COMPETING IN THE AGE OF TALENT:
QUALITY OF PLACE AND THE NEW ECONOMY

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EXECUTIVE SUMMARY

The rise of the new economy has radically altered the ways that cities and regions establish and maintain their competitive advantage. In the new economy, regions develop advantage based on their ability to quickly mobilize the best people, resources, and capabilities required to turn innovations into new business ideas and commercial products. The nexus of competitive advantage has thus shifted to those regions that can generate, retain, and attract the best talent.

This report summarizes the key findings of a yearlong study of the role of talent in the new economy. The study looked specifically at how quality-of place – that is amenities, lifestyle, and environmental quality - affect the ability of regions to attract talent and to generate and sustain high technology industry. To do so, it examined the performance of regions across the country on these dimensions, explored what leading regions are doing to be successful, and conducted focus groups with young knowledge workers in technology-based fields to better understand how they choose places to live and work.

The key findings of the study confirm that amenities and environmental quality matter in the attraction of talent and development of high technology regional economies, as follows.

- Quality-of-place - particularly natural, recreational, and lifestyle amenities – is absolutely vital in attracting knowledge workers and in supporting leading-edge high technology firms and industries. Knowledge workers essentially balance economic opportunity and lifestyle in selecting a place to live and work. Thus, quality-of-place factors are as important as traditional economic factors such as jobs and career opportunity in attracting knowledge workers in high technology fields. Given that they have a wealth of job opportunities, knowledge workers have the ability to choose cities and regions that are attractive places to live as well as work.

- The availability of job and career opportunities is a necessary but insufficient condition to attract the young knowledge workers. Knowledge workers favor cities and regions with a "thick labor market" which offers the wide variety of employment opportunities required to sustain a career in high technology fields. Quality-of-place completes the picture.

- Leading high technology regions also rate very highly in terms of quality-of-place with high levels of amenities and environmental quality. Austin, Texas; Seattle, Washington; the San Francisco Bay area; the greater Boston region; and Washington, DC score consistently high across virtually every quality-of-place measure - natural amenities, lifestyle amenities, and overall environmental quality. There is a strikingly strong correlation across the board between regions that are home to large concentrations of knowledge workers, amenities, and the environment. In this regard, amenities and the environment are part of a total package of factors required to become a successful technology-based region with a large pool of knowledge workers.

- Leading high technology regions have aggressively pursued strategies to bolster their environmental quality, natural amenities, and lifestyle offerings to attract and retain talent. Austin and Seattle have placed high priority on recreational amenities such as bike paths, mountain bike trails, parks and recreational areas, and accessibility to water for rowing and sailing. These regions have cultivated thriving music scenes and are also known for their youth-oriented cultures that are open and supportive of diversity. Both regions are among the national leaders in smart growth and sustainable development. Leading high

technology regions have also supported the development of extensive lifestyle and recreational amenities around major university districts where knowledge workers reside.

- Knowledge workers prefer places with a diverse range of outdoor recreational activities (e.g., rowing, sailing, cycling, rock climbing) and associated lifestyle amenities. Access to water and water-based recreation is of particular importance to these workers. Knowledge workers prefer regions where amenities and activities are easy to get to and available on a "just-in-time" basis. Due to the long hours, fast-pace, and tight deadlines associated with work in high technology industries, knowledge workers require amenities that blend seamlessly with work and can be accessed on demand. They favor cities and regions that offer a wide range of experiences, and are somewhat less concerned with "big ticket" amenities such as "high" arts and culture or professional sports. Knowledge workers also express a strong preference for progressive regions that are youth-oriented and supportive of demographic diversity.

The findings of this report suggest that cities and regions have a great deal to gain from developing a quality-of-place strategy designed to attract knowledge workers and from embedding it in ongoing economic development and competitiveness efforts. In doing so, the report indicates that the region should consider the following actions:

- Make quality-of-place a central feature of regional economic development strategies.

- Integrate amenities and natural assets into all aspects of regional economic development, talent attraction, and marketing efforts.

- Invest in outdoor, recreational and lifestyle amenities as a component of regional economic development and talent attraction efforts; for example, the creation of climbing walls, mountain bike trails, bike paths, roller-blading areas and the like. Sponsor outdoor competitions and events to the region such as triathlons, bike races, rowing competitions, and similar efforts that attract the attention of knowledge workers. Orient waterfront improvements to encourage recreational activities such as rowing, sailing and windsurfing, particularly by improving access.

- Develop a comprehensive amenity strategy for university districts and integrate them into economic development strategies. Establish more user-friendly transit connections between university districts, downtowns, and centers for high-technology enterprise through light rail, mass transit and bike lanes for commuting.

- Encourage smart growth and sustainable development on a regional basis, particularly sustainable use, preservation, and revitalization of natural assets. Equip neighborhoods and communities with tools to preserve open space and to create recreational amenities. Work with developers to provide more examples of successful residential and commercial developments that feature amenities, particularly in reconverted brownfield sites in urban areas.

- Create mechanisms for harnessing the knowledge and ideas of all citizens at the neighborhood, local, and regional levels for improving the quality-of-place around the environment and amenities. Develop vehicles for involving young people in the regional amenity and lifestyle agenda as well as in the broader economic development agenda.

A quality-of-place strategy is relatively inexpensive and involves marshalling resources (parks, waterfronts, etc.) that are already in place. It also is strongly place-based and as such confers direct benefits on broad segments of the local population and industry, in contrast to conferring large subsidies to non-residents or outside industry. For example, elderly populations express support for bike trails and paths especially around the university district, as they will take commuting cyclists off the sidewalks. Amenities will also benefit disadvantaged neighborhoods and populations as well as attracting knowledge workers.

Quality-of-place is the missing piece of the puzzle. To compete successfully in the age of talent, regions must make quality-of-place a central element of their economic development efforts.

1.0 INTRODUCTION

The new economy is reshaping virtually every aspect of economic development, as we know it. Knowledge has replaced natural resources and the efficiency of physical labor as the source of wealth creation and economic growth. In this new era, talent has become the key factor of production.[1]

The rise of this new economy radically alters the ways that cities and regions can establish and maintain competitive advantage.[2] The key to success in the old economy was simple – costs. In the mass production era, regions established competitive advantage via advantages in natural resource endowments, transportation access, the cost and productivity of physical labor, and by reducing the overall costs of doing business. Driven to reduce costs, firms selected locations that provided low-cost land, cheap or highly productive physical labor, and a cost-conscious business climate. Regional development strategies typically emphasized the use of so-called business incentives designed to win over businesses by pushing their costs even lower. The environment and natural amenities were seen as sources of raw materials or as places to dispose wastes.

In the new economy, regional advantage comes to places that can quickly mobilize the best people, resources, and capabilities required to turn innovations into new business ideas and commercial products. Leading regions establish competitive advantage through their capabilities. They are vehicles for resource mobilization that can almost instantaneously bring together the resources required to launch new businesses and turn innovations into successful products. For these reasons, the nexus of competitive advantage shifts to those regions that can generate, retain, and attract the best talent. This is particularly so since knowledge workers are extremely mobile and the distribution of talent is highly skewed.

For regional development strategy, this means a shift from low cost to high quality – from attracting firms to generating, retaining, and attracting talent. The rise of the new economy dramatically transforms the role of the environment and natural amenities – from a source of raw materials and a sink for waste disposal – to a critical component of the total package required to attract talent and, in doing so, generate economic growth.

This report summarizes the key findings of a yearlong study of the role of talent in the new economy. The research looked closely at the location decisions of knowledge workers – that is, how young professionals in technology-based industries choose places to live and work. In doing so, it focused in particular on the role of quality-of-place – that is amenities, lifestyle, and environmental quality - in the attraction of knowledge workers and the development of high technology industries and regions.

The study seeks to better understand the location choices of knowledge workers and the factors associated with the ability of cities and regions to generate, retain, and attract talent. The study begins from the premise that talent is the critical factor of production in the new economy. Knowledge workers are highly mobile, eagerly sought after by technology companies, and can locate virtually anyplace they desire. At the same time, regional growth increasingly turns upon generating, attracting, and maintaining the talent base needed to create and grow technology-based companies. In previous eras, nations and regions could prosper because they had strategic locations near raw materials or on major transportation routes. But, today, it is the ability to attract talent that creates regional advantage: Those that have the talent win, those that do not lose. In this regard, the “quality” of a city or region has

replaced cost and access as the pivot point of competitive advantage. Thus, quality-of-place – the amenities, lifestyle offerings, and environmental quality of a region - plays a key role in the ability to attract talent and develop high technology industries.

1.1 Key Questions

To shed light on these issues, the study addresses three key questions.

- What are the primary factors that shape the location decisions of knowledge workers or talent? Traditionally, market factors such as the availability of jobs or careers have been thought to dominate these decisions – and obviously they remain very important – but what role do factors such as lifestyle, environmental quality, and amenities play in these choices?

- What is the relationship between quality-of-place, the location decisions of knowledge workers, and economic development? Are leading high technology regions also leaders in terms of amenities, lifestyle, and environmental quality?

- What cities and regions are attracting knowledge workers and high technology talent, and what role does quality-of-place play in this process? How do amenities, lifestyle considerations, and environmental quality factor into the economic development strategies of leading high technology regions? What are leading regions doing to enhance these factors?

2.0 RESEARCH AND STUDY DESIGN

To shed light on these issues, the study conducted the following research.

2.1 Literature Review

The study reviewed the a wide range of documents, studies, data and literature on the knowledge economy, talent, the career and location choices of knowledge workers, amenities and economic development, the environment and the new economy, sustainable development, and best practices in regional development.

2.2 Case Studies

The case studies were performed through a comprehensive review of printed and on-line documents and by phone interviews. After an extensive search and review of regional strategies, case studies of four best-practice regions were conducted: Austin, Texas; Seattle, Washington; Burlington, Vermont; and Chattanooga, Tennessee.

- **Austin** and **Seattle** provide examples of leading technology-based regions that have made environmental quality and amenities key elements of their strategies for technology-based economic development.

- **Chattanooga** is the nation's recognized leader in developing an economic strategy around the concepts of environmental remediation, community dialogue, restoration of natural amenities, and sustainable development.

- **Burlington** provides an example of a smaller city that developed an economic development strategy around amenities. It has focused on environmental quality and amenities as a mechanism to attract talent and improve quality-of-life.

2.3 Focus Groups and Interviews

Focus groups and interviews were conducted with knowledge workers to explore the factors associated with how and why young people in technology-based industries choose places they will live and work. Participants included young knowledge workers who were either in the process of making or had already made their decisions about where to locate. They were asked a wide range of questions about their preferred cities and the reasons behind those choices. The groups were broken down into four segments: college juniors and seniors in technology-based fields, juniors and seniors in management or related fields, graduate students in all fields, and young professionals who had already entered the workforce.

2.4 Regional Statistical Comparisons

Statistical research was conducted to compare the role of amenities and environmental factors in high technology industry and knowledge worker attraction across regions. This aspect of the research examined the relationship between high technology industries, knowledge workers, environmental quality and amenities. That is, do relatively high levels of environmental quality and amenities also distinguish regions with large concentrations of high technology industries and knowledge workers? To do so, the researchers collected and analyzed a variety of data on high technology industries, knowledge workers, environmental quality, and recreational and cultural amenities for 35 benchmark metropolitan statistical areas (MSAs) across the United States.[3]

2.5 Econometric Research

Econometric research on the role of amenities in the location decisions of knowledge workers was also undertaken as part of this study. This research was conducted by Gary Gates, a doctoral student at the Heinz School of Public Policy and Management at Carnegie Mellon University, in collaboration with Professors Ashish Arora, Richard Florida, and Mark Kamlet. This aspect of the research implemented an econometric analysis of the role of amenities in the location decisions of workers across a wide range of industries in 67 metropolitan statistical areas across the United States.[4]

3.0 HIGH TECHNOLOGY REGIONS AND THE KNOWLEGE ECONOMY

Before proceeding to explore the role of amenities and environment in the new economy, it is useful to identify the leading regions of the technology-based knowledge economy. The research focuses on two key dimensions of the new economy:

- The ability of regions to generate high technology industry.
- The ability of regions to attract knowledge workers.

3.1 High Technology Regions

The numerous ways to define high technology regions have been the subject of considerable debate among academics and professional analysts. A 1999 report by the Milken Institute, however, provides a careful and comprehensive rating of 350 U.S. regions across several dimensions of high technology, making it the best available summary ranking of high technology regions.[5] Table 1 provides overall Milken "*techpole"* score and rank for the 35 benchmark regions in this study. This techpole score is a composite of several measures of high technology concentration and growth. The key findings are as follows.

- Not surprisingly, the most highly ranked region was San Jose – California's Silicon Valley, followed by Dallas, Texas; Boston, Massachusetts; Seattle, Washington; and Washington, DC.

It is useful to compare the Milken rankings to other rankings of high technology regions. Table 2 provides a listing of *Forbes* leading technology regions and Table 3 lists the *"Most Wired"* cities. While the specific regional rankings vary, there is considerable overlap between these lists.

- Seattle, Washington; Austin, Texas; Dallas, Texas; Ventura, California; and Oakland, California top the list of *Forbes'* best cities for technology business [Table 2].[6]

- San Francisco, Atlanta, Washington DC, Austin, Seattle, Minneapolis, and Boston top the list of "wired" cities [Table 3].[7]

Table 1: High Technology Rankings for Benchmark Regions

Rank	City	Score	Rank
1	San Jose	23.686	1
2	Dallas-Fort Worth	7.063	2
3	Boston	6.308	4
4	Seattle	5.191	5
5	Washington	5.078	6
6	Albuquerque	4.978	7
7	Atlanta	3.462	10
8	Phoenix-Mesa	2.604	12
9	Oakland	2.213	14
10	Philadelphia	2.192	15
11	Rochester, MN	1.953	16
12	San Diego	1.932	17
13	Raleigh-Durham	1.892	18
14	Denver	1.812	19
15	Austin-San Marcos	1.775	21
16	San Francisco	1.623	22
17	Houston	1.621	23
18	Boise City, ID	1.427	24
19	New Haven	1.333	25
20	Portland-Salem-Vancouver	1.333	26
21	Boulder	1.123	27
22	Kalamazoo, MI	1.093	28
23	Indianapolis	1.070	29
24	Kansas City	1.034	31
25	Minneapolis-St. Paul	0.981	32
26	Lubbock, TX	0.967	33
27	St. Louis	0.927	34
28	Cedar Rapids, IA	0.916	35
29	Orlando	0.822	36
30	Detroit	0.790	38
31	Pittsburgh	0.482	47
32	Tampa-St. Petersburg	0.420	51
33	Baltimore	0.357	58
34	Cleveland-Akron	0.225	69
35	Miami-Ft. Lauderdale	0.240	70.5

Source: Ross C. DeVol, *America's High Technology Economy*, 1999

3.2 Knowledge Workers

In addition to knowing which regions are leading centers of high technology industry, it is also useful and important to know which regions are able to attract knowledge workers. Table 4 provides several measures of *knowledge workers* for the benchmark regions. Since the available data are not organized to account for a precise and comprehensive assessment of the total pool of knowledge workers across all industries and occupations, this analysis uses workers in the software industry (SIC 737) as a proxy for knowledge workers.[8] To control for the different sizes of various regions, Table 4 ranks regions by the number of knowledge workers per million population. It also presents the total number of knowledge workers, the change in knowledge workers between 1991 and 1996, the overall rate of change or growth rate, and the average annual rate of change over this period.

Table 2: Forbes Best Places Top 15

Rank	City		
1	Seattle, WA	9	Houston, TX
2	Austin, TX	10	Atlanta, GA
3	Dallas, TX	11	Orange County, CA
4	Ventura, CA	12	San Diego, CA
5	Oakland, CA	13	Omaha, NE
6	Somerset, NJ	14	Santa Rosa, CA
7	Denver, CO	15	Tampa, FL
8	San Jose, CA		

Source: *Forbes* magazine, 1999

Table 3: America's Most Wired Cities

Rank	City
1	San Francisco
2	Atlanta
3	Washington
4	Austin
5	Seattle
6	Minneapolis-St. Paul
7	Boston
8	New York
9	Chicago
10	Miami
11	Denver
12	San Diego
13	Dallas
14	Pittsburgh
15	St. Louis

Source: *Yahoo! Internet Life* magazine, http://www.zdnet.com/yil/content/mag/9803/

- Leading high technology regions – San Jose, Washington DC, San Francisco, and Boston – top the list in terms of knowledge workers per million people, followed by Atlanta, Dallas, and Denver.

- Kansas City, Missouri; Austin, Denver, and Oakland, California had average annual growth rates of knowledge workers in excess of 20 percent. Atlanta, Seattle, Tampa, Orlando, Phoenix, San Francisco, and Boston had average annual knowledge worker growth rates of roughly 15 percent or more.

Table 4: Knowledge Workers in Benchmark Regions

Region	Per Million	Number	Change (91-96)	Rate of Change (91-96)	Annual Rate
San Jose, CA	24348.74	38818	14039	56.66%	11.33%
Washington, DC	22561.95	102652	33249	47.91%	9.58%
San Francisco, CA	17632.61	29147	12930	79.73%	15.95%
Boston, MA	16871.44	54959	23346	73.85%	14.77%
Atlanta, GA	11633.74	41098	19849	93.41%	18.68%
Dallas-Fort Worth, TX	11345.50	51692	18268	54.66%	10.93%
Denver, CO	11258.22	20964	11337	117.76%	23.55%
Oakland, CA	9700.85	21703	11058	103.88%	20.78%
Minneapolis-St. Paul, MN	9407.78	25976	10702	70.07%	14.01%
Raleigh-Durham, NC	9308.79	9512	2526	36.16%	7.23%
Austin-San Marcos, TX	9156.99	9511	5159	118.54%	23.71%
Seattle-Bellevue-Everett, WA	8365.94	18663	8912	91.40%	18.28%
Detroit, MI	7337.06	32717	12786	64.15%	12.83%
Tampa-St. Petersburg, FL	6872.22	15086	6858	83.35%	16.67%
Orlando, FL	5986.83	8509	3754	78.95%	15.79%
San Diego, CA	5953.73	15918	5349	50.61%	10.12%
St. Louis, MO	5632.89	14363	4050	39.27%	7.85%
Philadelphia, PA	5552.37	27475	5824	26.90%	5.38%
Houston, TX	5171.45	19497	4395	29.10%	5.82%
Portland, OR	5160.55	9053	1568	20.95%	4.19%
Indianapolis, IN	4703.72	7005	2000	39.96%	7.99%
Pittsburgh, PA	4272.07	10143	3950	63.78%	12.76%
Baltimore, MD	4224.04	10429	2554	32.43%	6.49%
Kansas City, MO	4069.50	6897	3983	136.68%	27.34%
Phoenix-Mesa, AZ	3927.91	10815	5394	99.50%	19.90%
Cleveland-Akron, OH	3740.38	10906	3380	44.91%	8.98%
Miami-Ft. Lauderdale, FL	3207.01	11372	4143	57.31%	11.46%

Source: County Business Patterns
Workers in SIC 737, Computer Services, have been used as a proxy for all knowledge workers.

