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**Planning for Technology:
A Case Study in Champaign, Illinois**

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Executive Summary

With the completion of its Comprehensive Planning process, the City of Champaign has outlined its goals and objectives for economic development. While the retention of existing and established businesses and industries is a priority in the Economic Development Element of the Comprehensive Plan, the City also encourages an expansion of the economic base into new realms.¹ The development of the University Research Park will cause changes within the City of Champaign that will impact decisions made by City leaders. This study has been conducted in order to give elected officials and City staff more information about the structure of anticipated changes so that they may capitalize on new opportunities that will manifest in the region.

Project Goals:

- Characterize the circumstances surrounding change in the City of Champaign.
- Analyze the impact of the establishment of the University Research Park.
- Identify economic patterns that may emerge with the Research Park development.
- Provide recommendations for further planning studies to be completed.

Growth Areas. By recognizing the industries that have real potential to grow with the development of the University Research Park, the City can be strategic in planning for these industries. While there are numerous factors that contribute to the economic profile of a community, the following industries can be expected to exhibit signs of growth in the region as a result of the establishment of the Research Park. These industries have a strong relationship to the types of high-tech industries expected to locate within the Park:

- ♦ Professional Services Industries
- ♦ Medical Industries
- ♦ Real Estate Industries
- ♦ Communications Industries
- ♦ Transportation Industries

The Recommendations section of this study directs elected officials and City staff toward further planning studies to prepare for anticipated growth. City leaders should prepare to make contacts within these industries, to assist in conducting studies within their markets, and to promote the attraction and expansion of these types of firms. Internal and external resources should be inventoried to facilitate these preparatory measures, and reorganization and recruitment of staff should occur before the City loses its early advantage.

If the City of Champaign is to realize the full potential of a technology-influenced economy, elected officials and City staff must commit time and resources to the cause. While the City has already contributed financial incentives towards the University Research Park and towards the attraction of high-tech jobs, additional resources must be appropriated to ensure that the benefits associated with this type of economy locate or remain within the City of Champaign.

¹ See Appendix A: City of Champaign Comprehensive Plan Goals and Objectives for Economic Development.

1. Introduction

“Communities and economic development professionals are faced with an almost bewildering array of industries and businesses on which to focus in their economic development efforts. Millions of business establishments and hundreds of industries exist from which to choose. Thousands of additional businesses come into existence and go out of existence in a year. Faced with these choices, a community must be able to find a way to sort through this mass of information and identify industries and firms that would find their community an attractive location for their investment dollars.”²

Until recently, neither the City nor the University had the means to retain firms that benefit from clustering with other high-tech businesses. University faculty and students who were able to develop promising technology products were forced to bring them to places like Silicon Valley or the Research Triangle to see them realized. In order to mitigate the effects of such losses, the University has begun a massive undertaking, the University Research Park. The Association of University Related Research Parks reports that 295 research parks and associated developments have been created in conjunction with Institutions of higher learning over the last few decades.³ Such a partnership is being developed between the Champaign’s new Research Park and the University of Illinois. The Park itself is estimated to create over 5000 new jobs upon its completion, with various benefits to follow. Because the Research Park is to be a great asset to the region, the City of Champaign has contributed significant financial incentives to the project. As the City readies itself for the increase in technology-related industries, the Research Park shall serve as a milestone towards a future vision of Champaign.

Recent events have focused upon the emergence of technology-related industries within the greater University of Illinois region. The strong research, academic, and entrepreneurial foundation within the University of Illinois has led to Champaign-Urbana being named one of the “10 Hot New Tech Cities” by Newsweek in 1998. The magazine reported that 70 high-tech firms are already located within the metropolitan area.⁴ Several entities within and surrounding Champaign have a stake in deciphering the degree to which this potential impact could affect the community. Using the recommendations presented in this report in conjunction with input from the community, the City of Champaign and its decision-makers will be able to develop strategic planning measures to capture the benefits that result from new technology development now and in the future.

² Voytek, K. and L. Ledebur. 1997. *Is Industrial Targeting a Viable Economic Development Strategy? Dilemmas of Urban Economic Development*. Thousand Oaks, CA: Sage, p. 171-94.

³ Source: The Association of University Related Research Parks

⁴ The Hottest Tech Cities. Newsweek. November 9, 1998.

This paper attempts to characterize the Champaign economy and the effects that high-tech development will have upon it. Its intent is to introduce the idea of planning for certain types of industries that locate within the City so that it might take full advantage of all opportunities. Through the use of an impact analysis model, the areas where the City may expect growth are highlighted, and indicate areas towards which the City should devote further study.

After presenting some general information about the stakeholders involved and the overall state of the economy, this report will delve into the real substance of its venture. The development of the University Research Park will be detailed. The model will be described and its results will be analyzed. From the results of the model, further planning studies will be identified for the City to consider. By carrying out the planning recommendations presented in this report, the City will gain the optimal benefit from the establishment of the University Research Park and technology industries that may follow.

