



The City-University Partnership:
Applying the *City Vitals* Framework to Creating a Sustainable Region

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“Let Knowledge Serve the City”

There could be no more appropriate slogan to guide urban economic development in the 21st century than Portland State University’s motto: Let Knowledge Serve the City. By virtue of its location and history, Portland State University is closely bound to the center of the City of Portland, and its role and its relationship with the City is magnified in importance by the increasing shift to a knowledge-based economy.

As we near the end of the first decade of the 21st century and face the most serious economic turmoil since the Great Depression, it is worth considering the lessons of the recent past and explore the opportunities of the near future and how they are influenced by the relationship of the university to the city in which it is located.

“Stadt luft macht frei”

A much older slogan, one that hung on the gates of Hanseatic cities in the late middle ages, proclaimed: *Stadt luft macht frei*,” city air makes one free. The freedom that one had in cities to think different thoughts, to create different kinds of art and music, to pursue different crafts, and to tinker and innovate became a major source of economic advancement. As urbanist Jane Jacobs forcefully argued, cities have been throughout history the crucibles of all kinds of new ideas.

These slogans remind us that universities and cities both have important roles to play in moving the knowledge economy forward. The traditional roles that both institutions have played in an industrial economy, segmented largely by national boundaries, is evolving as we move to a globalized economy dominated by knowledge creation. There are enormous opportunities to re-think how cities and universities can play even more influential roles in the years ahead.

This paper explores the roles of the university and the city in achieving place-based prosperity in a knowledge economy. Briefly put, our argument follows five steps beginning with the premise that we are increasingly in a knowledge-based economy with the ability to create new ideas at the heart of our capacity to achieve and maintain prosperity. With that premise in place, there are four dimensions that contribute to place prosperity in which the city and university interact: building talent, fostering innovation, making connections, and capitalizing on distinctiveness. This paper explores each of these dimensions and then offers a series of recommendations about how Portland State University and the City of Portland can work together for mutual benefit.

1. Knowledge is Key

The single factor that best explains success in the global economy today—whether for individuals, businesses, communities or nations—is the ability to create economically valuable new ideas. A relatively recent school of economic thought called “New Growth Theory” makes knowledge creation a central part of the explanation for what makes economies grow. New Growth Theory has several key implications for places looking to secure their prosperity in an economy increasingly based on knowledge.

The key aspect of New Growth Theory is to explicitly make new technology—and not capital and labor—the central explanation for continuing growth. New technology and new knowledge have a fundamentally different characteristic than other economic goods: they are non-rival. Non-rivalry means that any one can make use of them without diminishing anyone else’s use of them. This is an old and important concept. As Jefferson once remarked: “He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me.”

Non-rival goods possess another important characteristic: they are not subject to the law of diminishing returns. Rather, they exhibit increasing returns since greater output results from applying the same idea multiple times. As a result, the economics of ideas points to a new and decidedly optimistic view of our economic prospects. Ideas are not subject to the limits of scarcity but to the potential of abundance. The opportunities to improve ourselves by coming up with better ideas seem to be limitless.

While the pace of technological change in the last decade or two seems to be underscoring the importance of new technologies and new ideas to growth, we shouldn’t lose sight of the fact that ideas have really been the driving force for economic growth all along. Our development and prosperity don’t result primarily from our accumulation of physical capital or our expanding supply of labor. The reason we enjoy a higher standard of living today than a century and a half ago is, as Paul Romer has pointed out, not because we have accumulated more oxen and clipper ships, but because we have invented tractors and container ships, and millions of other ideas great and small that have enabled us to accomplish more.

In a world that depends on ideas, places that come up with better ways of generating ideas will flourish—a key implication of New Growth Theory.

“As the world becomes more and more closely integrated, the feature that will increasingly differentiate one geographic area (city or country) from another will be the quality of public institutions. The most successful areas will be the ones with the most competent and effective mechanisms for supporting collective interests, especially in the production of new ideas.”(Romer 1992, p. 89).

