

Driving Regional Innovation and Growth

The 2012 Survey of North American University Research Parks

RESULTS

Prepared for Association of University Research Parks (AURP)
by Battelle Technology Partnership Practice

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AURP is a non-profit organization that promotes the development and operations of research parks that foster innovation, commercialization and economic competitiveness in a global economy through collaboration among universities, industry and government.

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Insightrix Inc., established in June 2001, offers research-related services (such as online survey capabilities, traditional data collection, focus groups, personal interviews, strategic planning and management consulting) via the Internet, and helps clients develop, administer and manage data collection and information strategies to achieve their informational needs.

In memoriam for Stephen Andrade, a good friend and highly respected colleague, whose efforts in shaping this report demonstrate his commitment and many years in advancing technology-based economic development.



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INTRODUCTION AND KEY FINDINGS

As national and regional economies recover from the most severe global recession since the Great Depression of the 1930's, there is a growing emphasis on the importance of innovation for sustained economic growth and competitiveness in today's global, fast-paced, knowledge-based economy. Not only is innovation critical for industry development, it directly impacts the standard of living found in a nation and its regions. As the World Economic Forum explains in its highly touted *Global Competitiveness Report*:

*In the long run, standards of living can be expanded only with innovation...This requires an environment that is conducive to innovative activity, supported by both the public and the private sectors. In particular, this means sufficient investment in research and development especially by the private sector, the presence of high-quality scientific research institutions, extensive collaboration in research between universities and industry, and the protection of intellectual property.*¹

University research parks provide a best practice means of focusing on innovation and sustaining economic competitiveness. According the National Research Council in its study of research park best practices:

*Research parks are seen increasingly around the world as a means to create dynamic clusters that accelerate economic growth and international competitiveness. They are widely considered to be a proven tool to encourage the formation of innovative high technology companies. They are also seen as an effective means to generate employment and to make existing companies more competitive.*²

The reason why university research parks matter is that innovation in today's global economy is still a very local phenomenon. In an interesting paradox, the more globally integrated the world economy becomes, the more *local* research and development know-how, entrepreneurial culture, workforce skills and manufacturing competencies matter for economic success. A 2009 *Harvard Business Review* article by Harvard professors Gary Pisano and Willy Shih, entitled *Restoring American Competitiveness*, suggests that geographic proximity is in fact critical to the competitiveness of industries:

*...the evidence suggests that when it comes to knowledge, distance does matter...An engineer in Silicon Valley, for instance, is more likely to exchange ideas with other engineers in Silicon Valley than with engineers in Boston. When you think about it, this is not surprising, given that much technical knowledge, even in hard sciences, is highly tacit and therefore far more effectively transmitted face-to-face. Other studies show that the main way knowledge spreads from company to company is when people switch jobs. And even in America's relatively mobile society, it turns out that the vast majority of job hopping is local.*³

University research parks are viewed as creating the nexus in which industry clusters thrive. Christian Helmets from the London School of Economics finds that firms within the same industry benefit from being

¹ World Economic Forum, *The Global Competitiveness Report 2010–2011*, page 8.

² National Research Council, *Understanding Research, Science and Technology Parks: Global Best Practices*, Washington D.C., 2009.

³ Gary P. Pisano and Willy C. Shih, "Restoring American Competitiveness," *Harvard Business Review*, July 2009, page 3 of reprint.

co-located at a research park.⁴ Pisano and Shih further explain this phenomenon as creating geographically based “industrial commons”:

Once an industrial commons has taken root in a region, a powerful virtuous cycle feeds its growth. Experts flock there because that’s where the jobs and knowledge networks are. Firms do the same to tap the talent pool, stay abreast of advances and be near suppliers and potential partners.⁵

Report Roadmap

It is against this backdrop—of the importance of innovation and the role that university research parks can play—that this 2012 survey, commissioned by the Association of University Research Parks (AURP), was conducted.

The survey is intended to update the information on university research park activities considering a wide range of key topics involving their operation and success factors, as was done in similar surveys conducted in 2002, 2005 and 2007. Given the heightened global focus on innovation and economic competitiveness, the results of the 2012 AURP survey of North American university research parks are organized in this report to focus specifically on the value that research parks contribute to advancing regional innovation systems and regional economic development.

In this section, the parameters of the survey and the distinguishing attributes of university research parks are discussed, along with the key findings.

The second section of the report, entitled ***The Contribution of University Research Parks to Regional Innovation Ecosystems***, discusses how all of the various elements of an innovation ecosystem—including advancing innovation through commercialization of university-based technologies, advancing industry product development and supporting emerging technology companies—are incorporated into university research park goals, activities, real estate development and ultimate success.

The third section of the report, entitled ***The Contribution of University Research Parks as Regional Economic Drivers***, examines the trends and broader implications of the economic impact of university research parks, including a discussion of the range of industries served and the resulting economic activity and job creation.

The fourth section of the report, entitled ***The Changing Face of Development Across University Research Parks***, considers issues related to the physical development of university research parks.

The final section of the report, entitled ***The Basic Details of Research Park Characteristics: 2012***, provides an examination of a broad array of park characteristics for those seeking more in-depth knowledge of structure, governance, budget and other characteristics of university research parks.

More about the 2012 AURP Survey

A web-based, 38-question survey of university research parks in North America was conducted covering the activities of university research parks in 2012. The survey requested data on park characteristics, input on trends in university research park development and data to measure the economic impact of park development. The survey was sent to 174 university research parks in the United States and Canada; 108 parks (62 percent overall) responded to the full survey, while an additional 30 parks (17 percent) replied only to questions on park employment. Of the 108 full survey responses received, 84 percent of the

⁴ Christian Helmers, “What Makes Science Parks Successful,” *University World News*, May 8, 2011, Issue 170

⁵ Gary P. Pisano and Willy C. Shih, “Restoring American Competitiveness,” *Harvard Business Review*, July 2009, page 3 of reprint.

respondents were in the United States, with the remainder in Canada. Survey services were provided by Insightrix Research Services.

The 62 percent response rate to this 2012 survey is excellent, and well above the norm for surveys of this type. However, it must be noted that the survey results represent a snapshot in time and are not always directly comparable to the past surveys of 2002, 2005 and 2007 in absolute values of employment and build-out of research parks. This is due to the differences in park characteristics, particularly size, of the university research parks that responded in different years to the survey. Where possible, trends are reported based on data from research parks that responded across multiple survey years.

Figure 1: 2012 Survey Response Distribution – 108 University Research Parks Responding to Full Survey



Key Findings

The 2012 survey of North American university research parks brings up-to-date the state of university research park activities considering a wide range of key topics about how university research parks operate and what matters in driving success. Given the heightened global focus on innovation and economic competitiveness, the results of the 2012 AURP survey of North American university research parks are organized to focus specifically on the value that research parks contribute to advancing regional innovation systems and regional economic development.

The results from the 2012 survey of North American university research parks demonstrate the extent to which university research parks are focused on advancing innovation in regions across North America.

- The focus on innovation starts with the goals and objectives of nearly all university research parks, with the top rated priority being “The creation of an environment that encourages innovation and entrepreneurship”.
- Innovation services are offered by nearly all university research parks responding to the survey, with nearly all providing either university-industry collaboration services or access to commercialization services, and many providing multiple types of innovation services.
- Innovation activities result in measurable economic development successes, particularly through the incubation of emerging technology companies. The 108 university research parks responding to the survey report that 963 new businesses have graduated from their incubators or related

startup space in the last five years. Of these graduate startup companies, 26 percent remained in the park, 43 percent left the park but remained in the region and just 12 percent left the region. Significantly, only 19 percent of these startup companies were no longer in business, considerably outperforming overall national statistics on startup companies, where over 50 percent fail within five years.⁶

The focus on innovation is viewed as critical to the success of university research parks. Six key attributes for success relating to innovation were rated by university park directors as being of High or Very High importance to the success of a park. These six key attributes were:

- Good match between the core competency of the affiliated university and the recruited tenants
- Capacity to assist early-stage business organizations in commercialization
- Access to equity capital sources for research park tenants
- Priority availability of multi-tenant space for incubator graduates
- Priority access to university resources, facilities, faculty and students
- Availability of a formal business incubator in the research park boundaries

University research parks are becoming even more integrated into regional innovation efforts and are often signature developments for creating the dynamic live-work-play environments that attract high-skilled, technology professionals to a region.

- The seeds of these live-work-play developments were found in many of the new university research parks brought on line over the last decade, such as Centennial Campus (affiliated with North Carolina State University), Mission Bay (affiliated with the University of California San Francisco) and the Fitzsimmons Life Science District in Colorado (affiliated with the University of Colorado's academic medical center).
- The 2012 survey finds that even established university research parks are transforming themselves from primarily commercial real estate environments into thriving live-work-play environments. For example, while today only 7 percent of university research parks offer non-student housing, 21 percent of parks are planning such developments within the next five years. Non-food/restaurant retail is also on the rise, with projected growth within the next five years from just 12 percent of existing university research parks currently offering such services, to 30 percent based on university research parks' plans to offer such facilities. Putting this all together, within five years, the share of university research parks offering live-work-play environments will rise from 6 percent to 21 percent.

The focus on innovation is enabling university research parks to demonstrate continued strong growth despite the severe economic recession and weak economic recovery since 2007.

- Thirteen percent of the 108 university research parks responding to the 2012 survey were formed since 2008. These 14 new university research parks have a current build-out of 3.2 million square feet and directly support 3,526 jobs.
- Just as encouraging is the fact that 80 of the 108 university research parks surveyed (74 percent) have opened a new building since 2008.