2. Stakeholders

Because of the nature of the Champaign-Urbana metropolitan area and the location of the University of Illinois within it, there are a number of stakeholders concerned with the technology development occurring within the community. It is important to identify each of these players and their current or future interests in these ventures so that there is an awareness of the common goals between these groups. In this way, critical partnerships can be established and strengthened.

2.1 City of Champaign. The City is committed to the support of technology-related industries. With expansion in these industries, the City stands to benefit from new employment markets will open, bringing with them continued growth and increased tax revenues. With an increase in high quality jobs, there will be an incentive for talented University students to reside in the City after their schooling is complete. In order to secure some of these positive benefits, the City has allocated \$750,000 to be used towards the University Research Park. It has also changed one of its incentive programs to make up to \$150,000 available annually for high-tech development.

2.2 University of Illinois. The University is an internationally respected institution, in no small part because of its engineering and computer science programs of study. Yet, there has been a loss of key faculty to universities that are able to accommodate both their research and business endeavors. In order to compete with comparable institutions, the University must make a commitment to developing the technology sectors of the Champaign-Urbana economy. The University has made significant contributions to the Research Park projects through the donation of land and capital, while also acting as the project's coordinator. This spring the Board of Trustees earmarked additional funds for a project that will finance University-related start-up companies. This undertaking, iVenture (Illinois Venture), aims to keep entrepreneurial faculty connected to the University.

2.3 Greater Champaign-Urbana Economic Partnership. The Partnership is an organization that serves to represent various groups within the community through the attraction and retention of key businesses and promotion of the area's assets. It is a joint venture between the cities of Champaign and Urbana, the University of Illinois, Parkland College, the Champaign County Chamber of Commerce, the Illinois Department of Commerce and Community Affairs, Illinois Power, and Ameritech. As such, it has a vested interest in exploring the possibilities within the development of high technology industries. The Partnership is an entity that has the capacity to devote staff time to work with prospective businesses wishing to locate within Champaign.

2.4 TechCommunity. Like the Partnership, TechCommunity is a collaborative effort between several interested parties within the region, however its interests are more narrowly defined. The organization states that its "primary goal is to ensure long-term economic growth for our community and the University. Our strategy for achieving this goal is to aggressively position Champaign-Urbana as a premier location for conducting high-tech business and research by building on the University of Illinois' tradition of

technological innovation and leadership.” TechCommunity hosts conferences that bring together local leaders and businesses, connects new businesses with the resources available at the University of Illinois and Parkland College, and fosters an entrepreneurial and innovative spirit within the community. With the increase of high-tech firms, *TechCommunity could emerge as the most important partnership for industries and institutions within the Champaign Urbana community.*

3. Employment Base

An economic profile of the City of Champaign will help to illustrate the foundation for the promotion of high-tech development. The City's success can be attributed, in large part, to the location of the University of Illinois within the metropolitan area. As the beneficiary of such a stable institution, Champaign enjoys a relatively strong and healthy economy. Unemployment rates are consistently below the national average, with a rate of only 2.6% reported for June 2000.⁵

3.1 Major Employers. A few major firms and institutions serving the community characterize the employment composition in the City. The University of Illinois, Parkland College, Champaign School District, Kraft Foods, Collegiate Cap & Gown, Wolfram Research, Christie Clinic, and Busey Bank are a few of the major employers in the City⁶. This sample of employment leaders within the community illustrates the City's stable institutional and private employment base. By building upon the existing job base through the attraction of new employers and investments to the area, the City hopes to capture the positive benefits of its prosperity.

While it enjoys the comfort of a secure employment base, Champaign has been experiencing a bountiful change in its economy over the last five to ten years. As an integral part of the central Illinois economy, the city of Champaign possesses tremendous opportunity to further establish its role as a regional center. Changes in the economy over the last decade have led to Champaign's emergence as a regional metropolitan area. The vicinity of Interstate-74 contains a shopping, dining, and entertainment destination for citizens across Central Illinois. The region contributes greatly to the retail sales tax base, bringing in over \$9 million dollars to the City in the 1997-1998 fiscal year.⁷ This area alone serves as the premier retail district for central Illinois.

3.2 Location Quotient Analysis. Location quotient analysis is useful in looking at the level of specialization of an economy. Here, the number of jobs in Champaign County has been compared to the national averages across various industries. From this proportional comparison, the location quotient (LQ) is derived. While it does not give much insight into the economy on its own, the location quotient is a tool that verifies and supports other analysis. In order to understand the results of the quotients, the following points are necessary:

- ♦ If an industry has an $LQ > 1$, it is considered to be more specialized than the nation in that particular industry.
- ♦ If the $LQ=1$, the total number of jobs in that place for that industry is proportionate to the nation.
- ♦ If the $LQ < 1$, the place demonstrates a lower level of specialization than the nation.