It is worth remembering, in the historical context, that universities, cities and the knowledge economy all emerged at the time of the Renaissance. The Renaissance represented the new found primacy of science and ideas over tradition and religion in daily life. Cities were the crucibles of discovery, invention, experimentation and change in the arts and sciences. And these cities spawned a whole new institution, the university, as a place for education and inquiry, to embody this knowledge generating process.

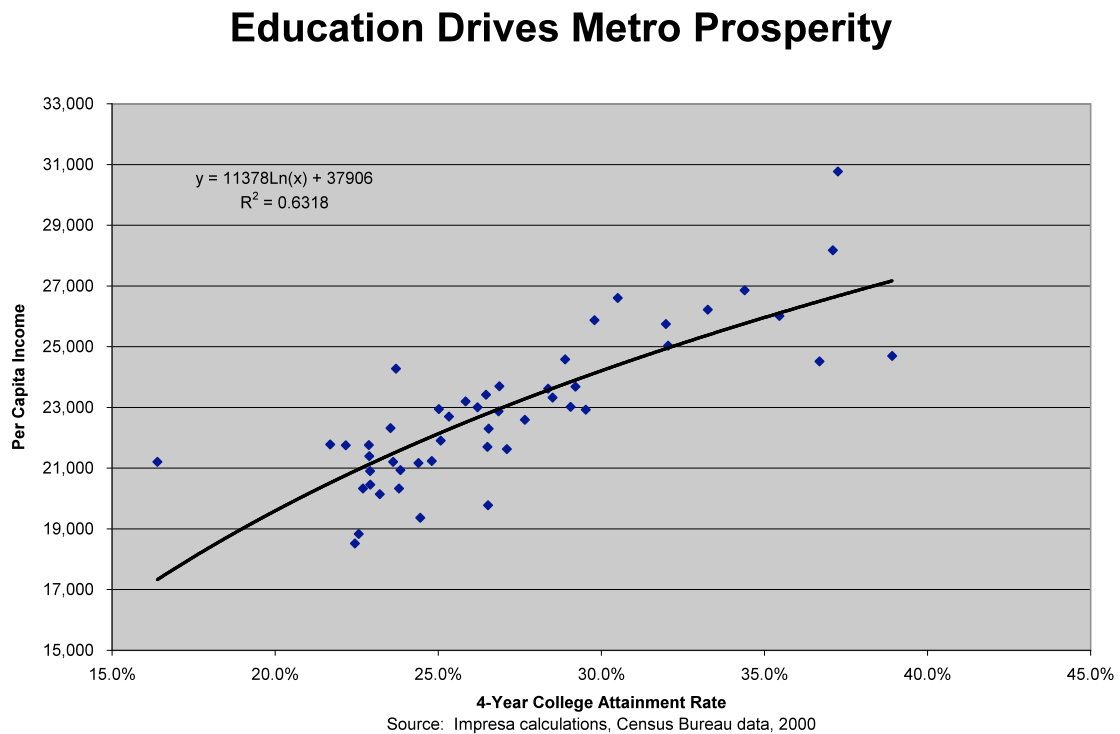
It would be myopic, though, to assume that all ideas—or at least all of the important ones—spring from only academic research. Increasingly, the currency of economic success has become the ability of businesses and all other kinds of organizations to create economically valuable new ideas.

As Jane Jacobs argued, that process of idea creation doesn’t take place in a vacuum nor does it occur randomly. Instead, certain kinds of environments give rise to the experimentation, juxtaposition and synthesis that produce economic innovations (Jacobs 1969).

2. Talent

One of the most striking and salient corollaries of the knowledge economy is the growing economic return to education. Today, workers with a college education make proportionately more than their less educated counterparts and the difference is greater than ever before.

The relationship between income and education is true not only for individuals but also for places. Communities with better-educated populations have higher incomes, on average, than those with lower levels of education. Figure 1 shows the correlation between the fraction of the adult population with a four-year degree or more and the per capita income of the 50 largest U.S. metropolitan areas in 2000. Cities with better educated populations have significantly higher per capita incomes.



