

**Technology, Workforce and the DFW Business Climate:
A Review and Critique of Recent Assessments**

Prepared for the North Texas Commission

By

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Executive Summary

Preparing rankings and ratings of states, metropolitan areas and cities has become a major undertaking by the media, business groups, consulting firms, and non-profit organizations. Nearly every week, it seems, an article appears in a newspaper or magazine titled “The Best States for Business” or “The Best Places to Live.” Though most of the studies and surveys comparing states or cities are based on subjective evaluative criteria, they nonetheless receive widespread attention in the domestic and international press and often focus attention on a particular state, city or metro area.

Texas and the Dallas-Fort Worth Metroplex are fortunate in that we generally score high in these surveys. For instance, in December 1999 Dallas was designated the Best North American City for Business by Fortune Magazine. In January 1999, a survey conducted by Plant Sites and Parks identified Texas as the most desirable state for new manufacturing facilities.

The North Texas Commission retained the University of North Texas Center for Economic Development and Research to summarize, evaluate and critique 18 “business climate” and “quality of life” surveys that were released in 1999. In particular, we were asked to identify data or perceptions from these studies that might be helpful to the Commission in formulating strategies for either capitalizing on the region’s assets or dealing with its shortcomings.

Recognizing that the Metroplex is part of Texas, and that perceptions of the state business climate may influence the prospects for DFW, we first evaluated five state-to-state comparisons prepared by national organizations. In terms of business vitality, Texas

scores high in several surveys and is also deemed well-positioned to capitalize on the “New Economy.” However, two studies fault the state for its human capital deficiencies, especially as regards educational attainment levels, its deteriorating air quality, and its slowness in bringing technology into the classroom.

In the 12 city-to-city comparisons, Dallas and/or the DFW region receive high marks in most cases. Forbes Magazine ranks Dallas the 3rd best business location in the U.S. while Fortune ranks us number one. Sprint Business concludes the Dallas metropolitan area is the “most productive” in the country while PricewaterhouseCoopers ranks DFW fifth in the nation for internet venture capital. The Metroplex ranks 6th in the nation in terms of internet penetration, and the Milken Institute rates Dallas as the second strongest “Tech-Pole” in the nation, after San Jose, due to the high concentration of information technology industries in both manufacturing and services.

The surveys and studies reviewed in this report paint a predominantly positive picture of the Metroplex and its preparedness for the new millennium. Among the nation’s largest urbanized regions, DFW can boast the strongest, most diversified and most promising economy because of our broad range of fast-growing and competitive industries. Still, there are two puzzling dimensions to these studies. First, what factors cause Austin to score higher than Dallas or Dallas-Forth Worth on many of the rankings? Is Austin doing something the Metroplex isn’t? Probably not. Austin is really a “start-up” economy, which is now just coming into its own. It’s much easier for a relatively small community to post high growth rates than a larger one. Though Austin’s percentage gains in population, employment, high-tech startups and the like have been impressive, in absolute numbers the Dallas-Forth Worth area overwhelms Austin.

The second puzzling dimension to these surveys is Fort Worth's frequently lower rankings relative to Dallas. We believe the separation of the two intertwined metro areas in most of the studies reviewed below makes absolutely no economic sense. Tens of thousands of Metroplex residents commute between Dallas, Fort Worth and their suburbs each day for work, shopping, recreation and air travel. If Dallas is the best city in North America for business, then Fort Worth must be too.

Like other major metropolitan regions, the Metroplex faces many problems and challenges, including under-performing public schools, rising traffic congestion, deteriorating air quality and maintaining a skilled workforce. These are all issues that must be addressed if the region is to continue prospering. In particular, we must ensure that the region's human capital, as well as its physical infrastructure, is maintained and improved. The twin problems of worker shortages and workforce training demand renewed attention, and resources must be made available to meet these and other challenges facing the Metroplex in the 21st century.

I. Introduction

Over the past year, a number of research institutes and private firms have released a bewildering array of surveys and studies purporting to rank states, metropolitan areas and cities in terms of their quality of life or business vitality. Each of these reports has been publicized in the local and national media, and several have received widespread attention in the international press. In some of these studies, the state of Texas and the Dallas-Fort Worth Metroplex rank very high, but in others our region does not score favorably compared with other metropolitan areas.

Some of the surveys and studies are based solely on “impressions;” i.e., how does a group of respondents “feel” about the livability or business climate of a state or city. Others claim to be more objective—i.e., they base their rankings on measurable indicators. In some cases, the ranking of Texas or the Metroplex is clearly a function of the types of questions asked.

Whether or not these studies attract or discourage companies from locating or expanding in Texas and the Metroplex is unknown, and perhaps even unknowable. But a more important issue for the North Texas Commission and other area business leaders is whether they contain information or perceptions that may be helpful in either capitalizing on the region’s assets or dealing with its shortcomings. To that end, we have reviewed and critiqued 18 of these studies and surveys with an eye towards determining, on balance, what they tell us about the comparative strengths and weaknesses of Texas and the Metroplex. And because “quality of life” is often included as an element in a state or region’s business climate, we have examined both types of studies.

II. State-to-State Comparisons

Because the Dallas-Fort Worth is the largest and most dynamic metropolitan area in the state of Texas, perceptions and evaluations of Texas are important to the region. Thus, we begin our assessment by looking at several studies that compare states in terms of business climate and quality of life.

A. Plant Sites and Parks Annual Survey of the Most Favored Business Locations

PS&P is a monthly magazine mailed to industrial location specialists, and it derives its revenues from ads placed by state and local economic development agencies. The magazine's focus is manufacturing, warehousing and distribution. Each January, it publishes a special "Hot Spots" issue that rates state business climates. Actually, PS&P prepares two rankings: one based on new facilities and expansions during the previous year and another based on a readers' survey.

In the January 1999 "New Facilities" survey, Texas was ranked 6th in the nation behind Michigan, New York, North Carolina, Ohio, and California (see Table 1). A new facility is defined as one creating 20 or more jobs, utilizing a minimum of 20,000 square feet of new space, or entailing a capital investment of at least \$1 million. In the "Reader's Choice" survey, which is based on a telephone interviews with a sample of PS&P subscribers, Texas was ranked number one in the country. The Reader's Choice survey asks respondents where they would locate if they were to choose a site for a new project. PS&P argues the survey is a leading indicator of future investment behavior.

In essence we have two rankings, one objective and one subjective, which paint Texas in a positive light as a business location. In fact, Texas has been among PS&P's top ten for the past decade.¹

B. Site Selection Magazine's State and Metro Scoreboard

Each year, *Site Selection Magazine* publishes an industrial expansion scoreboard. This is a simple "count" of the number of new facilities and expansions in each state, and it naturally tends to favor the largest ones. In 1998, Texas, with 926 new manufacturing facilities or expansions, ranked 6th in the nation behind Michigan, California, Ohio, North Carolina and New York (see Table 2). Among the nation's metro areas, Dallas ranked number nine. In its report, *Site Selection* calls Dallas the "Lone Star State's hot spot."

By this measure, it would appear that Texas—the nation's second most populous state—isn't attracting its "fair share" of new manufacturing businesses. But the survey probably isn't counting small businesses, software companies, and start-ups that have been so important in the state's economic growth. The Dallas ranking would seem about right, since the Metroplex is the nation's ninth largest metropolitan area.

C. CFED Development Report Card for the States

For more than ten years, the Corporation for Enterprise Development in Washington, DC has published an annual economic report card "grading" the various states on a number of benchmarks. The CFED is a non-profit organization, though much of its financial support comes from organized labor. It uses a wide range of economic, demographic and social statistics in calculating its grades, and these are grouped into sub-categories—each of which received a grade. The CFED then assigns three "final" grades

¹ The January 2000 issue, released after this study was completed, rated Texas #1 in the readers' survey and #5 in new facilities.

in the following categories: (1) performance, (2) business vitality, and (3) development capacity.

In their just-released 1999 report, Texas received an “F” in performance, a “B” in business vitality, and a “C” in development capacity (see Table 3 and Figure 1). The “F” in performance was based on the following criteria: Despite ranking 8th in the nation in job growth and 1st in wage growth, Texas recorded comparatively high unemployment (35th), a high number of layoffs (49th), poor employer health coverage (43rd), large numbers of working poor (46th), and high poverty (43rd). Texas also ranked near the bottom on a number of social indicators.

Texas’ “B” grade for business vitality was based in improved competitiveness, new capital investment, a large number of fast-growing companies, and the second-highest number of IPOs in the nation. But the state ranked 41st in new business job growth.

The grade of “C” awarded for development capacity supposedly reflects Texas’ future potential for economic and social development. The CFED finds the state’s math and reading proficiencies relatively high (5th and 15th) but marks us down for high school graduation rates (43rd) and educational attainment levels (47th). Texas also ranks low in its digital infrastructure (40th) and in its air quality (44th).

Top performers in the CFED report card are listed alphabetically in Table 4 with the top-performing states, Colorado and Utah, receiving straight As. According to CFED, what boosts these states’ grades is a reduction in income inequality, improvements in job quality, attention to sustainable development and the environment, and an abundance of innovation assets.

Though the CFED has been preparing state report cards for many years, this is not a widely read or widely disseminated publication. And it certainly doesn't appear to be influencing the flow of capital and entrepreneurial talent among the states. Nonetheless, it does highlight some of Texas' endemic "human capital" deficiencies, which are slowly being addressed by the state's business and political leadership. As with the rest of Texas, the Metroplex needs to improve the graduations rates and skill levels of its young residents because they represent the bulk of tomorrow's workforce. Improving air quality is another challenge facing the Metroplex. The consequences of not doing so have been well publicized.

D. *American Electronics Association Cyberstates and Cyber Education Reports*

August of 1999, the American Electronics Association (AEA) released two reports dealing with the status and outlook for high-tech industries in the United States. It found that high-tech industries employed nearly 5 million workers and that the ranks of cyberworkers had increased by more than 1 million in the previous five years. Texas ranked second to California in the number of high tech-jobs and was the second fastest growing state in high-tech employment after Georgia (see Table 5 and Figure 2). Significantly, Texas ranked first in the number of new high-tech jobs between 1990 and 1997, gaining nearly twice as many as California (see Table 6 and Figure 3). Within the state of Texas, Dallas was by far the leader in high-tech employment, though Austin's growth rate has been more than three times that of Dallas (see Table 7). Still, in 1996 Dallas could boast three times as many high-tech jobs as Austin.