⁵ Source: United States Bureau of Labor Statistics

⁶ Source: The Greater Champaign-Urbana Economic Partnership's Top Employers Directory, 1997.

⁷ Source: Illinois Department of Revenue

In Table 3-1, the top 50 industries are listed that have location quotients greater than one. Champaign has a greater proportion of jobs than the national average in these industries and is therefore considered to have a specialization in these fields⁸. In addition to listing the location quotient for each industry, the table includes the number of firms and the total number of jobs in that industry in Champaign County.

Industry	Number of Firms	LQ	Number of Jobs	Industry	Number of Firms	LQ	Number of Jobs
Pickles, sauces, and salad dressings	1	122.62	1870	Games, toys, and children's vehicles	1	2.91	45
Rooming and boarding houses	5	29.54	175	Textile bags	1	2.82	19
Toys and hobby goods and supplies	3	25.26	687	Machine tools, metal cutting types	1	2.72	37
Clay refractories	1	23.89	135	Grain and field beans	26	2.67	72
Magnetic and optical recording media	1	22.32	370	Medical equipment rental	2	2.6	41
Edible fats and oils	1	16.1	318	Bolts, nuts, rivets, and washers	1	2.59	65
Plastic bottles	2	15.39	381	Title insurance	2	2.54	49
Sporting and athletic goods	2	14.46	769	Floor laying and floor work	16	2.5	73
Apparel and accessories	1	12.58	273	Book stores	11	2.5	138
Membership-basis organization hotels	38	12.12	95	Educational, religious, etc. trusts	2	2.39	37
Milkwork	2	10.17	628	Offices and clinics of medical doctors	40	2.37	1707
Toilet preparations	2	7.71	335	Radio, TV, and electronic stores	17	2.21	156
Groceries, general line	4	7.61	825	Newspapers	5	2.19	359
Typesetting	3	7.07	122	Radiotelephone communications	6	2.12	112
State		6.13	22546	Canvas and related products	1	1.99	14
Water supply	2	5.1	83	Gift, novelty, and souvenir shops	29	1.99	158
Vocational schools	10	4.33	228	Refrigeration equipment and supplies	1	1.96	10
Book publishing	7	3.67	183	Construction machinery	1	1.95	62
Pension, health, and welfare funds	3	3.62	68	Photocopying and duplicating services	9	1.93	62
Iron and steel forgings	1	3.59	54	Radio and television broadcasting	13	1.92	173
Drinking places	53	3.59	631	Construction sand and gravel	2	1.88	18
Professional organizations	12	3.59	159	Asphalt paving mixtures and blocks	3	1.85	9
Trusts	1	3.41	19	Misc. apparel and accessory stores.	7	1.84	25
Plastics products	6	3.37	1309	Electrical equipment and supplies	1	1.79	76
Taxicabs	3	3.09	45	Motor vehicle parts and accessories	2	1.79	301

Table 3-1

In studying the results of the location quotient analysis, the results seem consistent with some of the employment facts already stated. It makes sense that Champaign is specialized in the production of "pickles, sauces, and salad dressings" or "edible fats and oils", given that Kraft Foods maintains a factory there. Also, the University of Illinois is located in the region, so it is intuitive that the location quotient for "state government" is much higher than average.

The diversification of the Champaign economy stands out as the unifying theme in the analysis of major employers and the areas of specialization. With an employment base founded in long standing institutions and corporations, Champaign has the opportunity to explore new markets to shape its economy in a new direction. The City can reach out to high-technology firms and new ventures without endangering other areas of employment. It is with this attitude that the City of Champaign has worked closely with the planning of the University Research Park to aggressively pursue new advances toward further economic diversification.

⁸ Source: Bureau of Economic Analysis.

4. Existing Incentive Program Summaries

The City of Champaign is committed to providing individual businesses with every chance of success, while also attempting to strengthen all aspects of the commercial environment. One way in which they hope to accomplish these goals is through the policies that have been established to help businesses to be competitive. The three major incentive programs offered by the City are outlined below.

4.1 Redevelopment Incentive Program. Currently within the City there are two Tax Increment Financing (TIF) Districts: the Downtown and East Side Districts. These are areas that the City has designated as places needing assistance in revitalizing the business community in the form of financial incentives. Tax revenue in these areas is reinvested in those communities to ensure that development continues to take place.