We use levels of education to measure human capital—recognizing that years of education are only an imprecise measure and that the choice of any particular threshold (in this case, completion of a four-year degree) is arbitrary. Human capital is, of course, much richer and more varied than can be captured in these simple measures.

Cities with higher levels of education not only have higher levels of incomes but also experience faster rates of income growth (Gottlieb and Fogarty 2003). For cities, each 2 percent increase in the fraction of the population with a college degree was associated with a 1 percent increase in personal income growth in the 1990s (Weissbourd 2004). Cities with better education and higher productivity also appear better able to deal with economic shocks (Glaeser 2003).

Higher levels of growth and productivity stemming from concentrations of urban talent don't simply benefit those with more education; those benefits spill over to others in the same region. Economists estimate that each 10 percent increase in the fraction of a region's population with a four-year degree has the effect of increasing wages 8 percent at every education level (Glaeser 2008)

One recent study found that the gains to skill in the U.S. are highly concentrated in metropolitan areas. Between 1981 and 1991, the rise in the skilled wage premium occurred only in metropolitan areas and resulted in a substantial difference in that premium between metro and non-metro areas (Chung, Clark et al. 2008). This implies that the opportunities for the nation to realize economic gains from its investments in education are heavily concentrated in cities.

This finding about connecting educational attainment to prosperity highlights the most fundamental economic role of a university: adding to the stock of human capital by producing a better-educated citizenry. Portland State already plays this role. The University has produced 83,854 undergraduate and 34,131 graduate degree holders since 1955, when it achieved degree-granting status. Over the past five years, the University has graduated an average of 3,058 undergraduates and 1,557 graduate students each year (PSU Institutional Research Office). Of those who graduated with an undergraduate degree in 2007, 81 percent were working for pay, and 87 percent of those were employed in Oregon (Oregon University System 2008). While it is clear that educating students provides economic benefits to the community, that benefit hinges on a number of key factors: are the skills and abilities the University teaches applicable to the region's needs? Do students develop a connection with the community or are they led to apply their talents elsewhere? Is the scale of the University's impact sufficient to materially affect the economy?

Our research has shown that recent college graduates are the most mobile segment of our society. In many cases, cities that are well-endowed with institutions of higher education see most of their graduates migrate to other cities upon graduation. One key strategy for retaining a higher number of graduates is for an institution to do a better job of connecting students and their educational program with the local community.

Connection between students and their community is one of PSU's primary strengths, as reflected in PSU's international reputation for engaged learning. This success is due to an institutional transformation that began in the early 1990s and continues today.

PSU students engage in community-based learning throughout their academic careers. Each undergraduate completes his experience at PSU with a senior capstone class that brings groups of students from different majors together with a faculty facilitator and a community partner. Each course must include a final product that directly responds to an issue or need identified by the community partner. Thus, these courses are a critical component of community-based learning and the overall community engagement work.

Over the past decade, the Capstone program and other community-based learning experiences have grown substantially. In the 2006-2007 academic year, 9,437 students at PSU were enrolled in community service-learning projects (Oregon University System 2008b).

As Paul Romer has argued, we should also provide stronger incentives for graduate level science and engineering students to acquire "real world" experience in the application of their skills. Much of the graduate science education is financed by research fellowships that

prepare students admirably for future academic careers, but often provide them with no awareness or interest in possible private sector employment. As Romer recommends, it would be wise to establish well-funded graduate fellowships that enable students to work in challenging private sector environments (Romer, 2000).

Educating talent is an economic engine in its own right. Portland is under-developed when it comes to its higher education “cluster”—graduates can be an export industry. Among the nation’s 50 largest metropolitan areas, Portland ranks 42nd in the proportion of 18 to 24 year olds enrolled in colleges and universities. As shown in Table 1, the typical large metropolitan area enrolls about 33 percent of its this population in higher education, while metro Portland enrolls only 27 percent. Expanding the number of students enrolled in the region, both by encouraging more local residents to attend college and by competing more effectively nationally and internationally, would bolster the regional economy. Out-of-state students generally pay higher levels of tuition, and their spending represents net new income in the local economy. Indeed, a number of metropolitan areas are treating higher education as an export sector of their economy (Bartik and Erickcek 2007), (Waits 2005).