Texas and Dallas-Fort Worth appear quite competitive when high-tech salaries are compared with those paid in other states and cities (see Tables 8 and 9). Texas boasts the

lowest average hi-tech wages among the large Cyber States, and Dallas and Fort Worth salaries are well below the averages paid in San Jose and Boston. The competitive wage structure is no doubt one reason hi-tech firms have flocked to Texas and the Metroplex.

In its *Cyber Education* report, the AEA expresses concern at the slow growth in the number of high-tech degrees being earned in engineering, science, and businesses information systems. Nationally, high-tech degrees awarded fell five percent between 1990 and 1996. In Texas, by contrast, the number of degrees awarded increased eight percent during the same period (see Table 10). But the number of high-tech jobs grew 25 percent during the same period. What's more, interest among undergraduates in pursuing technical degrees is slipping, which does not bode well for the long-term.

Because the Metroplex is the epicenter of Texas' information technology industries, we need to be concerned about future shortages of degreed technology workers. The North Texas Commission has already recognized this problem as is working with local universities and other training institutions to upgrade the education and skill levels of the local workforce and to build bridges to area industries.

E. *The State New Economy Index*

In July 1999, the Washington-based Progressive Policy Institute issued a report examining the various states' postures with reference to the so-called "New Economy." The New Economy is defined as "a knowledge and idea-based economy where the keys to wealth and job creation are the extent to which ideas, innovation, and technology are embedded in all sectors of the economy."

The report identifies 17 key indicators that are divided into five categories that capture the parameters of the New Economy:

1. **Knowledge jobs.** Separate indicators measure jobs in offices; jobs held by managers, professionals and technicians; and the educational attainment of the workforce.
2. **Globalization.** These indicators measure the export orientation of manufacturing and foreign direct investment.
3. **Economic dynamism and competition.** Here the focus is on the number of jobs in fast-growing companies (those with sales growth of 20 percent or more for four straight years); the rate of economic “churn” (a product of new business start-ups and existing business failures); and the value of initial public stock offerings (IPOs) by companies.
4. **The transformation to a digital economy.** This category includes such measures as the percentage of adults online; the number of dot.com domain name registrations; technology in schools; and the degree to which state and local governments use information technologies to deliver services.
5. **Technological innovation capacity.** These indicators include the number of high-tech jobs; the number of scientists and engineers in the workforce; the number of patents issued; industry investment in research and development; and venture capital activity.²

Overall, Texas ranks number 17 among the 50 states, a curious result considering the state added more high-tech jobs than any other during the 1990 to 1996 period (see Table 11 and Figure 4). We score high in such items as export focus in manufacturing

² The authors use a convoluted methodology to generate “scores” for each state upon which the rankings are then based. Each state’s final score in each category is expressed as a percentage of the total score a state would have achieved if it had finished first in every category. In addition, the indicators are weighted so that closely correlated ones don’t bias the results.

(#4), venture capital (#9) and high-tech jobs as a share of total employment (#11) (see Table 12). But Texas' overall rank is pulled down by managerial, professional and technical jobs as a share of the total workforce (#47), scientists and engineers as a percent of the workforce (#33), digital technology in state government (#31), private sector R&D (#26), and technology in schools (#25).

Some of these measures of “new economy” readiness are questionable, and the DFW region by itself would probably score much higher in such a ranking. For example, according to the U.S. Bureau of Labor Statistics, managerial, technical and professional workers comprise 23.5 percent of the DFW workforce, which is comparable to the national average. Still, the study suggests several areas deserving attention by the region's business and political leadership, particularly with reference to technology in the classroom and boosting DFW's R&D activities.

III. City-to City Comparisons

Ranking cities and/or metropolitan areas in terms of “business climate” or “quality of life” has become a popular pastime. There are literally dozens of comparisons made annually by the media, business groups, consulting firms, university research centers and other groups purporting to show that some place is better or worse than some other place based on selected criteria. As with the state-to-state comparisons, many of these evaluations are either highly subjective or extremely arbitrary in terms of the indicators that are compiled. A dozen of the most prominent ones are discussed below.

A. *Forbes Magazine Best Places to Live*

In its May 31, 1999 issue, Forbes Magazine ranked the nation's 162 biggest metropolitan areas with a focus on jobs and business. The following criteria were used to come up with the rankings:

1. Average wage and salary increase 1993 to 1997.
2. 1996 to 1997 average wage and salary increase vs. the average 1993 to 1997 increase.
3. 1993 to 1998 job growth rate.
4. 1997 to 1998 job growth vs. average 1993 to 1998 rate.
5. Number of technology clusters in 13 different areas.
6. Overall concentration of technology activity relative to national average.
7. Technology output growth 1990 to 1998.
8. Technology output growth 1996 to 1998.

Using these measures, Dallas was ranked the 3rd best business location in the country after Seattle and Austin (see Table 13). Fort Worth-Arlington came in 35th. Not surprisingly, all of the top choices in the Forbes calculation are located in the Sunbelt. The "worst" cities are found mainly in the Northeast and Midwest.

B. *Sprint Business Most Productive Cities in America*

In January 1999, Sprint Business released a study on the most productive cities (metropolitan areas) in the country. Dallas came in first among the 313 MSAs examined, followed by San Francisco, San Jose, Houston and Atlanta. Fort Worth-Arlington was ranked 20th (see Table 14).

Eight criteria were used for determining each metro area's productivity index:

1. Employment rates.
2. Growth rates in population and employment.
3. Average real per capita income adjusted for the cost of living in metropolitan areas.
4. Educational attainment and workforce training.
5. Output per worker.
6. Business sector diversity, including growth of business establishments; earnings differences between manufacturing and services sectors; and earnings per capita and growth rates for each sector.
7. Per capita income and earnings growth rate.
8. Air transportation accessibility.

Dallas' top ranking in the Sprint survey was based on the area's diverse and vibrant economic climate, including a 17 percent growth in the number of business establishments in recent years. Dallas also scored well because of the presence of fast-growing industries in technology, communications, professional services, banking and financial services. The Dallas metro area ranked highest among the top five most productive cities in terms of per capita income and employee earnings growth. Dallas' skilled workforce and transportation infrastructure also helped it achieve the number one ranking in the Sprint survey.

C. Outlook Magazine Top Choice Cities

Outlook Magazine, published in Dallas by World Economic Development Alliance—a business location consulting firm—is mailed six times a year to CEOs and senior level executives around the world. It has a circulation of about 30,000. Each year,

it publishes a list of the top 25 top cities for business expansion or relocation. “Top Choice Cities” are those which surpass threshold levels for a number of variables. Outlook considers factors such as quality of life, cultural amenities, work force availability, crime and public safety, job creation, pro-business attitudes, taxes, transportation and educational opportunities.

Dallas-Fort Worth was among the 25 cities selected in a January 1999 survey. The predominance of high-tech companies, a large health care industry, short commutes, DFW Airport, and a wide array of culture venues were the factors cited in the DFW write-up.

In November 1999, another survey was published in which Dallas and Fort Worth weren’t even mentioned (see Table 15). A call to the publisher revealed that the magazine had changed its weighting criteria and was now putting more emphasis on crime and traffic congestion. Dallas and Fort Worth didn’t make the cut because of comparatively high crime rates and worsening traffic. For that matter, no other large cities made the November 1999 list either.

D. P.O.V.’s Best American Cities to Start a Business

P.O.V. Magazine is a guidebook for young professional men and has a circulation of about 300,000. Its focus is more on style and sex than business, but each year it publishes a list of the best cities for business startups. The criteria for selection include “coolness and quality of life,” whatever that means, and general business concerns. Of the 75 cities selected, Dallas-Fort Worth was ranked number 12 while Austin came in second (see Table 16). The publication provides no further description of the “methodology” employed to rate the cities.

E. PricewaterhouseCoopers Money Tree Survey

PricewaterhouseCoopers publishes a quarterly survey of venture capital invested in internet-related companies. Since 1997, Dallas-Fort Worth has ranked fifth in this survey behind Silicon Valley, New York City, Los Angeles/Orange County and Austin (see Table 17). The only surprise in this ranking is that Austin, which is one-fifth the size of the Metroplex, is attracting nearly twice as much venture capital for internet startups.

Because DFW is a major financial, technology and trading center, the region is well-positioned to exploit the economic potential of the internet. As more and more business-to-business and business-to-consumer commerce is conducted over the internet, venture capitalists and other investors should become even more focused on the Dallas-Fort Worth region.

F. 1999 Scarborough Report

Scarborough Research of New York, a service of the Arbitron Company, conducted a survey of internet usage among 170,000 adults in 64 major markets between February 1998 and February 1999. In October 1999, they released the survey of the “Top 25 Markets for Internet Penetration,” and Dallas-Fort Worth came in 6th with a 49.6 percent adult penetration rate (see Figure 5). Washington, D.C. was first, followed by San Francisco, Austin, Seattle/Tacoma, and Salt Lake City.

There are no real surprises in this ranking, though again Austin beats out DFW. The Metroplex is currently one of the nation’s most wired communities, and given the area’s industrial structure, we’re likely to stay ahead of the pack.

G. The Wall St. Journal's 13 Hottest Places on the New High-Tech Map

A series of lengthy articles in the November 23, 1999 issue of the Wall St. Journal identified and discussed the 13 hottest high-tech regions in the U.S. The Journal did not rank the 13 regions but simply listed them with witty names like “Billville” for Seattle-Redmond and “Roboburgh” for Pittsburgh. Perhaps fortunately, they were unable to come up with a clever appellation for the Metroplex, so we just appear as Dallas—though the article mentions Ft. Worth as well (see Figure 6).

In citing Dallas as one of the nation’s hot spots for high-tech, the Journal mentions semiconductors, telecommunications, defense electronics, computer services, and entertainment software as well as Dallas being the home of the first internet broadcaster. The recent jump in venture capital flowing to the Metroplex is also mentioned.

However, the article also makes the point that in the first half of 1999, Austin accounted for more high-tech investment than Dallas and Houston combined.

H. Cushman & Wakefield Best Cities to Work

Cushman & Wakefield is a New York-based real estate services firm. In November 1999, they released the results of survey in which 2,000 professionals and top executives with college degrees were asked to name the city where they’d most like to work. Of the 20 cities studied, Dallas came in 8th and Houston 13th (see Table 18). Denver came in first and Detroit last.

In terms of recreational and leisure resources, Dallas was ranked in the first tier of cities. Dallas was also cited, along with New York and Chicago, as a preferred location for marketing, finance and business services.

I. Money Magazine Best Places to Live

In November 1999, Money Magazine published its annual ranking of “best places to live.” San Francisco was named the best big city and Rochester, Minnesota the best small city. Runners-up were New York, Boulder, Austin and Columbia, Missouri. In addition, Money rated the nation’s 300 largest metropolitan areas and posted the results on their website: www.money.com/contents.