The City has been successful in establishing a program, whereby current and prospective business owners within these TIF districts and certain adjacent areas may obtain these recaptured tax dollars to assist in making building and site improvements. There are two of these Redevelopment Incentive Programs (RIPs) available to business owners, making both comprehensive and exterior improvements to the building and/or site possible. With the Major RIP grant, more permanent improvements to the building are subsidized, and they must be fixed to the real estate while not restricting any future use of the building. These include life safety and accessibility code requirements, structural improvements, façade restoration, parking lot paving and landscaping. With the minor RIP grant, assistance is provided at a lesser amount to make such improvements as tuckpointing, painting, landscaping, and parking lot paving.

4.2 Enterprise Zone. In July of 1986, the State of Illinois certified the establishment of the City of Champaign-Champaign County Enterprise Zone. The Zone is the result of legislative action that has committed the State to stimulating economic growth and neighborhood revitalization. The Enterprise Zone is the culmination of efforts put forth by the City of Champaign and Champaign County to encourage private investment in areas targeted for development or rehabilitation.

The Zone encompasses approximately seven square miles of land located in and around the City. Industrial, commercial, and residential uses can qualify for program incentives, which include tax abatement, exemption, and credit.

4.3 Technology Development Program. An Industrial Development Program was created with the implementation of the Economic Development Plan of 1995. Its purpose is to provide infrastructure incentives to major new industrial employers in the City on the basis of their contribution to the community. Many of the goals set forth by this program have been achieved, so the program has been restructured to target high-tech industries. The criteria remain the same:

- The creation of a minimum of 100 new jobs in the community.
- Minimum salary level of two times minimum wage for the newly created positions

- Incentives limited to the provision of infrastructure improvements that are not typically required by the City Subdivision Regulations
- Location within the City of Champaign
- An industry that enhances the City's mix of industrial uses and is a positive asset to the community
- Compatibility with the City Comprehensive Plan and other adopted land-use policies
- Maximum incentive of \$150,000 per project (with the amount being directly linked to the number of jobs created)

5. Job Creation Assumptions

The number of jobs that will be directly created through the building of the Research Park is difficult to determine. Therefore, assumptions had to be made about the data that were collected for the impact analysis. The data for this section were gathered from the project's developer, Fox/Atkins Development, L.L.C. (the Developer).

5.1 Research Park Development. Upon completion, the Research Park is expected to contain 948,000 square feet of office space. The construction of the buildings within the Park will take place in three phases, with the first two phases scheduled for completion by 2003. Details on the completion of the third phase are not yet final, and its impact on the economy will therefore be treated separately.

Phases I and II

Year	Developed Square Footage
2000	60,000
2001	85,000
2002	82,000
2003	70,000
	<i>275,000 square feet</i>

Phase III

673,000 square feet

The Developer supplied information about the number of employees anticipated within different industries. For every 1000 square feet of space, Computer and Biotech Research firms will have 6.03 employees, Support Service industries will have 3.28 employees, and Food Service companies will employ 15.02 people. It is important to note that Food and Beverage typically employ up to 95% of their staff part-time only. Table 5-1 also shows the nine categories of jobs that are to be a part of the research Park. Further explanation of these positions can be found in the Appendix.

	Bio-Tech Research	Computer Research	Support Service	Food Service
Officials and Managers	0.67	0.067	0.86	0.97
Professionals	5.06	5.06	0.71	
Technicians	0.15	0.15		
Sales			0.14	
Office and Clerical	0.15	0.15	1	
Craft Workers (Skilled)				
Operatives (Semi-Skilled)			0.14	
Laborers (Unskilled)			0.43	
Service Workers				14.05
Total	6.03	6.03	3.28	15.02

Table 5-1: Jobs per 1000 sq. ft. for various professions within an industry.

5.2 *Development by Industry.* Based upon market research and the Development Agreement with the City of Champaign, the Developer estimated the percent of the total square footage that each industry would occupy within the Park. With these figures, and estimated number of jobs that would be generated at the Research Park was calculated within each industry for the different phases of the project.

Computer Research	60%	Support Services	20%
Bio-tech Research	15%	Retail/Food Service	5%

Table 5-2 shows the number of jobs estimated to be generated within the Research Park itself. Of these jobs, there are probably that will be relocations from Urbana's Motorola plant and other existing firms within the economy. In the planning and agreement stages of this project, the Developer estimated 5,000 jobs would be created. While the exact relocation numbers are not known, the model described in the next section will use the number of total jobs found in the chart below.

	Phases I and II	Phase III	Total
Bio-Tech Research	268.64	609.18	877.82
Computer Research	1074.55	2436.72	3511.27
Support Service	194.83	441.82	636.65
Food Service	223.05	505.8	728.85
Total Jobs	1761.06	3993.52	5754.58

Table 5-2

6. Impact Analysis Model

Once the number of jobs that the Research Park is expected to generate had been calculated, further economic analysis could be undertaken. Using the estimates for employment data calculated from the Developer's information, the effects of the Research Park can be seen upon the Champaign County economy in its entirety. The jobs created within these industries have an enormous expected impact upon employment and expenditures throughout the entire Champaign economy. This is called the multiplier effect, where the generation of employment within one industry prompts further growth within related and unrelated fields. The manifestations of the multiplier effect are best captured through the use of a mathematical model that identifies the relationships between various industries.