⁶ Scott Shane, "Start Up Survival Rates: The Definitive Numbers," Small Business Trends, December 17, 2012, see <http://smallbiztrends.com/2012/12/start-up-failure-rates-the-definitive-numbers.html>

- Of the 85 university research parks that responded to the employment portion of the survey in both 2007 and 2012, 64 percent gained employment from 2007 to 2012. In total, the 85 university research parks experienced an average employment gain of 27 percent over those five years—a significantly better performance than the economy as a whole, which due to the global recession and weak recovery suffered a 4.5 percent loss of employment during the same period.

Total university research park employment reported for the 2012 survey of North American university research parks reached 379,754 jobs. (Note that this is only for the parks that responded—the 108 parks with a full survey response and an additional 30 parks that responded only to the employment portion of the survey. These 138 parks make up 79 percent of the parks that received the survey.)

A high level analysis was undertaken to quantify the ripple effect of these jobs. This sophisticated employment impact analysis measured the additional economic activities—including jobs, taxes/other public revenues and spending from the salaries of university research park employees—in the larger economy. Based on this analysis, the 379,754 jobs reported from the survey responses are estimated to support an additional 561,504 jobs throughout the U.S. and Canadian economies. Thus the total employment impact of university research parks responding to the survey amounts to 941,258 jobs in 2012.

Still, university research parks were not immune to the impacts of the recent recession and weak economic recovery. Two out of three university research park directors indicated that the recession had a significant negative impact on the growth and development of their parks. The leading impacts of the recession and weak economic recovery reported by survey respondents were a lack of investment capital for buildings with more stringent underwriting criteria, higher vacancy in the local markets resulting in downward pressure on rental rates, a reduction in government R&D funding and less build-to-suit demand.

Altogether, the results from the 2012 North American University Research Park Survey point to a robust and growing innovation and business creation model. Since the last survey in 2007, the university research parks sector has shown growth on multiple measures, including the development of new parks, the physical expansion of existing parks, increased employment and new business spin-outs. The results of the survey also highlight the increasing relevance of university research parks within regional innovation ecosystems. The survey points to a future in which many university research parks will be transformed into broader districts encompassing the vibrant signature live-work-play developments critical for driving technology-based economic development within regions. While the university research parks in the 2012 survey have shown outstanding positive growth over the preceding 5 years, they are nonetheless clearly impacted by overall economic conditions. Efforts to improve availability of capital and raise government funding for R&D are important drivers for the successful future of North American research parks.



What is a University Research Park

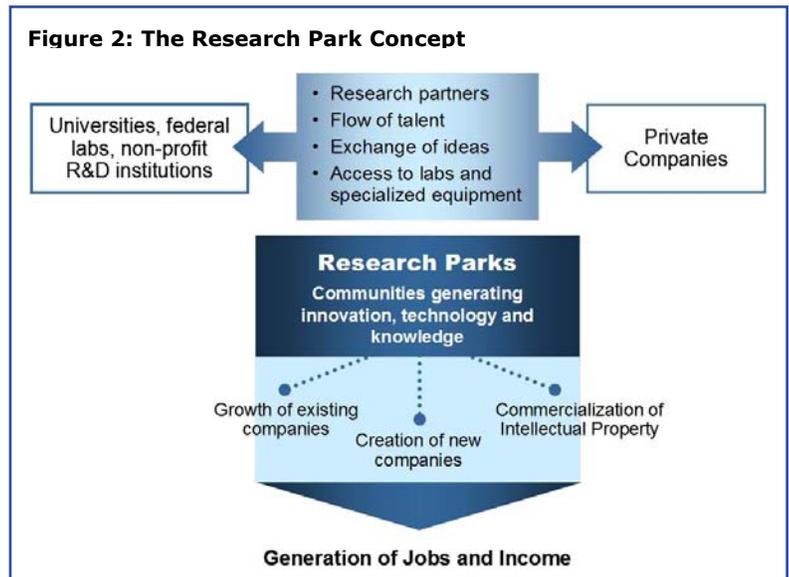
University research parks are physical environments that can generate, attract and retain technology companies and talent in alignment with sponsoring research institutions (universities and public and private research laboratories). As presented in Figure 2, research parks enable the flow of ideas between technology generators (universities, federal labs, and non-profit R&D institutions) and technology companies located in both the research park and the surrounding region. Ideally, the innovations, technologies, and knowledge generated by, and the interactions between, a park's companies and research institutions support the creation of startup companies, the retention and expansion of existing firms and the attraction of new firms into the region.

University research parks differ from other science or technology parks in that they are generally developed by, or in collaboration with, a leading research institution. Most research parks are affiliated with one or more universities; however, research parks have also been affiliated with, and located close to, national laboratories or other sources of technology and innovation. The term "university research park" encompasses all of these situations.

AURP defines a university research park as a property-based venture which has the following attributes:

- A property master plan designed for research and commercialization
- Partnerships with at least one university or other research institution
- Encouragement of the establishment and growth of new companies
- Technology translation from the lab to the marketplace
- A focus on technology-led economic development

The key factor differentiating a university research park from a technology or industry park is the meaningful interaction between the companies in the park and the affiliated research institution(s). This interaction can include providing internship and employment opportunities for students, sharing facilities and equipment or conducting collaborative research. In addition, most university research parks have a university presence within the park, which can include research labs, test beds, education and training facilities and technology transfer offices. Research park tenants undertake R&D within their premises in the park, employ high concentrations of scientific, technical and professional workers and generate products or processes that are based on scientific or technological discoveries. While the development community tends to classify many technology and industry parks as research parks, they usually do not meet the above criteria.





THE CONTRIBUTION OF UNIVERSITY RESEARCH PARKS TO REGIONAL INNOVATION ECOSYSTEMS

While university research parks do involve the development of a physical setting proximate to a research driver and thus involve commercial real estate activities, it is commercial real estate with a purpose. And that purpose—clearly revealed by the 2012 Survey of University Research Parks—is to advance regional innovation ecosystems.

Importance of Regional Innovation Ecosystems

A regional innovation ecosystem in today's global, knowledge-based economy is the means by which a region can ensure its economic competitiveness, and is directly tied to quality job creation and a high standard of living. The 2010 update to *Rising Above The Gathering Storm*—a highly influential report from the National Academies of Sciences set out by a blue ribbon panel of leading industry and academic leaders—explains:

...the fundamental measure of [regional] competitiveness is quality jobs. It is jobs that to a considerable degree define the quality of life of a nation's individual citizens...Substantial evidence continues to indicate that over the long term the great majority of newly created jobs are the indirect or direct result of advancements in science and technology, thus making these and related disciplines assume what might be described as disproportionate importance.⁷

Across North America, regions are working hard to safeguard their economic futures in light of the competitive demands of today's economy. There is a growing recognition that the factors that drive economic development are rapidly shifting. In the past, a region's natural resources and proximity to markets were the critical factors for economic development. But with the rising importance of innovation and technology development, a region's economic competitiveness increasingly depends on its ability to establish a high quality system that fosters innovation and promotes the development, transfer and commercialization of technology. Such innovation ecosystems provide environments in which emerging technology companies can be incubated and grow, researchers and companies can collaborate and access to scientific, engineering and entrepreneurial talent can be easily facilitated.

Technology-based development has emerged as the key difference in a region's economic performance. A study by the Milken Institute, a private, non-profit research organization, in evaluating the economic growth across 315 regions in the U.S. over the 1975 to 1998 period, found that 65 percent of the difference in economic success for regions is accounted for by the growth and presence of high technology industries. Moreover, the Milken Institute identified that research centers and institutes are "indisputably the most important factors in incubating high tech industries."

And the Milken Institute is not alone in noting that fast-growing technology-oriented economies are typically anchored by major research universities interacting with a robust technology-oriented private sector. A study prepared for the U.S. Small Business Administration (SBA) found that "Research universities and investment in research universities are major factors contributing to economic growth in the labor market areas in which the universities are situated." Studies by the Office of Technology Policy and others have found that all areas of technology-based economic development in the U.S. have strong concentrations of both university and private research.

Notes: Milken Institute, *America's High-Tech Economy: Growth, Development and Risks for Metropolitan Areas*, 1999; Bruce Kirchoff, "The Influence of R&D Expenditures on New Firm Formation and Economic Growth," Maplewood, N.J. BJK Associates, 2002; U.S. Department of Commerce, Office of Technology Policy, *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, Washington, D.C., 2000.

⁷ National Academy of Sciences, *Rising Above the Gathering Storm, Revisited: Rapidly Approaching Category 5*, September 2010, page 17–18

The 2012 University Research Park Survey Results

The 2012 University Research Park Survey results demonstrate the extent to which university research parks are focused on advancing innovation in their regions. The focus on innovation starts with the goals and objectives of university research parks, is found in their services, is critical to their success and is demonstrated in measurable economic development results. This effort by university research parks to be a place for advancing regional innovation systems is multi-dimensional and recognizes the many different factors which can foster innovation and technology commercialization, from incubation of emerging technology companies to industry-university partnerships to accessing top talent.

University Research Park Goals and Objectives Focused on Advancing Innovation

University research park directors identified the establishment of an innovation system as a priority goal and objective of their parks.

- **The top ranked priority was "Create an environment that encourages innovation and entrepreneurship,"** ranked as a Very High or High priority on 97 percent of the responses. Its average rating was nearly a perfect 5.
- The second highest ranked priority was **"Offer a place for faculty and students to work with industry,"** ranked as a Very High or High Priority by 83 percent, with an average rating of 4.27.

What also stands out is what was rated low as a goal or objective of university research parks. The lowest ranked goal was "Generate income for university and developer," with only 40 percent ranking it as a Very High or High priority. Also ranked low was "Promote development/redevelopment in the neighborhood around the university," with only 50 percent ranking it as a Very High or High priority. This points out that while university research parks are by their nature real estate developments, the profitability and expansion of real estate holdings is a minor consideration compared to the focus on leveraging the real estate for broader innovation and economic development goals for their region. This is in stark contrast to most real estate developments.