Once again, Austin is reviewed more favorably than Dallas in a national survey that is highly publicized. It was picked as one of the six best places to live because of its rapid job growth, low unemployment rate, and affordable cost of living as well as its cultural and recreational amenities.

Table 19 compares San Francisco, Austin and Dallas on each of the factors ranked by Money. In addition to economic performance, Austin beats out Dallas on air and water quality and also shows lower crime rates. Commutation times and median housing costs are more favorable in Austin, while the overall cost of living is marginally lower. Dallas outranks Austin in arts and culture, professional sports, and municipal bond rating.

It bears keeping in mind that the Money ranking is not an assessment of an area’s business climate but, rather, factors that are deemed important to educated professionals when assessing the desirability of communities. Dallas as the perennial runner-up to Austin should also be viewed skeptically because of a number of unique factors. Austin is really a “start-up” economy, which is just now coming into its own. What’s more, it’s much easier for a small community to post high growth rates than a larger one. Though Austin’s percentage gains in population, employment, high-tech start-ups and the like

have been impressive, in absolute numbers the Dallas-Fort Worth Area is much larger and showing very robust growth.

J. Fortune Magazine's Best Cities for Business

Since 1989, Fortune Magazine has prepared an annual ranking of the Best Cities for Business. Dallas-Fort Worth was ranked number one in 1989, when the Fortune survey began, and remained in the top 10 in 1990 and 1991. Absent from the list from 1992 through 1994, DFW reappeared in 1995 and 1996. In 1997 and 1998, DFW didn't make the cut. (Austin came in first in 1998). But this year—ten years after receiving its last crown—Dallas was once again designated the Best City for Business in the U.S. (see Table 20).

Fortune worked in partnership with the Business Location Practice of Arthur Andersen in compiling the annual list of best cities. Andersen relied on three sources for evaluating cities: (1) a survey of business executives worldwide; (2) a survey of economic development organizations for 160 cities, and (3) independent research done by Andersen. The information was analyzed to select cities that satisfied critical business-location needs, in particular the ability to recruit and retain managerial and professional talent. Fortune made the final ranking decisions, incorporating the results of Arthur Andersen's work with information and analysis supplied by writers and researchers.

Fortune cited Dallas' infrastructure, including DFW Airport, the region's comparatively low cost of living, civic and cultural activities, and a rapidly growing economy in selecting it as the top North American city for business. The article also mentions that Dallas has more restaurants per capita than New York City. According to

Fortune's editors, this year's evaluations considered Ft. Worth separately from Dallas, and that city did not make the top ten.

Being designated number one by Fortune is a signal achievement, mainly because of the wide-ranging (and free) publicity the area will receive over the next year. But like all such surveys and studies, this one has serious flaws. First, how can Dallas be the best and Fort Worth not make the list, when we're all part of the same economy? Second, how can the Metroplex not even make the top-ten list in 1997 and 1998 and yet jump to number one in 1999? Have we had an amazing turnaround in the past year? The fact is, the regional economy was actually growing faster in 1998 than in 1999. Third, the Fortune editors change their evaluation criteria somewhat every year.

In sum, the Fortune survey tells us what we already know—that the Metroplex is one of the most dynamic major metropolitan economies in the world with a fine airport, a hospitable climate, and lots of good restaurants. It doesn't tell us what we need to do to keep the economy humming and the quality-of-life improving in the decades to come.

K. Milken Institute Tech-Pole Ranking

The Milken Institute is a privately-funded economic policy think tank in Santa Monica, California. In July 1999, the Institute published a study entitled "America's High-Tech Economy: Growth, Development and Risks for Metropolitan Areas." The report argues that the high-tech sector is boosting the long-term potential growth trajectory of the U.S. economy and is also determining the relative success of metropolitan areas around the country. Table 21 lists the industries defined as "high-tech" in the Milken report.

The study ranks all of the nation's 315 metropolitan areas on three different scales: (1) the value of high-tech output as a share of total output in a metro area relative to the same percentage for the United States. This ratio is called the 'location quotient;' (2) the percentage of the nation's total high-tech output coming from that particular metropolitan area; and (3) the metro area's growth in output of high-tech industries as compared to the national growth rate in high tech between 1990 and 1998.

Both Dallas and Fort Worth-Arlington rank favorably on the three scales (see Tables 22, 23 and 24). By the relative share, or location quotient measure, Dallas ranks #18 and Fort Worth #64. On the percent of national real output measure, Dallas ranks #6 and Fort Worth #34. Using the high-tech growth rate measure, Dallas ranks #26 and Fort Worth # 130. The Institute then calculates a 'Tech-Pole' ranking by combining the location quotient with the share of national high-tech output in a multiplicative fashion. These areas are Tech-Poles in the sense of the relative technology gravitation pull they exert.

By the composite measure, Dallas ranks as the second strongest Tech-Pole in the nation after San Jose (Silicon Valley) (see Table 25). Dallas' diversified high-tech base—seven industries out of a possible 14 are more concentrated than the national average—coupled with the presence of six of the nation's 20 largest telecommunication services companies helped the region achieve the next-to-the highest ranking as a Tech-Pole. What's more, as the report points out, Dallas remains the center of Texas' electronic components industry, with 4,200 more workers than Austin and output more than 20 percent greater than Austin's. Fort Worth-Arlington came in 41st in the Tech-Pole rankings.

Of all the studies reviewed in this report, the Milken Institute's is without doubt the most objective because it is based entirely on quantitative measures. It is not a business climate study or a quality of life study; instead, it makes the indisputable case that high-technology drives the DFW economy. This is the same conclusion reached in an independent study conducted by the UNT Center for Economic Development and Research for the North Texas Commission two years ago. The Milken report is also useful because it conveys a plethora of information about the structure of the Metroplex economy and how we compare with our principal high-tech competitors.

There is a sobering side to the Milken Institute study as well. The authors point out that high-tech industries, especially those engaged in manufacturing, are among the most volatile in the economy. Metropolitan economies dominated by the technology sector may experience other dislocations such as: (1) widening income disparities along educational attainment levels, (2) lower job security and job tenure, and (3) a higher probability of unemployment among workers in their 50s.

In short, having a high-tech economic base doesn't mean a region will be insulated from a national business downturn. A simulation conducted as part of the Milken study found that among the 15 top Tech Poles, San Jose would have the greatest exposure to a future recession (see Table 26). Dallas, with a greater share of its high-tech employment in the service sectors, would be less exposed to a future recession.

The Milken report concludes with a discussion of the factors that matter in the inception, growth and fortification of regional high-tech industries (see Table 27). Not surprisingly, skills, education and training—along with research institutions—are

considered “critical” variables in the high-tech growth formula. Less important factors include transportation and proximity to markets.

Finally, the report argues against a heavy hand of government intervention in regional high-tech development:

State and local governments, public policies, and the interaction between private and public sectors are crucial for the genesis, the expansion, and the fortification phases of high-tech development. Nonetheless, due to the unique characteristics of high-tech industries, government’s role is also limited. Overly active government intervention and public policy may be counterproductive and harmful to the long-term development of high-tech industries.

L. Cognetics Startup Business Rankings

Cognetics, Inc. is a Cambridge, Mass. research and consulting firm. For years, they have published an annual ranking of the best cities for starting and growing a new business. Cognetics bases its rankings on data from Dun & Bradstreet showing the birth and growth rates of small businesses in recent years. Of the 50 large metropolitan areas analyzed in 1999, Dallas-Fort Worth was ranked number 9 (see Table 28). Cognetics conducted a second ranking of 25 smaller metropolitan areas, and Austin came in number two behind Las Vegas.

Cognetics says the best locales for entrepreneurs require dynamic universities, ample skilled labor, a major airport, and a good quality of life. They point out, however, that only about two percent of rapidly growing small companies make high-tech products.

IV. Conclusion

The surveys and studies reviewed above paint a generally positive picture about the economy of the Metroplex and its preparedness for the new millennium. Among the

nation's largest urbanized regions, DFW arguably boasts the strongest, most diversified, and most promising economy because we are fortunately endowed with a broad range of fast-growing and competitive industries, especially in the information technology sector. Entrepreneurial activity is strong and venture capital increasingly available. What's more, as the Milken Report points out, we appear to have the "right stuff" for prospering in the high-tech new economy.

One puzzling dimension to these studies is why Austin generally scores higher than Dallas or Dallas-Fort Worth. Certainly, Austin has received lots of hype and attention in recent years with the growth of Dell, Motorola and other high-tech companies in the region. And Austin is a nice place to live, with easy access to recreational amenities and a new, modern airport. But is Austin doing something the Metroplex isn't? Are there lessons to be learned from the Austin experience that can enhance the prospects for high-tech development in DFW? Probably not. As discussed above, Austin's explosive growth is partly a consequence of its relatively small size. DFW's growth rates may trail Austin's, but the Metroplex overwhelms Austin in terms of the absolute numbers of high-tech workers and the total economic impact of the information technology sector. The DFW economy is booming, the region continues to attract and nurture new industry—both high-tech and traditional—and the business outlook remains extremely positive for at least the next decade.

What about Fort Worth, which seems to lag behind Dallas in most of the ratings and rankings? The separation of the two metro areas for descriptive or analytic purposes makes no economic sense. Tens of thousands of Metroplex residents travel each day

from one MSA to the other for work, for shopping, and for recreation. If Dallas is the best city in North America for business, then Ft. Worth is too!

Like other large metropolitan regions, the Metroplex faces many problems and challenges, including under-performing public schools, rising traffic congestion, and deteriorating air quality. These are all issues that must be addressed forthrightly if the region is to continue along its growth trajectory. In particular, we must ensure that the region's human capital, as well as its physical capital, is maintained and improved. The twin problems of worker shortages and workforce training must receive renewed attention.

Finally, the Metroplex's business and political leaders must join forces with leaders in other regions to counter the nation's drift toward protectionism and anti-globalism. The recent failure of the World Trade Organization to agree on an agenda for future talks on further liberalizing trade does not bode well for export-oriented economies like that of the Metroplex. A slowdown in world trade, more than any other development, stands the best chance of de-railing DFW's economic engine.

