feedstock of ideas that are required to serve as the foundation for a successful research park.

Studies carried out by the task force indicated that there would be a growing demand for small business to locate in the research park if it became a reality and that these businesses would create four permanent jobs for every 1,000 square feet of facility. These ratios are based on experiences of similar research parks in similar settings.<sup>5</sup>

The task force recognized that if their proposal was approved and funding for the research park secured, that there would need to be a significant effort to market the park both internally and externally. The university, the community and the business and industry base in southern Illinois would all contribute to the development of a marketing strategy. The purpose of this marketing initiative would be to generate interest and investment consistent with the goals of the park, the university and the community. This marketing plan was recently finalized and is consistent with the general parameters laid out in this overview.

## **The Site and the Infrastructure**

The characteristics of the site for the research park, and the supporting infrastructure will, in large part, determine the potential for success. While there are a large number of characteristics that should be assessed in determining the site a few are essential. If there is a partnership with a municipal jurisdiction, the site should lie within that jurisdiction. If the city or the university does not have appropriate property for the site what land is available for purchase or lease? The location of the research park should be easily accessible, especially from the university to facilitate traffic of students and faculty. Transportation linkages to roads, rail and air should be determined and assessed for their potential impact on potential tenants of the park. For example, the Tainan Science Park cannot host certain semiconductor companies because of the effect vibrations from a planned high-speed rail would interfere with their production processes.<sup>6</sup> Easy connection to existing transportation webs is important. The site should be highly visible to assist in marketing of the park and its tenants. Many of the research park campuses in the United States actually have the appearance of a traditional park. The setting should be one that capitalizes on natural beauty of the area when possible. Coupled with these site features should be a clear understanding of the infrastructure available to support the research parks. Utilities,

water, sewer, telephone fiber optic and other support for construction and use should be assessed in the early stages of the feasibility study. A site that blends the needs of the university and those of the city was the goal. The site for the Southern Illinois Research Park has been selected based on the criteria described above.

### RESEARCH PARK INFRASTRUCTURE COSTS

Phase	Sanitary	Water	Paved Surface	Electrical	Telecom	AE (15%)	Cont (10%)	Total
One	\$25,000	\$58,000	\$122,000	\$25,000	\$800,000	\$154,500	\$103,000	\$1,287,500
Two	58,000	31,000	130,000	40,000	50,000	46,350	30,900	386,250
Three	47,000	80,000	654,000	25,000	50,000	128,400	85,600	1,070,000
Four	40,000	49,000	101,000	25,000	50,000	39,750	26,500	331,250
<b>Totals</b>	<b>\$170,000</b>	<b>\$218,000</b>	<b>\$1,007,000</b>	<b>\$115,000</b>	<b>\$950,000</b>	<b>369,000</b>	<b>246,000</b>	<b>\$3,075,000</b>
Road			\$530,000			79,500	53,000	662,500
<b>Toals-1999</b>	<b>\$170,000</b>	<b>\$218,000</b>	<b>\$1,537,000</b>	<b>\$115,000</b>	<b>\$950,000</b>	<b>\$448,500</b>	<b>\$299,000</b>	<b>\$3,737,500</b>
<b>Totals 2000</b>								<b>\$3,849,625</b>

Source: SIUC Research Park Task Force

## Financial Considerations

A number of assessments were made regarding the ability of the sponsoring organizations to secure financing for the project. Sources of funds include state or government support, city and university commitment, and other jurisdictions that have interest in the park. Different organizations may be able to help in different ways. For example, in some cases the city might be able to provide the land at no cost and that contribution would impact the financial pro forma for the research park. Private developers may also invest in the site and its preparation. These and other considerations need to be made as a financial perspective of a given project develops.

## Management and Organizational Options

There are a number of models that may be used for managing a research park. The Southern Illinois Research Park task force looked at five specific models. Each has its own set of strengths and weaknesses. The *university owned and operated* model allows control of the park to rest with the university. The park director would report to the chancellor or the Vice Chancellor for Research. Usually an advisory council or board, including representation from the community, would be set up to guide strategy development and decision making. The primary benefit to this model is that the university retains a great deal of control.