Figure 1 is a chart that compares regions by their ability to generate and attract knowledge workers and concentrations of high technology industry. Regions that place in the far upper right-hand quadrant of these charts are in a win-win position, scoring well in both the growth of knowledge workers and in the concentration of high technology industries. Regions in the lower left-hand quadrant are laggards on both dimensions.

- Leading high technology centers such as San Jose, Boston, and Washington top the list in terms of this joint measure, placing in the far upper right-hand quadrant of this graph. Dallas, Atlanta, Seattle, Oakland, Denver, San Francisco, Raleigh-Durham, and Austin also score relatively highly on this measure.

- Regions such as Cleveland, Baltimore, Pittsburgh, and Tampa are laggards across both dimensions, placing in the far lower left-hand quadrant of the graph.

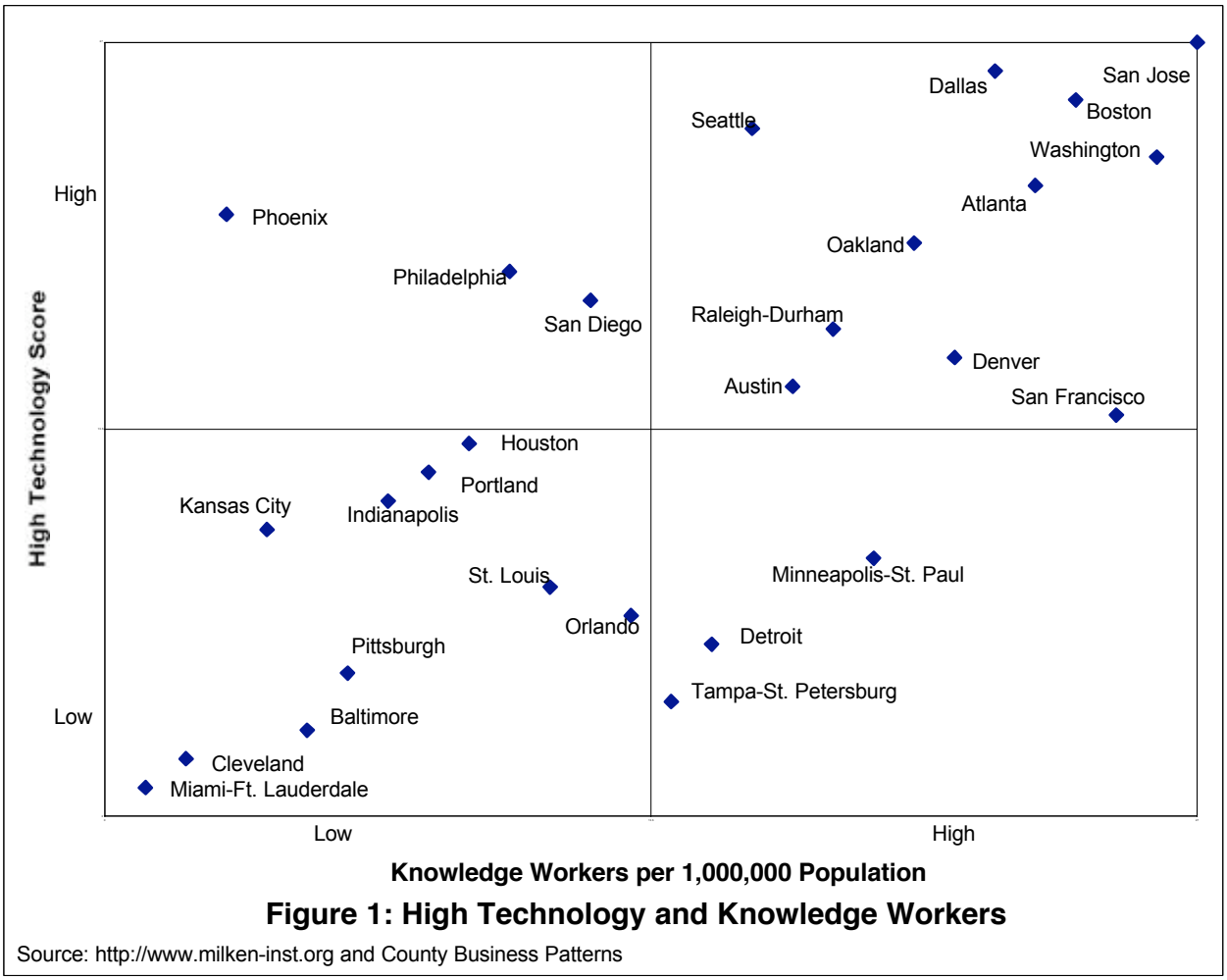


Figure 1: High Technology and Knowledge Workers

Source: http://www.milken-inst.org and County Business Patterns

3.3 Entrepreneurship, High Technology, and Knowledge Workers

Entrepreneurship – along with high technology industry and the ability to attract knowledge workers – is an essential element of regional economic growth. Table 5 presents the rankings of the 35 benchmark regions in terms of entrepreneurial activity using the rating system developed by *Cognetics*.[9] Figure 2 compares high technology and entrepreneurship and Figure 3 compares entrepreneurship and the growth rate for knowledge workers for the 35 benchmark regions. The key findings here are as follows:

- Phoenix tops the list of entrepreneurial hotspots among large cities, followed by Raleigh-Durham and Atlanta, in the 35 benchmark regions [Table 5].

- Austin tops the list of entrepreneurial hot spots among smaller cities [Table 5].

- Atlanta, Phoenix, Raleigh, Austin, Dallas, and Washington, DC rank highly as centers for high technology and entrepreneurship [Figure 2].

- Atlanta, Austin, Raleigh-Durham, Dallas, Washington, DC, Denver, and Minneapolis rank highly in terms of entrepreneurship and knowledge workers occupying the upper right-hand quadrant of Figure 3.

- Older industrial regions – namely, Pittsburgh, Cleveland and Baltimore – score poorly in terms of entrepreneurship, high technology and knowledge workers, occupying the far lower left hand quadrant of Figures 2 and 3.

Table 5: Entrepreneurial Rankings for Benchmark Regions

Large Cities		Large Cities (cont.)	
City	**Rank**	**City**	**Rank**
Phoenix-Mesa	1	Houston	27
Raleigh-Durham	3	San Francisco-Oakland-San Jose	29
Atlanta	4	Cleveland-Akron	34
Indianapolis	5	Boston	36
Orlando	6	Baltimore	37
Dallas-Fort Worth	8	Detroit	38
Washington	10	Seattle	39
Denver-Boulder	11	Philadelphia	44
Minneapolis-St. Paul	12	Pittsburgh	46
Kansas City	13		
Portland-Salem-Vancouver	19	**Smaller Cities**	
San Diego	22	Austin-San Marcos	3
St. Louis	23	Boise City, ID	7
Miami-Ft. Lauderdale	25	Cedar Rapids, IA	29
Tampa-St. Petersburg	26	Albuquerque	47

Source: David Birch, Anne Haggerty, and William Parsons, "Entrepreneurial Hot Spots," *Cognetics*, 1999: pp. 24, 26.

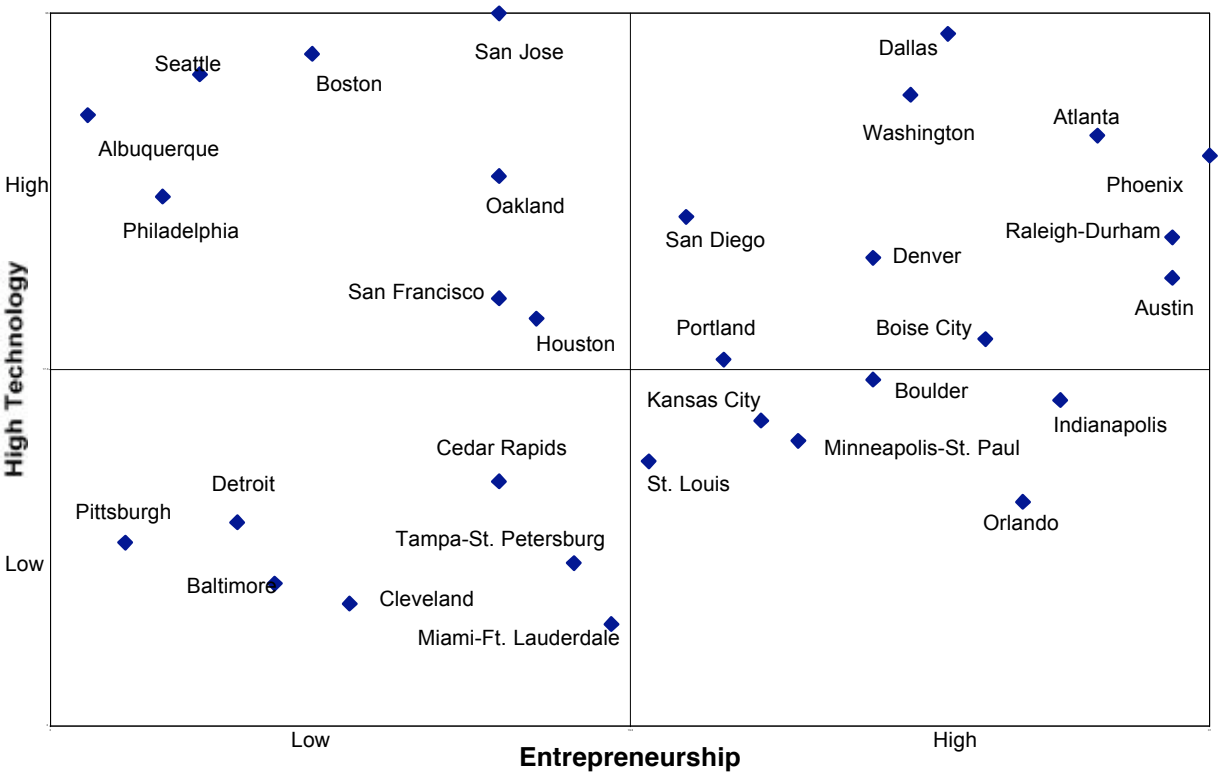


Figure 2: Entrepreneurship and High Technology

Source: http://www.milken-inst.org and David Birch, et al, "Entrepreneurial Hot Spots," *Cognetics*

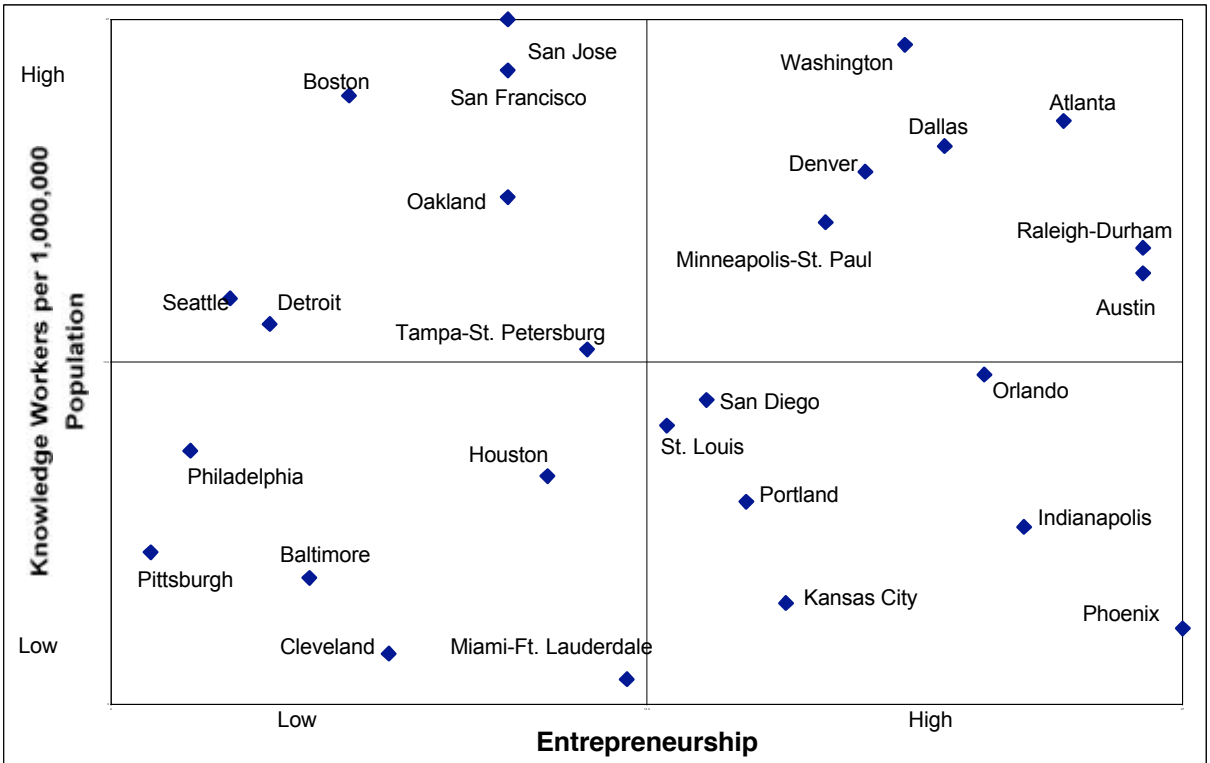


Figure 3: Entrepreneurship and Knowledge Workers

Source: County Business Patterns and David Birch, et al, "Entrepreneurial Hot Spots," *Cognetics*

4.0 THE ENVIRONMENT AND THE NEW ECONOMY

In the old economy, economic growth and the environment were typically seen to be at odds. Economic growth came at the expense of environmental quality. Indeed, the environment was viewed instrumentally as a source of raw material to be exploited and used as inputs to the production, as a vehicle for transporting raw materials or finished goods, and as a veritable dumping ground for waste and emissions. Industrial cities and regions suffered levels of air pollution so thick that managers would have to change their shirts at noon, and on some days the streetlights would be turned on at midday. Rivers were walled off from the population and in some cities occasionally caught fire.

In the new economy, environmental quality has become important not simply as an end in itself but as a prerequisite for attracting talent. Corporations have led the way in establishing a new relationship between the environment and economic competitiveness. Leading companies have pioneered new industrial systems which eliminate the century-old tradeoff between the environment and productivity, striving to achieve three zero production – zero defects (quality), inventory (just-in-time delivery), and waste and emissions.[10] These companies have also improved the design and environmental quality of their facilities to attract and motivate employees. Furthermore, leading high technology firms such as AOL have played and continue to play a leading role in "smart growth" movements to reduce congestion and limit urban sprawl in areas like Washington, Boston, the San Francisco Bay Area, and Seattle. These efforts have been motivated not only by altruistic concerns, but also by the bottom-line drive to increase profits, productivity, and performance by reducing waste and emissions and creating a cleaner, greener environment.

Regions have begun to see the environment as a source of economic competitiveness, quality-of-life, and talent attraction. Leading regions have undertaken efforts to reduce sprawl and move to smart growth, promote environmental sustainability, clean-up and reuse older industrial sites, encourage firms to adopt environmental management systems, and preserve natural assets for recreation and improved quality-of-life.

- Chattanooga, Tennessee has led the way in showing how regions can use environmental restoration, riverfront redevelopment, improved quality-of-life, and the use of natural resources for recreation cornerstones of their economic development strategy [*see Box 1: Environment Renewal as Economic Development: Chattanooga*].[11]

4.1 The Environment and High Technology Location

Surveys and other studies of high technology businesses have found that environmental quality and natural amenities are among the most important factors in their choice of locations.[12] Table 6 illustrates the importance of environmental quality as a location factor for high technology firms.

- Environmental quality was the top-rated factor for these firms, ranking ahead of housing costs, cost of living, commuting patterns, schools, climate, government services, and public safety.

- Environmental quality rated considerably ahead of CEO preference – frequently alluded to as a key location factor for high technology firms.

- Environmental quality ranked considerably higher as a location factor for high technology firms than for all firms.

Table 6: Environmental Quality and High Technology Location

High Technology Firms			All Firms	
Amenity	*Average Rank*		*Amenity*	*Average Rank*
Environmental Quality	3.00		Good Schools	2.11
Cost of Housing	3.24		Public Safety	3.89
Cost of Living	3.38		Environmental Quality	4.22
Good Schools	3.50		Cultural Amenities	4.56
Easy Commute	3.50		Proximity of Housing	4.89
Recreational Amenities	3.63		Easy Commute	4.89
Climate	3.75		Cost of Housing	5.00
Cultural Amenities	4.13		Recreational Amenities	5.22
Government Services	4.50		Climate	5.89
CEO Preference	4.50		Government Services	6.22
Public Safety	5.25		Cost of Living	6.67
Proximity of Housing	5.25		CEO Preference	6.78

Source: Paul Gottlieb, "Amenities As an Economic Development Tool: Is There Enough Evidence?," *Economic Development Quarterly*, August 1994, p. 276

Box 1: Environmental Renewal as Economic Development: Chattanooga, Tennessee

Chattanooga, Tennessee has made environmental quality and sustainable development the centerpiece of its regional economic strategy. Instead of following the traditional development model of low-cost business attraction, the city has attempted to craft a sustainable plan for development, based on environmental technology research and business creation, environmental quality, preserving natural amenities, and encouraging smart growth. In doing so, it has become a model for sustainable economic development based on the full use of all of its resources.