Table 1: Research Park Goals and Objectives

| Park Objectives | Average Rating (Scale of 1–5 with 5 being Very High Priority) |
|--|--|
| Create an environment that encourages innovation and entrepreneurship | 4.72 |
| Offer a place for faculty and students to work with industry | 4.27 |
| Serve as a landing pad for recruitment of industry (both national and international) to region | 4.21 |
| Serve as a location for existing businesses to grow and expand in region | 4.10 |
| Encourage commercialization of university Intellectual Property | 4.09 |
| Build university stature | 3.83 |
| Promote development/redevelopment in the neighborhood around the university | 3.22 |
| Generate income for university and developer | 3.16 |

University Research Park Services Bring Focused Attention to Innovation

University research parks offer a wide range of services to their tenants related to advancing innovation, particularly through the business, commercialization and industry-university collaboration services offered.

Ninety-eight percent of the responding research parks provide access to some university-industry collaboration services, 88 percent provide access to some business and commercialization services and most provide access to multiple innovation services. Of particular prevalence is the number of services provided by university research parks that are focused on helping their industrial tenants connect to the resources they need, whether they be financial, technological, commercial or talent related resources.

For the promotion of university-industry collaboration, the most common services offered were having park staff responsible for relationship building between industry and universities and offering industry tenants access to university research labs.

Table 2: Industry-University Collaboration Services Offered

| Partnering Mechanism | Percentage of Parks |
|--|---------------------|
| Partnership-developer staff or others charged with "relationship building" between industry and universities | 64% |
| Access to university research laboratories | 63% |
| Human resources matching: internship or co-op programs, mechanisms for student and post docs hiring | 59% |
| University tech transfer/commercialization office | 54% |
| University core user facilities (e.g., analytical lab, prototyping lab), open to industry | 49% |
| University educational course offerings to industry tenants | 44% |
| Pilot plants or demonstration labs, open to industry | 33% |
| Workforce advanced-technology training facilities | 27% |

Across individual business and commercialization services, the most common services offered include helping industry tenants access state and local programs for business and commercialization and linking to or directly providing sources of capital.

Table 3: Business and Commercialization Services Offered

| Service Offerings | Percentage of Total Parks |
|---|---------------------------|
| Help access state and other public programs | 81% |
| Link to or provide sources of capital | 72% |
| Assist with business planning | 64% |
| Advise on marketing and sales strategy | 61% |
| Provide access to subsidized space | 57% |
| Perform technology and market assessments | 56% |
| Assist with human resource issues | 44% |
| Provide proof-of-concept funding | 36% |

Success Factors of University Research Parks Point to Importance of Advancing Innovation

The university research park directors in the 2012 Survey were asked to consider the key attributes needed for the success of a university research park. The results point to the importance of innovation-related activities, in particular.

Six key attributes for success relating to innovation were rated by the vast majority of university research park directors as being of Very High or High importance to the success of a park. These attributes, along with their average ratings, are as follows:

- Good match between the core competency of the affiliated university and the recruited tenants – 4.31 out of a top score of 5.
- Capacity to assist early-stage business organizations in commercialization – 4.19
- Access to equity capital sources for research park tenants – 4.07
- Priority availability of multi-tenant space for incubator graduates – 4.06
- Priority access to university resources, facilities, faculty and students – 4.04
- Availability of a formal business incubator in the research park boundaries – 4.00

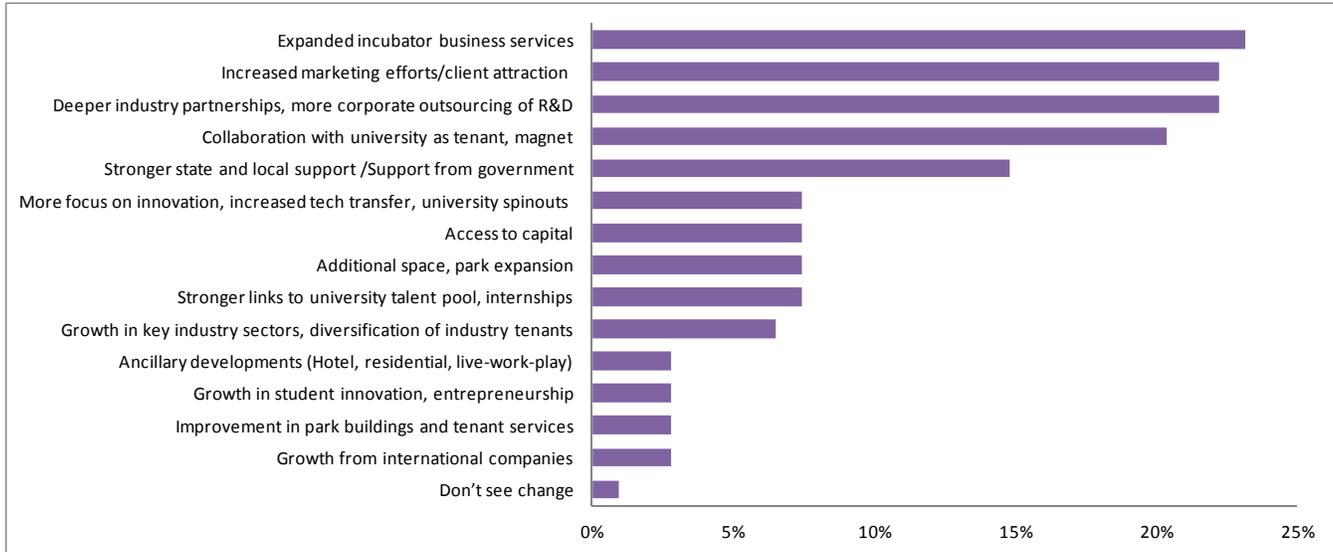
It was also recognized by research park directors that it takes more than innovation-related attributes to advance the success of research parks. Of particular importance is the connectivity of the park with university leadership and with the economic development community. In fact, the two mostly highly rated attributes for success of a university research park fell into this category. They were:

- Commitment of university leadership – 4.56
- Acceptance by the local economic development community – 4.50

Looking to the future, the university research park directors responding to the survey noted key opportunities for enhancing the growth, effectiveness and impact of research parks in the next five to ten years. Figure 3 shows the opportunities that were most frequently mentioned in the survey, and the number of park directors that identified each opportunity as key. Innovation-related activities clearly stand out as critical to the future of growing university research parks, with park directors noting, among the top rated opportunities, the following:

- Developing and expanding the business services offered by incubators
- Capitalizing on more corporate outsourcing of research and deepening university-industry research partnerships
- Strengthening collaboration between the park and its affiliated universities.

Figure 3: Key Opportunities for Enhancing the Growth, Effectiveness and Impact of Research Parks in the Next Five to Ten Years (by percentage of responses)



Measurable Economic Development Results for University Research Parks in Advancing Innovation

As a result of their targeted focus on building innovation ecosystems and on providing the services that such systems require, university research parks have a demonstrated record of economic development success that stem from their innovation activities, particularly through the incubation of emerging technology companies. This success not only fuels the growth of research parks, but has positive spill-over effects for the regions served as these emerging technology companies graduate from the university research park and, frequently, set up shop in the surrounding community.

Park directors from the 108 responding university research parks reported that 963 businesses have graduated from their incubators or related startup space in the last five years. Of these graduate startup companies 26 percent remained in the park (with 24 percent having moved to multi-tenant space and 2 percent having moved into their own buildings). An additional 43 percent of graduate startup companies left the park but remained in the region (with 30 percent locating in close proximity to the park). Just 12 percent of the graduate startup companies left the region. Significantly, only 19 percent of the graduate startup companies were no longer in business, considerably outperforming overall national statistics on startup companies, where over 50 percent fail within five years.⁸ Apart from the extraordinarily high success rate of startups that are incubated in a university research park, it is also important to note that of those startups that succeed, a full 77 percent remain in the region surrounding the park where they were incubated, further contributing to the region’s attractiveness as a center of innovation.

⁸ Scott Shane, “Start Up Survival Rates: The Definitive Numbers,” Small Business Trends, December 17, 2012, see <http://smallbiztrends.com/2012/12/start-up-failure-rates-the-definitive-numbers.html>

Table 4: Startup Companies Incubated Through University Research Parks

| Status of Startup After Graduation from Incubator | Percentage of Total |
|---|---------------------|
| Moved to multi-tenant space within park | 24% |
| Moved to own building in park | 2% |
| Left the park but remained in the region | 43% |
| Left the region | 12% |
| No longer in business | 19% |
| Other | 1% |
| TOTAL | 100% |

In summary, the 2012 University Research Park Survey results reveal the encompassing focus of university research parks in advancing regional innovation systems. It is clearly the mission of university research parks to play a value-added role in advancing the innovation ecosystem in their region. As discussed above, it is found across university research parks goals and objectives, services, key success factors and economic development results.

But supporting innovation is just a means towards broader economic development for regions in terms of jobs and growing economic activity. The next section considers how university research parks are performing in terms of helping to drive increased economic activity in their regions.