3. Innovation

University-based research can be an important contributor to local economic growth. But increasingly, the process of knowledge creation involves and depends on communities of innovators—some in research institutions, others in businesses or in the local community—to understand and solve key problems.

To be sure, university research has played a key role in the evolution of the U.S. economy in the past half century. A considerable and influential mythology has developed around the role of universities in influencing the regional economies in which they are located. Perhaps the most famous of these are the roles attributed to Stanford University and the Massachusetts Institute of Technology in giving rise to technology industries in the San Francisco Bay area and Boston over the last half of the 20th century.

The creation myths of these regional technology centers and their local universities have prompted an extensive, even global wave of imitation, as universities everywhere have created technology transfer offices and developed research parks in hopes of duplicating “the next Silicon Valley.”

Economists have come to call this kind of thinking “the linear model”: the notion that basic research in a university or laboratory setting, produces new scientific insights that then flow outward and are ultimately adopted and applied by private businesses. The linear model seems to accurately describe fields such as nuclear power or recombinant DNA, where fundamental scientific insights directly precede new industries (Einstein’s theory and Watson & Crick’s double-helix), but falls well short in other areas.

Actual economic innovation is more often a two-way street in which interactions between users of technology and researchers produce the key insights that drive progress. In some technologies, practical experience is the source of theoretical insights. The science of thermodynamics, for example, emerged from practical experience with steam power and not the other way around (Romer 1998). Similarly, today’s nano-scale photo-lithography requires practical adaptations to quantum effects. Even in the most widely cited case of local research giving rise to a technology industry cluster—the key role of Stanford University in

Table 1: Percent of 18 to 24 year old residents enrolled in College, 2000

Raleigh--Durham--Chapel Hill, NC MSA	46%	New Orleans, LA MSA	33%
Providence--Fall River--Warwick, RI--MA MSA	45%	Minneapolis--St. Paul, MN--WI MSA	33%
Rochester, NY MSA	44%	Orlando, FL MSA	32%
Austin--San Marcos, TX MSA	43%	Milwaukee--Racine, WI CMSA	32%
Buffalo--Niagara Falls, NY MSA	43%	Cleveland--Akron, OH CMSA	32%
Boston--Worcester--Lawrence, MA--NH--ME--CT CMSA	43%	Chicago--Gary--Kenosha, IL--IN--WI CMSA	32%
Hartford, CT MSA	43%	Denver--Boulder--Greeley, CO CMSA	31%
Pittsburgh, PA MSA	40%	Seattle--Tacoma--Bremerton, WA CMSA	30%
Sacramento--Yolo, CA CMSA	40%	Tampa--St. Petersburg--Clearwater, FL MSA	29%
Columbus, OH MSA	40%	Salt Lake City--Ogden, UT MSA	28%
San Francisco--Oakland--San Jose, CA CMSA	40%	Charlotte--Gastonia--Rock Hill, NC--SC MSA	28%
Oklahoma City, OK MSA	38%	Louisville, KY--IN MSA	28%
Philadelphia--Wilmington--Atlantic City, PA--NJ--D	37%	West Palm Beach--Boca Raton, FL MSA	28%
New York--Northern New Jersey--Long Island, NY--NJ	37%	Atlanta, GA MSA	27%
San Diego, CA MSA	36%	Norfolk--Virginia Beach--Newport News, VA--NC MSA	27%
Washington--Baltimore, DC--MD--VA--WV CMSA	35%	Phoenix--Mesa, AZ MSA	27%
Greensboro--Winston-Salem--High Point, NC MSA	35%	Portland--Salem, OR--WA CMSA	27%
Los Angeles--Riverside--Orange County, CA CMSA	34%	San Antonio, TX MSA	27%
Nashville, TN MSA	34%	Memphis, TN--AR--MS MSA	27%
Cincinnati--Hamilton, OH--KY--IN CMSA	34%	Jacksonville, FL MSA	26%
Detroit--Ann Arbor--Flint, MI CMSA	34%	Kansas City, MO--KS MSA	25%
Richmond--Petersburg, VA MSA	34%	Houston--Galveston--Brazoria, TX CMSA	25%
St. Louis, MO--IL MSA	33%	Dallas--Fort Worth, TX CMSA	25%
Miami--Fort Lauderdale, FL CMSA	33%	Indianapolis, IN MSA	24%
Grand Rapids--Muskegon--Holland, MI MSA	33%	Las Vegas, NV--AZ MSA	20%