6.1 Software. The model of the economy in Champaign County has been developed using a software package, known as IMPLAN.⁹ The IMPLAN model is able to summarize the effects of these impacts, or events, on the economy in a series of reports that detail some of the expenditure, employment, and tax information. These reports are created to show the resulting impacts in a clear manner. The report generation is a technique that provides the IMPLAN user with the type of detailed information that would be useful for further analysis of the impacts.

6.2 Model Description. The I-O developed the first technique of analyzing sectors within a regional, national, or global economy, and is often used "to assess the economic impact of some 'external' shock to the economy."¹⁰ While no modeling technique is flawless, one of the major shortcomings of the I-O model lies in the manner in which it deals with final demand. The I-O model loses a great deal of its momentum to final demand, or the ultimate consumer of a good or service. When a household or another entity purchases directly from another industry, the inter-industry transactions cease. Other modeling methods attempt to take the framework of the Input-Output model and extend it to internalize other variables. A Social Accounting Matrix was used here, extending upon the work of the classic I-O model to account for secondary and tertiary iterations of impact analysis.

The model was built from non-survey data to create a Social Accounting Matrix (SAM) that represents the relationships between 550 sectors of the Champaign economy. This SAM can then be used to forecast the employment and expenditure effects of a current economic event. This SAM can then be used to forecast the employment and expenditure effects of a current economic event, in this case, the Research Park development. Table 6-1 shows the industries that were manipulated in the model to achieve a "shock" that mimics the emergence of the Research Park.

⁹ Source: Minnesota Implan Group, Inc.

¹⁰ Miller, Ronald E. 1998. 'Regional and Interregional Input-Output Analysis' in Walter Isard, Iwan J. Azis, et al, (eds.), *Methods of Interregional and Regional Analysis*. Aldershot, England: Ashgate.

Sector Number	Industry	New Employees, Phases I and II	New Employees, Phase III (total)
342	Computer Peripheral	250	858
378	Electronic Components	325	934
509	Research Development and Testing	500	1720
493	Medical and Health Services	268	877
507	Accounting and Bookkeeping	194	635
454	Eating and Drinking	224	730

Table 6-1

The model was run twice, using the employment figures from Phase I and II and again using the employment estimates for the entire project. For the purpose of analysis, the results that utilized the Phase I and II estimates will be used. These employment figures for the first two phases depict a level of change that can reasonably be expected within the next five years, as the building schedule for Phase III is currently speculative.

“The SAM is a comprehensive, disaggregated, consistent, and complete data system that captures the interdependence that exists within a socioeconomic system.”¹¹ One of the greatest benefits of the SAM over other types of models is its ability to capture not only the direct effects of an impact, but also the indirect and induced effects of a change to the economy. In this sense, the SAM framework is an important extension of the Input-Output model.

- *Direct Effects* represent the impacts for the expenditures and/or production values specified as direct final demand changes.
- *Indirect Effects* represent the impacts caused by the iteration of industries purchasing from industries resulting from direct final demand changes.
- *Induced Effects* represent the impacts on all local industries caused by the expenditures of new household income generated by the direct and indirect effects resulting from final demand changes.

6.3 Assumptions and Limitations. Because the space within the Research Park has not yet been rented, it is difficult to determine exactly which industries will begin or grow as a result of the Park’s inception. The chart shows the sectors across which the effects of the impact were distributed. Of all high-tech sectors of the economy, Champaign only had employees in two sectors, Computer Peripheral Equipment and Electronics Components. New employees were added to these two industries in the model because the relationships between these industries and the others in the economy have been determined. It is also more likely that employment trends will continue before new industries emerge. The Medical and Health Services represents the bio-technology sector, while Accounting and Bookkeeping represents the Support Service firms that are expected to locate within the Park.

It is important to emphasize a few key points about the model’s inherent limitations and those placed upon it. One criticism of using models to predict a project’s impact is that the results often seem inflated. For the purpose of illustration, this model accounts for all

¹¹ Thorbecke, Erik. 1998. ‘Social accounting matrices and social accounting analysis’ in Walter Isard, Iwan J. Azis, et al, (eds.), *Methods of Interregional and Regional Analysis*. Aldershot, England: Ashgate.

of the impacts to be captured by the study area. Leakage has been taken from the model in order to heighten the impact effects so that Champaign may see the total potential of this new development. This may help the City prepare for the capture of as much of this new benefit for which it can plan. The impacts estimated by the model may never be realized, but looking at these direct, indirect, and induced effects shows the promise for growth within sectors. In this sense, the model's importance lies in the fact that it shows patterns and trends, creating a blueprint of the potential framework of Champaign's future economy. This further illustrates the industries and markets that have a chance to develop and increase with the emergence of technology-based development. With these points in mind, the impact analysis can be examined.