An Urban Driver of Regional Innovation: University City Science Center



Since its founding as the first urban-based university research park, the University City Science Center has been a critical foundation for technology-based economic development and technology commercialization in the Greater Philadelphia region. Its efforts in advancing innovation are multi-faceted. Its highly regarded Port Business incubator offers far more than just high quality lab space, offering connections to capital, access to networking, marketing and grant writing support and proximity to researchers. In recent

years, the Port Business incubator has successfully targeted emerging international technology companies to come to the Greater Philadelphia region as a way to entering the U.S. market. It also recently opened a co-working space, known as the Bullpen, focused on small startup companies requiring a desk, phone, high speed Wi-Fi and the camaraderie of other entrepreneurs motivated about growing their companies. Still, the focus on entrepreneurial connections goes well beyond incubator companies. Through its Quorum programs, the University City Science Center offers a wide range of networking activities to connect entrepreneurs. The Quorum is building and sustaining the high value, high touch environment needed for innovation to flourish. Beyond these services, the University City Science Center is directly involved in technology commercialization. Through its QED Program, it offers a multi-institutional proof-of-concept fund to support academic researchers developing early-stage life science technologies with high commercial potential. Investing alongside research institutions in a 12 month milestone-driven approach, the University City Science Center also taps the expertise of the technology domain experts and serial entrepreneurs to evaluate the prospects and provide critical business advice to advancing the commercialization of these university-based technologies. More than 16 awards have been made since 2009.

**Helping to Root Innovation within a University Research Community:
University Research Park at UW-Madison**

One of the nation’s most successful university research parks is found in Madison, Wisconsin. Today it encompasses 37 buildings totaling 1.8 million gross square feet, housing 125+ companies with nearly 4,000 employees. A cornerstone of its success is its ability to create a high quality environment for start-up companies. Early in its existence, the University Research Park benefitted from having the Madison Gas & Electric Company fund the creation of a 113,000 sq ft Innovation Center, which has helped more than 70 early stage companies grow since 1989. Today, the University Research Park is an integrated component of the university’s overall innovation and commercialization approaches. It is a destination of choice for spinoffs from the Wisconsin Alumni Research Foundation (WARF)—the patent and licensing agent for discoveries made by UW faculty—and houses the university’s Office of Corporate Relations, which is actively involved in connecting emerging companies to the University Research Park and cooperating with pre-commercialization research. Two new projects that recently were started include an 80,000 sq ft Accelerator Facility for second stage space for growing incubator companies in University Research Park and a new downtown Madison Metro Innovation Center.





THE CONTRIBUTION OF UNIVERSITY RESEARCH PARKS AS REGIONAL ECONOMIC DRIVERS

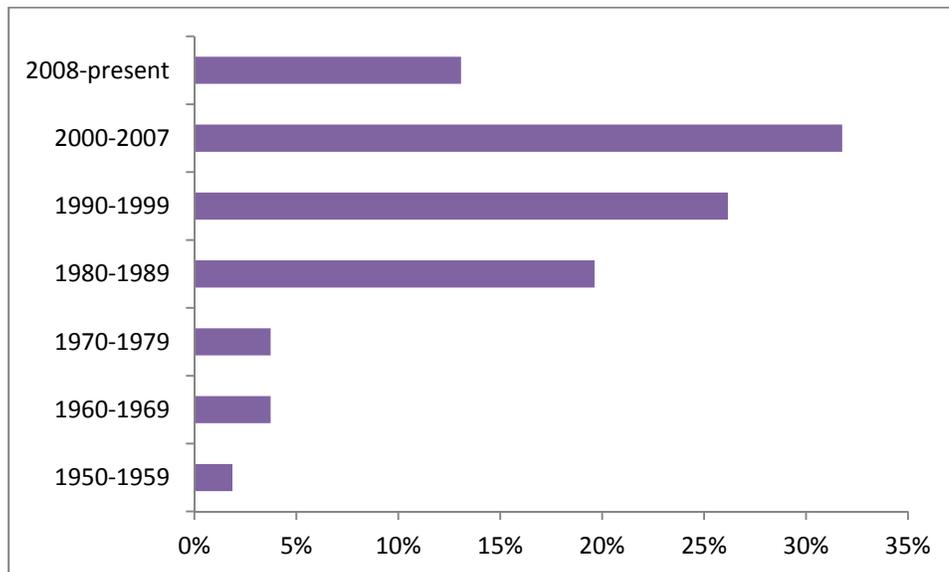
University research parks primarily affect the direct economic activity of their communities by offering a high quality location for existing businesses wanting to locate in their region as well as for new and emerging technology companies looking to take root and expand. The impact of the direct economic activity of university research parks can best be measured by the number of jobs located in their facilities. The survey results below provide insights into recent trends in research park activity since the onset of the 2007 recession, the range of tenants and the economic impact of the university research parks across North America for 2012.

Recent Trends Demonstrate the Continued Growth of University Research Parks, and Prospects for the Future Are Strong

University research park development has continued despite the severe economic recession and weak economic recovery found across North America.

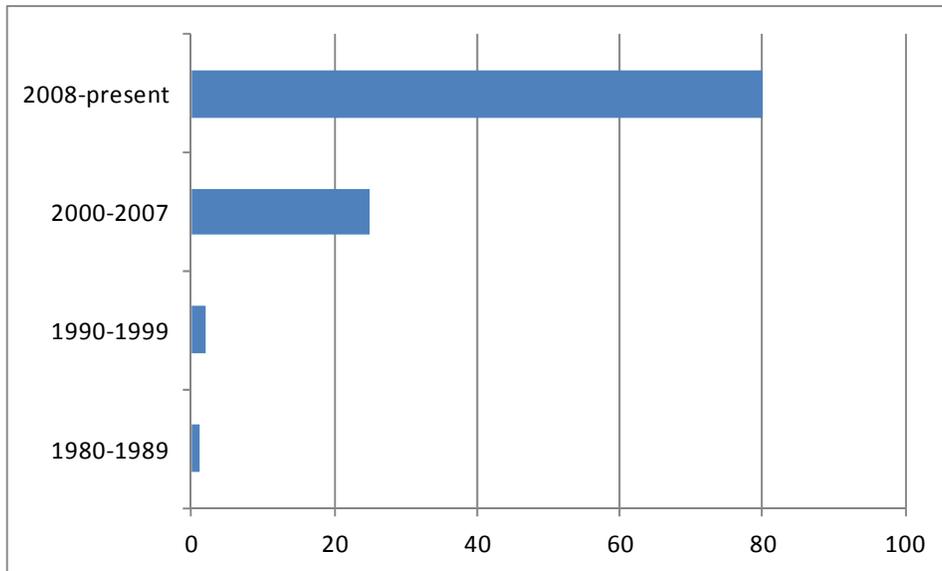
- Thirteen percent of the 108 university research parks responding to the 2012 survey were formed since 2008 (see Figure 4). These 14 new university research parks have a current build-out of 3.2 million square feet and have attracted 3,526 jobs.

Figure 4: Year Research Park Established



- Just as encouraging is the fact that 80 of the 108 university research parks surveyed (74 percent), have opened a new building since 2008 (see Figure 5).

Figure 5: Year Most Recent Building Completed

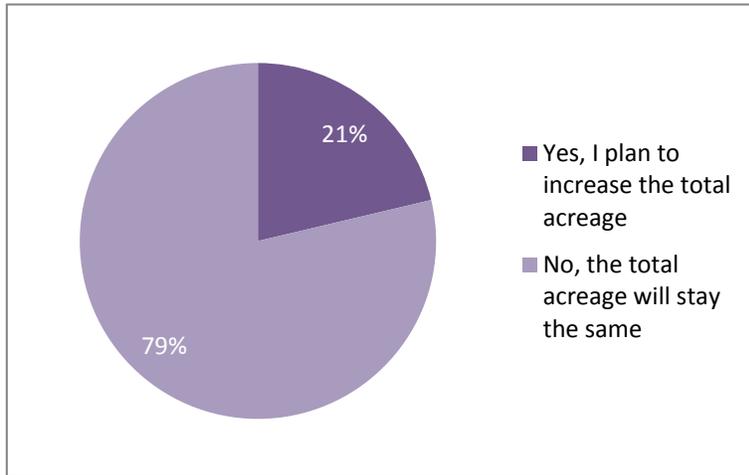


While it is difficult to assess overall employment change given the differences in the population of responders to the survey from 2007 to 2012, an apples to apples comparison of those university research parks that responded in both years shows that many university research parks did in fact grow in total employment during that time period.

- There were 85 university research parks that reported employment in both 2007 and 2012. Of these 85 university research parks, 54 (64 percent) gained employment from 2007 to 2012. In total, the 85 university research parks experienced an average employment gain of 27 percent over those five years—a significantly better performance than the economy as a whole, which due to the global recession and weak recovery suffered a 4.5 percent loss of employment during the same period.

Looking to the future, although research parks are typically designed to accommodate significant growth on the original property, roughly one in five of the university research parks surveyed expect to max out their existing properties and plan on increasing the area of their parks within the next 5 years.

Figure 6: University Research Parks Expecting to Increase Their Acreage in Next Five Years



Still University Research Parks Are Not Immune to the Impacts of Recent Recession and Weak Economic Recovery

The recession and weak economic recovery since 2007 have had an impact on the growth of university research parks.

- Two out of three university research park directors indicated that the recession had a significant negative impact on the growth and development of their university research parks.
- The leading impacts of the recession and weak economic recovery were:
 - Lack of investment capital for buildings and more stringent underwriting criteria, which significantly impacted 33 of the 108 (31 percent) university research parks responding.
 - Higher vacancy in the local markets resulting in downward pressure on rental rates, which significantly impacted 27 percent of the parks responding.
 - Reduction in government R&D funding, which significantly impacted 22 percent of the parks responding.
 - Less build-to-suit demand, which significantly impacted 22 percent of the parks responding.