Source: U.S. Census

fostering Silicon Valley—there was already a substantial industrial base in radio electronics before the emergence of Stanford’s engineering school in the 1940s (Sturgeon 2000).

Portland’s experience with technology related development has been a contrast to the conventional linear model. The region’s high technology industry cluster emerged despite the lack of a prestigious research university in the community (Mayer 2003). And in one notable case, when a local university researcher did produce a critical scientific breakthrough with important economic implications—Brian Druker’s research on the drug Gleevec as a treatment for leukemia—the economic benefits occurred almost entirely outside the local community. Therefore, particularly in regional economies, it is important to view private sector firms as active, equal partners in the research enterprise, rather than a distant beneficiary of academic labors.

Despite the fundamental importance of basic research, it has to be noted that the economic value of technology derives from its pervasive application throughout the economy. Realizing the full value of the internal combustion engine, telecommunications advances or the computer requires a series of complementary changes, including investment in physical and human capital, reorganization of management structures, and the birth (and death) of firms. Companies like Amazon, Google and EBay only become possible after widespread adoption of a new technology; they then engender further changes in markets and activity that enable a nation to realize the full advantages of science. It is very much in our national interest (and in the interest of healthy regional economies) that we encourage these kinds of derivative and knock-on adaptations of scientific advances.

Since the passage of the Bayh-Dole Act in 1980—which allows public entities to patent ideas derived from federally funded research—universities around the country have set up technology transfer offices and aggressively worked to patent research related ideas. The number of university patent offices has increased one 100-fold, the number of university patents, 16-fold, since 1980 (Lemley 2006).

However, the technology transfer office, and its mission to earn money for the university, can get in the way of deploying new ideas. Universities and researchers may be reluctant to discuss ongoing research with private companies, (prior to starting the invention disclosure or patent process) for fear of losing their intellectual property rights. And they can also be cautious about disclosing too much about an idea for fear that companies will be able to make use of the research without paying a licensing fee (Silverman 2007).

This secrecy forms a barrier to the free flow of information between researchers and companies. The trend toward increased intellectual property protection in universities, ironically, comes at just the time that private corporations are increasingly turning to a model of open innovation, making their research results—and even patented ideas—freely available to a wide group of users. (Most famously, IBM put 500 of its software patents in the public domain in 2005.) The open model recognizes that there are strong complementarities among different kinds of knowledge, and that encouraging others to follow your lead and refine and extend your knowledge, makes it more likely ideas will be developed more quickly.

What should universities like Portland State do? Most importantly, they’ll have to recognize that openness and free flow of information are critical to promoting innovation. They’ll need to balance their interest in getting direct financial paybacks with creating an environment where researchers—and companies—can engage in the kind of ongoing dialogue and information sharing that leads to progress. They need to be aware that putting

too much emphasis on patenting could work against their broader objectives of harnessing idea creation as a new economic driver. They may also want to consider measures to separate the networking function from the intellectual property function, as the University of California has done by creating its “Connect” program apart from the technology transfer office. Putting more emphasis on non-exclusive licensing can also help maximize social gains from research.

The open innovation model also implies that university research will be more successful if it embraces widespread collaboration with the community. Portland is already fortunate to be the epicenter of a number of open source software efforts. The collaborative culture is also a hallmark of many non-academic communities, including music, brewing, cycling, the arts and environmentalism.