Chattanooga was once known as the "Pittsburgh of the South" because of its heavy reliance on high-polluting industries for economic survival. Iron foundries, textile mills, and chemical plants formed the backbone of the city's economy. As these industries began to decline and factories closed down, the city slid into a deep recession. Today, the city has committed itself to be a "laboratory" for sustainable development programs, and is often called "The Sustainable City." Chattanooga has been recognized for its sustainable vision by being named the tenth most enlightened city in the country by *Urban Quality Indicators* in 1997 and by being named one of the best places to live by *Partners for Livable Places* in 1994.

The region's economic revitalization began in 1984 with a program called Vision 2000. Vision 2000 involved 1700 citizens in 20 weeks of meetings to develop ideas for improving the city. The program produced 34 overall goals and 223 projects. By 1992, over 85 percent of the goals had been met, leading to a 1993 program called ReVision 2000, which laid out 27 more goals. These achieved goals included a revitalization of downtown with historic theaters, inns, and a waterfront park called Riverwalk (see below). In 1992, the Tennessee Aquarium opened. This $45 million facility attracted over 1.5 million visitors to the downtown area in its first year alone. Current plans call for a "zero-emissions industrial zone," which would create a mixed residential-commercial district on what is now a blighted industrial area, and reusing the "Volunteer Site," a 7000 acre site that was once home to the world's largest TNT plant. This site is to be transformed into an ecoindustrial park.

Chattanooga's redevelopment efforts have focused on eliminating pollution and transforming once-contaminated sites into centers of outdoor recreation and natural amenities. It has done so through an inclusive public process that has involved thousands of residents and businesses. For example, the city holds regular public forums on environmental issues and uses a unique "Futurescape" process that involves citizen use of videotapes to determine public preferences on land use issues.

The city's riverfront area, once heavily polluted, is being transformed into the Riverwalk, with picnic areas and a sculpture garden extending over 22 miles of riverfront, part of a projected 75 miles of greenways throughout the city. The riverfront has also been used as a site for new housing development. Riverset Apartments, the first new downtown housing development in Chattanooga in 20 years, opened in 1993 and was completely leased within eight months of opening. The complex was built on an attractive riverfront site that offers quick access to other riverfront amenities, such as the Riverwalk and the Tennessee Aquarium.

Public transit is encouraged, and the city uses locally produced electric buses to transport residents. These electric buses have had the dual impact of alleviating air pollution and serving as an exportable product for the local business community. They are free to the public, and are subsidized from concessions from a downtown multiscreen theater. The city has high hopes for a planned high-speed rail connection to Atlanta that will cut commuting time to 45 minutes between the two cities, establishing a "*Chatlanta*" corridor.

Chattanooga also encourages residents to walk from place to place through its emphasis on outdoor amenities. The riverpark is one example of this, and the city also has built several walking bridges connecting parks, the aquarium, an arts district, and the University of Tennessee.

Chattanooga illustrates how a once badly polluted industrial city can revitalize by leveraging environmental renewal and a commitment to natural assets as an integral component of its economic development strategy. Chattanooga has become a model for cities looking to achieve economic success and a higher quality-of-life for all residents while generating improved environmental quality.

The importance of environmental quality and quality-of-life is clearly reflected in the findings of a telephone survey conducted for the 1998 *Money Best Places to Live*. The survey was conducted by Roper/Starch Worldwide, and consisted of 512 households across the United States. It asked these people to rank 37 quality-of-life factors on a scale of 1-10 with 10 being the most important, providing a snapshot of what most matters to Americans in choosing a place to live. See Table 7 for the complete data.[13]

- Environmental issues were two of the top three ranked factors – clean water, which ranked first, and clean air, which ranked third.

- Economic factors, such as recent job growth, forecasted job growth, and low unemployment, ranked considerably lower.

Table 7: Importance of Factors in Choosing a Place to Live

Factor	Score
Clean Water	9.0
Low Crime	8.9
Clean Air	8.8
Good Public Schools	8.5
Low Property Taxes	8.1
Low Cost of Living	8.0
Home Appreciation	7.9
Strong Local Government	7.8
Strong State Government	7.8
Low Sales Taxes	7.7
Recent Job Growth	7.7
Cheap Medical Care	7.7
Cheap Car Insurance	7.7
Forecasted Job Growth	7.6
Low Unemployment	7.5
Low Home Price	7.3
Low Probability of Natural Disasters	7.3
Short Commute	7.2
Civic Involvement	6.8
Near Specialty Hospital	6.8
Near Colleges	6.8
Good Public Transportation	6.7
Lots of Hospital Beds	6.7
Racially Diverse	6.6
Highly Rated by Conservationists	6.6
Near National Forests	6.6
Near Lakes or Ocean	6.5
Sunny Weather	6.0
Near Museums	5.5
Major Airport Nearby	5.5
Close to Zoos	5.4
A Big City Nearby	5.1
Local Repertory Theaters	4.9
Local Amusement Park	4.8
Major League Sports	4.8
Local Symphony	4.0
Skiing Close By	3.4

512 telephone respondents rated the importance of each factor from 1-10, with 10 being the most important. These are the average scores.

Source: *Money Best Places to Live*, http://www.pathfinder.com/money/bestplaces

4.2 Regional Comparisons

To get a more systematic handle on the connection between environmental quality and the new economy, we examined the relationship between environmental quality, high technology, and knowledge workers for the 35 benchmark regions. Basically, we compared regional performance to a composite measure of overall environmental quality (air quality, water quality, and urban sprawl) to measures of high technology industry and knowledge worker attraction.[14]

The bottom line of this analysis is that there is a considerable relationship between environmental quality, high technology industry and the attraction of knowledge workers.

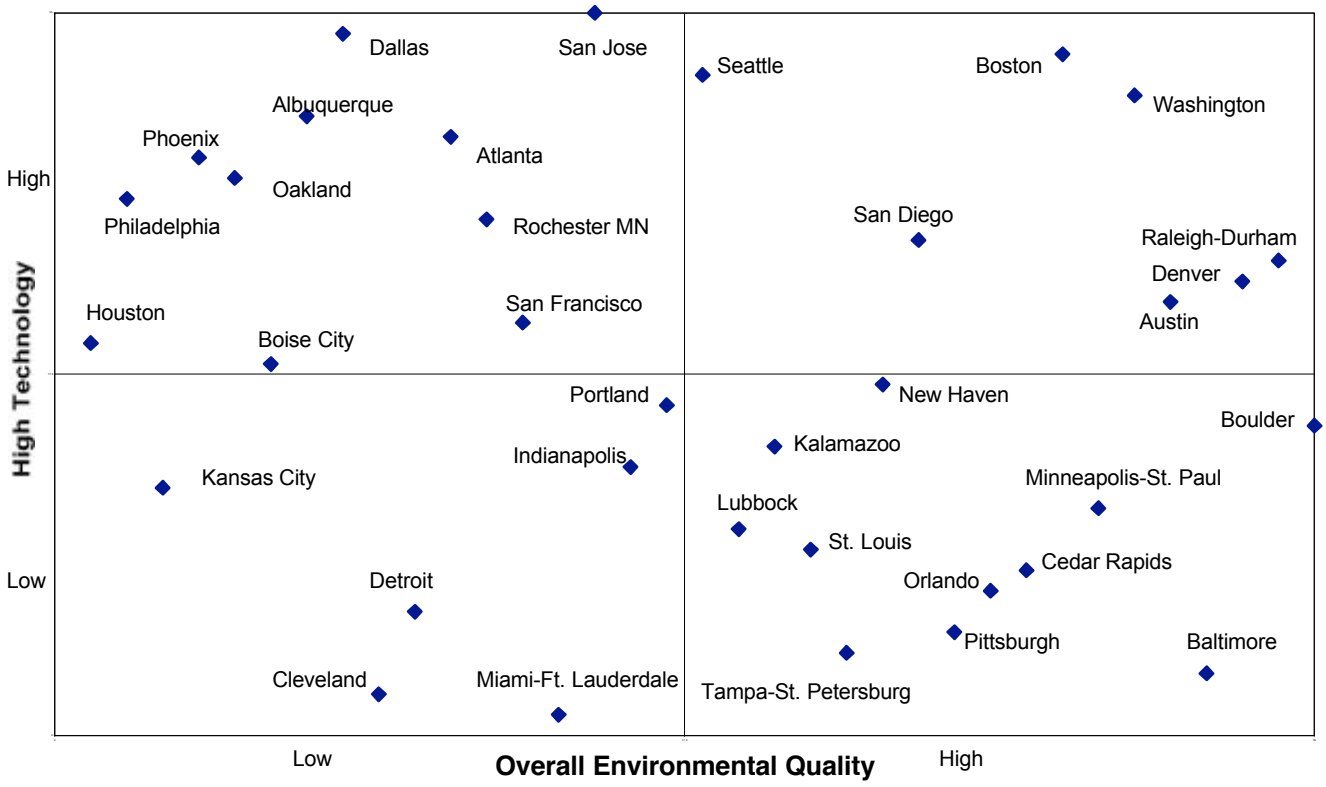


Figure 4: Environment and High Technology

Source: http://www.milken-inst.org, http://www.pathfinder.com/money/bestplaces/, and http://www.sierraclub.org/sprawl

Environmental Quality: Figures 4 and 5 compare the benchmark regions in terms on the relationship between overall environmental quality and high technology and knowledge workers respectively. The measure of environmental quality is a composite of air quality, water quality and sprawl.

- Boston and Washington DC top the list in terms of environmental quality and high technology. Denver, Austin, Seattle and San Diego also rank highly in terms of both environmental quality and high technology concentration, occupying the upper right-hand quadrant of Figure 4.

- Washington, DC, Austin, Raleigh-Durham, Denver, Boston, Seattle, Minneapolis, and Tampa score well in terms of environmental quality and knowledge workers, occupying the upper right-hand quadrant of Figure 5.

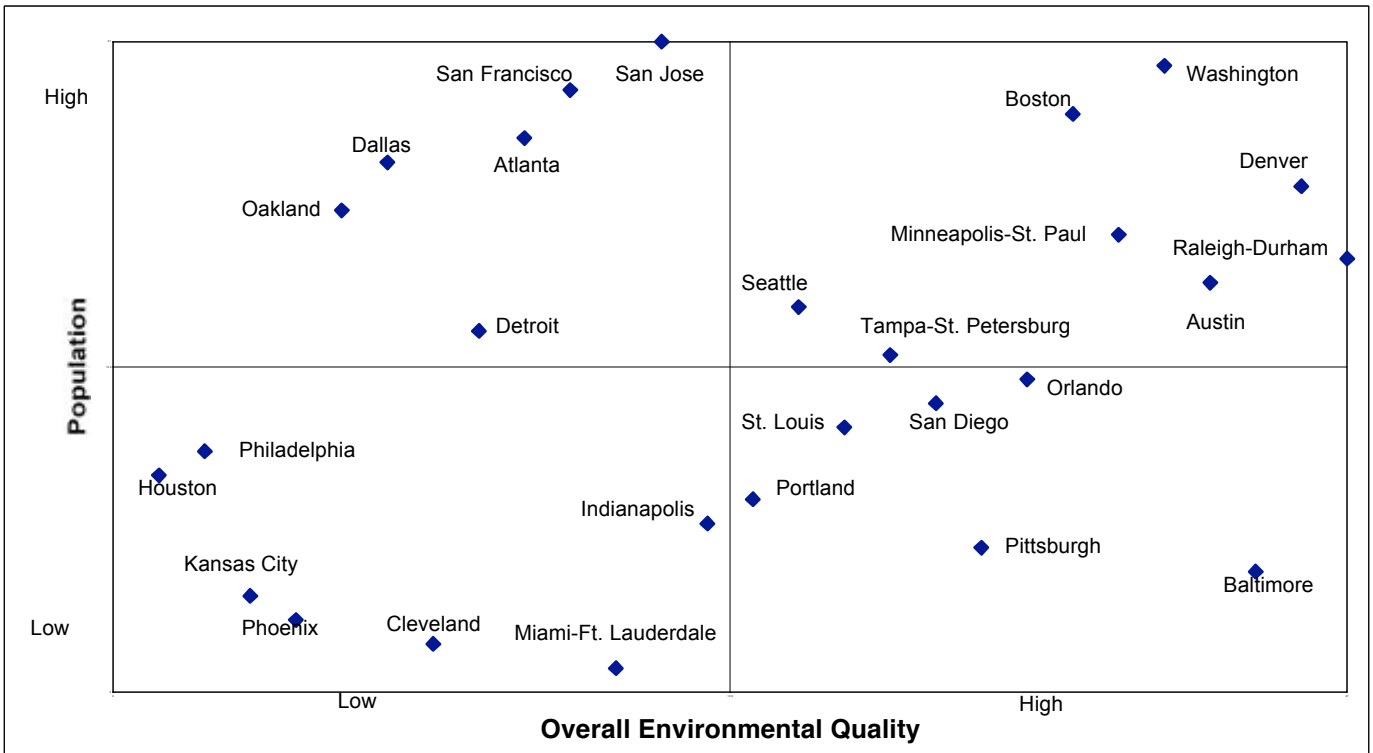


Figure 5: Environment and Knowledge Workers

Source: County Business Patterns, http://www.pathfinder.com/money/bestplaces/, and http://www.sierraclub.org/sprawl

4.3 Sprawl

The findings with regard to sprawl are mixed. A number of high technology regions have been able to develop without generating sprawl, while others are under considerable pressure. The measure of sprawl is adapted from the Sierra Club's ranking of *sprawl threatened* cities [see Table 8].

- A handful of successful high technology regions – notably San Jose, Boston, and San Francisco – appear to have been reasonably successful in developing a high technology economy without putting themselves at risk for urban sprawl. While traffic congestion may well be an issue in these regions, they did not make the Sierra Club's list of cities that are most threatened by sprawl.

- Several other leading high technology regions appear to be threatened to some degree by sprawl. Atlanta, Seattle, Austin, Denver, Dallas, Raleigh, and Washington DC all placed high on the Sierra Club's 1998 list of cities at risk for sprawl.

Table 8: Sprawl Rankings for Benchmark Regions

Large (1 million and over)

City	Sprawl Risk Rank
Atlanta	1
St. Louis	2
Washington	3
Cincinnati	4
Kansas City	5
Denver	6
Seattle	7
Minneapolis-St. Paul	8
Ft. Lauderdale	9
Chicago, IL	10
Detroit	11
Baltimore	12
Cleveland	13
Tampa	14
Dallas	15
Hampton Roads	16
Pittsburgh	17
Miami	18
San Antonio	19
Riverside/San Bernardino	20

Medium (500,000-1 million)

City	Sprawl Risk Rank
Orlando	1
Austin	2
Las Vegas	3
West Palm Beach	4
Akron	5

Small (200,000-500,000)

City	Sprawl Risk Rank
McAllen, TX	1
Raleigh	2
Pensacola, FL	3
Daytona Beach, FL	4
Little Rock, AR	5

Dishonorable Mentions

City	Sprawl Risk Rank
Los Angeles	1
San Diego	2
Phoenix	3

Source: The Sierra Club, http://www.sierraclub.org/sprawl/report98/map.html

Sprawl poses a particularly vexing problem for rapidly growing high technology regions. Part of their appeal in the first place came from their manageable size and high quality-of-life. Growth generates pressures that threaten these qualities. A rapidly growing high technology economy brings with it social and environmental costs as a consequence of greater industrial activity and population growth. Deteriorating air quality, traffic congestion, and damage to natural amenities are some of the negative outcomes that challenge prospering high technology regions. In extreme cases, unmanaged growth may eventually destroy the appeal of a region and create an impediment to growth and make other regions relatively more attractive location choices.

4.4 Smart Growth Strategies

A number of high technology regions are taking active steps to try to address the challenges created by sprawl by introducing smart growth campaigns and sustainable development strategies.

- Seattle has developed a strong sustainability agenda. Portland, Oregon has implemented a smart growth strategy and in some instances tied the expansion of high technology plants to environmental considerations.

- Austin, Texas has made smart growth one of two pillars of its high technology economic strategy – the other being the continued development of its high technology

clusters [*Box 2: Smart Growth and Austin's High Technology Strategy and Box 3: Austin's Sustainability Matrix*].[15]

- Portland, Oregon, known for its growth boundaries, has implemented a program of financial penalties designed to discourage excessive growth by one of its largest employers, Intel, Inc. Intel has said that it expects to create fewer than 1,000 manufacturing jobs over the next 15 years. If the company exceeds that target, it must pay the county a fine of $1,000 per year for each additional employee.[16]

5.0 LIFESTYLE AND AMENITIES IN THE NEW ECONOMY

In the new economy, the ability to attract talent creates regional advantage. Talent has become the single most critical factor of production. Contrast this with the old economy. In the mass production era, regional competition revolved around the competition for firms. The location decisions of firms drove regional economies, and the location decisions of people followed from the location of firms. For regions, the key was to combine endowments of natural resources or energy with advantages of transportation systems, labor costs, and/or business incentives to attract firms and industry.

The new economy dramatically alters this calculus. In the knowledge economy, those places that have talent thrive, while those that do not decline. Knowledge workers are both highly mobile and eagerly sought after by technology employers, and thus have the option of locating virtually anywhere they desire. At the same time, regional growth increasingly turns upon the ability to generate, attract, and maintain the talent base needed to create and grow technology-based companies. Simply put, regional advantage accrues to places that offer the lifestyle advantages required to attract talent, as well as economic and career opportunity and the ability to attract or create firms.