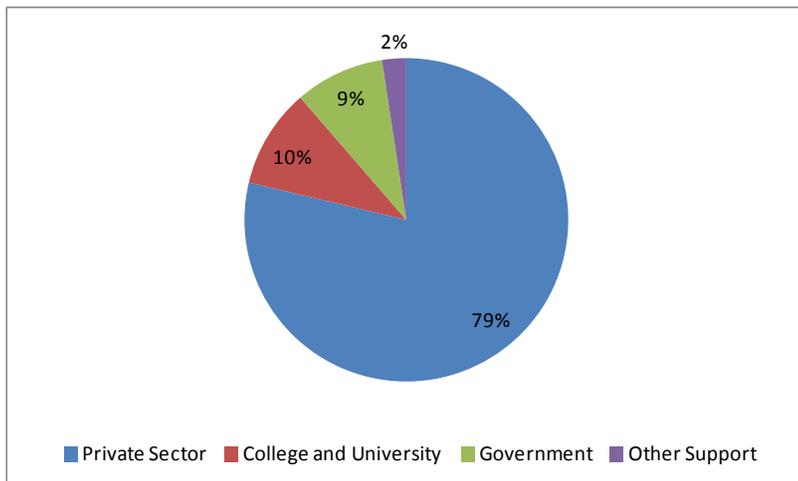
This suggests that university research parks, while still on a positive growth trajectory, are clearly impacted by overall economic conditions. Efforts to improve availability of capital and raise government funding for R&D are important drivers for their future success.

In 2012, University Research Parks Are Home to a Significant Level of Technology Industry Jobs Primarily Focused on Conducting Research and Development

137 university research parks reported total employment of 379,754 in 2012. Eight of the responding university research parks reported employment of 10,000 or more, with these eight parks accounting for 53 percent of total reported employment. The average number of employees per park is 2,752 while the median number of employees is 850, signifying that a few parks account for a large share of total employment.

Based on detailed industry employment breakouts from roughly 20 percent of those responding to the survey, a broad base of employment is found across university research parks. Of those responding with detailed industry employment breakouts, 79 percent of research park personnel are employed in the private sector technology related sector—representing 301,126 jobs. An additional 10 percent are employees of colleges and universities (both public and private institutions), 9 percent are employed by government agencies and the remaining 2 percent are employed in businesses supporting other park tenants, such as retail stores, restaurants, daycare centers, banks, health clubs and other on-site support services and amenities (see Figure 7).

Figure 7: Composition of North American Research Park Employment by Sector



Within the private sector technology industries, employment at university research parks is dominated by three sectors as reported by those completing this portion of the survey: Software and Internet Services; Aerospace and Defense; and Biosciences, which together account for 48 percent of total university research park employment.

Given the importance of university research parks as drivers of innovation, one would expect that most of the employment is focused on research and development activities, and the results of the 2012 survey confirm this. Overall, almost 62 percent of all university research park jobs, and 78 percent of total private sector technology-related jobs, found in the responding university research parks are reported to be involved with R&D activities.

Table 5: Research Park Employment by Detailed Industry as Reported in the 2012 Survey Responses

| Industry | Percentage of Total Park Employment | R&D Employment as a % of Industry Employment |
|---|-------------------------------------|--|
| Total Park Employment | 100% | 62% |
| Private Sector – Technology Related | 79% | 78% |
| Software and Internet Services | 19% | 81% |
| Aerospace/Defense | 15% | 95% |
| Bioscience | 14% | 70% |
| Scientific and Engineering Services | 9% | 85% |
| Electronics | 6% | 98% |
| Business Support Services | 6% | 49% |
| Environmental Consulting | 3% | 97% |
| Other | 2% | 17% |
| Management and Business Consulting | 2% | 16% |
| Advanced Materials | 2% | 55% |
| Digital Media | 1% | 85% |
| Alternative Energy | 0.3% | 81% |
| Colleges and Universities | 10% | n/a |
| Government | 9% | n/a |
| Park Support (Retail, Personal Services, etc) | 2% | n/a |

Note: 20% of the 108 survey responses completed this detailed listing of tenant employment by industry

The Economic Impact of University Research Parks is Significant

Employment in university research parks has regional economic benefits that extend far beyond a particular job or one individual’s salary. The private sector research and technology-based tenants located in university research parks have interdependent relationships with suppliers of other goods and services in the larger regional and state economies in which they are located. In other words, companies in research parks both depend on and support other companies in the regional, state and national economies as they purchase goods and services from other companies and pay salaries and wages to their employees, who then go on to make purchases of goods and services from other companies. These cycles of income and purchases are called “ripple” or “multiplier” effects. As a result of these effects, a research park has an economic impact much greater than the number of the total jobs located in the park, as do virtually all business locations that use goods and employ people.

Based on an economic impact analysis undertaken by Battelle,⁹ the 379,754 jobs reported from survey responses of university research parks is estimated to support an additional 561,504 jobs throughout the

⁹ In order to analyze the economic importance of university research parks, this report includes a high level analysis of the employment impacts of university research parks on the U.S. and Canadian economies. To measure the employment impact of U.S. and Canadian university research parks, a set of industry-specific multipliers were used. Multipliers quantify the ripple effect discussed here where one industry or group of industries supports or creates additional economic activities including jobs, taxes and other public revenues, and spending from the salaries of industry workers in the larger economy. For U.S. parks, the Battelle Team utilized state-specific industry multipliers

U.S. and Canadian economies—so the total employment impact of university research parks responding to the survey amounts to 941,258 jobs. Keeping in mind that the respondents represented only 79 percent of the qualifying university research parks in North America, the true employment impact of university research parks is well over one million jobs. This analysis yields a total employment multiplier of 2.48.

Demonstrating the economic impact of research parks has become an increasingly important issue—and fully half of all of the responding parks reported that they have completed an economic impact analysis apart from this survey. Some examples of the results of such studies are as follows:

- The University Science Center in Philadelphia, the first major urban research park in the nation, estimated that the economic impact of the business that have been generated or assisted by the park have directly created 15,686 jobs, and when multiplier effects are included created a total of 42,021 jobs and almost \$9.4 billion in economic activity.¹⁰
- A study of the University of Arizona Science and Technology Park found that the 6,494 jobs in the park supported a total of 14,332 jobs in Pima County, AZ and generated \$2.7 billion in economic activity.¹¹
- The Purdue Research Park network of four locations directly employ 3,771 full-time equivalent workers, and when multiplier effects are included, support 9,632 jobs and over \$1 billion in economic activity.¹²

Formal Economic Impact Analysis is Just One Measure of University Research Park Broader Impacts on Their Local Economies

The university research parks that have conducted economic impact analyses measured their impacts using a wide variety of measures. Most analyzed the economic contribution of the tenants located in the parks. Many assessed the role of the park in catalyzing the development of new technologies and businesses. Some, like a 2006 study of Research Triangle Park,¹³ assessed the role of the research park in developing and changing the regional economy.

Table 6 shows the variety of methods university research parks use to measure the broader impacts of their activities on their community, including firms attracted into the park (used by 92 percent),

developed by the Bureau of Economic Analysis (BEA). The employment impacts of Canadian research parks were similarly analyzed using national level direct effect employment multipliers produced by Statistics Canada. The direct-effect employment multipliers from BEA and Statistics Canada were then used to tabulate the unique state/Canada and industry impact multipliers for each major industry of research park tenants. The multipliers represent the total change in number of jobs in all industries (direct, indirect, and induced effects) that result from a change of one job in the corresponding industry sector.

To calculate the total employment impacts of each industry, direct employment was multiplied by an industry-specific multiplier. It was first necessary to determine whether a given firm's activities were primarily R&D in nature. University research park directors were asked to report whether private sector tenants were primarily engaged in research related activities. For example, overall employment in the drugs and pharmaceuticals sector was 54,057 (as shown in Table 5) and research park directors surveyed indicated that, for 70 percent of these jobs, the primary function was R&D in nature. The BEA and Statistics Canada industry multipliers include a specific scientific R&D industry sector which was applied to the share of each parks employment identified as such. Thus, Table 6 details research park employment in industries allocated for these multipliers including a large separate R&D employment total that spans almost every major industry group shown.

¹⁰ <https://www.sciencecenter.org/upload/files/Full%20Report%20-%20Science%20Center%20is%20a%20Regional%20Engine%20of%20Economic%20Growth.pdf>

¹¹ <http://aurp.memberclicks.net/assets/documents/uatechparkeconomicimpact2009.pdf>

¹² http://purdueresearchpark.com/sites/default/files/economic_impact_statement.pdf

employment growth in existing/new business organizations (85 percent) and job growth in the region (64 percent). According to research park directors, as shown in Table 6, the two most important community impacts of research parks are firms attracted into the park and job growth in the region, with 92 percent of the parks identifying each as being of Very High or High importance. Employment growth in existing and new companies and the average salaries of park employees relative to the average wage in the region were also key methods of measuring the impact of a university research park on its community. The number of local residents hired and the number of people who receive workforce training were considered of less importance than measures of job and firm growth.

Table 6: Usage of Methods for Measuring Benefits of a Park to its Community

| Methods Used by Parks to Measure Community Impacts | Percentage of Parks Using Measure |
|---|-----------------------------------|
| Firms attracted to the park | 92% |
| Headcount growth in existing/new business organizations | 85% |
| Job growth in the region | 64% |
| Average salaries of park tenants relative to region | 48% |
| Number of state or community residents hired | 29% |
| Headcount growth in non-profit organizations | 20% |
| Community Benefits Agreement in place | 15% |
| Number of people that receive workforce training | 10% |

In summary, university research parks, while not immune from the effects of the recent recession, continue to advance and be a driver for job creation. Since the last survey in 2007, the university research parks sector has shown growth on multiple measures, including the development of new parks, the physical expansion of existing parks, increased employment of university research parks responding in both 2007 and 2012 surveys and continued strong activity in new business spin-outs. The direct jobs found in North American university research parks responding to the survey reached 379,754 jobs and the full economic impact of these jobs, after accounting for multipliers from industry supply chain and worker spending amounts to 941,258 jobs. (Note that this is only for the parks that responded—the 108 parks with a full survey response and an additional 30 parks that responded only to the employment portion of the survey. These 138 parks make up 79 percent of the parks that received the survey.)