TABLES AND FIGURES

Top States

Reader's Choice Sept. – Oct. 1998 Survey

1.	Texas
2.	California
3.	North Carolina
4.	Georgia
5.	Pennsylvania
6.	Arizona
7.	Tennessee
8.	Illinois
9.	South Carolina
10.	Michigan
11.	Ohio
12.	Florida

Bizsites Monitor 10/1/97 – 6/30/98

1.	Michigan
2.	New York
3.	North Carolina
4.	Ohio
5.	California
6.	Texas
7.	Florida
8.	Virginia
9.	Tennessee
10.	Georgia Pennsylvania

Table 1

Source: *Plant Sites & Parks*

Table 2

1998's Top 10 States New Facilities/Expansions

1.	Michigan	1,722
2.	California	1,673
3.	Ohio	1,153
4.	North Carolina	1,044
5.	New York	1,025
6.	Texas	926
7.	Virginia	462
8.	Illinois	448
9.	Florida	430
10.	Minnesota	402

Source: Site Selection Magazine Online

Table 3
1999 Report Card Grades

<i>State</i>	<i>Performance Grade</i>	<i>Business Vitality Grade</i>	<i>Development Capacity Grade</i>
Alabama	D	C	C
Alaska	C	F	D
Arizona	D	C	C
Arkansas	D	D	F
California	D	A	A
Colorado	A	A	A
Connecticut	A	B	B
Delaware	B	A	B
Florida	D	C	C
Georgia	C	C	C
Hawaii	D	F	C
Idaho	C	C	D
Illinois	C	A	B
Indiana	B	C	C
Iowa	B	D	B
Kansas	B	B	C
Kentucky	C	C	D
Louisiana	F	C	F
Maine	A	C	D
Maryland	C	A	A
Massachusetts	B	A	A
Michigan	B	B	B
Minnesota	A	B	A
Mississippi	F	D	F
Missouri	B	C	C
Montana	C	F	D
Nebraska	A	D	C
Nevada	C	D	D
New Hampshire	A	A	C
New Jersey	B	B	A
New Mexico	F	D	D
New York	D	C	B
North Carolina	C	B	C
North Dakota	B	D	D
Ohio	C	B	B
Oklahoma	D	C	D
Oregon	B	A	B
Pennsylvania	C	A	A
Rhode Island	C	D	B
South Carolina	C	D	F
South Dakota	C	F	D
Tennessee	D	C	C
Texas	F	B	C
Utah	A	A	A
Vermont	A	C	C
Virginia	C	B	B
Washington	A	B	A
West Virginia	F	F	F
Wisconsin	A	C	A
Wyoming	C	D	B

Source: 1999 Development Report Card

CFED Top Performers

	<u>Performance</u>	<u>Business Vitality</u>	<u>Development Capacity</u>
Colorado	A	A	A
Delaware	B	A	B
Massachusetts	B	A	A
Michigan	B	B	B
Minnesota	A	B	A
New Jersey	B	B	A
Utah	A	A	A
Washington	A	B	A

Table 4

Source: Corporation for Enterprise Development

Table 5

High-Tech Employment by State

<i>Rank</i>	<i>State</i>	<i>1997 Employment</i>
1.	California	784,151
2.	TEXAS	375,933
3.	New York	320,410
4.	Illinois	207,201
5.	Massachusetts	205,091
6.	Florida	193,559
7.	New Jersey	179,528
8.	Pennsylvania	159,952
9.	Virginia	154,712
10.	Georgia	132,524

Source: American Electronics Association Cybersstates 3.0 Survey

High-Tech Job Scorecard 1990 vs. 1997

97 Ranking	90 Ranking	States	1990	1997	# Change	% Change
		United States	3,972,573	4,566,056	+593,483	+15%
1	1	California	718,030	784,151	66,121	9%
2	3	Texas	274,196	375,933	101,737	37%
3	2	New York	350,579	320,410	-30,169	-9%
4	5	Illinois	181,415	207,201	25,786	14%
5	4	Massachusetts	221,641	205,091	-16,550	-7%
6	7	Florida	169,626	193,559	23,933	14%
7	6	New Jersey	171,696	179,528	7,832	5%
8	8	Pennsylvania	142,043	159,952	17,909	13%
9	9	Virginia	121,708	154,712	33,004	27%
10	16	Georgia	86,119	132,524	46,405	54%

*1997 data are the most recent available.

Source: U.S. Bureau of Labor Statistics

Table 6

Texas High-Tech Metropolitan Scorecard by Employment 1990 vs. 1996

Ranking	States	1990	1996	# Change	% Change
	United States	4.0 million	4.3 million	+288,000	+7%
	Texas	274,196	343,075	68,900	25%
1	Dallas	125,400	151,900	26,500	21%
2	Houston	44,600	57,500	12,900	29%
3	Austin	33,600	56,100	22,500	67%
4	Fort Worth	14,600	18,500	3,800	26%
5	San Antonio	12,000	17,600	5,600	46%
	Boston	241,400	222,700	-18,700	-8%
	San Jose	196,800	221,300	24,500	12%

*1996 data are the most recent available.
Source: U.S. Bureau of Labor Statistics

High-Tech Wage Scorecard 1997*

Ranking (by wage)	State	Av. High-Tech Wage	Av. Private Sector Wage	% Difference
	United States	\$53,145	\$30,053	77%
1	Washington	\$81,375	\$30,337	168%
2	California	\$62,771	\$32,982	90%
3	New Jersey	\$62,589	\$37,015	69%
4	Washington, D.C.	\$61,862	\$42,667	45%
5	Massachusetts	\$59,622	\$35,661	67%
6	Connecticut	\$58,165	\$38,959	49%
7	New York	\$57,319	\$38,675	48%
8	Virginia	\$56,757	\$28,848	97%
9	Maryland	\$54,976	\$30,473	80%
10	Colorado	\$54,528	\$29,774	83%
11	Texas	\$53,778	\$30,102	79%

*1996 data are the most recent available.

Source: U.S. Bureau of Labor Statistics

Texas High-Tech Metropolitan Scorecard by Wages 1990 vs. 1996

Ranking	States	1990	1996	# Change	% Change
	United States	\$43,800	\$49,600	\$5,800	13%
	Texas	\$43,100	\$50,000	\$6,900	16%
1	Houston	\$46,500	\$53,800	\$7,300	16%
2	Dallas	\$45,000	\$53,700	\$8,600	19%
3	Austin	\$45,900	\$51,800	\$5,900	13%
4	Fort Worth	\$35,200	\$41,500	\$6,200	18%
5	San Antonio	\$37,000	\$39,300	\$2,300	6%
	San Jose	\$55,600	\$71,900	\$16,200	29%
	Boston	\$47,700	\$55,300	\$7,600	16%

*1996 data are the most recent available. Adjusted for inflation to 1996 dollars.

Source: U.S. Bureau of Labor Statistics

Table 10

Texas High-Tech Degrees Conferred 1990 vs. 1996

	<u>1990</u>	<u>1996</u>	<u>% Change</u>
Associate	3,355	3,225	-4%
Bachelor	1,948	1,805	-7%
Master	1,877	2,202	17%
Doctor	375	558	49%
Total High-Tech	12,058	12,991	8%

Source: American Electronics Association

Table 11

The State New Economy Index

The Rankings - Overall Scores

STATES BY RANK			ALPHABETICALLY		
Rank	State	Score	State	Rank	Score
1	Massachusetts	82.27	Alabama	44	32.28
2	California	74.25	Alaska	13	57.7
3	Colorado	72.32	Arizona	10	59.23
4	Washington	68.99	Arkansas	49	26.22
5	Connecticut	64.89	California	2	74.25
6	Utah	63.98	Colorado	3	72.32
7	New Hampshire	62.45	Connecticut	5	64.89
8	New Jersey	60.86	Delaware	9	59.87
9	Delaware	59.87	Florida	20	50.75
10	Arizona	59.23	Georgia	25	46.61
11	Maryland	59.16	Hawaii	26	46.14
12	Virginia	58.76	Idaho	23	47.93
13	Alaska	57.7	Illinois	22	48.37
14	Minnesota	56.53	Indiana	37	40.95
15	Oregon	56.1	Iowa	42	33.51
16	New York	54.48	Kansas	27	45.8
17	Texas	52.31	Kentucky	39	39.4
18	Vermont	51.87	Louisiana	47	28.22
19	New Mexico	51.43	Maine	28	45.62
20	Florida	50.75	Maryland	11	59.16
21	Nevada	49.03	Massachusetts	1	82.27
22	Illinois	48.37	Michigan	34	44.59
23	Idaho	47.93	Minnesota	14	56.53
24	Pennsylvania	46.72	Mississippi	50	22.63
25	Georgia	46.61	Missouri	35	44.24
26	Hawaii	46.14	Montana	46	28.98
27	Kansas	45.8	Nebraska	36	41.81
28	Maine	45.62	Nevada	21	49.03
29	Rhode Island	45.31	New Hampshire	7	62.45
30	North Carolina	45.16	New Jersey	8	60.86
31	Tennessee	45.14	New Mexico	19	51.43
32	Wisconsin	44.92	New York	16	54.48
33	Ohio	44.77	North Carolina	30	45.16
34	Michigan	44.59	North Dakota	45	28.99
35	Missouri	44.24	Ohio	33	44.77
36	Nebraska	41.81	Oklahoma	40	38.63
37	Indiana	40.95	Oregon	15	56.1
38	South Carolina	39.69	Pennsylvania	24	46.72
39	Kentucky	39.4	Rhode Island	29	45.31
40	Oklahoma	38.63	South Carolina	38	39.69
41	Wyoming	34.49	South Dakota	43	32.33
42	Iowa	33.51	Tennessee	31	45.14
43	South Dakota	32.33	Texas	17	52.31
44	Alabama	32.28	Utah	6	63.98
45	North Dakota	28.99	Vermont	18	51.87
46	Montana	28.98	Virginia	12	58.76
47	Louisiana	28.22	Washington	4	68.99
48	West Virginia	26.79	West Virginia	48	26.79
49	Arkansas	26.22	Wisconsin	32	44.92
50	Mississippi	22.63	Wyoming	41	34.49
	U.S. Average	48.07			