Indeed, pioneering research by University of Chicago economist Robert Lucas and Harvard University urban economist Edward Glaeser and his colleagues suggests that the key to regional competitiveness lies in the ability to attract high-skilled people or human capital and to generate ideas. In their view, successful cities and regions are those that attract human capital and reduce the costs associated with generating ideas and turning them into successful products.[17] Glaeser's research indicates that regional growth is strongly correlated with the human capital level or level of educational attainment. He also finds that the need to access common pools of labor or talent rather than access to suppliers and customers is what drives the tendency of firms, including high technology firms, to cluster together in regional complexes. These findings are leading a whole generation of "new urban economists" and "new economic geographers" to the conclusion that *non-market* forces and interactions increasingly lie at the heart of regional economic development.

Another way of saying this is that sociological factors are increasingly as important – if not more important – than economic factors in generating and sustaining regional advantage in the new economy.[18] These sociological factors revolve around creating the broad environment that is attractive to talent. In the new economy then, the *quality* of a region's lifestyle has as much to do with its success as its business cost structure, taxes, or physical location. How else can one explain the tremendous success of the highest cost locations – regions like Silicon Valley, the greater Boston area, Washington DC, and Seattle. A key dimension of regional advantage turns on the ability of a place to capture the

Box 2: Smart Growth and Austin's High Technology Strategy

Austin, Texas has developed a two-pronged strategy for its economic future: high technology and smart growth along with lifestyle amenities. In 1998, the Greater Austin Chamber of Commerce undertook a new regional strategy outlined in a report entitled *Next Century Economy*. This report examined where Austin had come from in its economic turn-around and where it needed to go to sustain that economic prosperity. It outlined a vision for "creating sustainable advantage." The report identified three strategies for the city to follow in developing sustainable advantage.

The first strategy involved bolstering the region's already thriving high technology economy by improving communication between the region's economic clusters and their suppliers, improving the economic foundations of existing businesses, leveraging "cluster based" R&D at the University of Texas, and implementing business attraction strategies to attract firms to complement existing industries by filling supply gaps in existing clusters.

The second strategy called for the region to "ensure environmental quality and social opportunity by explicitly linking social and environmental goals to economic development goals." The strategy called for programs to protect the region's high quality-of-life from the pressures created by rapid economic growth. Additionally, the report called for more effective land use and transportation planning by linking planning processes to the needs of cluster industries to maximize their future growth. As the report argued, "addressing social and environmental issues are also increasingly key to maintaining support for future growth."

The third strategy involved developing a regional collaborative mechanism for major problem-solving, in particular for linking high technology development to smart growth and amenities.

The report outlined the strategy as follows:

> *A clean and well-managed environment and an economy that provides job opportunities for all its residents, are important community objectives. But given Austin's economic direction, environmental and social issues are important for a second reason: they are also critical inputs to its long-term economic competitiveness. If Austin's robust technology-driven economy has one weakness, it is a chronic labor shortage in technical fields…Similarly, if Austin is to keep its skilled workforce and continue to attract people from other regions, it will have to offer more than high wages – many regions can offer high wages. The region will need to leverage its quality-of-life: its clean environment, recreational opportunities, and stimulating cultural scene…If the region is to continue to grow and develop, it must take full advantage of all of its assets. It also means that the assets that have made the economy what it is, such as its workforce capabilities and its quality of life, receive the reinvestment necessary to keep them strong.*

The Austin case shows that far-sighted regions are recognizing that continued success in the high technology economy will turn on the ability to deliver environmental quality, natural amenities, and the lifestyle desired by knowledge workers.

Box 3: Austin's Capital Improvements Sustainability Matrix

Austin launched its Sustainable Communities Initiative in July 1996. This initiative focuses on the combined social, economic, and environmental issues of new development, building upon Austin's existing record of sustainable development. As part of this initiative, a Capital Improvements Sustainability Matrix was created to assist city leaders in making decisions about major new infrastructure investments.

The initiative starts from the premise that capital improvements are a major factor in determining a city's long-term sustainability, and since the city is the largest investor in such improvements, it must have a mechanism for determining their impact on the sustainable agenda. The matrix is part of the community review process and provides a way for city officials to examine the social, economic, and environmental impacts of major new investments. It scores projects on the following objectives:

> *equity issues such as investing in economically/socially disadvantaged areas of the region; economic issues such as maintaining and optimizing use of existing infrastructure; and environment issues such as minimizing impact on ecologically sensitive areas by making appropriate strategic location decisions…reducing sprawl by supporting favored growth areas; reducing/eliminating emissions that are harmful to human health, ecosystem functioning, or climate stability; and designing projects with aesthetic qualities and heritage value.*

The matrix consists of a series of scores in various weighted criteria, as follows:

- Public Health and Safety – 13
- Maintenance – 13
- Social Justice – 12
- Neighborhood Impact – 11
- Socio-economic Impact – 10
- Land Use – 10
- Coordination with Other Projects – 6
- Alternative Funding – 5
- Air Impact – 4
- Water Impact – 4
- Energy Impact – 4
- Biota Impact – 4
- Green Building – 4

Austin's Capital Improvements Sustainability Matrix is a useful tool in looking comprehensively at the long-term social, economic, and environmental impacts of proposed infrastructure investments and reflects the city's deep commitment to environmental quality, smart growth, and natural amenities.

imagination, dreams, and desires of young knowledge workers who are making location decisions. In recent years, a growing number of regions have developed strategies to bolster their amenities and attract knowledge workers by developing amenities associated with the new economy [*Box 4: Quality-of-life as Economic Development Strategy: Burlington, Vermont*].[19]

Box 4: Lifestyle Matters - Burlington, Vermont

Burlington has used lifestyle as a lever for economic development. A smaller city on the banks of Lake Champlain, Burlington is becoming a growing center for knowledge workers and high technology industry. The city ranked fifth in *POV* magazine's list of the top 75 "boomtowns" in America and fourth in the *Utne Reader* list of America's "Most Enlightened Cities."

Burlington has sought to combine economic development, environmental health, and outdoor amenities into a powerful package for generating sustainable economic advantage. The city has combined entrepreneurship, commitment to diversity, progressive and participatory civic culture, and commitment to the environmental and natural amenities to spur economic development. It has encouraged local business ownership and it has leveraged assets such as the University of Vermont and its proximity to Lake Champlain. The presence of the University of Vermont is an important part of the lifestyle mix and serves as an attraction for students, professionals and entrepreneurs. Burlington has actively worked to revitalize its waterfront along Lake Champlain and to make public transportation seamless and accessible to all residents. The city views entrepreneurship and progressive government as complementary, not contradictory.

Burlington has emphasized natural amenities and outdoor recreation. While cities like Austin and Seattle are known for their music scenes and nightlife, Burlington boasts of excellent skiing in the winter and boating, hiking, and cycling in the summer. It has been rated a top "walking city" by *Walking Magazine*, due in part to the city's commitment to maintaining and restoring historic sites. The city has tried to insure that all citizens can benefit from the waterfront area, adding a nine-mile bike path with a view of the Adirondack Mountains and, instead of a private yacht club, a community boathouse where anyone can rent sailboats. The city was a pioneer in the development of a pedestrian mall near the University of Vermont. The pedestrian mall was created by actually closing a street between the university and the waterfront and working to attract high-end retail establishments to the location. In contrast to failed pedestrian malls in other cities, Burlington's mall has been successful, with a combination of upscale retailers like the Gap or Banana Republic and locally-owned establishments like used book stores and coffee shops. It also boasts a redeveloped waterfront, park space, beaches, and a wildlife refuge along a 6.5-mile walking and cycling path, which extends all the way around Lake Champlain. The city has long been at the forefront on recycling, green design, and sustainability. It converted an industrial zone into the Pine Street business incubator, which now provides office space for over 80 start up companies.

With its commitment to natural amenities, youthful orientation, environmental quality, and quality-of-life, Burlington has become an increasingly attractive place for knowledge workers and a growing cadre of entrepreneurial high technology enterprises. With a strong commitment to sustainable development, Burlington can continue to grow without losing the natural assets that have made it so attractive.

5.1 Talent Retention versus Attraction

A 1999 study by the Southern Technology Council examined the migration trends of recent high school and college graduates in science and engineering fields using data from the National Science Foundation.[20] Its key findings are as follows:

- Overall, the report found that the ability to ***attract*** talent was more important than the ability to retain it. This is an important point given that many states and regions are developing talent retention strategies to retain existing people or lure back those that have moved away. This report suggests that broader efforts to attract talent on a national scale are likely to be more efficacious in the long run.

- The top states in terms of talent retention were California, Texas, Massachusetts, Michigan, and several others. These states retained between 67 and 84 percent of their college graduates in science and engineering fields and between 60 and 81 percent of their high school graduates in science and engineering fields. Leading high technology states were consistently in the first and second quartiles on this measure.

- The top states in terms of talent attraction were New Jersey, Vermont, California, and Texas. New Jersey and Vermont attracted between 1 and more than 2 times the number of college graduates, while California and Texas attracted from 1.15 to more than 1.5 times the number of high school students they graduated. Again, leading high technology states were consistently in the first or second quartile on this measure. The report notes that retaining high school graduates – that is, sending them to high-quality colleges and universities in-state – is an important step in retaining talent generally.

5.2 Amenities and Regional Performance: Regional Comparisons

To better establish the relationship between talent, amenities and regional performance, we compared regions on the basis of their amenities and their ability to generate high technology industry and attract knowledge workers. We did this for the 35 benchmark regions following the same basic methodology used in the section on the environment. The bottom line of the analysis is clear: leading high technology regions are also high amenity regions. The more specific findings are as follows:

Overall Amenities: Three high technology regions – Boston, Washington, and Seattle – score very highly in terms of overall amenities and high technology development and are located in the far upper right corner of Figure 10. We measure overall amenities as a combination of arts and culture and more youth-oriented amenities.[21]

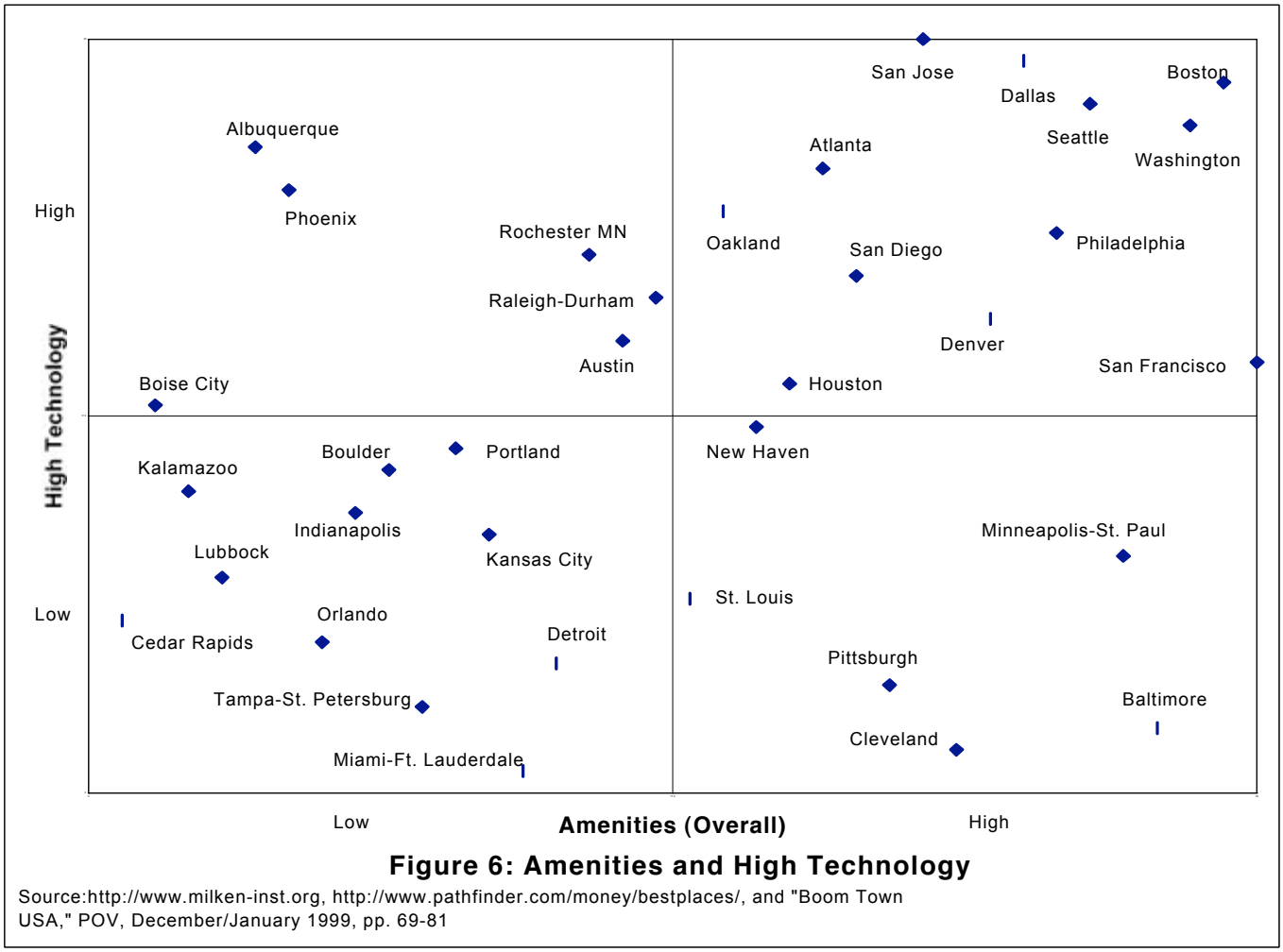


Figure 6: Amenities and High Technology

Source:http://www.milken-inst.org, http://www.pathfinder.com/money/bestplaces/, and "Boom Town USA," POV, December/January 1999, pp. 69-81

- Washington DC, San Francisco, and Boston score very highly in terms of overall amenities and knowledge workers occupying the far upper right-hand quadrant of Figure 11. San Jose, Dallas, Minneapolis, Seattle, Denver, and Atlanta also fare reasonably well on this measure.

- A number of mainly older industrial regions such as Baltimore, Cleveland, St. Louis, and Pittsburgh occupy the lower right-hand quadrant of both charts. These regions have not generated high technology growth despite their reasonable level of amenities. This suggests that the overall amenity packages of these regions may not be compatible with the demands of knowledge workers.

NEW VERSUS OLD ECONOMY AMENITIES

There is a considerable difference between the amenities of the new and the old economies. The old economy emphasized “big ticket” amenities like professional sports, the fine arts (e.g., opera, classical music, and the theater), and cultural destinations (e.g., museums and art exhibits). New economy amenities typically revolve around outdoor recreational activities and lifestyle amenities. While there is not much in the way of systematic and comparable data that

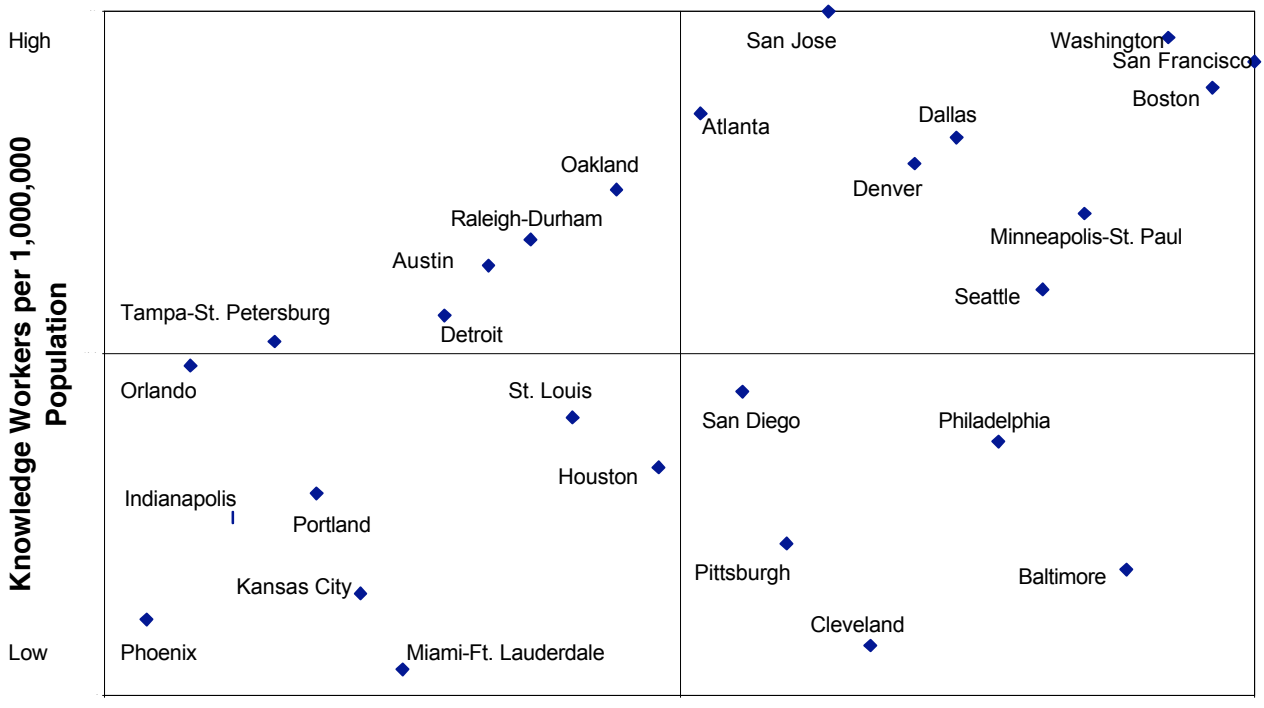


Figure 7: Amenities and Knowledge Workers

Source: County Business Patterns, http://w w w .pathfinder.com/money/bestplaces/, "Boom Tow n USA," *POV*, December/January 1999, pp. 69-81

allows one to examine these differences, we constructed a variety of measures to probe the differences between new and old economy amenities.

Arts and Culture: Amenities like symphonies, opera companies, museums, and art galleries are certainly desirable, but there is not a clear relationship between arts and culture and either high technology industries or the ability to attract knowledge workers.[22] A number of leading high technology regions are also exceptionally endowed in terms of arts and culture. However, other leading high technology regions score rather poorly on this measure. Furthermore, several regions that score low in terms of both knowledge workers and high technology score relatively highly in terms of arts and culture. This leads to the conclusion that while arts and cultural amenities are helpful in attracting high technology industries and knowledge workers, they alone are not enough, as other amenities come into play.