Jane Jacobs famously observed that cities are the place where “new work” gets created (Jacobs 1969). Cities are places where entrepreneurs can study and understand consumers and find the critical initial market for their goods and services. While we generally think of innovations as being generated by the producers of products (Intel designs a new, faster microprocessor), many innovations emerge from adaptations or modifications of existing products by end-users. In open source software and sporting goods, for example, many important innovations—and critically, whole new product lines—emerged from user innovation (von Hippel 2005). More broadly, interactions with users—observing how they use and modify products—can give manufacturers insights into further possible innovations. Again, many of these important interactions concentrate in certain places.

The process of discovery in cities is at work in more prosaic industries as well, even ones that we would think of as being primarily rural in character, like agriculture. In Portland, a series of farmers markets has exposed urban consumers to a wide range of locally produced crops, enabling consumers to learn about new varieties and product attributes not available in supermarkets. It also provides a place for farmers at very low cost to test new products in the marketplace. The farmers markets, coupled with the farmer-chef collaborative (an organization that promotes interactions between local farmers and restaurant chefs) has similarly produced new product innovation. Without the demand afforded by shoppers and chefs open to discovery in the city, these rural businesses would have found it difficult to break into the food business. Farmers markets have, for example, popularized several new varieties of potatoes, some of which, like the Yukon Gold, are becoming much more widely available in mainstream market channels (Starke 2002).

Portland State University has a good opportunity to apply the lessons of open innovation to its efforts to bring knowledge to the community. Its success is likely to turn on how well connected it is to the community in which it is located, a topic to which we now turn.

4. Connections

In a global economy, the essence of success is the ability to tap into the global marketplace. Ideas and knowledge are more valuable because there are so many more communities, consumers and businesses that can use them. Bill Gates would not be numbered among the richest people in the world if he could sell software only to people in Seattle or Washington State.

There are many dimensions in which a city has to connect. The simplest and most obvious are the physical connections—ports and airports—that facilitate the flow of goods among

nations. But the importance of goods movement is increasingly being surpassed by the connections between people that are the lifeblood of nearly all urban economies. We define these connections broadly, from the far-reaching global to the intensely local. Great cities are connected at all these levels.

As Harald Bathelt and his colleagues have observed in a slightly different context, local success in the global economy is a function of "local buzz and global pipelines." Urban areas have to have their own strong localized interactions and knowledge and function well locally, but they must also have easy and extensive connections to other places with "buzz" around the world (Bathelt, Malmberg et al. 2002).

Even in a world that has grown increasingly interconnected, thanks to the Internet and falling telecommunications prices, face-to-face interaction continues to play a decisive role in economically important relationships. Face-to-face interactions promote trust, reciprocity, and facilitate the exchange of ambiguous information. Informal, unplanned interaction—serendipity—produces unanticipated results (Storper and Venables 2003). Creativity—defined as the combination of previously unconnected elements—more easily flourishes in this kind of environment (Yusuf 2007).

Tapping the economic potential of a region's human capital and scientific insights depends on developing a strong web of connections with the local community. As a general proposition, Robert Putnam found that social capital—generalized norms of reciprocity—played a key role in explaining variations in regional economic development in Italy (Putnam, Nanetti et al. 1993). In the specific instance of high technology development in the United States, AnnaLee Saxenian showed that stronger local networks of interaction in Silicon Valley enabled it to outperform metropolitan Boston during the 1980s (Saxenian 1994).

One of the most important roles the University can play is as a provider of space for diverse groups to have open-ended conversations about industry development pathways and new technological and market opportunities (Lester 2005). Interaction happens most intensely in small geographic scales. Within universities, a physical and cultural predisposition to frequent unplanned interactions among faculty members, and between the faculty and those from outside the community, helps facilitate the advancement and application of research.

PSU's campus location also provides the potential to combine the University's connective assets with those of Portland's downtown. Evidence suggests that downtown business districts are reinventing themselves as venues for easy unplanned interactions among diverse populations with overlapping interests. Across the nation, creative industries tend to cluster and flourish in central business districts. The economic success of the downtown of the future requires capitalizing on its ability to attract talent and promote such interactions (Waits 2001).