Building at the Scale of a State: Purdue Research Park Network

The Purdue Research Park network provides a statewide presence. The Purdue Research Park network has sites in West Lafayette, Indianapolis, Merrillville and New Albany. Each site offers technology-based business incubator facilities that support entrepreneurial environments. The park network has more than 240 companies that employ about 4,100 people. Many of these companies are based on Purdue University innovations and technologies. A 2011 independent study by Thomas P. Miller and Associates reports that the park network provides an annual economic impact of \$1.3 billion to the State of Indiana. Between 1999 and 2010, \$256 million has been invested in facilities and infrastructure for the park network.

This statewide network reflects a significant partnership between Purdue University and the State of Indiana. Three of the four Purdue University Research Park network sites have made use of Indiana's Certified Technology Park (CTP) program. Under the program, the state and the municipality allocate anticipated tax collections of up to \$5 million to support facility and land improvements designed to foster economic development.

By investing Purdue Research Park funds and leveraging tax-increment financing through the state's Certified Technology Park program, the park network has doubled its developed land space from 1 million square feet in 2000 to 2 million square feet in 2010. This growth has brought dedicated space to startups and expanding companies based in the park network.



Linking a University in New Ways for Strengthening Regional Industry Drivers: McMaster Innovation Park

The McMaster Innovation Park is a relatively new university-affiliated research park started on a 37-acre site with a long industrial history, having been a Westinghouse foundry and lamp plant starting in 1913 and most recently an appliance manufacturing facility for Camco until its closing in 2004. Staying true to its roots and the industrial strengths of the Hamilton, Ontario region, the McMaster Innovation Park has created important new research and development centers to collaborate with leading manufacturing industries in the region. In this way, the impact of McMaster Innovation Park will go far beyond the direct employment found at the site and foster innovation and top talent needed to support the future competitiveness of leading industries in the region.

The first research and development facility was CanmetMATERIALS. It is the largest research center in Canada dedicated to the fabrication, processing and evaluation of metals and materials, with a mandate to work closely with industry clients and stakeholders in three specific sectors—

Transportation, Energy and Metal Manufacturing. McMaster Innovation Park is site of one of the two facilities of CanmetMATERIALS, with the other being in the University of Calgary University Research Park.

The second signature research and development facility at McMaster Innovation Park to strengthen the region’s industry base is the new McMaster Automotive Resource Center (MARC), opened in May of 2013. MARC is one of only a handful of automotive research centers in the world located in an academic setting. It will focus on developing, designing and testing hybrid automotive technology and other sustainable solutions for the auto industry in its 80,000 square foot facility, bringing together teams of engineers, scientists, and their students from the university to collaborate with industry’s own engineers and scientists.





THE CHANGING FACE OF UNIVERSITY RESEARCH PARKS: TRENDS IN THE PHYSICAL DEVELOPMENT OF UNIVERSITY RESEARCH PARKS

A crucial characteristic of all university research parks is their physical development. While the research park model has been in existence for nearly 60 years, the physical development of university research parks continues to evolve. This section describes the trends underway in the physical development of research parks and describes key issues and challenges impacting their evolution.

Trend Toward Incorporating Mixed-Use, Live-Work-Play Development Continuing to Unfold and Transform the Physical Environments of University Research Parks

A common denominator in the physical development of university research parks is having a mix of multi-tenant and single tenant commercial space supportive of research and development activities. These more R&D-oriented commercial real estate buildings often include a range of enhancements that are not found in typical commercial office space, such as increased air handling systems, higher floor heights and loading capacity, presence of chilling and wastewater pre-treatment systems and increased and redundant electrical power systems. Many university research parks also house more specialized and dedicated laboratory facilities, often associated with a specific university research center that is seeking to engage in industry collaborations. Instructional facilities, many targeting continuing education, are also becoming more widespread in university research parks. It is also common to see basic hospitality services, such as restaurants and even hotel and conference centers, on a university research park site. As presented in Table 8, 75 percent of university research parks contain specialized laboratory facilities, 45 percent contain university instructional facilities, 40 percent have restaurant space, 26 percent contain conference facilities and 13 percent contain hotels.

A more far-reaching change in the physical development of university research parks is the trend towards incorporating mixed-use, live-work-play environments. The beginnings of these mixed-use developments were found in many of the new university research parks brought on line over the last decade, such as Centennial Campus (affiliated with North Carolina State University), Mission Bay (affiliated with the University of California San Francisco) and the Fitzsimmons Life Science District in Colorado (affiliated with the University of Colorado's academic medical center).

The survey finds, as shown in Table 7, that even established university research parks are adding more physical developments to transform into thriving live-work-play environments. While today only 7 percent of university research parks offer non-student housing, 21 percent of university research parks are planning such developments within the next five years. Non-food/restaurant retail is also on the rise, with projected growth within the next five years from just 12 percent of existing university research parks currently offering such services, to 30 percent based on university research parks' plans to offer such facilities.

Further aggregate analysis of research park survey responses finds that in 2012 the share of university research parks that are "mixed-use" involving food/restaurant, non-food/restaurant retail and housing (either student or non-student) involves only 6 percent of all university research parks. Within five years, the share of university research parks with "mixed-use" development is projected to rise to 21 percent.

Table 7: Research Park Facilities

| Other Facilities | Currently in Park | Planned Within 5 Years |
|-------------------------------------|-------------------|------------------------|
| Specialized laboratory facilities | 74% | 45% |
| University instructional facilities | 45% | 27% |
| Food/Restaurants | 40% | 41% |
| Conference center | 26% | 22% |
| Other education facilities | 19% | 13% |
| Hotel | 13% | 25% |
| Other retail shops | 12% | 30% |
| Student housing | 8% | 11% |
| Other residential | 7% | 21% |

With the growing trend towards more mixed-use development, university research parks are becoming even more integrated as signature developments for creating the dynamic, life-style communities that attract high-skilled and entrepreneurial technology professionals to a region. These new physical developments unfolding at university research parks are creating the physical environments that capture the characteristics that drive rising urban starts as identified in the ongoing *World Winning Cities* research program by Jones Lang LaSalle of LaSalle Investment Management:¹⁴

- **Being Technology Rich:** Technology hubs—whether Raleigh-Durham or Austin, Texas or Helsinki, Finland—with high-value, knowledge-intensive industries linked to strong research and educational infrastructures—are seen as key to offering the quality of life needed to retain and attract highly educated knowledge workers.
- **Resort/Urban Hip with Urban Sustainability:** The quality of the urban environment will become a more important determinant of city competitiveness, particularly in mature cities. Cities will be making substantial efforts to improve their urban landscapes and their cultural and entertainment offerings, recognizing that they are the key ingredients in attracting and retaining footloose, well-educated knowledge workers.

In the future, university research parks may be transformed into broader districts creating the vibrant industrial commons for technology-based economic development that is envisioned as key for regional competitiveness, as highlighted by Harvard professors Gary Pisano and Willy Shih in their work.

University Research Parks are Increasingly Part of Urban Redevelopment

Following the trend towards more mixed-use, live-work-play developments at university research parks is an evident shift towards more urban locations as part of overall redevelopment efforts. Overall, 35 percent of university research parks are located in urban areas; however the trend is moving slowly toward more urban locations, as 40 percent of the university research parks formed since 2000 are in urban areas, compared to 32 percent of research parks formed prior to 2000.

The development of urban university research parks has become an important component of overall efforts to promote urban redevelopment, with 45 percent of urban research parks located in distressed communities. Key examples of urban redevelopment efforts centered around research parks include the development of the University of Maryland BioPark and the Science and Technology Park at Johns

¹⁴ See <http://www.joneslanglasalle.com/Pages/WorldWinningCities.aspx>

Hopkins, both in Baltimore, Maryland and CORTEX research park in St. Louis, Missouri, affiliated with Washington University and St. Louis University. University research parks, and urban university research parks in particular, are taking advantage of innovative tax credits and other programs.

Financing the Ongoing Physical Development of University Research Parks Stands Out as a Key Challenge

University research park directors indicated through the survey that the greatest challenge facing them would be obtaining capital for park development and renovation. Eighty-two percent indicated that this financing challenge was of Very High or High significance.

Another leading development challenge for university research parks reported in the survey was identifying, supporting and growing a sufficient tenant base. Seventy-eight percent of respondents reported that this challenge was of Very High or High significance.

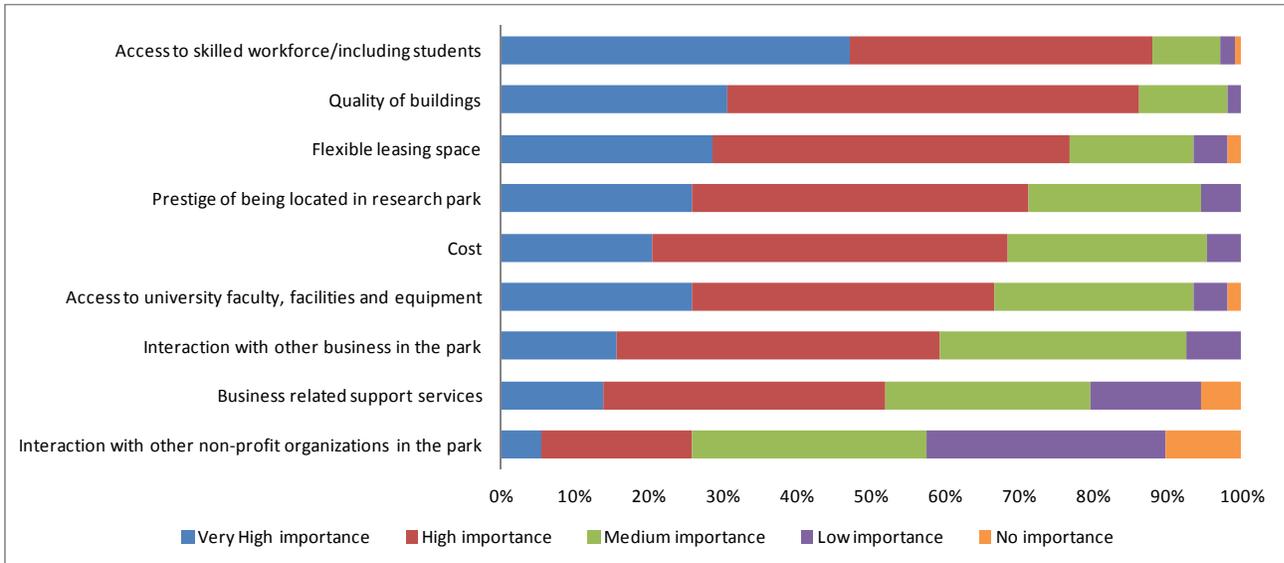
Below is the average rating, out of a scale of 1 to 5 where 1 is “No Significance” and 5 is “Very High Significance”, that the university research park directors reported on the key development challenges facing university research parks in the next few years:

- Capital for park development and renovations – 4.7
- Identifying, growing and supporting a sufficient tenant base – 4.3
- Equity capital for tenants – 3.9
- Financing for wet-lab space – 3.8
- Financing for multi-tenant space – 3.8
- Competition from other sources – 3.3
- Decreasing demand for office space as companies move to operate virtually – 2.9
- Insufficient customer use to expand retail/commercial components of the park – 2.7
- Loss of developer interest in partnering with research parks – 2.6
- Limitations on the use of tax-exempt financing for buildings within the park – 2.6

To Attract Tenants, University Research Parks Also Have to Get the Basics of Quality and Cost Right

While the key factor differentiating university research parks from science and technology parks and standard office parks are the potential linkages with affiliated universities along with the new trends towards mixed-use, live-work-play environments, four of the top five reasons why tenants locate in a research park relate to the quality of buildings, flexibility in leasing, reputation and cost of locating in the research park (see Figure 8). Thus, while university interactions are the key differentiating factor for university research parks, the real-estate basics of quality and cost cannot be ignored.

Figure 8: Reasons Why Tenants Locate in University Research Parks



In summary, the survey points to a future in which many university research parks will be transformed into broader districts encompassing the vibrant signature live-work-play developments critical for driving technology-based economic development within regions.

**Re-envisioning the 21st Century University Research Park:
The New Master Plan for Research Triangle Park**

With 7,000 acres, 170+ companies, over 39,000 workers and 22.5 million sq. ft. of built space, Research Triangle Park remains the largest research park in North America. According to the 2012 Master Plan for Research Triangle Park: "In today's world many of the qualities that made the Park so successful in earlier decades run counter to trends in innovation industries and land stewardship. Whereas earlier generations of American workers fled urban areas for newly built, suburban and car-accessible employment centers, today's innovation workers seek the greater connectivity, convenient amenities and vitality that comes from a denser mix of uses, as well as a firmer commitment to sustainability."

With that in mind, the 2012 Master Plan for Research Triangle Park sets out a new direction of creating a new mixed-use center to create an innovative knowledge community at RTP to attract the next generation of knowledge workers.



Photo courtesy of the Research Triangle Foundation.

Known as the "Triangle Commons," this new mixed use center aims to be a destination at RTP merging the social needs of a leading-edge research center with the functional needs of a vibrant mixed use center. It will offer transit-oriented development, retail space, conference center and hotel and up to 1,400 residential units integrated with parks and stream corridors—along with a range of research-based office space with a significant amount of incubator and swing space.

An Urban Research Park to Redefine a City: St. Louis CORTEX

CORTEX stands for the Center of Research, Technology and Entrepreneurial Exchange. It's ambitions are to redefine the physical landscape of St. Louis, developing a 240 plus acre area into one of the nation's leading research districts. CORTEX involves a collaboration of Washington University, Saint Louis University, BJC Healthcare, the University of Missouri-St. Louis and the Missouri Botanical Garden.

Unlike other research districts, CORTEX is designed for live, work and play. Its focus is on life sciences...and it will seek to provide everything a growing life sciences company needs to succeed—from biotech facilities and research relationships to neighborhood amenities with a high quality of life to strong economic incentives and competitive cost of doing business.



Photographer: Bill Zbaren; courtesy of CORTEX



THE BASICS OF RESEARCH PARK OPERATIONS IN 2012 – SIZE, LOCATION, GOVERNANCE



This concluding section offers those seeking more in-depth knowledge of the structure, governance, budget and other detailed information on the characteristics of university research parks in 2012. These basics of university research park operations can be considered benchmarks, and are particularly important for those seeking to form new university research parks.

Typical Park Characteristics

The typical university research park is 119 acres, has 7 buildings open and is located in a suburban jurisdiction with a population of 500,000 or less. Table 8 presents a profile of a typical North American university research park.

Table 8: Profile of a Typical North American Research Park Based on Median Values from Survey Responses

| Typical Research Park | |
|-----------------------|---|
| Size | <ul style="list-style-type: none"> • 119 acres • 7 buildings open • 250,000 sq ft, 90% of space is currently occupied • 25,000 sq ft incubator space |
| Location | <ul style="list-style-type: none"> • Located in a suburb • Population of fewer than 500,000 |
| Governance | <ul style="list-style-type: none"> • Operated by a university or a university-affiliated non-profit |
| Tenants | <ul style="list-style-type: none"> • 26 resident organizations • 64% for-profit companies • 24% university facilities • 4% government agencies |
| Employment | <ul style="list-style-type: none"> • Typical park employs 850 • Major industries include software, aerospace/defense and biosciences |
| Finances | <ul style="list-style-type: none"> • Operating budget of less than \$1 million a year • Revenue primarily from park operations, but also university, state, local and other sources • 28% of parks reported generating less than 5% retained earnings, 34% of parks reported no retained earnings |
| Services | <ul style="list-style-type: none"> • Provide a range of business and commercialization assistance services including: <ul style="list-style-type: none"> ▪ Help accessing state and other public programs ▪ Linking to or providing sources of capital ▪ Business planning ▪ Marketing and sales strategy advice ▪ Access to subsidized space ▪ Technology and Market Assessments |

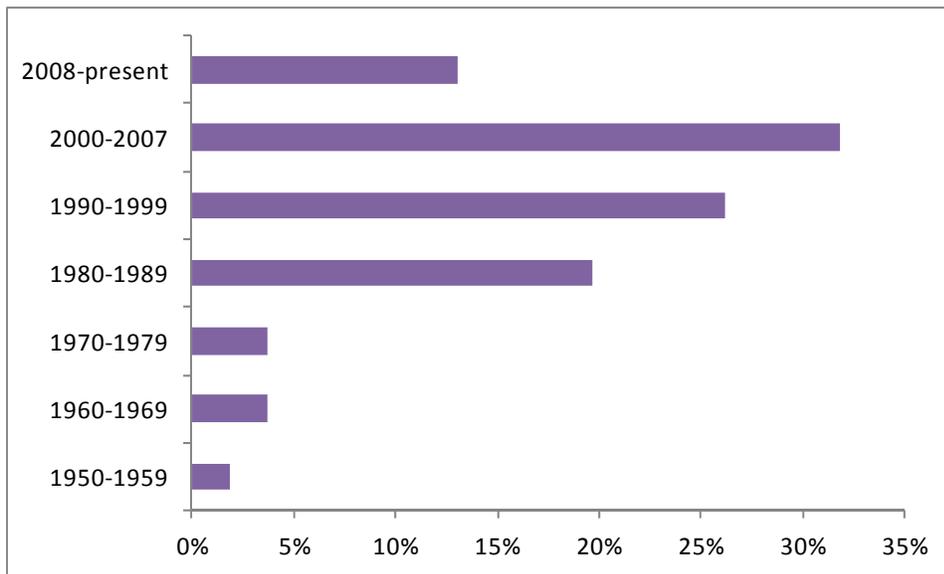
Overall university research parks are quite diverse. Some selected descriptive statistics based on the survey responses are as follow:

- 49 percent of university research parks are located in suburban areas, 35 percent are located in urban areas and 16 percent are in rural areas.
- 29 percent of university research parks serve communities with a population of fewer than 100,000, 32 percent serve communities of 100,000–499,999, 17 percent serve populations of 500,000–999,000 and 23 percent serve populations of a million or more.
- There has been rapid growth in the development of university research parks over the past decade, with 40 percent of existing university research parks forming between 2000 and 2009.

Overall the average research park in the survey was established in 1995, built its first building in 1997 and completed its most recent building in 2008. The earliest park opened in 1951 and the most recent in 2011¹⁵ (Figure 9);

- Overall, 23 percent of research parks are located in distressed communities, but for university research parks located in urban jurisdictions, 45 percent are located in distressed communities, indicating the importance of university research parks in urban redevelopment efforts across the country.

Figure 9: Year Research Park was Established



Governance

There is a great diversity of governance structures in place at university research parks. Half of university research parks are managed either by a university affiliated non-profit (31 percent) or directly by the university (19 percent). Eighteen percent of university research parks are governed by a governmental or quasi-governmental agency, and 17 percent are operated by independent, private non-profits that may or may not include university representation. Few parks, 5 percent, are managed by a for-profit developer (see Table 9).

¹⁵ Three parks that have just started operations completed surveys but were not included in this analysis.