- San Jose, Boston, and Washington score very highly in term of arts and culture and high technology development, occupying the far upper right-hand quadrant of Figure 12, while Seattle and Dallas also score quite highly on this measure.

- Washington, Boston, and San Francisco top the list in terms of arts and culture and knowledge workers, occupying the far upper right-hand quadrant of Figure 13. San Jose, Dallas, Oakland, Denver, Seattle, Minneapolis, and surprisingly Detroit also score reasonably well on this measure.

- A number of a regions that have been successful in generating high technology and attracting knowledge workers – particularly Austin and Raleigh-Durham - score poorly in terms of arts and culture.

- Several regions that rank relatively low in terms of high technology industry and/ or knowledge workers – such as Baltimore, Philadelphia, Detroit, and Cleveland – have among the highest rankings in terms of arts and culture.

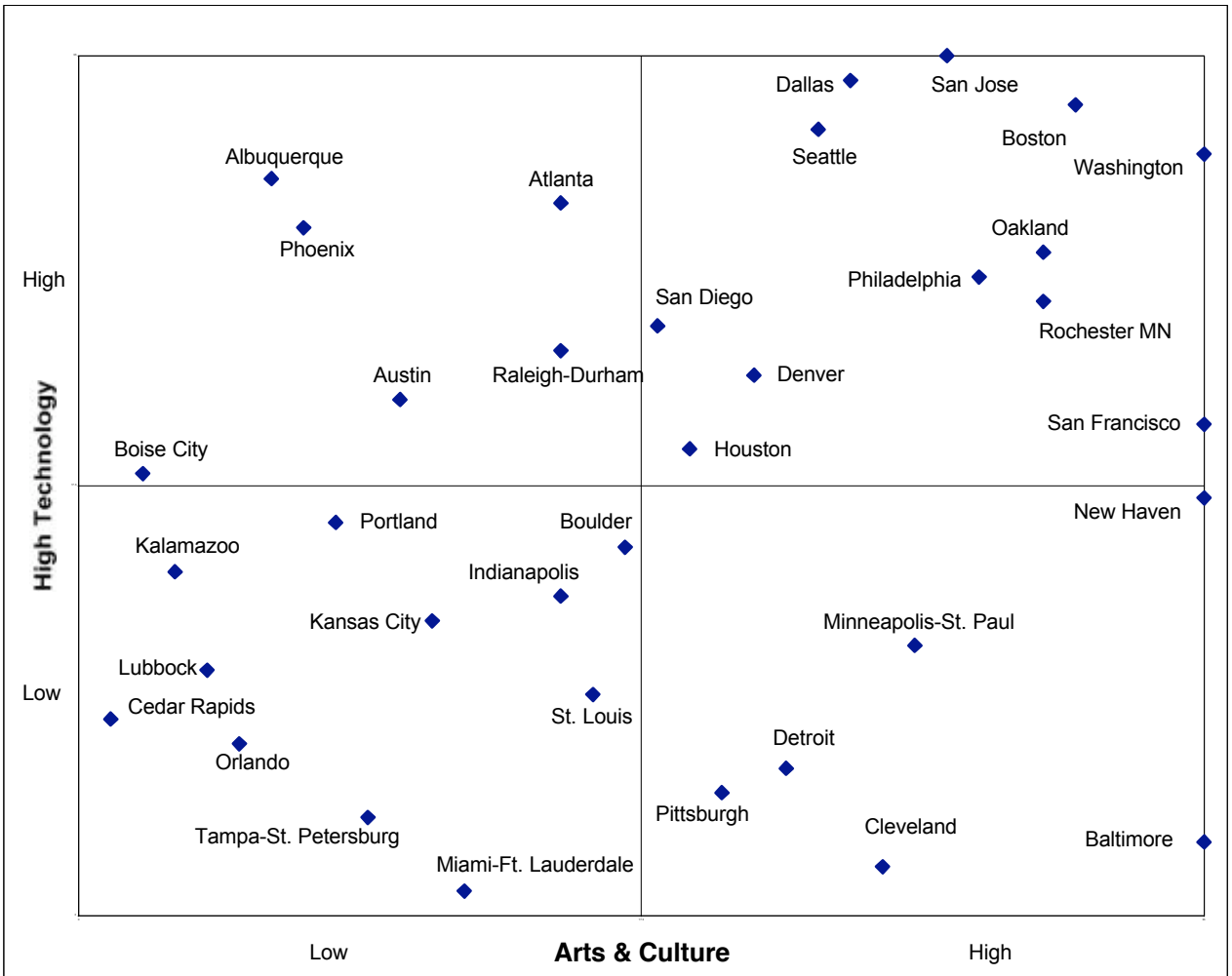


Figure 8: Arts and Culture and High Technology

Source: http://www.milken-inst.org and http://www.pathfinder.com/money/bestplaces/

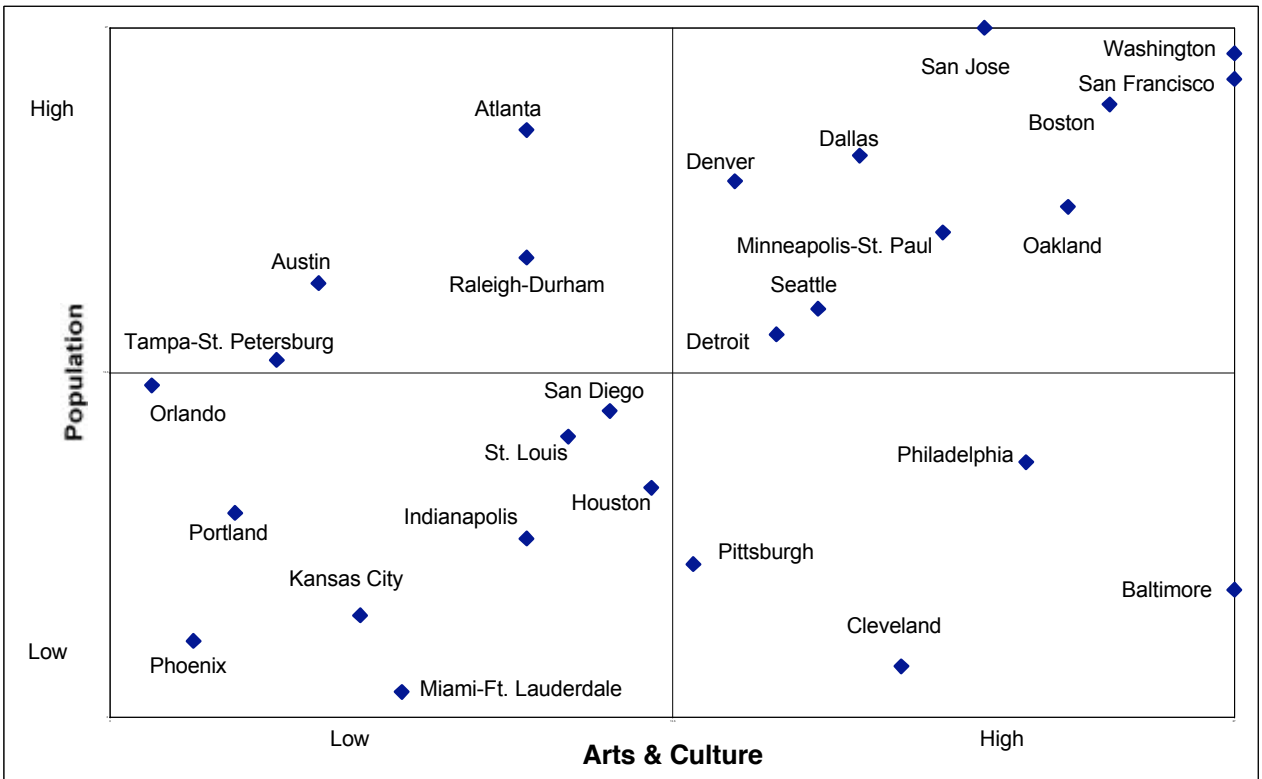


Figure 9: Arts and Culture and Knowledge Workers

Source: County Business Patterns and http://www.pathfinder.com/money/bestplaces/

Professional Sports: While professional sports are increasingly seen as a mechanism for achieving "big league" status and attracting talent, the data suggest that there is little relationship between them and high technology or knowledge workers.[23]

- While a number of leading high technology regions – Boston, Washington DC, Seattle and Dallas – score highly in terms of professional sports, others score quite poorly [see Figures 14 and 15].
- Indeed, many successful high technology regions – notably Austin and Raleigh-Durham – have little or no professional sports presence at all.
- Regions such as Pittsburgh and Cleveland have a high level of professional sports but a low level of high technology and knowledge workers.
- Several regions - Kansas City, Baltimore, Indianapolis, Orlando and Portland – occupy the lower left hand quadrant of Figures 12 and 13, scoring relatively poorly in terms of professional sports presence, knowledge workers, and high-technology.

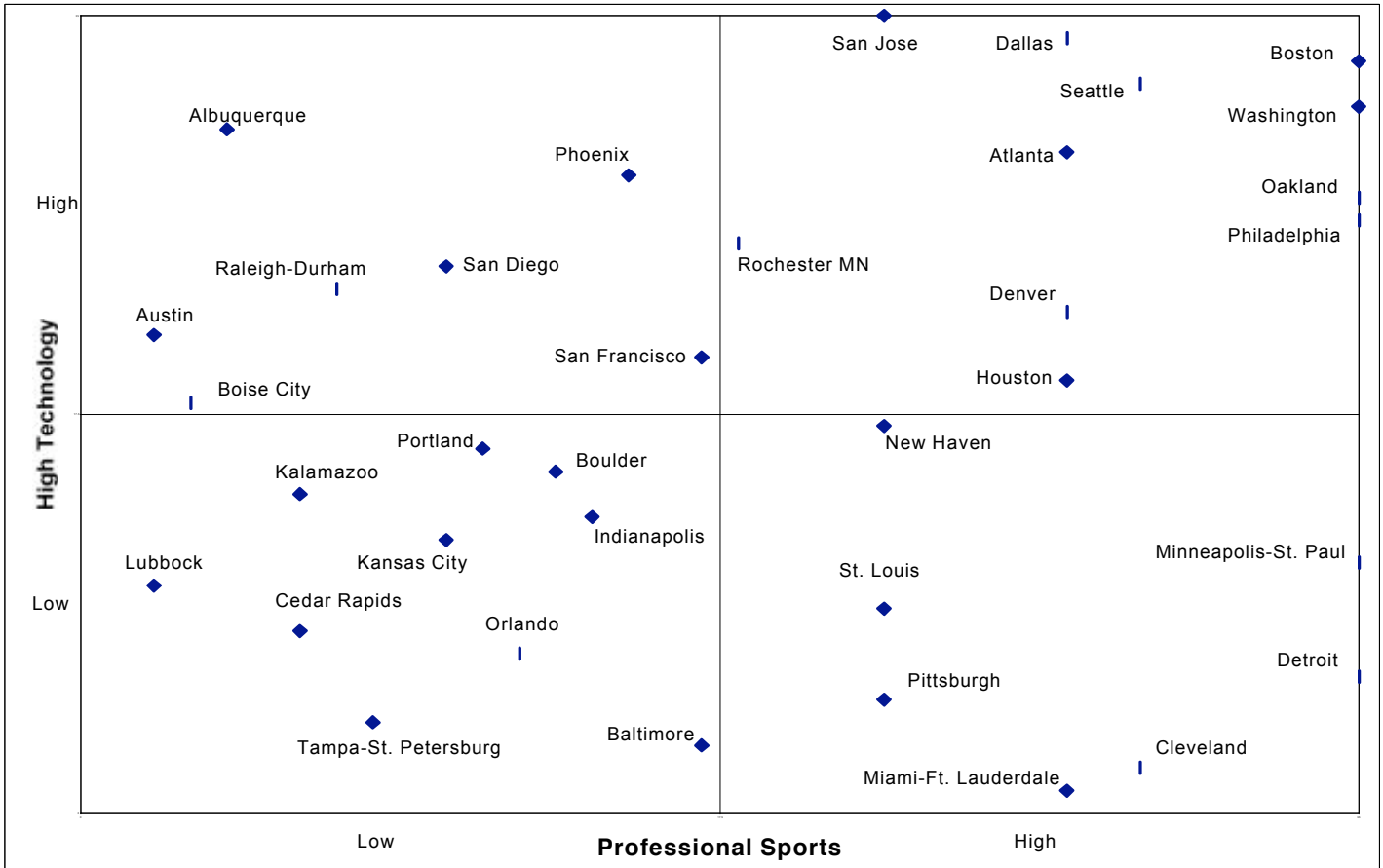


Figure 10: Professional Sports and High Technology

Source: http://www.milken-inst.org and http://www.pathfinder.com/money/bestplaces/

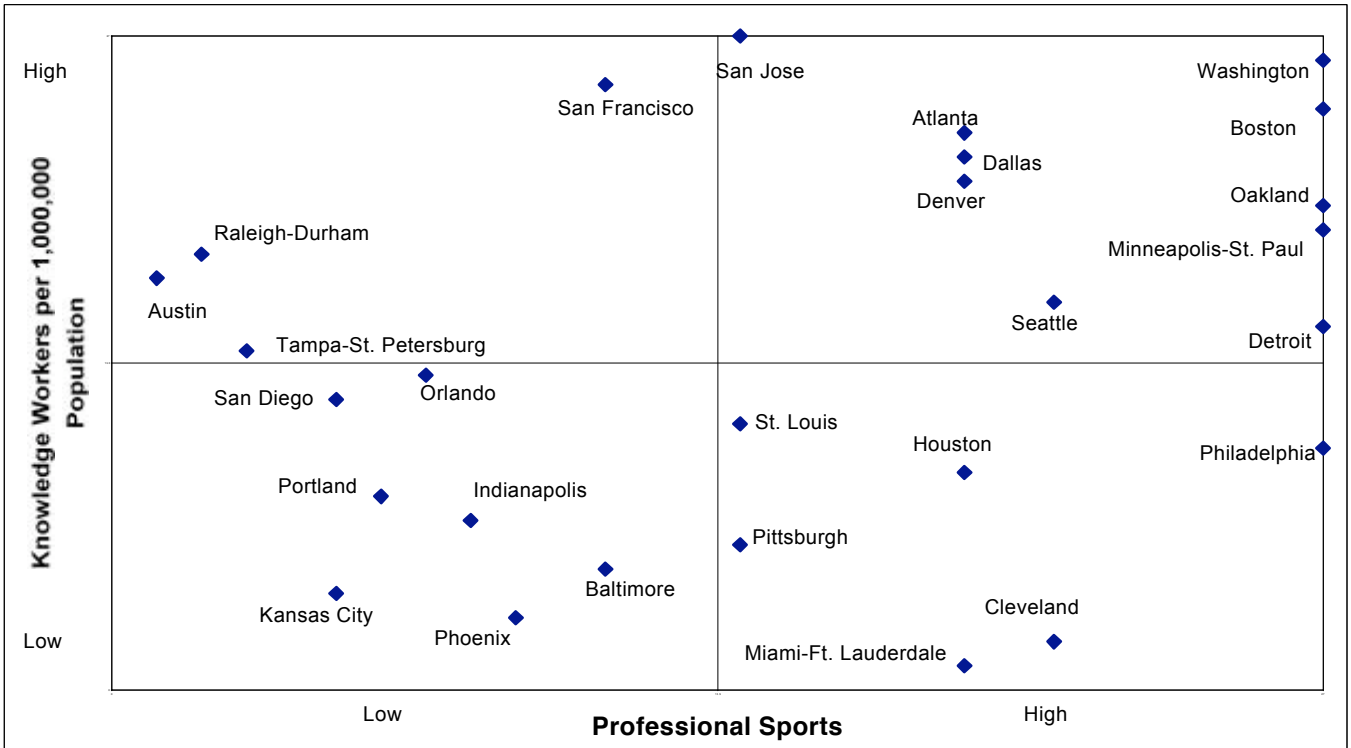


Figure 11: Professional Sports and Knowledge Workers

Source: County Business Patterns and http://www.pathfinder.com/money/bestplaces/

Coolness: A *coolness* indicator was developed by *POV Magazine* to measure a region's appeal in terms of amenities like nightlife, bars, and restaurants. There appears to be some relationship between this "coolness" measure, high technology development, and knowledge workers.[24]

- Leading high technology regions like Boston, Seattle, Austin, and San Francisco score highly in terms of the coolness measure and high technology [Figure 18]. The same regions also score highly in terms of the coolness measure and knowledge workers [Figure 19]. Atlanta, Denver, Minneapolis, and Dallas also score reasonably on these measures.

- A number of regions – Houston, St, Louis, Pittsburgh, Orlando, and Portland - score relatively highly in terms of the coolness measure but rank low in terms of high technology and knowledge workers.

- Indianapolis, Kansas City, Baltimore and Cleveland occupy the lower left hand quadrant of Figures 16 and 17, scoring relatively poorly in terms of the coolness measure, high technology and knowledge workers.