Of the more than 500 industries included within the model, nearly 100 had a total expenditure impact of over \$200,000. A closer look at these industries shows how some trades were particularly impacted. The 50 industries to which there are the greatest total expenditures are listed in Table 6-2 on the following page, with all expenditures in 2000 dollars. This collection of impacted industries represents several sectors of the economy and provides a general picture of how all industries would be effected. While the detailed listing of all of the expenditure results is included in Appendix B, the next section will attempt to define some of the most important changes to the economy as a result of the development of the Research Park.

Top 50 Industries in Total Expenditures	Direct	Indirect	Induced	Total
Computer Peripheral Equipment	964,529,920	47,575,360	122,935	1,012,228,215
Electronic Components	87,848,392	5,273,128	6,110	93,127,632
Wholesale Trade	-	71,376,888	6,035,396	77,412,284
Real Estate	-	12,382,520	9,248,323	21,630,843
Research Development and Testing	20,094,804	1,005,112	240,069	21,339,985
Computer and Data Processing Services	-	15,956,804	1,765,341	17,722,145
Eating and Drinking	6,475,466	1,932,919	8,327,455	16,735,840
Owner Occupied Dwellings	-	-	16,499,054	16,499,054
Banking	-	8,341,828	6,602,326	14,944,154
Other Medical and Health Services	11,584,222	8,893	1,786,236	13,379,351
Doctors and Dentists	-	-	11,372,982	11,372,982
Legal Services	-	8,244,558	2,169,474	10,414,032
Maintenance and Repair- Other Facilities	-	8,156,553	1,197,884	9,354,437
Accounting Auditing and Bookkeeping	6,406,089	1,531,177	490,187	8,427,453
Motor Vehicle Parts and Accessories	-	6,813,014	529,066	7,342,080
Other Business Services	-	5,842,430	1,428,367	7,270,797
Communications Except Radio and TV	-	4,531,630	2,669,729	7,201,359
Hospitals	-	37,711	7,139,988	7,177,699
Radio and TV Broadcasting	-	5,608,009	691,911	6,299,920
Hotels and Lodging Places	-	5,006,553	1,245,362	6,251,915
Automotive Dealers and Service Stations	-	68,333	5,724,857	5,793,190
Motor Freight Transport and Warehouse	-	3,516,655	1,859,877	5,376,532
Periodicals	-	3,500,054	510,235	4,010,289
Food Stores	-	171,093	3,722,480	3,893,573
Air Transportation	-	2,971,029	901,038	3,872,067
Newspapers	-	3,276,523	471,295	3,747,818
General Merchandise Stores	-	148,762	3,356,064	3,504,826
Miscellaneous Retail	-	146,520	3,315,658	3,462,178
Automobile Repair and Services	-	1,127,169	2,189,332	3,316,501
Management and Consulting Services	-	2,599,635	529,192	3,128,827
Other State and Local Govt Enterprises	-	1,615,988	1,484,538	3,100,526
Insurance Carriers	-	693,758	2,308,442	3,002,200
Personnel Supply Services	-	2,323,309	333,123	2,656,432
Electrical Equipment	-	2,187,891	78,441	2,266,331
Electric Services	-	1,186,625	1,078,135	2,264,760
Engineering- Architectural Services	-	1,874,116	366,059	2,240,175
U.S. Postal Service	-	1,339,987	878,684	2,218,671
Miscellaneous Plastics Products	-	2,159,473	58,972	2,218,445
Photofinishing Commercial Photos	-	1,714,004	499,553	2,213,557
Drugs	-	349,153	1,662,324	2,011,477
Maintenance and Repair- Residential	-	509,892	1,498,986	2,008,878
Motion Pictures	-	1,312,377	675,724	1,988,101
Furniture and Home Furnishings Stores	-	75,445	1,695,713	1,771,158
Apparel and Accessory Stores	-	75,151	1,682,898	1,758,049
Services to Buildings	-	1,246,650	427,973	1,674,623
Social Services	-	-	1,654,293	1,654,293
Nursing and Protective Care	-	-	1,630,341	1,630,341
Building Materials and Gardening	-	68,385	1,554,447	1,622,832
Metal Stampings	-	1,565,382	22,808	1,588,190
Equipment Rental and Leasing	-	1,266,111	191,317	1,457,428
Total	1,096,938,893	248,714,557	121,930,994	1,467,584,445

Table 6-3

7. Recommendations

The industries named within this section illustrate the relevance of using a Social Accounting Matrix (SAM) to show the impact of the Research Park within the Champaign economy. By looking at not only the direct inter-industry effects, but also at the indirect and induced effects, the ultimate patterns of change that will result from new development have been highlighted. The culmination of these added effects would not be realized fully if other methods of analysis were employed.