Source: <http://www.neweconomyindex.org/states/rankings.html>

Table 12

The State New Economy Index - Texas

Indicator	Rank	Score
Overall	17	52.31
Aggregated Knowledge Jobs Scores	32	5.17
Office Jobs <i>Jobs in offices as a share of the total number of jobs in each state.</i>	25	18.60%
Managerial, Professional, and Technical Jobs <i>Managers, professionals, and technicians as a share of the total workforce.</i>	47	19.50%
Workforce Education <i>A weighted measure of the educational attainment of the workforce (advanced degrees, bachelor's degrees, associate's degrees, or some college course work).</i>	24	60.15
Aggregated Globalization Scores	10	6.86
Export Focus of Manufacturing <i>The share of jobs in manufacturing companies dependent upon exports.</i>	4	23.90%
Foreign Direct Investment <i>The percentage of each state's workforce employed by foreign companies.</i>	26	3.50%
Aggregated Economic Dynamism Scores	10	7.8
"Gazelle" Jobs <i>Jobs in gazelle companies (companies with annual sales revenue that has grown 20 percent or more for four straight years) as a share of total employment.</i>	15	14.60%
Job Churning <i>The number of new start-ups and business failures, combined, as a share of all companies in each state.</i>	13	2.80%
Initial Public Offerings <i>The value of the initial public stock offerings of companies as a share of gross state product.</i>	11	0.63%
Aggregated Digital Economy Scores	23	6.13
Online Population <i>The percentage of adults with Internet access in each state.</i>	18	33%
Commercial Internet Domain Names <i>The number of commercial Internet domain names (".com") per firm.</i>	21	0.24
Technology in Schools <i>A weighted measure of the percentage of classrooms wired for the Internet, teachers with technology training, and schools with more than 50 percent of teachers having school-based e-mail accounts.</i>	25	1.93
Digital Government <i>A measure of the utilization of digital technologies in state governments.</i>	31	58.2
Aggregated Innovation Capacity Scores	17	6.72
High-Tech Jobs <i>Jobs in high-tech electronics manufacturing, software and computer-related services, and telecommunications as a share of total employment.</i>	11	5.40%
Scientists and Engineers <i>Civilian scientists and engineers as a percentage of the workforce.</i>	33	0.34%
Patents <i>The number of patents issued to companies or individuals per 1,000 workers.</i>	22	0.45
Industry Investment in R&D <i>Private sector investment in research and development as a share of Gross State Product.</i>	26	1.20%
Venture Capital <i>Venture capital invested as a percentage of Gross State Product.</i>	9	0.16%

Source: www.neweconomyindex.org/states/texas.html

Best & Worst Locations

The Top 10

Rank	Location	Score
1.	Seattle, WA	184.5
2.	Austin, TX	221.0
3.	Dallas, TX	232.5
4.	Ventura, CA	234.5
5.	Oakland, CA	242.0
6.	Somerset, NJ	253.5
7.	Denver, CO	254.0
8.	San Jose, CA	257.4
9.	Houston, TX	267.0
10.	Atlanta, GA	273.5
35.	Fort Worth- Arlington, TX	

The Bottom 10

Rank	Location	Score
162.	Johnson City, TN	865.5
161.	Spokane, WA	779.5
160.	Honolulu, HI	777.0
159.	Reading, PA	765.0
158.	Buffalo, NY	758.5
157.	Gary-Hammond, IN	749.0
156.	Asheville, NC	743.5
155.	Atlantic City, NJ	742.0
154.	Akron, OH	701.5
153.	Shreveport, LA	699.5

Table 13

Source: *Forbes*, May 31, 1999

Top 10 Most Productive Cities

	<u>Metropolitan Statistical Area</u>	<u>Economic Productivity Composite Index (US Average = 100)</u>
1.	Dallas	136
2.	San Francisco	131
3.	San Jose, CA	128
4.	Houston	128
5.	Atlanta	127
6.	Provo-Orem, UT	127
7.	Boise City, ID	126
8.	Sioux Falls, SD	124
9.	Nashville, TN	123
10.	Salt Lake City-Ogden, UT	123
20.	Fort Worth	120

Source: *Sprint Business*

Table 15

OVERALL RANKINGS

1	Sunnyvale	
2	Raleigh	NC
3	Madison	WI
4	Seattle	WA
5	Alexandria	VA
6	Lincoln	NE
7	Tallahasee	FL
8	Costa Mesa	CA
9	Arden-Arcade	CA
10	Overland Park	KS
11	Torrance	CA
12	Springfield	IL
13	Boise City	ID
14	Tempe	AZ
15	Stamford	CT
16	Reno	NV
17	Honolulu	HI
18	Ann Arbor	MI
19	Portland	OR
20	Durham	NC
21	Scottsdale	AZ
22	Arlington	VA
23	Greensboro	NC
24	Little Rock	AK
25	Minneapolis	MN

MANUFACTURING RANKINGS

1	Costa Mesa	
2	Irving	TX
3	Greensboro	NC
4	Manchester	NH
5	Sioux Falls	SD
6	Lincoln	NE
7	Cedar Rapids	IA
8	Charlotte	NC
9	Reno	NV
10	Sunnyvale	CA
11	Wichita	KS
12	Orange	CA
13	Des Moines	IA
14	Huntington Beach	CA
15	Torrance	CA
16	Anaheim	CA
17	Portland	OR
18	Livenia	MI
19	San Buena Ventura	CA
20	Fullerton	CA
21	Green Bay	WI
22	Arvada	CO
23	Fremont	CA
24	Hollywood	CA
25	Omaha	NE

Source: www.bdomag.com (Nov/Dec '99)

P.O.V.'s Best Cities to Start a Business

1. Seattle
2. Austin
3. Las Vegas
4. Denver
5. Burlington, VT
6. Salt Lake City
7. Raleigh-Durham
8. Orlando, FL
9. Atlanta
10. Jacksonville, FL
11. Boston
12. Dallas-Fort Worth
13. Charleston, S.C.

14. Sioux Falls, SD
15. Colorado Springs, CO
16. Madison, WI
17. Nashville, TN
18. Jackson, MS
19. Portland, OR
20. Chicago
21. Phoenix
22. Baton Rouge, LA
23. Houston
24. San Francisco
25. Santa Fe, NM

Source: P.O.V. Magazine

Venture-Capital Dollars Invested in Internet-Related Companies

in millions

<i>Region</i>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>
Silicon Valley	\$117.9	\$579.4	\$1,067.4	\$1,509.1	\$4,443.2
New York metro area	---	56.4	161.8	304.0	949.2
Los Angeles/ Orange County	1.1	14.3	94.3	196.7	915.6
Austin	0.1	20.8	56.6	89.8	215.9
Dallas/Fort Worth	0.6	17.8	12.5	34.7	113.4

Source: PricewaterhouseCoopers MoneyTree Survey

Table 17

Overall Desirability Rating of Dallas Versus Other Markets

	Very Desirable	Desirability		Not Desirable	Total
	7	6	5, 4	1-3	
Denver	4%	21%	55%	20%	4.5
Atlanta	9%	14%	51%	26%	4.4
Phoenix	6%	20%	48%	26%	4.4
San Francisco	9%	16%	48%	27%	4.3
Seattle	8%	22%	41%	29%	4.3
Portland, Oregon	5%	14%	53%	28%	4.3
Tampa/St. Petersburg	5%	16%	50%	29%	4.3
Dallas	4%	9%	53%	34%	4.0
Minneapolis/St. Paul	4%	9%	49%	38%	3.9
Boston	5%	11%	47%	37%	3.9
Chicago	8%	9%	39%	44%	3.8
New York City	10%	8%	34%	48%	3.6
Houston	3%	6%	46%	45%	3.6
Las Vegas	5%	10%	38%	47%	3.6
Philadelphia	3%	8%	43%	36%	3.5
Washington, DC	6%	8%	33%	53%	3.4
Los Angeles	5%	8%	27%	60%	3.2
Detroit	2%	2%	26%	70%	2.7

Table 18

A majority of workers from the fastest growing professions requiring education or experience rated Dallas “very desirable 7/6” or “desirable 5/4” and relatively low percent rated it “undesirable 1-3.” Its mean rating was 4.0, the eighth best rating of any market.

Source: Cushman & Wakefield, Best Cities Study, October 14, 1999

Table 19

Money Magazine's City Rankings

Category	San Francisco	Austin	Dallas
POLLUTION			
EPA watershed rating (100 is best; 0 is worst)	8.6 (261)	95.6 (13)	69.2 (36)
Air quality rating (200 is best; 0 is worst)	175 (8)	140 (73)	75 (294)
CRIME			
Property crime yearly per 100,000 people	4,240 (119)	5,414 (215)	5,470 (222)
Violent crime yearly per 100,000 people	688.2 (215)	490.9 (131)	717.6 (221)
ECONOMY			
Cost of living index (average=100)	184 (295)	96.5 (81)	100.6 (153)
Recent unemployment rate	2.3% (35)	2.2% (26)	3.0% (46)
Job growth since 1998	2.31% (211)	5.46% (7)	3.79% (29)
Forecast job growth to 2010	9.98% (248)	33.19% (3)	19.66% (64)
Municipal bond rating	AA- (92)	AA (30)	AAA (1)
HOUSING			
Median price for 3-bedroom home	\$360,000 (298)	\$160,000 (198)	\$193,310 (269)
Change in average home value since 1998	3.92% (200)	9.71% (16)	6.05% (97)
Utility costs (average for an 1,800 sq. ft. home)	\$120 (234)	\$89.3 (57)	\$97.9 (105)
QUALITY OF LIFE			
Average commute time (mins)	24.9 (283)	21.4 (227)	24.4 (281)
Pro sports index (100 is best; 0 is worst)	94 (36)	26 (228)	98 (25)
Arts & culture index (100 is best; 0 is worst)	100 (1)	47 (88)	81 (29)
WEATHER			
Sunny days (number of days per year with clear or partly clear weather)	265	231	233
Average July high (degrees Fahrenheit)	73.6	95.9	96.1
Average January low (degrees Fahrenheit)	41.2	39.3	33.9
Average annual rainfall (inches)	21	33	32
Average annual snowfall (inches)	0	1	3

Source: Money Magazine

Table 20

The Top 10

Fortune magazine's "Best Cities for Business" in the United States:

1.	DALLAS
2.	San Jose
3.	Austin
4.	New York City
5.	Atlanta
6.	Seattle
7.	San Francisco
8.	Denver
9.	Boston
10.	Chicago

Source: *Fortune* magazine; Arthur Andersen

Table 21

High-Tech Industries

High-Tech Manufacturing Industries

SIC	Industry Definition
283	Drugs
357	Computer & Office Equipment
366	Communications Equipment
367	Electronic Components & Accessories
376	Guided Missiles, Space Vehicles & Parts
381	Search, Detection, Navigation, Guidance, Aeronautical Nautical Systems, Instruments, & Equipment
382	Laboratory Apparatus and Analytical, Optical, Measuring, & Controlling Instruments
384	Surgical, Medical, & Dental Instruments & Supplies

High-Tech Service Industries

SIC	Industry Definition
481	Telephone Communications Services
737	Computer Programming, Data Processing, & Other Computer Related Services
781	Motion Picture Production & Allied Services
871	Engineering, Architectural, & Surveying Services
873	Research, Development, & Testing Services