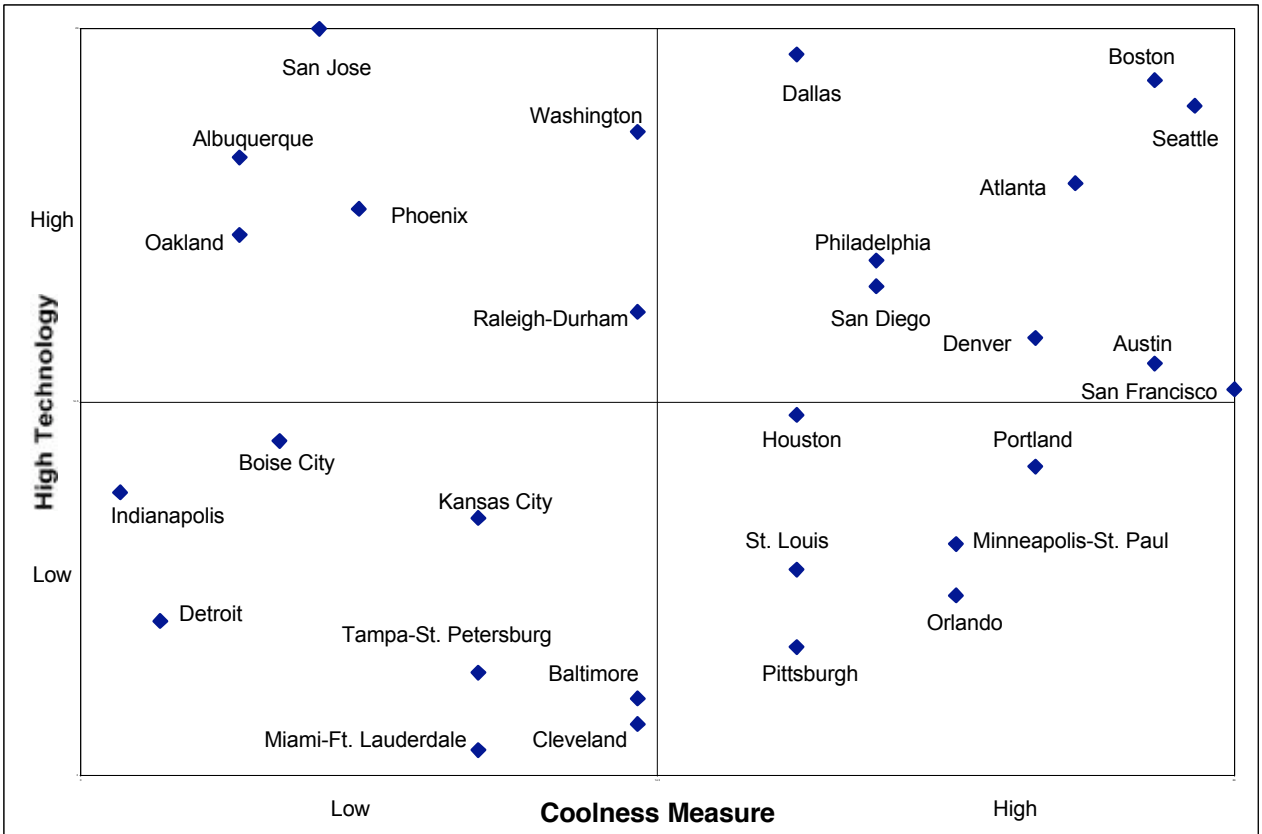


Figure 12: Coolness and High Technology

Source: http://www.milken-inst.org and "Boom Town USA," POV, December/January 1999, pp. 69-81

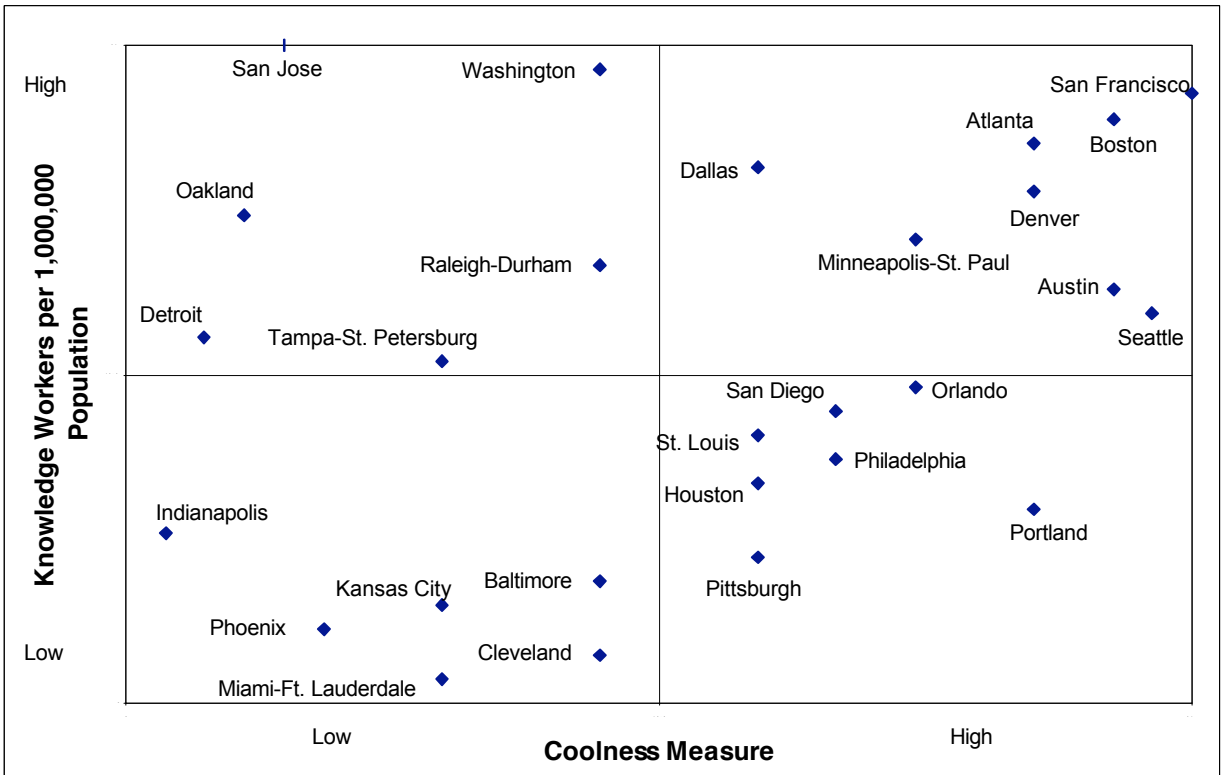


Figure 13: Coolness and Knowledge Workers

Source: County Business Patterns and "Boom Tow n USA," *POV* , December/January 1999, pp. 69-81

Outdoor recreation: While there are currently no accurate measures of outdoor recreational amenities such as kayaking or cycling, there are a number of specific measures and lists that collect such information.

- Seattle, Portland, and San Francisco, all leading high technology centers, make the list of top cycling cities [Table 9].[25]
- Austin, Seattle, Boston, and Washington as well as Portland and Minneapolis make the list of large walking cities [Table 10].
- Raleigh, Chattanooga, and Boulder make the list of the top medium-sized walking cities [Table 10].[26]

Table 9: Best Cycling Cities

Rank	City	High Technology	Knowledge Workers
1	Montreal	-	-
2	Portland	20	7
3	Tucson	-	-
4	Seattle	4	11
5	Toronto	-	-
6	Austin	15	1
7	Denver	14	5
8	San Francisco	16	20
9	Philadelphia	10	26
10	Chicago	-	-

Source: Alan Cote, "The Best Cycling Cities," *Bicycling,* March 1999, p. 53

Table 10: America's Best Walking Towns

Large Cities (over 350,000)

City	High Technology	Knowledge Workers
Washington, DC	13	5
Minneapolis, MN	12	25
Portland, OR	20	7
Austin, TX	15	1
Seattle, WA	4	11

Medium Cities (50,000-350,000)

City	High Technology	Knowledge Workers
Boulder, CO	21	-
Portland, ME	-	-
Raleigh, NC	13	3
Chattanooga, TN	-	-

Small Communities (under 50,000)

City	High Technology	Knowledge Workers
Eureka Springs, AK	-	-
Clayton, CA	-	-
Dunedin, FL	-	-
Exeter, NH	-	-
Xenia, OH	-	-
Burlington, VT	-	-

Source: McGovern, "America's Best Walking Towns," *Walking Magazine*, May 1998, p. 55

Diversity: Focus group evidence indicates that one of the most important amenities desired by young knowledge workers is a diverse cultural and demographic population. Gary Gates at Carnegie Mellon University's H. John Heinz III School of Public Policy and Management has researched the issue of local and regional diversity and developed a proxy measure (which we will call the Diversity Index) of regional diversity by measuring the concentration of gay couples within Metropolitan Statistical Areas. This reflects a region's openness and attractiveness to alternative lifestyles, a characteristic that was noted as a key element of diversity by knowledge workers in the focus groups. While not a perfect measure of diversity, it does provide a reasonable proxy for the kind of cultural and lifestyle diversity those young knowledge workers seem to desire.[27]

- The data, shown in Figures 16 and 17, suggests a high degree of correlation between the Diversity Index and a region's success in attracting high technology businesses and knowledge workers. It would appear that successful high technology regions are also regions that support and promote demographic diversity.

- Leading high technology regions – Washington DC, Boston, Seattle, Austin, and San Francisco – all score highly in terms of diversity and high technology and knowledge workers.

- Regions such as Indianapolis, Kansas City, Pittsburgh, Cleveland score relatively poorly in terms of diversity, high technology, and knowledge workers.

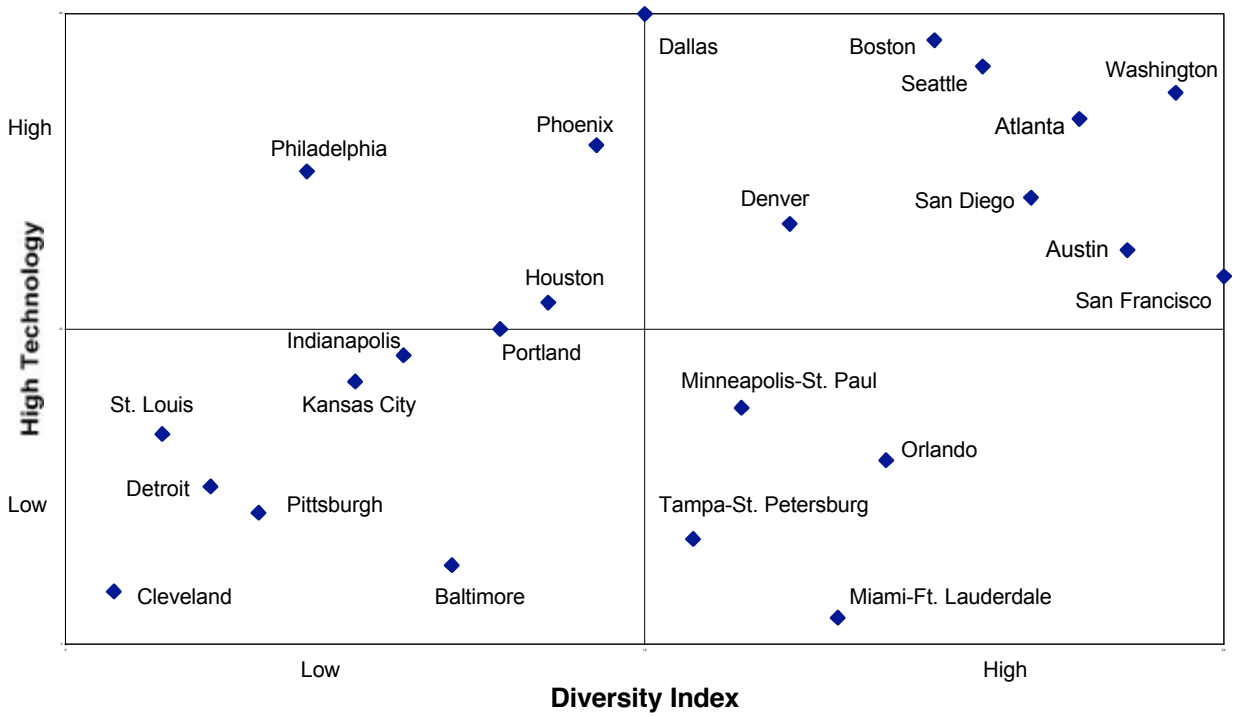


Figure 14: Diversity and High Technology

Source: http://www.milken-inst.org and Gates, et al, *Why Do Gay Men Live in San Francisco?* , 1997

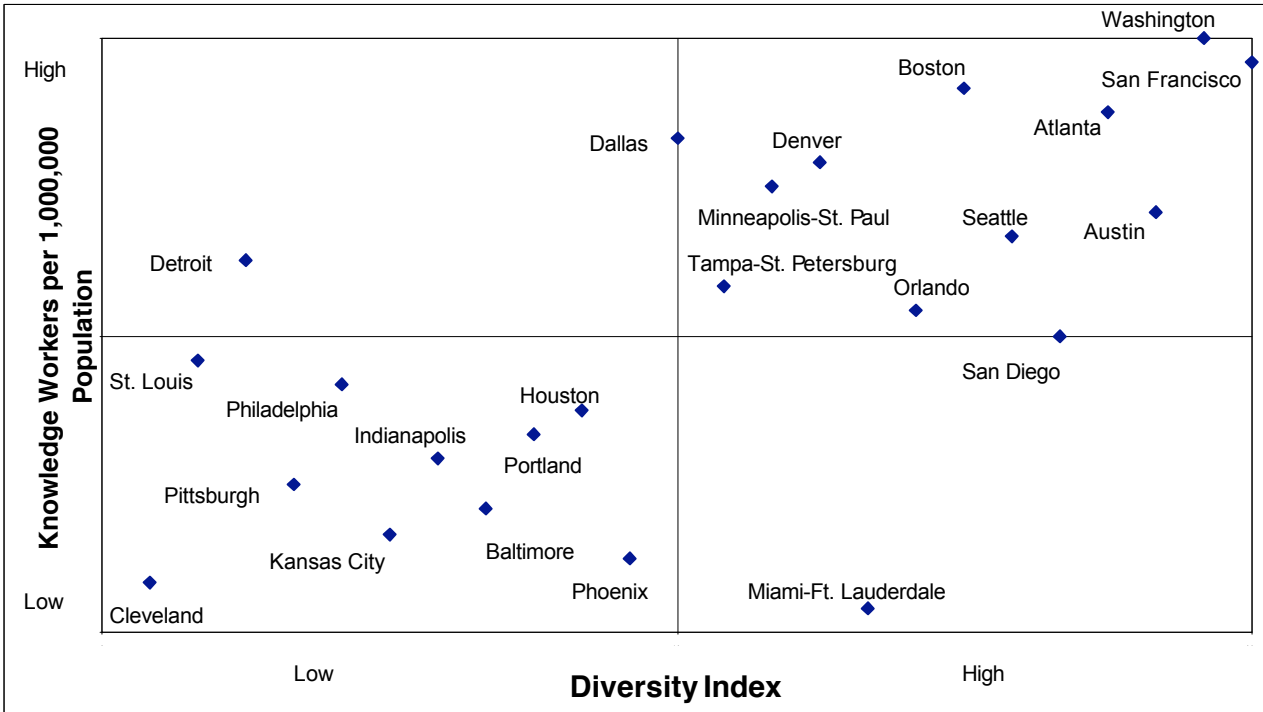


Figure 15: Diversity and Knowledge Workers

Source: County Business Patterns and Gates, et al, *Why Do Gay Men Live in San Francisco?* , 1997

5.3 Econometric Research

Econometric research conducted by a team of Carnegie Mellon researchers provides additional confirmation of the link between amenities and knowledge workers.[28] It examined this issue across 115 industries in 67 Metropolitan Statistical Areas (MSAs) with populations over 500,000. It used multi-variate regression analysis to examine the effect of amenities on employment in industries with different worker skill requirements or knowledge-intensity.

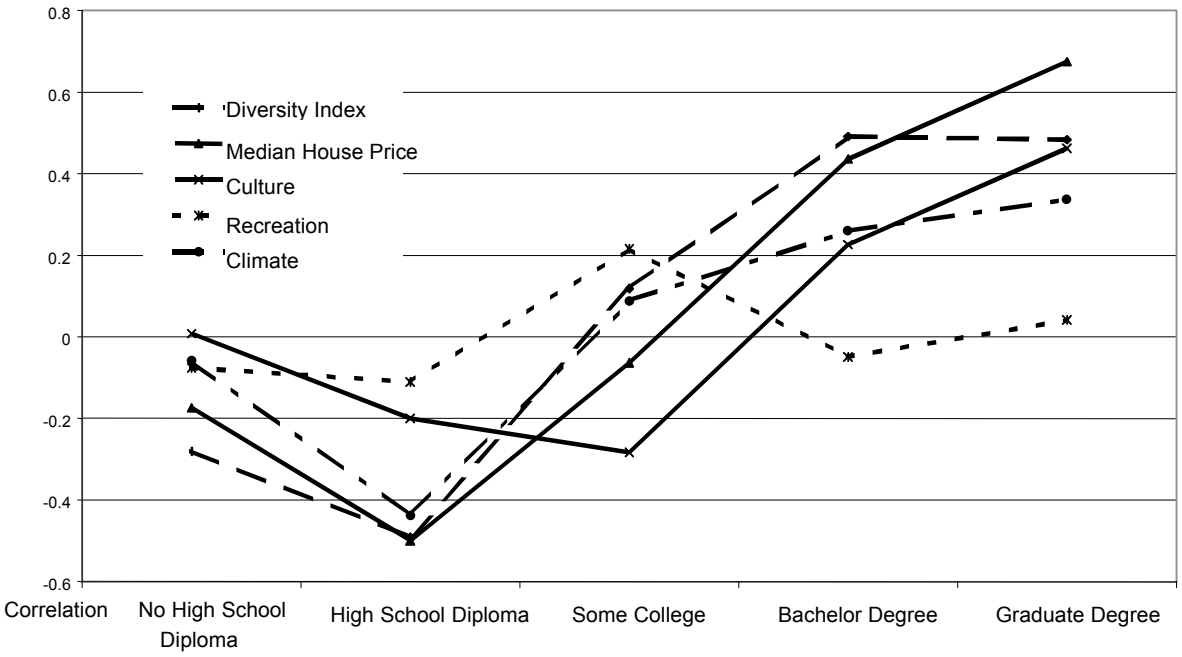
The research suggests that as an industry's need for high-skill or "knowledge-intensive" labor increases, it is more likely to employ workers in cities with high amenity levels.

- The findings also indicate that high skill workers and the industries that employ them are more likely to locate in high amenity areas, which tend to have higher costs of living.