The patterns that have emerged in the analysis of the model's results establish a framework around which further planning studies can be built. Within these top-grossing industries lie the obvious groups who stand to benefit from the types of high-tech development that are anticipated within the Champaign community.

Professional Services Industries	Direct	Indirect	Induced	Total
Real Estate	-	12,382,520	9,248,323	21,630,843
Banking	-	8,341,828	6,602,326	14,944,154
Doctors and Dentists	-	-	11,372,982	11,372,982
Legal Services	-	8,244,558	2,169,474	10,414,032
Accounting Auditing and Bookkeeping	6,406,089	1,531,177	490,187	8,427,453
Other Business Services	-	5,842,430	1,428,367	7,270,797
Management and Consulting Services	-	2,599,635	529,192	3,128,827
Engineering/Architectural Services	-	1,874,116	366,059	2,240,175
Nursing and Protective Care	-	-	1,630,341	1,630,341
Business Associations	-	735,507	248,765	984,272
Insurance Agents and Brokers	-	156,453	520,590	677,043
Total	6,406,089	41,708,224	34,606,606	82,720,919

Table 7-1

7.1 Professional Services. In looking at Table 7-1, it is clear that the Research Park would create a demand within the Professional Services industries. While the degree to which these increases will materialize cannot be known, the model's results show that planning considerations should be made to prepare for change in these industries. There are certain provisions that the City can make and plan for to ensure that expansions in these industries are captured in the Champaign economy. These are the types of firms that would require office space, parking facilities, public transportation, and services.

Further Planning Studies:

- Inventory existing office space and parking facilities.
- Promote target areas for the location of Professional Service offices.
- Sponsor Professional Associations that bring together the common interests of these industries in assisting high-tech businesses.
- Initiate focus groups with existing firms in these industries to solicit their opinions about how the community could best prepare for this type of growth.

Medical Industries	Direct	Indirect	Induced	Total
Other Medical and Health Services	11,584,222	8,893	1,786,236	13,379,351
Doctors and Dentists	-	-	11,372,982	11,372,982
Hospitals	-	37,711	7,139,988	7,177,699
Drugs	-	349,153	1,662,324	2,011,477
Surgical Appliances and Supplies	-	12,863	92,844	105,707
Nursing and Protective Care	-	-	1,630,341	1,630,341
Total	11,584,222	408,620	23,684,715	35,677,557

Table 7-2

7.2 *Medical Industries.* A great increase in expenditures to Medical Industries is anticipated with the Research Park. As the Champaign-Urbana metropolitan area is already considered to be a regional medical center, it only makes sense that it would continue to flourish with new jobs being added to the community. The results of the model in the field of Medical Services demonstrate both the successes and the shortcomings of impact analysis. While the model identifies patterns that may continue in the Champaign economy, it does not have the ability to predict any events that might change the results, such as the closing of a hospital, new medical technologies that make medicine less expensive, or even an over-saturation of the medical market. Further study of the reality of these industry changes is in order to discover how Champaign may best adjust for this potential growth area.

Further Planning Studies:

- ♦ Research the growth patterns of the medical field in relation to overall growth.
- ♦ Survey local medical facilities to determine the additional services and space they would require with this rate of growth.
- ♦ Coordinate the research and development capabilities of the Research Park with emerging technologies within the Medical Industries identified.
- ♦ Initiate focus groups with existing firms in these industries to solicit their opinions about how the community could best prepare for this type of growth.

Real Estate Industries	Indirect	Induced	Total
Real Estate	12,382,520	9,248,323	21,630,843
Owner Occupied Dwellings	-	16,499,054	16,499,054
Total	12,382,520	25,747,377	38,129,897

Table 7-3

7.3 *Real Estate Industries.* As the City may have anticipated, 1,700 new jobs creates a demand for additional housing and office space. With the possibility of millions of dollars in home sales, builders and real estate agents should be readied for change. The general real estate market is also significantly effected, as there will be a demand for office space and new housing opportunities. The City should devote further study to these increases because it ultimately provides services to the residences and work places.

Further Planning Studies:

- ♦ Examine the capability of the construction industry in Champaign to handle the influx of this new business.

- Survey existing financial institutions, and real estate and construction firms and associations for input about potential planning concerns related to these increases.
- Examine Comprehensive Plan to determine how land use is planned for in the City.
- Examine the Capital Improvements Plan to ensure that projections for infrastructure expenditures over the coming years match anticipated growth in the housing and real estate markets.
- In conjunction with utility and service providers in the area, conduct studies to weigh the income generated by new growth against the cost to serve more customers. Look at available tools (taxes, impact fees, service rate increases, etc.) to offset any possible losses.
- Initiate focus groups with existing firms in these industries to solicit their opinions about how the community could best prepare for this type of growth.