Table 9: Park Governance Structure

| Park is Governed by | Percentage of Total |
|---|---------------------|
| University-affiliated non-profit | 31% |
| Affiliated university | 19% |
| Government agency, quasi-public corporation or public authority | 18% |
| Independent, private non-profit | 17% |
| Formal joint venture among diverse organizational types | 6% |
| For-profit developer | 5% |
| Other | 5% |

Park Budgets and Capital Spending

The parks surveyed varied greatly in the size of their annual operating budgets; but, half of the parks (50 percent) reported an annual operating budget of less than \$1 million, with 29 percent of the respondents reporting a budget of less than \$500,000. One-fifth of the parks reported operating budgets of \$1–\$3 million, 21 percent reported budgets of \$3–\$10 million and 9 percent reported budgets of more than \$10 million (Table 10). The median operating budget lies in the range of \$500,000 to \$1 million. As presented in Table 12, the overwhelming majority of park operating funds, 80 percent, are derived from operations, with host universities providing 8 percent and state and local governments 5 percent.¹⁶

The parks surveyed also vary tremendously in terms of their average annual level of capital expenditures. The majority, 57 percent, of parks reported average annual expenditures of less than \$1 million per year, with 28 percent of parks reporting average annual expenditures of \$1–\$10 million and 14 percent of parks reporting average annual expenditures exceeding \$10 million (see Table 11). As presented in Table 12, the sources of capital funds are more diverse than those of operating funds, with park operations accounting for 48 percent of the funds used for capital expenditures, host universities providing 19 percent and state and local governments 11 percent.

Table 10: Current Annual Operating Budget and Average Annual Capital Expenditures

| | Current Annual Operating Budget | Average Annual Capital Expenditures |
|---------------------------|---------------------------------|-------------------------------------|
| | Percentage of Parks | Percentage of Parks |
| Less than \$500,000 | 29% | 46% |
| \$500,000–\$999,999 | 21% | 11% |
| \$1,000,000–\$2,999,999 | 20% | 17% |
| \$3,000,000–\$4,999,999 | 14% | 8% |
| \$5,000,000–\$9,999,999 | 7% | 3% |
| \$10,000,000–\$14,999,999 | 4% | 1% |
| \$15,000,000 or more | 5% | 13% |

¹⁶ The parks provide data on the range of operational and annual capital spending, not the actual amounts, and data on the distribution of operational and capital spending source. To calculate to overall percentage the mid-point of each spending range was multiplied by spending by source and analyzed.

Table 11: Reported Sources of Operating Revenue and Capital Expenditures

| Source | Operation Expenditures Percentage (%) | Capital Expenditures Percentage (%) |
|----------------------------|---------------------------------------|-------------------------------------|
| Park Operations | 80% | 48% |
| University | 8% | 19% |
| State and Local Government | 5% | 11% |
| Federal Government | 2% | 10% |
| Corporate/Foundations | 3% | 6% |
| Other | 2% | 6% |

Nearly two-thirds of the university research parks surveyed reported that they had generated retained earnings during the past 5 years. Twenty-eight percent of the parks reported average annual retained earnings that equaled 5 percent or less of operating revenue; 13 percent reported average annual retained earnings of 5–10 percent; and 24 percent reported average annual retained earnings of 10 percent or greater. It is important to note, however, that 34 percent of parks reported no retained earnings whatsoever (see Table 12).

Table 12: Average Annual Retained Earnings Generated over the Previous 5 Years

| Average Annual Retained Earnings Generated | Percentage of Total |
|---|---------------------|
| No retained earnings generated | 34% |
| Positive but less than 5% of operating budget | 28% |
| 5% up to 10% of operating budget | 13% |
| 10% up to 15% of operating budget | 7% |
| 15% up to 20% of operating budget | 5% |
| 20% or more of operating budget | 12% |

It must also be recognized, as reported in Table 11, that park annual operating budgets tend to be small; 50 percent of the parks have an operating budget of less than \$1 million. This suggests that where retained earnings exist, with a few exceptions, the amounts are very small. Thus, research parks, which are undertaken to diversify local economies and build stronger industry–higher-education partnerships, usually require, at least in the short-term, cross subsidization by their partners, communities and higher-education sponsors.

Role of Private Developers

The common approach to financing and constructing buildings in university research parks is to hire private developers on a per-building or per-project basis. Seventy-five percent of the responding parks reported that they use developers on a case-by-case basis, 19 percent work with private developers that serve as master developers overseeing and financing the development of buildings in the entire park and an additional 19 percent work with private developers as developers of “neighborhoods,” “clusters,” or other groupings of buildings within the park. Nine percent of the parks are managed and financed by private, for-profit developers. Only 17 percent of the responding parks report that they do not work with developers. Fourteen percent of the responding U.S. parks reported that they or their developers have utilized New Market Tax Credits.

Access to University Services and Amenities Offered

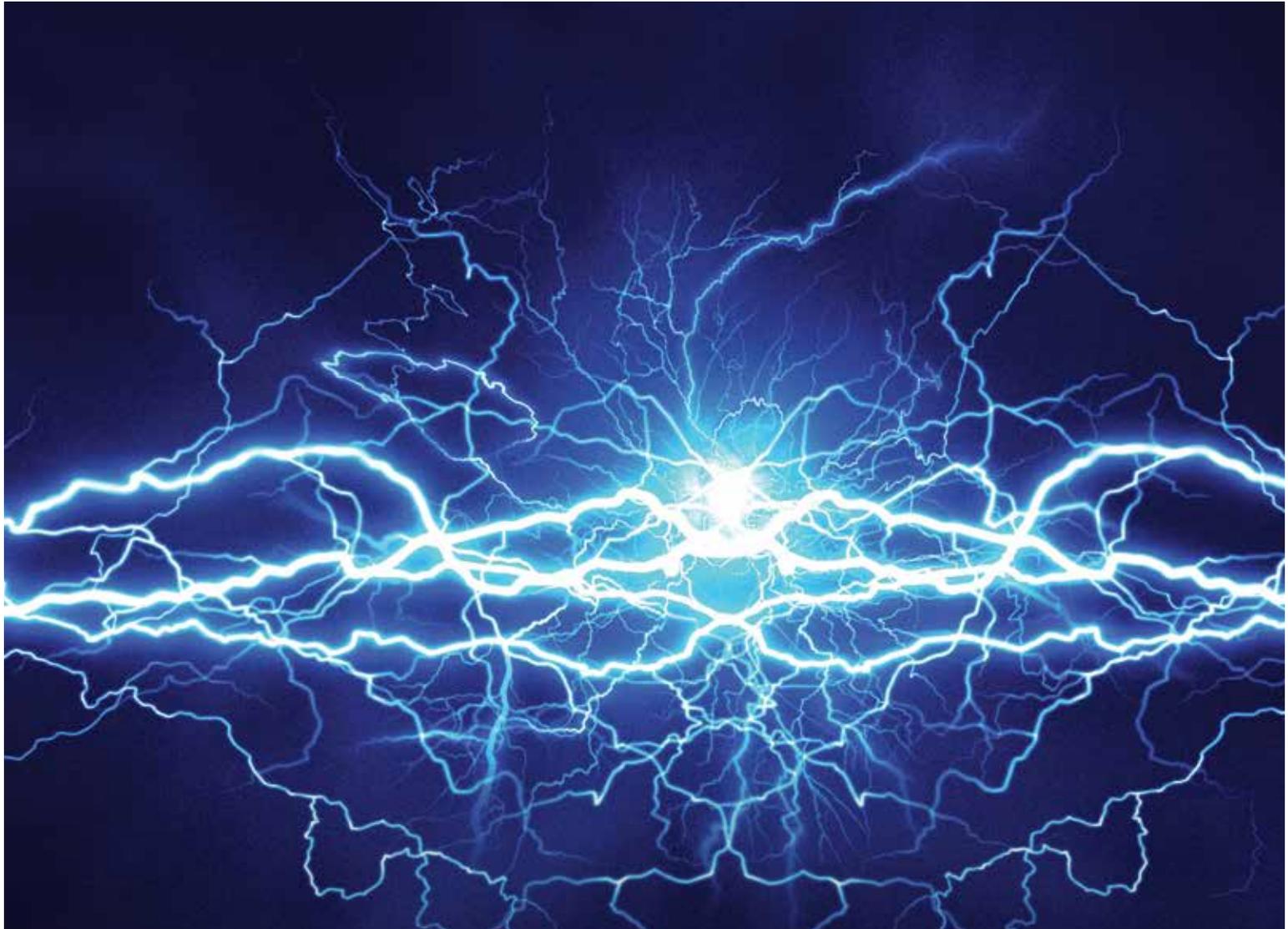
University research parks often provide tenants with access to a variety of university services, including university recreational facilities, lab animal-care facilities, hazardous material handling, library-information services, parking and bus or transportation systems. Some parks also allow employees to serve as adjunct faculty. Park managers were asked to identify which benefits they offer and the importance placed on each benefit by their tenants. As presented in Table 13, most parks offer parking (71 percent), access to university libraries/information systems (58 percent) and access to recreational facilities (56 percent). Park managers felt that their tenants placed the most importance on parking and access to university HR services. Animal-care facilities, though offered by only 19 percent of parks, were perceived by those park managers as being the most important service offered by their parks.

Table 13: University Services and Amenities Offered and Their Perceived Importance to Tenants

| Benefits Offered | Percentage of Parks | Importance* |
|---|---------------------|-------------|
| Adjunct status at university for key employees | 33% | 3.66 |
| Animal-care facilities | 19% | 4.00 |
| HR services | 19% | 3.95 |
| Access to and use of recreational facilities and privileges | 56% | 3.45 |
| Hazmat handling | 25% | 3.78 |
| Library/information services | 58% | 3.59 |
| Parking | 71% | 3.99 |
| University priced tickets to cultural/athletic events | 27% | 3.10 |
| Use of bus or other transportation systems | 45% | 3.65 |

Note: Importance based on a scale of 1 (No Importance) to 5 (Very High Importance)

These basics of university research park operations suggest there is no one-size-fits-all approach for university research park undertakings, but a range of options in how to govern, pursue development, operate and fund a university research park.



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