Much of the focus on connections is, appropriately, on harnessing local interactions. But as Bathelt and his colleagues argue, the issue is about buzz and pipelines. The pipelines are the connection to the wider world, and especially to other centers of buzz around the world. Without these pipelines, local buzz can be insular and inbred. Global connections provide a basis to test and compare local knowledge with best practice elsewhere.

Fostering better connections to the community, and from the community to the wider world is the key to successfully capturing knowledge for local economic benefit. One of the hallmarks of San Diego's rise as a biotech powerhouse has been a strong network of formal

and informal cooperation, best typified by UCSD Connect, an outreach program started in the 1980s. UCSD Connect helped organize and foster strong shared social capital, engaging the business community and the research community, and drawing participants from around the world (Walshok, Furtek et al. 2002).

Finally, it's worth noting that connections are as valuable to the University as they are to the wider community. One of the major challenges facing any institution of higher education is assuring that its curriculum and programs are attuned to the needs and trends of the world in which it operates. In basic matters such as estimating the future demand for different occupations, it would be helpful if universities could be prescient, but prescience is hard to come by. Connections and nimbleness as well as good contacts with the local community may be essential to getting practical information about which skills are in highest demand, whether university training is relevant, and what challenges are of greatest economic importance.

5. Distinctiveness

Every city represents a different bundle of characteristics in population, physical settings, social institutions, economic bases and histories. The combination of these differences positions each city to uniquely compete for talent and businesses and to develop new ideas. As technology erases or mutes some characteristics that differentiated cities in the past, other previously less valued distinctions have become relatively more important.

Harvard Business School's Michael Porter, the nation's leading scholar of business strategy, has argued that distinctiveness is the new competitive imperative. He writes that the essence of competitive strategy is about being different, being able to do things that your rivals can't do (1996). In the same vein, Jane Jacobs said, "The greatest asset that a place has is something that is different from everywhere else" (2002).

Distinctiveness influences the economy in many ways, and many distinctive local characteristics can be reinforced by the economy. As Porter has argued, local or national passions—like car racing in Italy or gardening in Britain—produce demanding local customers who provide the natural base for developing a globally competitive industry cluster (1990). In an era when the formation and growth of new industries is driven more and more by insights into market demand and customer-produced innovation, close proximity to customers whose tastes anticipate the larger market is an important business advantage (von Hippel 2005). For example, the early popularity of jogging and running in Oregon in the 1960s led to the formation of Nike, now the world's largest sports-apparel firm (Cortright 2002).

Local distinctiveness and the economy can be self-reinforcing. As a city grows certain economic niches based on its culture and behaviors, the firms that grow locally, the occupations they employ, the workers they train and the in-migrants they attract will often have similar or complimentary interests (Florida 2008). In addition, local distinctiveness is multi-dimensional and influenced by the decisions of many different actors. The complementarity between public policies, private sector decisions, local tastes and attitudes is likely to be complex and highly interrelated (Feldman and Martin 2004).

Over time, it appears that the economic bases of major metropolitan areas are becoming more specialized—more different from one another—and that city economic success is increasingly explained by cities finding their right niche (Markusen, Schrock et al. 2004). As

more activities becoming globalized, city economic success depends on defining the kinds of locally embedded knowledge and expertise that are hard to replicate and thereby construct a jurisdictional advantage

A critical part of Portland State University's role is helping the region understand and build on its uniqueness. What makes Portland different? Arguably, it is leadership in sustainability. Of course lots of places are now jumping on the sustainability bandwagon. But Portland was into sustainability long before sustainability was fashionable. It's in our DNA.

As entrepreneurs, consumers and citizens, Portland is ahead of the curve. An interlocking and reinforcing set of attitudes, policies, experience and knowledge mean that we are further along the path of figuring out how to integrate sustainability into our way of life. It's not easy or automatic, and it's certainly the case that a widespread interest and support for sustainability produces the kind of shared insights and mutually reinforcing actions that make this, more than any other place in the U.S., a hotbed of innovation in a wide range of sustainable policies.