- Figure 20 nicely illustrates this relationship, graphing the statistical correlation between several measures of amenities and the percentage of the population with various levels of educational attainment or knowledge-intensity. As this graph shows, there is a striking relationship between amenities and education/knowledge intensity. The correlation between amenities and knowledge workers rises sharply alongside educational level and knowledge intensity. [29]

- Furthermore, the correlation between amenities and knowledge-intensity tends to be highly positive for knowledge workers (measured as the percentage of the population with bachelors and graduate degrees) and negative for others (measured as percentage of the population with high school degree or less).

Figure 16: Amenities and Education Level/Knowledge Intensity



Source: Gates, Arora, Florida, and Kamlet, "Amenities and the Location of Knowledge Workers" (Carnegie Mellon University, H. John Heinz III School of Public Policy and Management, January 2000)

5.4 Regional Strategies toward Amenities

High technology regions around the nation are undertaking regional efforts to bolster and enhance their amenity offerings and quality-of-life. This is particularly true of rapidly growing high technology centers like Seattle and Austin [*see Boxes 5 and 6; Austin and Seattle*].[30]

- The Austin and Seattle regions have made amenities an increasingly important component of their economic growth strategies.

- Both regions developed amenity strategies early on and were recognized as highly desirable places to live before they became high technology growth centers.

Box 5: Technology, Lifestyle and Amenities in Austin

The city of Austin, Texas, is arguably the top recent high technology success story in the country. Building on the success of Dell Computers (founded in 1984), Austin has become one of the country's pre-eminent centers for computer and software development. Today, the city is home to over 1750 high technology companies (including companies like IBM, Motorola, and Dell) employing over 110,000 people (or 20 percent of the city's total employment).

As a leading center of high technology industry, Austin has a large pool of locally educated knowledge workers (the University of Texas has a total enrollment of over 48,000 students), a wide range of recreational opportunities, and a commitment to a high quality-of-life. The city's workforce is very well-educated; over 32 percent of Austin's adults have the equivalent of a bachelor's degree, and over 11 percent have the equivalent of some graduate degree (with another 10 percent enrolled in graduate study).

Austin exemplifies a city that has tried to make the environment and recreational amenities one of the cornerstones of its economic development. Before 1983, when Microelectronics and Computer Technology Corporation (MCC) decided to locate there, Austin was known for its thriving music scene (e.g., Austin City Limits) and laid-back outdoor-oriented lifestyle. The city is regularly recognized as being among the top cities in the country for live music and alternative film, and offers a diverse array of night-life options combined with outdoor activity like rock climbing, bow hunting, and mountain biking. The city constantly ranks among the top cities in the country in economic, recreational, and environmental listings. It has been ranked in the top ten in such lists as *Forbes's* best cities for business (#1), *Fortune's* high technology ranking (#2), *POV* magazine's boomtown rankings (#2), *Walking* magazine's best large walking towns (#5), and *Bicycling* magazine's top cycling cities (#6).

Austin's two-pronged approach to economic development began in 1984, when the city attempted to capitalize on the presence of government-based research consortiums like MCC and Sematech to build a technology-based economic cluster in the region. The city focused primarily on leveraging its university roots and a small existing base of technology manufacturing to develop a core of R&D centers. The combination of public and private research, high technology manufacturing, and commercial R&D led to the formation of a technology-based economy, focused primarily on personal computers, software, and electronics. An entrepreneurial atmosphere combined with available venture capital has led to a rapidly growing number of technology start-ups.

Austin also has focused its effort on lifestyle and quality-of-life issues. Austin has cultivated its recreational and cultural amenities in an attempt to attract and retain high-quality talent. This is an ongoing process, and one of Austin's priorities in the coming years is to further increase the number of cultural and recreational outlets in the city. Additionally, Austin's environmental record has been stellar. In 1995, Austin did not exceed any federal air quality standard, and the city does not have a single Superfund cleanup site.

If Austin has a shortcoming, it may be that the city is growing *too* fast. Residents have begun to complain that the city suffers from urban sprawl and has lost some of its character among new suburbs. Cost of living has risen dramatically, with home prices as much as doubling, though it is still much lower than in larger cities like New York or San Francisco. Austin has begun to take steps to address these problems by implementing more effective land use programs and zoning codes, and by looking at ways to reuse abandoned downtown land. The city has begun to identify geographic clusters of various industries in order to better map out future transportation needs and solutions. It has attempted to bring planning agencies together in a planning "summit," to allow for more seamless sharing of ideas. As Box 2 shows, the city is committed to smart growth and sustainable development as a key component of its regional economic development agenda.

Austin's success reflects its commitment to both high technology industry and the lifestyle amenities required to attract and to retain talent in the new economy.

- Both regions boast a thriving music scene, a wealth of high-quality, casual restaurants, a commitment to preserving natural beauty, smart growth, and focus on outdoor recreational amenities.

- Both regions have undertaken strategic efforts to improving the quality-of-life for the area where knowledge workers reside. That is, they have focused considerable energy and resources on improving and maintaining a high quality-of-life in the areas surrounding major university campuses and in "hip", "funky" urban neighborhoods oriented toward an eclectic mix of young people, high technology companies, artists, and gays, such as Seattle's Beltown and Capitol Hill neighborhoods.

5.5 Role of University Districts

This focus on lifestyle and quality-of-life around major universities is also true of most leading high technology regions. The major centers of high technology in areas like the Silicon Valley, the Route 128 area, or Seattle are not in the established downtown areas of these regions. Rather, fledgling high technology enterprises are typically incubated in and around the districts surrounding major university campuses and later move to technology campuses in more suburban locations as they expand.

- There have been major investments in renovating and refurbishing the Kendall Square area around MIT, which was once rundown and blighted. Renovated factory and warehouse districts are now home to startup companies, venture capital funds, restaurants, microbreweries, cafes, and hotels.

- Downtown Palo Alto, bordering Stanford University, functions as a veritable hub for activities and amenities with upscale shops, restaurants, cafes, and hotels as well as

offices for startup companies, venture capitalists, and high technology service providers.

- University districts like these provide visual cues that a region is "with it," occupies a place in the new economy, is youth-friendly, and values the technological and entrepreneurial contribution associated with its major universities. Such areas perform a critical function as a magnet for retaining and attracting talent and as places young knowledge workers want to live and work.

Simply put, the nation's leading high technology regions are also distinguished by a high quality-of-place. Amenities are an integral part in the success of a high technology region, and are particularly important to regions that are trying to break into the ranks of high technology, as they are increasingly required to attract knowledge workers and talent.

Box 6: Technology, Lifestyle and Amenities in Seattle

Seattle is frequently regarded as one of the leading centers for high technology industry generation. The region is home to thousands of high technology companies, including Microsoft, Amazon.com, and Real Networks. Seattle topped *Forbes* magazine's list of high technology cities and *POV* magazine's list of the top 75 boomtowns in America.

Seattle is also a center for the amenities of the new economy. It is rich in outdoor recreational amenities. It has been recognized as one of America's best cycling cities by *Bicycling* magazine and one of its best large walking towns in *Walking* magazine. The city has continually worked to meet the needs of cyclists and pedestrians by anticipating demand for bike trails and offering the latest innovations in pedestrian roadway safety. The region is also known for its active, thriving music scene – the birthplace of grunge rock. Microsoft co-founder Paul Allen has made major contributions to the city's rich array of new economy amenities, including funding for the "Experience Museum," which celebrates the legacy of Jimi Hendrix, who grew up in Seattle.

The region has long been home to an active movement for smart growth and sustainable development. Sustainable Seattle is a leading advocate of the smart growth movement nationally and has developed a leading-edge system of indicators to gauge the region's progress in achieving sustainable development.

During the 1980s and early 1990s, the region's high technology infrastructure grew outward in the suburban areas of Redmond and Bellvue. However, the increased traffic congestion and lengthened commuting times brought on by sprawl has encouraged a recent move toward redevelopment and revitalization of older inner-city neighborhoods as centers for emerging internet and high technology enterprises. Neighborhoods such as Beltown, Capitol Hill, and the Pike/Pine Corridor have emerged as new centers for both high technology companies and downtown living in converted and retrofitted industrial and commercial buildings. Amazon.com has renovated an abandoned hospital on the edge of downtown. Real Networks in establishing its new headquarters near the old downtown waterfront. Paul Allen is renovating a series of old industrial and warehousing buildings in the downtown area for his complex of new technology businesses. All of this has resulted in the resurgence of dense urban development, attracting an eclectic mix of yuppies, artists, gays, and the technology community who are able to live and work in renovated homes, apartment buildings, lofts, and industrial buildings. Knowledge workers are

attracted by the look and feel of these funky neighborhoods where people are able to walk, cycle, or rollerblade to work and in paths and trails along the waterfront.

The city is now focusing its attention on renovating and remodeling older downtown buildings as office space for high technology firms. High technology firms have been willing to pay premium prices for older downtown space, so the Seattle city council authorized developers to enlarge old buildings, fill light wells with housing, and add penthouses. Rent in these types of buildings has soared, and the Smith Tower, built in 1914, recently completed a $28 million renovation that has filled half of the building with internet firms. A large part of this renovation boom has been filling light wells, the open space in a U- or H-shaped floor plan, with new housing units.

In this way, Seattle has come to exemplify the new lifestyle package of technology, the internet, the environment, and amenities. Additionally, it has done so in a way that emphasizes the advantages that come from the co-location of work, home, and leisure in dense, older urban neighborhoods. Seattle clearly shows how proximity and place can function as a mechanism for talent attraction in the new economy.

6.0 WHAT DO YOUNG KNOWLEDGE WORKERS WANT?

As we have already seen, knowledge workers are the key to regional competitiveness in the new economy. So, it is vitally important to better understand what they are looking for in a place to live and work.

A 1998 KPMG survey of more than 1200 high technology workers examined the factors associated with the attractiveness of a new job. It found that "community quality-of-life" was the second most important factor – just below salary – and more important than benefits, stock options, or company stability.[31]

- *Salary:* for every percentage increase in salary, the likelihood of attracting a person to a position increases by 1 percent.
- *Quality-of-life in the community* increases the attractiveness of a job by 33 percent.
- *Proximity to family and friends* increases the attractiveness of a job by 19 percent.
- *Benefits* increase the attractiveness of a job by 17 percent.
- *Stock options* increase the attractiveness of a job by 14 percent.
- *Established company:* a job with an established company increases in attractiveness by 7 percent.

6.1 Focus Group Findings

To get more detailed information on how knowledge workers choose places to live and work, a series of focus groups were conducted. The focus groups examined the factors associated

with how and why young people in technology-based industries choose places to live and work. Participants included young knowledge workers who were either in the process of making or had already made their decisions about where to locate. They were asked a wide range of questions about their preferred cities and the reasons behind those choices. The groups were broken down into four segments: college juniors and seniors in technology-based fields, juniors and seniors in management or related fields, graduate students in all fields, and young professionals who had already entered the workforce. Focus group participants came from a wide array of places, including U.S. cities of varying sizes and foreign countries in Europe, South America, and Asia. There was considerable diversity across racial, ethnic, and gender lines. The undergraduate participants came from a more varied set of locations and were more diverse by ethnicity and gender. The young professionals were more homogenous; that is, they were more likely to be white males.

Table 11: Focus Groups
City Rankings

City	*Mentions*
New York	13
Boston	13
Chicago	13
Washington	9
Atlanta	7
San Francisco	7
San Diego	7
Charlotte	6
Denver	5
Dallas	4
Austin	4
Cleveland	4
Raleigh	4
Philadelphia	4
Portland	3
Toronto	3
Seattle	3
Minneapolis	3

Source: Campos Market Research

The findings from the focus groups supplement the results of the statistical research and case studies, enabling us to zero in more precisely on the factors that affect the location choices of knowledge workers. The key findings of the focus groups can be summarized as follows:

Amenities Matter: Amenities clearly matter in the location choices of young knowledge workers. The focus group participants place a high value on amenities and the environment in their choices of where to live and work. The focus group participants essentially *balance economic opportunity and lifestyle* in selecting a place to live and work. They are not simply looking for "a job," but a place to advance their career by moving among jobs and one that has a new economy lifestyle. In fact to some degree, the findings of the focus group research show that knowledge workers in high technology fields place more emphasis on lifestyle factors such as the environmental and recreational quality of a region than on its job market when choosing where to live. The participants defined amenities to include:

- Large numbers of visibly active young people,
- Easy access to a wide range of outdoor activities,
- A vibrant music and performance scene with a wide range of live music opportunities,
- A wide range of nightlife experiences, including many options without alcohol,

- A clean, healthy environment and commitment to preserving natural resources for enjoyment and recreation,

- A lifestyle that is youth-friendly and supportive of diversity.

Focus group participants noted a strong preference for high-amenity locations, with high levels of environmental quality, and a range of outdoor recreational options. Indeed, many participants spoke of wanting to know that a particular amenity "is around," almost as an external symbol of a region's vibrancy, even though they personally might not make use of that amenity.

Amenities and the Nature of Knowledge Work: The preference for high-amenity places is related to the nature of knowledge work careers. Jobs in high technology fields are stressful and require long working hours. Lifestyle amenities are seen as sources of stress relief. Young knowledge workers say that long working hours give them little time to enjoy themselves, so that when they do something "it has to be good."

Jobs in high technology fields are unstable and characterized by frequent turnover. Knowledge workers see their career as a portfolio of opportunities and experiences. According the U.S. Department of Labor, the median job tenure for workers ages 25 to 34 is just 2.7 years. By age 32, the average worker has had 9 full or part time jobs. The old saying in Silicon Valley where job-hopping is a well-established norm goes like this: "you can change jobs without changing your parking lot."

Knowledge workers express a distinct preference for cities and regions with a "thick labor market" that offers a wide variety of employment opportunities in high technology fields. Because job tenure in high technology industries tends to be relatively short and young knowledge workers expect to change jobs frequently, such a thick labor market has become a key factor in selecting a place to live and work.

Given the reality of work and careers in the new economy, focus group participants report that they choose cities that both afford a robust array of job opportunities and are also a high-quality place to live. A high-amenity city, which is a nice place to live, provides a level of "permanence" that a job does not.

The amenities that knowledge workers desire differ from traditional amenities. The amenity package of the old economy tended to focus on passive cultural amenities (the symphony, opera, theater, ballet, etc.) and on *big-ticket* items like national chain restaurants and nightspots and major league sports venues. There is mounting evidence that, while, still important, these types of amenities are taking a backseat to more casual, open, inclusive, and participative activities. Focus group participants expressed a preference for a diverse range of such activities, including outdoor amenities (e.g., rowing, cycling, rock climbing) and other lifestyle activities (e.g., vibrant music scene, outdoor restaurants, organic supermarkets, juice bars). Focus group participants expressed a preference for a wider range of nightlife activities or experiences that do not exclusively revolve around bars and drinking. Participants were looking for a wide range of experiences that are diverse, open, and inclusive of other young people, and drew a sharp distinction between these sorts of activities and more expensive and exclusive amenities like the symphony or even professional sports.

Accessibility: A major concern of focus group participants is the accessibility of amenities. Participants expressed a strong preference for regions where amenities and activities are easy

to get to and available on “just-in-time” basis, with easy access on foot, bicycle, or via public transportation. Many of the younger knowledge workers did not have cars and wanted to locate in regions where they did not need a car. Furthermore, focus group participants expressed a preference for amenities that blend seamlessly with work. In other words, knowledge workers working long hours need to be able to access amenities almost instantly on demand, whether on their lunch break or immediately following the workday.

Connectivity: Young knowledge workers in the focus groups felt isolated and trapped on college campuses. They expressed a desire to learn more about the city and region. They did not see any specific mechanism at their disposal for connecting to the city and region. There was a universal preference for mass transportation like the subway or light rail as a means for connecting to the broader region. There was a broad consensus across the focus groups on the attractiveness of a subway or light rail system in selecting a place to live and work. This was seen as a fast, reliable, user-friendly way to connect the university district where many of them reside to other parts of the city and region. The mobility and connectivity provided by a subway or light rail system was noted as a key factor in the attractiveness of regions such as Boston, Washington DC, New York City, and Chicago. Focus group participants also thought that more active alumni associations could help to improve connectivity.

Water: Focus groups indicated both the importance of water-based activities, like sailing, kayaking, and rowing, as well as the importance of access to the water for outings or nightlife. Focus group participants noted the additional attractiveness of water-based transportation. Furthermore, water seems to be a common theme among high-amenity regions. Several of the most successful high technology cities are located on or near bodies of water and have utilized those bodies strategically to enhance both the local environment and the opportunity for recreation and transportation [*see Box 5, Austin and Box 6, Seattle].*

Diversity: Focus group participants noted the importance of diversity and the attractiveness of regions that reflect and are supportive of diversity. Diversity is a highly valued amenity or characteristic of a place to live and work. This came through strongly in all of the focus groups. Knowledge workers in technology-based industries come from diverse ethnic and racial backgrounds and desire places that reflect that diversity. They also are looking for environments where they can easily “fit in.” New economy amenities – lifestyle, outdoor, and recreational amenities – are not just important in-and-of-themselves, but provide signals or visual cues of a diverse, supportive, youth-friendly environment. Focus group participants expressed a preference for places where they can readily “plug-in” and develop a support structure of colleagues and friends. This is particularly important to recognize as many of these young people are relocating without the support structure of friends and family. The presence of such a youth-oriented environment functions as a “surrogate family" of sorts. Furthermore, leading high technology regions such as Austin and Seattle have actively cultivated local environments that are youth-oriented and supportive of diversity.

There was some variation in the responses of focus group participants. Younger knowledge workers, who tended to be more diverse across the board, were more interested in the quality of a region’s environment and amenities than the young professionals. These undergraduate students tended to make location decisions based more on the availability and quality of amenities than on the local job market. Undergraduates were willing to take somewhat lower pay in order to live in a more amenity-rich market. They seemed to be looking for shopping and entertainment opportunities within easy access via public transportation, and were more interested in smaller-scale amenities like coffee shops, gyms, open markets, and music/comedy clubs than in big-ticket items like large discotheque-type bars and sports

venues. They also emphasized the importance of cultural, ethnic, and racial diversity in their choice of location. Diversity, openness, and inclusiveness were of substantial importance to this group. Graduate students tended to make their location decisions based upon a mix of employment and recreational/environmental considerations.