Source: Milken Institute

Table 22

**Top 50 High-Tech Metros, by Concentration
Total High-Tech Real Output, 1998**

Metro*	Location Quotient**	Output (Bill., 1992\$)	% of MSA Total Output	% of U.S. Industry Total	Empl. (Thou.)
1 Rochester, MN	5.56	2.41	50.54	0.35	10.48
2 San Jose, CA	4.09	39.78	37.17	5.79	279.06
3 Albuquerque, NM	3.55	9.62	32.30	1.40	35.73
4 Lubbock, TX	3.08	2.16	28.00	0.31	3.63
5 Cedar Rapids, IA	3.07	2.05	27.93	0.30	16.10
6 Boulder-Loogmont, CO	2.89	2.67	26.28	0.39	31.88
7 Boise City, ID	2.68	3.66	24.32	0.53	19.76
8 Kalamazoo-Battle Creek, MI	2.66	2.82	24.21	0.41	10.67
9 Richland-Kennewick-Pasco, WA	2.41	1.11	21.92	0.16	23.06
10 Middlesex-Somerset-Hunterdon, NJ	2.30	10.14	20.92	1.48	78.70
11 Seattle-Bellevue-Everett, WA	2.06	17.31	18.72	2.52	216.36
12 Melbourne-Titusville-Palm Bay, FL	2.00	1.75	18.16	0.25	28.54
13 Raleigh-Durham-Chapel Hill, NC	2.00	0.00	18.16	0.95	77.27
14 Pocatello, ID	1.99	0.35	18.11	0.05	1.82
15 Albany, GA	1.97	0.62	17.91	0.09	1.85
16 South Bend, IN	1.96	1.16	17.78	0.17	5.56
17 Burlington, VT	1.94	1.14	17.67	0.17	12.5
18 Dallas, TX	1.92	25.21	17.49	3.67	210.18
19 Wichita, KS	1.89	2.62	17.22	0.38	54.16
20 Flagstaff, AZ-UT	1.89	0.35	17.14	0.05	1.39
21 Colorado Springs, CO	1.85	2.17	16.80	0.32	29.01
22 Tucson, AZ	1.83	2.52	16.66	0.37	24.04
23 Huntsville, AL	1.78	1.69	16.14	0.25	34.38
24 Atlantic-Cape May, NJ	1.72	1.74	15.59	0.25	4.94
25 Sherman-Denison, TX	1.60	0.38	14.50	0.05	3.58
26 Binghamton, NY	1.57	0.94	14.28	0.14	15.83
27 Austin-San Marcos, TX	1.56	7.83	14.16	1.14	74.19
28 Boston, MA	1.51	28.72	13.71	4.18	329.28
29 Provo-Orem, UT	1.49	0.78	13.57	0.11	13.91
30 Phoenix-Mesa, AZ	1.46	12.24	13.29	1.78	120.32
31 Washington, DC-MD-VA-WV	1.45	24.01	13.20	3.50	264.98
32 Oakland, CA	1.43	10.65	12.97	1.55	90.69
33 Orange County, CA	1.40	12.68	12.75	1.85	123.44
34 Denver, CO	1.39	8.93	12.66	1.30	90.55
35 San Diego, CA	1.37	9.66	12.49	1.41	104.36
36 Atlanta, GA	1.37	17.40	12.42	2.53	154.49
37 Williamsport, PA	1.36	0.28	12.34	0.04	1.01
38 Rocky Mount, NC	1.36	0.42	12.33	0.06	5.29
39 Los Angeles-Long Beach, CA	1.35	35.11	12.28	5.11	402.14
40 Newark, NJ	1.33	9.29	12.11	1.35	84.55
41 Monmouth-Ocean, NJ	1.31	2.88	11.90	0.42	28.46
42 Santa Cruz-Watsonville, CA	1.30	0.83	11.84	0.12	7.49
43 Portland-Vancouver, OR-WA	1.30	7.04	11.82	1.02	82.11
44 Mansfield, OH	1.29	0.43	11.69	0.06	3.28
45 Indianapolis, IN	1.28	5.75	11.62	0.84	43.8
46 Ventura, CA	1.26	2.14	11.44	0.31	22.77
47 Dutchess County, NY	1.26	0.93	11.43	0.14	16.28
48 Glens Falls, NY	1.25	0.28	11.37	0.04	3.13
49 Elkhart-Goshen, IN	1.25	0.74	11.36	0.11	4.84
50 Trenton, NJ	1.25	1.40	11.34	0.20	16.49

*Each metro must contain either a place with a minimum population of 50,000 or a Census Bureau defined urbanized area and total population of at least 100,000 (75,000 in New England). A metro comprises one or more counties.

**The Location Quotient (LQ) equals % output in metro divided by % output in the U.S. If LQ > 1.0, the industry is more concentrated in the metro area than in the U.S. on average.

Sources: Milken Institute; RFA

Table 23

Top 50 High-Tech Metros, by Size
Percent of National High-Tech Real Output, 1998

Metro*	Percent
1 San Jose, CA	5.79
2 Los Angeles-Long Beach, CA	5.11
3 New York, NY	4.23
4 Boston, MA	4.18
5 Chicago, IL	3.76
6 Dallas, TX	3.67
7 Washington, DC-MD-VA-WV	3.50
8 Atlanta, GA	2.53
9 Seattle-Bellevue-Everett, WA	2.52
10 Philadelphia, PA	2.09
11 Orange County, CA	1.85
12 Houston, TX	1.84
13 Phoenix-Mesa, AZ	1.78
14 Oakland, CA	1.55
15 Middlesex-Somerset-Hunterdon, NJ	1.48
16 San Francisco, CA	1.45
17 San Diego, CA	1.41
18 Albuquerque, NM	1.40
19 Newark, NJ	1.35
20 Denver, CO	1.30
21 Detroit, MI	1.20
22 Minneapolis-St. Paul, MN-WI	1.14
23 Austin-San Marcos, TX	1.14
24 New Haven-Bridgeport-Stamford, CT	1.07
25 Portland-Vancouver, OR-WA	1.03
26 Nassau-Suffolk, NY	1.02
27 St. Louis, MO-IL	0.98
28 Raleigh-Durham-Chapel Hill, NC	0.95
29 Kansas City, MO-KS	0.88
30 Indianapolis, IN	0.84
31 Orlando, FL	0.67
32 Sacramento, CA	0.66
33 Pittsburgh, PA	0.64
34 Fort-Worth-Arlington, TX	0.64
35 Tampa-St. Petersburg-Clearwater, FL	0.58
36 Bergen-Passaic, NJ	0.57
37 Baltimore, MD	0.57
38 Boise City, ID	0.53
39 San Antonio, TX	0.51
40 Cincinnati, OH-KY-IN	0.50
41 Columbus, OH	0.49
42 Charlotte-Gastonia-Rock Hill, NC-SC	0.46
43 Cleveland-Lorain-Elyria, OH	0.45
44 Hartford, CT	0.43
45 Salt Lake City-Ogden, UT	0.42
46 Monmouth-Ocean, NJ	0.42
47 West Palm Beach-Boca Raton, FL	0.41
48 Kalamazoo-Battle Creek, MI	0.41
49 Fort Lauderdale, FL	0.40
50 Milwaukee-Waukesha, WI	0.40

*Each metro must contain either a place with a minimum population of 50,000 or a Census Bureau defined urbanized area and total population of at least 100,000 (75,000 in New England). A metro comprises one or more counties.

Sources: Milken Institute; RFA

Table 24

Top 50 High-Tech Metros, by Growth
Relative High-Tech Real Output Growth, 1990 to 1998

	Metro*	Relative Growth**
1	Albuquerque, NM	4.37
2	Pocatello, ID	3.08
3	Boise City, ID	2.93
4	Cedar Rapids, IA	2.68
5	Harrisburg-Lebanon-Carlisle, PA	2.58
6	Columbus, GA-AL	2.39
7	Merced, CA	2.23
9	Richland-Kennewick-Pasco, WA	2.02
9	Yuma, AZ	1.95
10	Austin-San Marcos, TX	1.92
11	Eugene-Springfield, OR	1.88
12	Albany, GA	1.87
13	Yolo, CA	1.80
14	Tyler, TX	1.78
15	Flint, MI	1.78
16	Portland-Vancouver, OR-WA	1.77
17	Killeen-Temple, TX	1.77
18	Iowa City, IA	1.75
29	Phoenix-Mesa, AZ	1.71
20	New London-Norwich, CT	1.67
21	Little Rock-North Little Rock, AR	1.64
22	Texarkana, TX-AR	1.64
23	San Antonio, TX	1.64
24	Waco, TX	1.64
25	Clarksville-Hopkinsville, TN-KY	1.64
26	Dallas, TX	1.60
27	Kenosha, WI	1.58
28	Colorado Springs, CO	1.55
29	Waterloo-Cedar Falls, IA	1.53
30	Lancaster, PA	1.52
31	Lynchburg, VA	1.51
32	Tallahassee, FL	1.50
33	Atlanta, GA	1.50
34	Brazoria, TX	1.50
35	Sacramento, CA	1.48
36	Houston, TX	1.48
37	Grand Forks, ND-MN	1.47
38	Denver, CO	1.47
39	Springfield, MO	1.47
40	Longview-Marshall, TX	1.45
41	Lubbock, TX	1.45
42	Greeley, CO	1.44
43	Bismarck, ND	1.43
44	Lafayette, LA	1.41
45	Johnstown, PA	1.41
46	San Luis Obispo-Atascadero, CA	1.40
47	Boulder-Longmont, CO	1.39
48	Goldaboro, NC	1.37
49	Vallejo-Fairfield-Napa, CA	1.36
50	San Jose, CA	1.36

*Each Metro must contain either a place with a minimum population of 50,000 or a Census Bureau defined urbanized area and total population of at least 100,000 (75,000 in New England). A metro comprises one or more counties.

**Relative growth in high-tech real output is equivalent to metro output indexed to 1990 then divided by U.S. index. A metro with a value of >1 grew faster than the national average from 1990 to 1998.