A *private non-profit organization* formed by the university is another common model in the United States. Here a corporate board would govern the research park and yet allow the university and its board of trustees to retain some control and ultimate authority for decision-making. Southern Illinois University Edwardsville uses this model to run their research park and the results have been favorable. A *private non-profit corporation* is similar to the model above but in this case the university does not form the entity. The university rather becomes one member of the corporation; as would other entities, both public and private, and the governance of the research park is shared in a more direct manner. This represents a good deal of shared decision making, which in the context of outreach and economic development is a powerful case for using the private non-profit corporation approach. This model also creates the opportunity to pursue a variety of revenue sources, as there are a greater number of members involved in the governance that would have a vested interest in the success of the research park.

A fourth model is the *private developer* approach. The essence of this model is a contract between the private developer and the university, a private non-profit or some other entity. The greatest benefit of this model is that the developer would bring real estate development and management experience to the group. The single most significant disadvantage of this model is that the public entities, the university and any municipalities, involved have less control. The last model, used by the Southern Illinois Research Park, is a *joint venture*. In the case of the Southern Illinois Research Park this means an equal partnership between the city and the university. Co-investment and shared decision-making create an environment of mutual concern and benefit for a well-managed venture.

## Current Status

The SIU Board of Trustees and the City of Carbondale adopted the Southern Illinois Research Park (SIRP) Plan in the spring of 2000. In January 2001, the Southern Illinois Research Park was incorporated and issued IRS 501(c)3 status by the State of Illinois. In June 2001, the City of Carbondale and Jackson County granted Enterprise Zone status to the SIRP. Verizon invested \$1 million in a fiber optic switching center to be located at the Research Park site. The SIRP also received state and federal funding for infrastructure improvements to the Phase 1 site in 2001 and 2002. Construction will be completed by December 2002. Focus recently has been on obtaining financing for a multi-tenant building to be built on the Phase I site. In August 2002, The Illinois Development Finance Authority Board gave preliminary approval for a \$4.2 million bond issue and \$350,000 debt reserve fund with flexibility to reshape final deal structure. In September 2002, the State of Illinois granted \$375,000 to SIUC for an Illinois Technology Enterprise Center, which will provide partial funding for administrative operations for the Southern Illinois Research Park.

## Conclusions and the Future

The brief description above only partially captures the complex set of decisions that have been levied in the successful development of the Southern Illinois Research Park. Today, the site infrastructure for the first phase is in place and construction financing is being finalized. While it is too early to suggest that the park will be a success a few observations can be made that could prove useful to a university considering such a venture.

**First**, the development of the park has been consistent with the university mission of teaching, research and service and continues to add to rather than subtract from that mission.

**Second**, the city and the university, as well as a number of other public and private entities, have found that they can successfully work together and aid in creating a strong economic engine for southern Illinois.

**Third**, the impact of the research park on the region is in its infancy, but preliminary indications are that both the university and the community will prosper from the research park, and the university will have fulfilled one of its contemporary political and social responsibilities as a public research university - to materially and forcefully aid in driving the economic vitality of the region.

The Southern Illinois Research Park currently has 170 employees with a payroll of \$7.0 million plus. Full development of the existing 42-acre site will result in up to 1,400 employees with a present value payroll of \$40 million to \$50 million per year and a payroll impact in the four-county area around the University of \$80 million to \$100 million. This will be equal to approximately 50 percent of the University's current payroll. The significance is further underscored by the fact that the University is currently the largest employer in the southern half of the State of Illinois.<sup>7</sup>

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<sup>4</sup> Diane L. Hartley, Senior Vice President, Spaulding & Slye Colliers, “Intellectual Property: Exploring University-Related Research Parks,” Spaulding & Slye Colliers White Paper, page 1.

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