All four groups agreed that the "ideal" city would be appealing environmentally as well as recreationally, offering easy access to local and regional activities and amenities. Respondents were looking for a variety of outdoor activities and clean open spaces in and around the city center:

> *"When I go to a place, I want to see people outside, even if I am not out there rollerblading or jogging. To me, that healthy image equates to young people."*

Several focus group participants were interested in a thriving and diverse music scene.

> *"…not just big name bands either, although we could use a wider variety of those…there needs to be more jazz clubs and more coffee shops where you can go and relax and listen to some guy play an acoustic guitar."*

Participants also desired more liberal attitudes toward nightlife.

> *"…it doesn't necessarily mean that we want to be partying in the streets, but some of the laws need to be adjusted to suit the lifestyles of young people if they want to keep them here. I may only have one night to go out with my friends because of school and because of my busy lifestyle, so I don't want to have to come home at 2 o'clock."*

Focus group members identified various *visual cues* of a region's "hipness," including coffee shops, open markets, a variety of outdoor activities, and performance venues like jazz or comedy clubs. Many felt that they would like to see these types of establishments and activities in their ideal city, even if they were not interested in patronizing those establishments or taking part in those activities. Additionally, several respondents argued that transportation was a major issue – they wanted to be able to easily access the majority of a region's entertainment and outdoor amenities without necessarily owning a car. Most focus group participants expressed a strong preference for regions with subway or light rail systems.

It would appear from the focus group findings that regions that want to increase their attractiveness to young knowledge workers will need to undertake an amenity strategy. Simply providing or marketing job opportunities is not enough. The availability of job and career opportunities is a necessary but insufficient condition to attract the young knowledge workers. Amenities are a critical piece of the total package young, technology oriented talent is looking for. The rise of the new, knowledge-based economy requires that all regions take quality-of-place seriously.

7.0 STRATEGIC RECOMMENDATIONS

As this report has shown, quality-of-place is a critical factor in regional competitiveness. The findings of this study inform one overarching strategic recommendation. To compete in the age of talent, **regions must make the quality-of-place and the amenities of the new economy central elements of their strategies to attract knowledge workers and build high technology economies.** Regions must seamlessly link their amenity strategies to

ongoing economic development and competitiveness efforts. Based upon the results of the regional performance benchmarking analysis, the focus group findings, and the practices of leading high technology regions, the following actions are recommended as steps toward reaching that goal.

- Make quality-of-place a central element of regional economic development efforts.

- Integrate amenities and natural assets into all aspects of the regional economic development, talent attraction, and marketing efforts.

- Invest in the outdoor, recreational, and lifestyle amenities of the new economy as a component of regional economic development and talent attraction efforts; for example, the creation of climbing walls, mountain bike trails, bike paths, roller-blading areas throughout the city and region. Explore the possibility of bringing in outdoor competitions and events such as triathlons, bike races, rowing competitions, and similar efforts. Orient waterfront improvements to encourage active, recreational activities such as rowing, sailing and windsurfing and improve public access for these activities.

- Upgrade the areas surrounding major universities and colleges and make them centers for new economy recreational amenities. Establish better and more user-friendly transit connection from the university districts to downtowns and high technology business areas through the use of light rail, mass transit or bike lanes.

- Encourage smart growth and sustainable development on a regional basis, particularly sustainable use, preservation, and revitalization of natural assets. Encourage private enterprise to become more involved in smart growth initiatives. Increase community involvement in the development of amenities – for example, provide incentives and funding for local groups to maintain and enhance amenities. Equip city neighborhoods and outlying communities with tools to preserve open space and protect natural assets. Work with developers to provide more examples of successful residential and commercial developments that feature amenities, particularly in reconverted brownfield sites in urban areas.

- Create mechanisms for harnessing the knowledge and ideas of all citizens at the neighborhood, local, and regional levels for improving the quality-of-life around the environment and natural and lifestyle amenities. Develop vehicles for involving young people in the regional amenity and lifestyle agenda.

There are two possible critiques of this amenity perspective. It is worth addressing them now.

First, some might say that regions – particularly older, industrial regions - should eschew the competition for younger, knowledge workers in technology-oriented industries and concentrate instead on “expatriates,” younger, family-oriented professionals in their 30s and 40s who grew up in and have ties to those places. While such a strategy certainly has its merits, there are several reasons why it will fail to sufficiently close the talent gap.

- As this report has shown, national studies indicate that talent attraction is as important as – if not more important than – talent retention. What sets leading high technology regions like Silicon Valley, the Route 128 area around Boston, Seattle, and Austin apart is their ability to attract talent on a national and international scale. Both the regional case studies and the regional performance benchmarking indicate that growth regions are not only able

to capture a significant fraction of their own talent, but also are able to attract huge numbers of talented people from outside their regions. In fact, the ability to attract outside talent of all age groups is one of the key factors that make these growth regions attractive, according to the focus group participants. An expatriate strategy may tend to alienate newcomers to the region by granting special status to natives, exacerbating the problem of attracting new talent.

- An expatriate strategy also confuses strong family ties with the factors that are required to attract knowledge workers in the 22-to 40-year-old age group. Many returning natives are willing to overlook or discount gaps in a region's amenity profile to be close to family and benefit from deep personal ties. The focus groups indicate that family and having previous ties to a region are the principal reasons why younger professionals are likely to move back. However, this research and the research of others suggest that members of this group are attracted to many of the same factors that attract younger knowledge workers – both a high level of amenities and a "thick" labor market with lots of opportunities for individuals and their significant others. Interestingly, an amenity strategy will enhance and reinforce strategies to bring back natives.

- It is also important to note that young knowledge workers in the immediate post-college age group are important to attract in their own right. They are in many respects the "work-horses" of a regional technology economy. They have cutting edge technical skills needed in high technology industries, particularly in knowledge-intensive areas where technical skills tend to depreciate rather quickly. They also have the energy level to work extremely long hours under highly stressful conditions, without the personal and family ties that might discourage such a workload. That is why leading high technology companies like Microsoft and top consulting companies make such an effort to recruit top people in this age group.

Second, others may say that regions should focus on jobs and that amenities will follow. There are several reasons to question this view.

- As this report has shown, jobs alone cannot compensate for a perceived deficit in terms of quality-of-place. Jobs are a necessary but insufficient condition to attract young knowledge workers. The research presented here indicates that amenities are an important complement to a thick labor market with lots of opportunities.

- A large number of regions are starting from a somewhat laggard position in quality-of-place – considerably behind leading high technology regions in terms of amenities and lifestyle considerations. Thus, there is a need to marshal a critical mass of investments quickly to catch up.

A quality-of-place strategy is relatively inexpensive and involves marshalling resources that are already in place. It also is strongly place-based and as such confers direct benefits on broad segments of the local population and industry, in contrast to conferring large subsidies to non-residents or outside industry. For example, elderly populations express support for bike trails and paths especially around the university district, as they will take commuting cyclists off the sidewalks. Amenities will also benefit disadvantaged neighborhoods and populations as well as attracting knowledge workers.

The rise of the new, knowledge-based economy requires that all regions take quality-of-place seriously. Amenities are a critical piece of the total package required to attract technology-

oriented talent. This nation's high technology regions are also leaders in terms of quality-of-place. The bottom line is clear: To compete successfully in the age of talent, regions must make quality-of-place a central element of their economic development efforts.

ENDNOTES

[1] See Peter Drucker, *The Post-Capitalist Society*, New York: HarperBusiness: 1993; and Ikujiro Nonaka and Hirotaka Takeuchi, *The Knowledge Creating Company*, New York: Oxford University Press 1995.

[2] Richard Florida, "Toward the Learning Region*", Futures: The Journal of Forecasting and Planning 27, 5, J*une 1995: pp. 527-36; and Richard Florida, "Economic Development for the New Economy," American Chamber of Commerce, *Chamber Executive*, August 1999.

[3] Regions were selected along the following lines. We began with a list of the largest metropolitan regions in the nation. We eliminated the three largest regions – New York, Los Angeles and Chicago, principally because their large size makes them very special cases from which it is difficult to make meaningful comparisons to other regions. We then selected the next 25 largest metropolitan regions. Because we wanted to focus on regions that are self-contained entities we separated a number of consolidated metropolitan statistical areas into their component regions. That is, we separated out the San Francisco, Oakland, and San Jose areas from the larger San Francisco consolidated metropolitan area. Since we were particularly interested in high technology regions we added the next ten regions listed in the recent comprehensive report on high technology regions by the Milken Institute.

Data for various indicators are adapted from the following sources. The measure of high technology industry is from Ross C. DeVol, *America's High Technology Economy: Growth, Development, and Risks for Metropolitan Areas,* Milken Institute: 1999. The knowledge worker measures are from *County Business Patterns.* The entrepreneurship measure is from *Cognetics, Inc*. Environmental measures are adapted from rankings provided by *Money Magazine*, while the sprawl measure is from the *Sierra Club*. The amenities' measures are adapted from *Money Magazine,* and the "coolness measure" is from *POV Magazine.* For the two-by-two tables, regions are simply arrayed by their rank among the benchmark regions. The number of regions varies based on the availability of data.

[4] Gary Gates, Ashish Arora, Richard Florida, Mark Kamlet," Amenities and the Location of Knowledge Workers" Carnegie Mellon University, H. John Heinz III School of Public Policy and Management, January 2000.

[5] Ross C. DeVol, *America's High Technology Economy: Growth, Development, and Risks for Metropolitan Areas.* Milken Institute,1999.

[6] Tim W. Ferguson, "Sun, Fun, and Ph.Ds, Too," *Forbes*, May 30, 1999, p. 220.

[7] *Yahoo! Internet Life* magazine, http://www.zdnet.com/yil/content/mag/9803

[8] The data for knowledge workers are based on data for SIC 737. It is adapted from *County Business Patterns*. Data are shown for 27 of 35 benchmark regions. All knowledge workers charts include data for 27 of the 35 total benchmark regions.

[9] David Birch, Anne Haggerty, and William Parsons, "Entrepreneurial Hot Spots: The Best Places in American to Start and Grown a Company," *Cognetics*, 1999. Data are available for 26 of 35 benchmark regions.

[10] See Michael Porter and Claas van der Linde, "Toward a New Conception of the Environment-Competitiveness Relationship," *Journal of Economic Perspectives*, 9, 1, 1995: pp. 97-118; Michael Porter and Claas van der Linde, "Green and Competitive: Ending the Stalemate," *Harvard Business Review*, 1995:, pp. 120-134; Richard Florida, "Lean and Green: The Move to Environmentally Conscious Manufacturing," *California Management Review*, 39, 1, 1996: pp. 80-105; and Richard Florida, Mark Atlas, and Matt Cline, "What Makes Companies Green? Organizational Capabilities and the Adoption of Environmental Innovations" H. John Heinz III School of Public Policy and Management, Carnegie Mellon University: 1999.

[11] See Richard Florida and Tracy Gordon, *Regional Environmental Performance and Sustainability: A Review and Assessment of Indicator Projects*, Environmental City Network and Sustainable Pittsburgh, 1999; The Chattanooga Institute, http://www.rivervalleypartners.com/cstory/inno/innod.htm#discmus; Cathy Madison, "Most Enlightened Towns: 10. Chattanooga, Tennessee," *Utne Reader*, http://www.utne.com/bTravel.tmpl$search?db=dArticle.db&eqheadlinedata=Towns%20Chattanooga; and Dave McGovern, "America's Best Walking Towns," *The Walking Magazine*, May-June 1998: p. 55.

[12] Paul D. Gottlieb, "Amenities as an Economic Development Tool: Is There Enough Evidence?," *Economic Development Quarterly*, 8 ,3, August 1994: pp. 270-285.

[13] Source: *Money Best Places to Live*, http://www.pathfinder.com/money/depts/real_estate/bestplaces/how.html

[14] The data on environmental quality was comprised of three sub-measures: air quality, water quality, and sprawl risk. The data on air and water quality are adapted from the rankings provided in *Money Magazine's* ranking of the 300 largest metropolitan areas in the United States. The data was based on demographic and U.S. Census data. These data are available for 35 of the 35 benchmark regions. See http://www.pathfinder.com/money/bestplaces/ for the full listings. The data on sprawl are from the Sierra Club list of the 30 most sprawl-threatened cities, and 13 of the 35 benchmark regions made the list. See http://www.sierraclub.org/sprawl/report98/map.html for the full list.

[15] For Box 2, see *Next Century Economy: Sustaining the Austin Region's Economic Advantage in the 21st Century.* Greater Austin Chamber of Commerce,1998. For Box 3, see http://www.ci.austin.tx.us/

[16] "Intel tax break gets generally favorable reception at forum," http://www.oregonlive.com/news/99/06/st061011.html

[17] See, Vijay Mathur, "Human Capital-Based Strategy for Regional Economic Development," *Economic Development Quarterly*, 13, 3 August 1999, pp. 203-16.

[18] Edward Glaeser provides a nice summary of this field. See Glaeser, "The Future of Urban Research: Non-Market Interactions," Brookings Institution (September 9, 1999). Robert Lucas, "On the Mechanics of Economic Development," *Journal of Monetary Economics*, 22, 1988: pp. 3-42. As Glaeser notes, the intellectual heritage of his position hearkens back to Alfred Marshall, *The Principles of Economics.* London: Macmillan, 1890 and Jane Jacobs, *The*

Life and Death of Great American Cities. New York: Vintage Books, 1960 and *The Economy of Cities.* New York: Vintage Books, 1968.

[19] See "Boomtown USA," *POV Magazine*, http://www.povmag.com, December/January 1999; http://sustainabledev.nrel.gov/success/Burlin%7E1.htm; Elaine Robbins, "Most Enlightened Towns: 4. Burlington, Vermont," *Utne Reader*, http://www.utne.com/bTravel.tmpl$search?db=dArticle.db&eqheadlinedata=Towns%20Burlington%2C%20VT; and McGovern, "America's Best Walking Towns," *The Walking Magazine*, May/June 1998.

[20] Louis Tornatzky, Denis Gray, Stephanie Tarant, and Julie Howe, *Where Have All the Students Gone? Interstate Migration of Recent Science and Engineering Graduates*, Southern Technology Council, 1998.

[21] The overall amenities ranking is a composite of the following measures: an arts and culture rank provided by *Money Magazine*, a professional sports rank also provided by *Money*, and a "coolness," or new economy amenities, rank provided by *POV Magazine*. Data are available for 35 of the 35 benchmark regions. Regions are ranked on a scale of 1 through 35 based on their average rank among the three components.

[22] The arts and culture measure is based on data adapted from *Money Magazine's* ranking of the 300 largest metropolitan areas in the US. It is based on demographic and US Census data. Data are available for 35 of the 35 benchmark regions. See http://www.pathfinder.com/money/bestplaces/ for full listings.

[23] The measure for professional sports is adapted from *Money Magazine's* ranking of the 300 largest metropolitan areas in the US. It is based on demographic and US Census data. Data are available for 35 of the 35 benchmark regions. See http://www.pathfinder.com/money/bestplaces/ for full listings.

[24] The coolness measure is adapted from *POV Magazine*. It is a composite measure of the following indicators: average age of the population, demographic diversity, nightlife (number of bars, nightclubs, etc. per capita), culture (number of museums and art galleries per capita), and pride. Data are available for 35 of the 35 benchmark regions. See "Boomtown USA," *POV Magazine*, http://www.povmag.com, December/January 1999, for full listings.

[25] Alan Cote, "The Best Cycling Cities," *Bicycling,* March 1999, p. 53

[26] Dave McGovern, "America's Best Walking Towns," *Walking Magazine*, May 1998.

[27] The diversity measure is based on data adapted from Gary Gates, Ashish Arora, Richard Florida, Mark Kamlet, "Amenities and the Location of Knowledge Workers," Carnegie Mellon University, H. John Heinz III School of Public Policy and Management, January 2000. Data are available for 24 of the 35 benchmark regions.

[28] Gates, et al, "Amenities and the Location of Knowledge Workers," January 2000.

[29] Figure 18 is from Gates, et al, "Amenities and the Location of Knowledge Workers" (January 2000). Data on the education level/ knowledge intensity of the population are from the Public Use Microdata Sample of the US Census. The diversity index is from Gates et al (2000). Median house value is from the US Census (it is expected that higher median house

values reflect higher levels of amenities). The culture, recreation, and climate measures are adapted from the *Places Rated Almanac.* The culture measure is a composite of radio broadcasts of classical music, public televisions stations, art museums and galleries, and arts and musical performances. The recreation measure includes restaurants public golf courses, bowling lanes, zoos and aquariums, family theme parks, automobile race tracks, pari-mutuel betting, professional and college sports teams, miles of coast line and inland water, and national parks.

[30] For Box 5, see http://denverpreps.com/business/0329mhtt0.shtml; http://www.pathfinder.com/fortune/bestcities/city1.htm; "Boomtown USA," *POV Magazine*, http://www.povmag.com, December/January 1999; and *Next Century Economy: Sustaining the Austin Region's Economic Advantage in the 21st Century*, Greater Austin Chamber of Commerce, 1998. For Box 6, see "Boomtown USA," *POV Magazine*, http://www.povmag.com, December/January 1999; Tim W. Ferguson, "Sun, Fun, and Ph.D.s, Too," *Forbes*, May 30, 1999, p. 220; Brier Dudley, "Smith Tower Goes dot.com: 1914 Antique is now a Hot Internet-firm Address," *Seattle Times*, January 27, 2000, http://www.seattletimes.com/news/local/html98/smit_20000127.html; McGovern, "America's Best Walking Towns," *The Walking Magazine*, May/June 1998; and Alan Cote, "The Best Cycling Cities," *Bicycling,* March 1999.

[31] KPMG/ CATA Alliance, *High Technology Labour Survey: Attracting and Retaining High Technology Workers,* KPMG, June 5, 1998.