Sources: Milken Institute; RFA

Table 25

Top 50 Milken Institute Tech-Poles
Composite Index, 1998

	Tech-Poles	Composite Index*	Number of High-Tech LQs Over 1**
1	San Jose, CA	23.69	10
2	Dallas, TX	7.06	7
3	Los Angeles-Long Beach, CA	6.91	5
4	Boston, MA	6.31	11
5	Seattle-Bellevue-Everett, WA	5.19	6
6	Washington, DC-MD-VA-WV	5.08	5
7	Albuquerque, NM	4.98	3
8	Chicago, IL	3.75	4
9	New York, NY	3.67	2
10	Atlanta, GA	3.46	4
11	Middlesex-Somerset-Hunterdon, NJ	3.40	7
12	Phoenix-Mesa, AZ	2.60	1
13	Orange County, CA	2.59	10
14	Oakland, CA	2.21	8
15	Philadelphia, PA	2.19	4
16	Rochester, MN	1.95	1
17	San Diego, CA	1.93	9
18	Raleigh-Durham-Chapel Hill, NC	1.89	7
19	Denver, CO	1.81	3
20	Newark, NJ	1.80	5
21	Austin-San Marcos, TX	1.78	4
22	San Francisco, CA	1.62	5
23	Houston, TX	1.62	2
24	Boise City, ID	1.43	2
25	New Haven-Bridgeport-Stamford, CT	1.33	10
26	Portland-Vancouver, OR-WA	1.33	2
27	Boulder-Longmont, CO	1.12	9
28	Kalamazoo-Battle Creek, MI	1.09	2
29	Indianapolis, IN	1.07	4
30	Nassau-Suffolk, NY	1.05	7
31	Kansas City, MO-KS	1.03	2
32	Minneapolis-St. Paul, MN-WI	0.98	4
33	Lubbock, TX	0.97	2
34	St. Louis, MO-IL	0.93	4
35	Cedar Rapids, IA	0.92	5
36	Orlando, FL	0.82	4
37	Sacramento, CA	0.82	6
38	Detroit, MI	0.79	2
39	Wichita, KS	0.72	3
40	Tucson, AZ	0.67	5
41	Fort Worth-Arlington, TX	0.66	4
42	Colorado Springs, CO	0.58	9
43	Monmouth-Ocean, NJ	0.55	4
44	Bergen-Passaic, NJ	0.51	6
45	Melbourne-Titusville-Palm Bay, FL	0.51	7
46	San Antonio, TX	0.49	3
47	Pittsburgh, PA	0.48	2
48	Atlantic-Cape May, NJ	0.44	1
49	West Palm Beach-Boca Raton, FL	0.43	3
50	Huntsville, AL	0.43	7

*Composite Index is equivalent to the percent of national high-tech real output multiplied by the high-tech real output location quotient for each metro.

**The Location Quotient (LQ) equals % output in metro divided by % output in the U.S. If LQ > 1.0, the industry is more concentrated in the metro area than in the US on average

Sources: Milken Institute, RFA

Table 26

Tech-Poles Sensitivity to Recession
Ranked by Index

	Tech-Pole	Composite Index*	Percent Decline, Peak to Trough	Percent Decline, Cycle Relative to Trend
1	San Jose, CA	23.69	-3.30	-12.28
2	Dallas, TX	7.06	-1.63	-8.50
3	Los Angeles-Long Beach, CA	6.91	-1.12	-6.88
4	Boston, MA	6.31	-2.38	-9.85
5	Seattle-Bellevue-Everett, WA	5.19	-2.70	-8.83
6	Washington, DC-MD-VA-WV	5.08	-0.02	-6.40
7	Albuquerque, NM	4.98	-1.75	-12.75
8	Chicago, IL	3.75	-0.72	-7.44
9	New York, NY	3.67	-0.66	-4.78
10	Atlanta, GA	3.46	-2.79	-7.41
11	Middlesex-Somerset-Hunterdon, NJ	3.40	-0.26	-4.64
12	Phoenix-Mesa, AZ	2.60	-2.40	-11.43
13	Orange County, CA	2.59	-2.89	-8.88
14	Oakland, CA	2.21	-1.26	-7.61
15	Philadelphia, PA	2.19	-0.12	-5.86
16	Rochester, MN	1.95	-11.61	-20.85
17	San Diego, CA	1.93	-0.66	-8.63
18	Raleigh-Durham-Chapel Hill, NC	1.89	-4.54	-12.18
19	Denver, CO	1.81	-1.58	-5.95
20	Newark, NJ	1.80	0.22	-4.72
21	Austin-San Marcos, TX	1.78	-3.57	-12.44
22	San Francisco, CA	1.62	0.53	-6.71
23	Houston, TX	1.62	-3.96	-8.85
24	Boise City, ID	1.43	-4.73	-15.31
25	New Haven-Bridgeport-Stamford, CT	1.33	-1.55	-7.79
26	Portland-Vancouver, OR-WA	1.33	-2.95	-10.75
27	Boulder-Longmont, CO	1.12	-3.34	-11.80
28	Kalamazoo-Battle Creek, MI	1.09	-1.67	-6.57
29	Indianapolis, IN	1.07	-2.49	-7.37
30	Nassau-Suffolk, NY	1.05	-3.61	-10.52
31	Kansas City, MO-KS	1.03	-2.04	-5.37
32	Minneapolis-St. Paul, MN-WI	0.98	-0.90	-7.04
33	Lubbock, TX	0.97	-2.35	-13.16
34	St. Louis, MO-IL	0.93	-3.05	-7.86
35	Cedar Rapids, IA	0.92	-1.58	-9.45
36	Orlando, FL	0.82	-3.69	-7.76
37	Sacramento, CA	0.82	-4.13	-10.74
38	Detroit, MI	0.79	-2.59	-7.30
39	Wichita, KS	0.72	-8.74	-13.33
40	Tucson, AZ	0.67	-7.84	-13.44
41	Fort Worth-Arlington, TX	0.66	-2.89	-9.12
42	Colorado Springs, CO	0.58	-3.49	-10.10
43	Monmouth-Ocean, NJ	0.55	-0.16	-5.62
44	Bergen-Passaic, NJ	0.51	-0.09	-5.81
45	Melbourne-Titusville-Palm Bay, FL	0.51	-3.28	-10.24
46	San Antonio, TX	0.49	-1.02	-6.12
47	Pittsburgh, PA	0.48	-1.75	-7.06
48	Atlantic-Cape May, NJ	0.44	3.10	-1.76
49	West Palm Beach-Boca Raton, FL	0.43	-5.72	-11.41
50	Huntsville, AL	0.43	-3.69	-10.69

*Composite Index is equivalent to the percent of national high-tech real output multiplied by the high-tech real output location quotient for each metro.

Sources: Milken Institute; RFA

Table 27

Factors in Regional High-Tech Development

	<i>Inception</i>	<i>Growth</i>	<i>Fortification</i>
<i>Public Policy</i>			
Tax Incentives	•••	•	
Public Investment	•		••
Commercialization of Ideas	•	••	••
<i>Comparative Location Benchmarking</i>			
Cost Factors	•••		
Research Institutions	•••	•••	•••
Skilled or Educated Labor Force	••	•••	•••
Transportation Center	•		
Proximity to Supplies & Markets	••	•	•
<i>Social Infrastructure Developments</i>			
Attending Changing Needs		••	•••
Re-education & Training Facilities		•••	•
Establishing Trade Groups & Affiliations		•••	•••
Housing, Zoning & Quality of Life	••	••	•••
<ul style="list-style-type: none"> ••• <i>Critical</i> •• <i>Very Important</i> • <i>Important</i> 			

Source: Milken Institute

Table 28

Cognetics Top Metro Areas for Startups

One research firm's ranking of the top ten large metropolitan areas for starting and growing a company:

1.	Phoenix
2.	Salt Lake City-Provo
3.	Atlanta
4.	Raleigh-Durham, NC
5.	Indianapolis
6.	Washington
7.	Memphis, TN
8.	Orlando, FL
9.	Dallas-Fort Worth, TX
10.	Nashville, TN

Source: Cognetics, Inc.

Texas

1999 Report Card

Performance

Employment
Earnings and Job Quality
Equity
Quality of Life
Resource Efficiency

Business Vitality

Competitiveness of Existing Businesses
Entrepreneurial Energy
Structural Diversity

Development Capacity

Human Resources
Financial Resources
Infrastructure Resources
Amenity Resources and Natural Capital
Innovation Assets

F
C
C
D
F
F
B
B
C
C
C
C
B
D
C

Performance

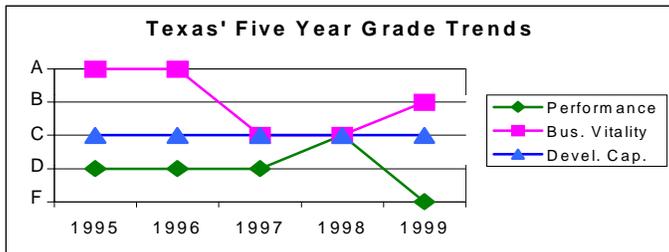
Despite excellent long-term job growth (8th), the nation's best wage growth (1st), and high average pay (13th), Texas earned an F in Performance. Comparatively high unemployment (35th), high layoffs (49th), poor employer health coverage (43rd), large numbers of working poor (46th), and high poverty (43rd) contributed to the failing grade, as did a highly unequal income distribution (47th), and high disparity between urban and rural residents (47th). Although the Lone Star state scored well in net migration (12th) and infant mortality (17th), it led the nation in the proportion of low-income children lacking insurance (50th) and had the poorest performance in the use of renewable energy sources (50th). Texas also performed near the bottom of all states in teen pregnancy (47th), homeownership (44th), voting rates (49th), energy consumption (47th), and toxic releases (42nd).

Business Vitality

Despite poor economic Performance, Texas scored well in Business Vitality, improving its grade to a B. The state's businesses improved their Competitiveness outside the state (2nd), and also invested in manufacturing capital at a comparatively high rate (8th). Even though job growth created by new businesses was lacking (41st), the state performed well in the number of fast-growing gazelle companies (16th), technology companies (11th), and initial public offerings (2nd).

Development Capacity

Development Capacity in Texas has not changed over the past five years and could be best described as "average." Even though math (5th) and reading (15th) proficiencies were high, high school graduation (43rd) and attainment (41st) rates were in the bottom-fifth of all states. A poor score in loans to deposits (47th) was offset by an excellent mark in commercial and industrial loans to total loans (6th). The Lone Star State could work to improve its digital infrastructure (40th) and air quality (44th). Texas scored only moderately in nearly all Innovation measures.