Communications Industries	Indirect	Induced	Total
Communications Except Radio and TV	4,531,630	2,669,729	7,201,359
Ratio and TV Broadcasting	5,608,009	691,911	6,299,920
Periodicals	350,054	510,235	4,010,289
Newspapers	3,276,523	471,295	3,747,818
Miscellaneous Publishing	182,897	29,432	212,329
Book Publishing	62,414	141,847	204,261
Total	17,161,527	4,514,449	21,675,976

Table 7-4

7.4 *Communications Industries.* Significant increases in many major communications industries have been identified from the model's results. Such substantial growth in these areas could pave the way for Champaign's emergence as a major city in the Midwest. Further planning analysis may reveal methods to capitalize on these potential changes.

Further Planning Studies:

- Survey communications firms to determine possible linkages between growth in these industries and the overall economy.
- Market the City as a location for regional communication headquarters offices. Assist interested firms in conducting surveys and studies of the Champaign market.
- Investigate opportunities to utilize growth in these industries to promote the image of Champaign as a high-tech City.
- Initiate focus groups with existing firms in these industries to solicit their opinions about how the community could best prepare for this type of growth.

Transportation Industries	Indirect	Induced	Total
Motor Vehicle Parts and Accessories	6,813,014	529,066	7,342,080
Automotive Dealers and Service Stations	68,333	5,724,857	5,793,190
Air Transportation	297,1029	901,038	3,872,067
Automobile Repair and Services	1,127,169	2,189,332	3,316,501
Automobile Rental and Leasing	728,782	359,514	1,088,296
Railroads and Related Services	185,177	277,211	462,388
Local Interurban Passenger Transit	120,028	211,135	331,163
Local Government Passenger Transport	80,988	143,876	224,864
Automotive Stampings	194,539	16,261	210,800
Automobile Parking and Car Wash	20,450	101,096	121,546
Total	12,309,509	10,453,386	22,762,895

Table 7-5

7.5 *Transportation Industries.* Growth patterns in these industries to which the City should pay the most attention, as they require a great deal of planning. With growth in the overall economy, there will be more cars on the road, people on the busses and trains, and airplanes at the airport. Before these changes materialize, it would behoove the City to conduct analysis of the infrastructure and services that it has in place to prepare for changes in the Transportation Industries.

Further Planning Studies:

- Survey existing automotive and transportation firms in the City to ensure that sufficient facilities are in place to maintain service during this period of growth.
- Compare the expenditures set forth in the Capital Improvements Plan to the patterns of change predicted by the results of the model.
- Work with Willard Airport and the University of Illinois to complete an Airport Master Plan that would capitalize on these changes and prepare for increases in the level of air service.
- Study the efficiency of the transportation services in Champaign since the introduction of the Inter-modal Transportation Center. Work with firms and individuals that run this center to ensure that they are primed to absorb potential growth.
- Initiate focus groups with existing firms in these industries to solicit their opinions about how the community could best prepare for this type of growth.

8. Conclusion

The City of Champaign is in a prime position to determine its own economic future. The City has a strong employment base, yet it seeks to further diversify its economic structure to capture all possible opportunities for the current and future residents of Champaign. With the development of the University Research Park, the City has the opportunity to make great strides in transitioning its economy to one that is more focused on technology industries. The City of Champaign shows commitment to this task, as it has made the promotion of technology firms a priority for economic development through policy change and other types of support.

Analysis of the Champaign model isolated patterns of economic change resulting from the anticipated impacts of the University of Illinois' Research Park. This report has outlined some areas in which Champaign can expect to see growth over the next few years. However, the analysis of data is only useful if it is employed to plan for anticipated changes through policy and strategy revision.

Champaign should attempt to undertake some of the planning studies recommended in this report in order to prepare for anticipated economic changes. As this economic evolution may take several years to take shape, the City can complete the planning analysis in several phases:

- Assess available resources and staff
- Prioritize strategies
- Design a work program that includes some of the recommended strategies
- Begin their execution
- Determine which resources that it currently lacks
- Train existing staff, hire new employees, or contract out additional work

While the City of Champaign may not develop in the same manner as Silicon Valley or the Research Triangle, or Boulder, or Cambridge, it has the same potential that those places had when technology development began to occur there. Champaign may have one advantage over those high-tech conglomerates, however, because it has the foresight to plan for the onslaught of new firms that will locate in the area. The dominance of the University of Illinois computer science and engineering programs combined with the technology-friendly business environment puts Champaign in the spotlight as a location for high-tech firms to thrive.