None of this is to say that Oregon plans, or expects to have a monopoly on sustainable practices or businesses. But the burgeoning market for green products and services means that there are plenty of opportunities for growth and job creation. Portland is already an important player in the green building movement and is seeing significant local economic development as a result (Allen and Potiowsky 2008). PSU can and is supporting and contributing to Portland's leadership in green building by partnering with the City, developers, architects, and builders to demonstrate and test emerging green building and development practices.

Building a more sustainable economy is not just about businesses. Oregon's consumers, with their strong interest in sustainability, constitute a critical initial market for green businesses. Demanding customers prompt innovative new products and services (Porter 1990). Similarly, the state's public policy environment creates the institutions and incentives that enable and encourage more sustainability.

Portland's interlocking set of civic values, wide range of entrepreneurs and common experience, coupled with its small size give it a critical mass that will enable us to innovate faster and more effectively on sustainability.

Distinctiveness plays an added role in shaping the human talent of a city. Today, the world's most educated workers are extremely mobile, and many are choosing the places they will live and work based on aligning their interests and values with those of a particular place (Florida 2008). Over the past decade, Portland has attracted young college graduates at a rate five times faster than their growth in the U.S. population, and many of these have been attracted to Portland by its urban quality of life and strong commitment to green policies (Cortright 2005).

Conclusions

Portland State University has already decided that its role is to be a part of the community, and not to stand apart from the community as has been the choice of many institutions of higher education elsewhere. The growing importance of knowledge and the continuing

democratization of innovation suggest that this is the right choice and that the greatest opportunities for both the University and the City will come from working more closely together, and blurring the town and gown lines that have traditionally divided work from scholarship and research from practice.

Our four part framework for thinking about the connections between knowledge and prosperity suggest specific steps the University and the City can follow to achieve their potential.

Developing Talent

The first is continuing the University's long-established role of developing talent: Here there are opportunities for both qualitative and quantitative improvement.

Qualitatively, the University can work to mesh the educational process with the community, such as through its capstone project requirements. This kind of work simultaneously makes education more relevant for students and taps into the knowledge of the community.

Quantitatively, it is apparent that the region's overall higher education infrastructure, including Portland State University, is undersized relative to the region's economy. This is a missed opportunity for economic activity in its own right. Expanded higher education can also help reinforce the region's economic competitiveness by improving the talent base available to the region's employers.

And in developing talent, the University must be sensitive to the need not just to train for the skills of existing jobs and current employers, but to equip its students with the skills they need to invent, develop, and fully participate in a world that will be different from the one we currently know.

Encouraging Innovation

The second opportunity is to encourage innovation. Some of what Portland State can do is to communicate its research activities to the external world through technology transfer. But in a world of open innovation, Portland State's most influential opportunities will be to nurture and join into communities of practice that foster a two-way sharing of knowledge among those in the academic community and in wider world of innovative producers, consumers and citizens. This model of open innovation would use the community as the laboratory for new ideas, treating businesses and citizens as collaborators and peers rather than simply subjects. University-city collaboration in Portland around open innovation may itself serve as an example to other cities (and their universities) about how to employ this methodology, and could become an exportable knowledge in its own right.

Promoting Connections

The success of the open innovation model hinges on the University's ability to connect locally and globally: building local buzz and maintaining global pipelines. Locally, it has to be engaged with local citizens and businesses in an ongoing, two-way process. The University's location in downtown Portland provides the physical basis for this connection, and Portland State's established ethic of pushing its research and student activity into the community underscores its philosophical commitment. In addition, the University can also serve as a portal for the local community to communicate with and better understand Portland's role in the global situation.

Cultivating Distinctiveness

The logic of distinctiveness and specialization requires the City of Portland to understand its unique characteristics and opportunities in order to foster a prosperous economy. Just as the city cannot be best at everything, and must choose those areas where it has distinctive advantage, Portland State University has to structure its relationship, not just as a typical university might relate to its host city, but in a way that recognizes the region's unique strengths. The commitment to sustainability and the culture of community collaboration that are Portland's hallmarks are also two of the keys to an effective university-city relationship. Part of the challenge for the University will be to play the role of an honest broker, testing the city's sense of its perceived distinctiveness against objective data—in effect, serving as a truthful mirror of the city's image.

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