Source: 1999 Development Report Card, CFED

Figure 1

Rankings – Measure by Measure

PERFORMANCE

Measure	Rank
<i>Employment</i>	
Long-Term Employment Growth	8
Short-Term Employment Growth	20
Unemployment Rate	35
Mass Layoffs	49
<i>Earnings and Job Quality</i>	
Average Annual Pay	13
Average Annual Pay Growth	1
Employer Health Coverage	43
Working Poor	46
Involuntary Part-Time Employment	34
<i>Equity</i>	
Poverty Rate	43
Income Distribution	47
Income Distribution Change	42
Rural/Urban Disparity	47
<i>Quality of Life</i>	
Net Migration	12
Infant Mortality	17
Uninsured Low Income Children	50
Teen Pregnancy	47
Heart Disease	29
Homeownership Rate	44
Charitable Giving	35
Voting Rate	49
Crime Rate	35
<i>Resource Efficiency</i>	
Per Capita Energy Consumption	47
Renewable Energy	50
Toxic Releases	42

Business Vitality

<i>Competitiveness Of Existing Businesses</i>	
Traded Sector Strength	13
Change in Traded Sector Strength	2
Business Closings	37
Sector Competitiveness	29
Manufacturing Capital Investment	8
<i>Structural Diversity</i>	
Sectoral Diversity	21
Dynamic Diversity	32
<i>Entrepreneurial Energy</i>	
New Companies	30
Change in New Companies	27
New Business Job Growth	41
Gazelles	16
Technology Companies	11
Initial Public Offerings	2

Development Capacity

<i>Human Resources</i>	
Basic Educational Proficiency Reading	15
Basic Educational Proficiency Math	5
Average Teacher Salary	29
K-12 Education Expenditures	26
High School Graduation	43
High School Attainment	41
College Attainment	23
<i>Financial Resources</i>	
Commercial Bank Deposits	37
Loans to Deposits	47
Loans to Equity	35
Commercial and Industrial Loans	29
Comm. And Indus. Loans to Total Loans	6
Venture Capital Investments	14
SBIC Financing	15
<i>Infrastructure Resources</i>	
Highway Deficiency	14
Bridge Deficiency	26
Urban Mass Transit	19
Sewage Treatment Needs	14
Digital Infrastructure	40
<i>Amenity Resources And National Capital</i>	
Energy Cost	22
Urban Housing Costs	35
Health Professional Shortage Areas	30
Tourism Spending	30
Conversion of Cropland to Other Uses	19
Air Quality	44
<i>Innovation Assets</i>	
Ph.D. Scientist and Engineers	34
Science/Engineering Grad. Students	23
Households with Computers	24
University Research and Development	29
Federal Research and Development	16
Private Research and Development	24
SBIR Grants	26
Royalties and Licenses	20
Patents Issued	23
University Spin-Outs	23

50th 40th 30th 20th 10th 1st

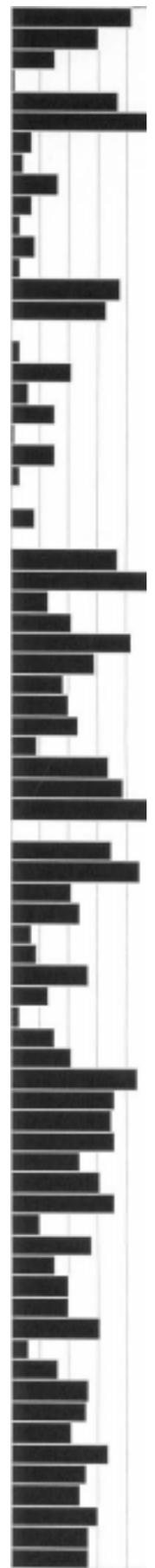


Figure 2

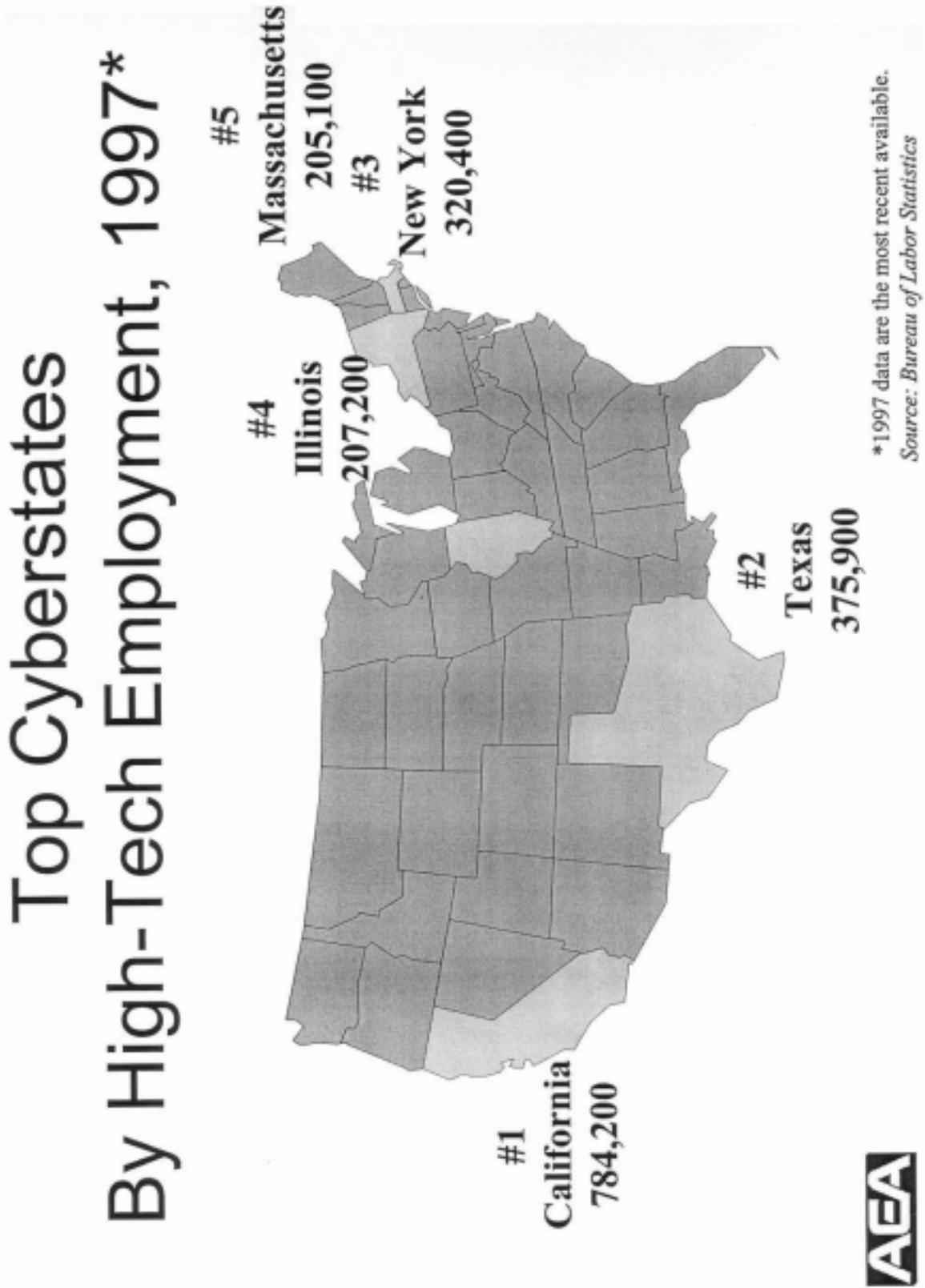
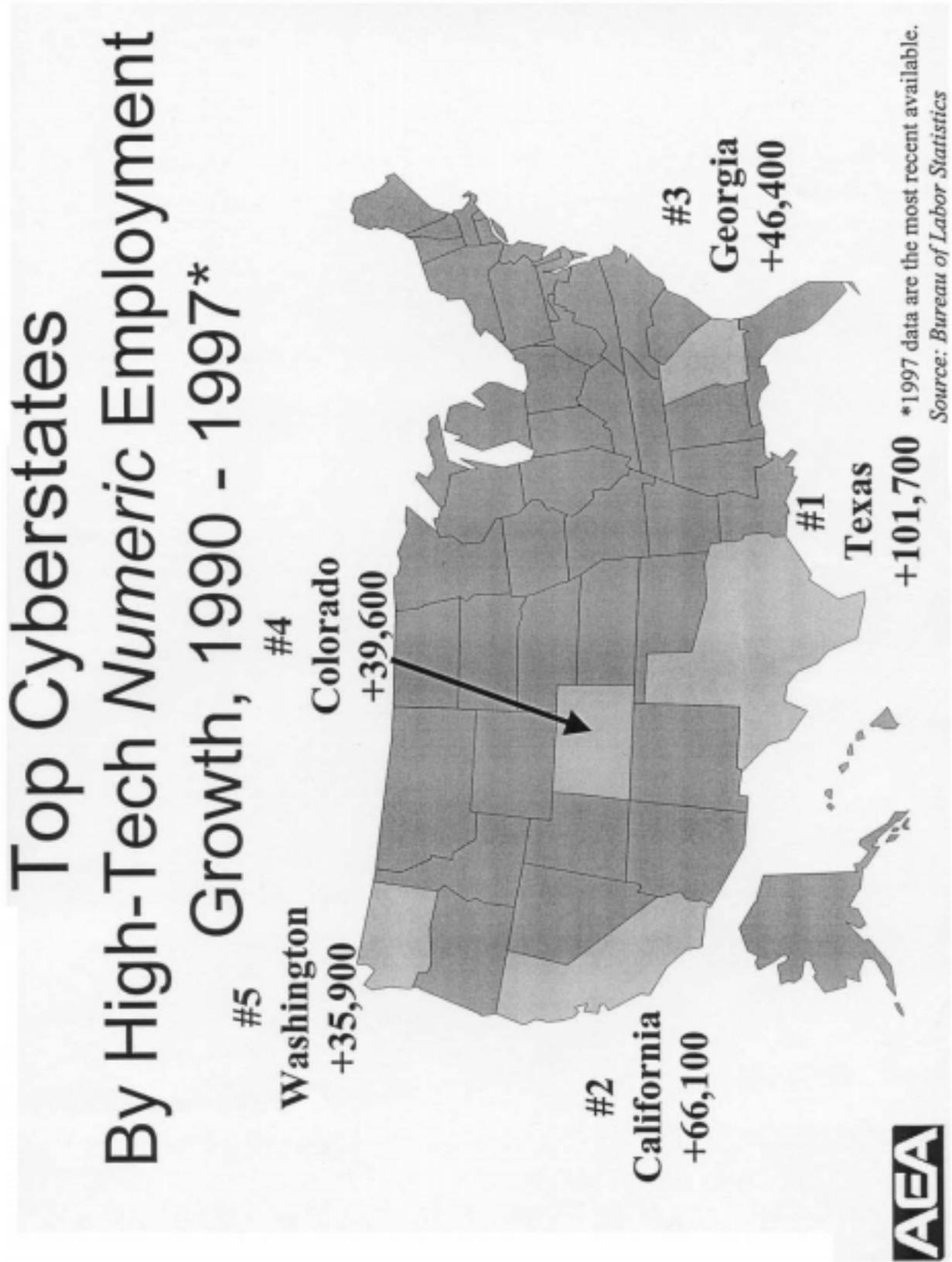
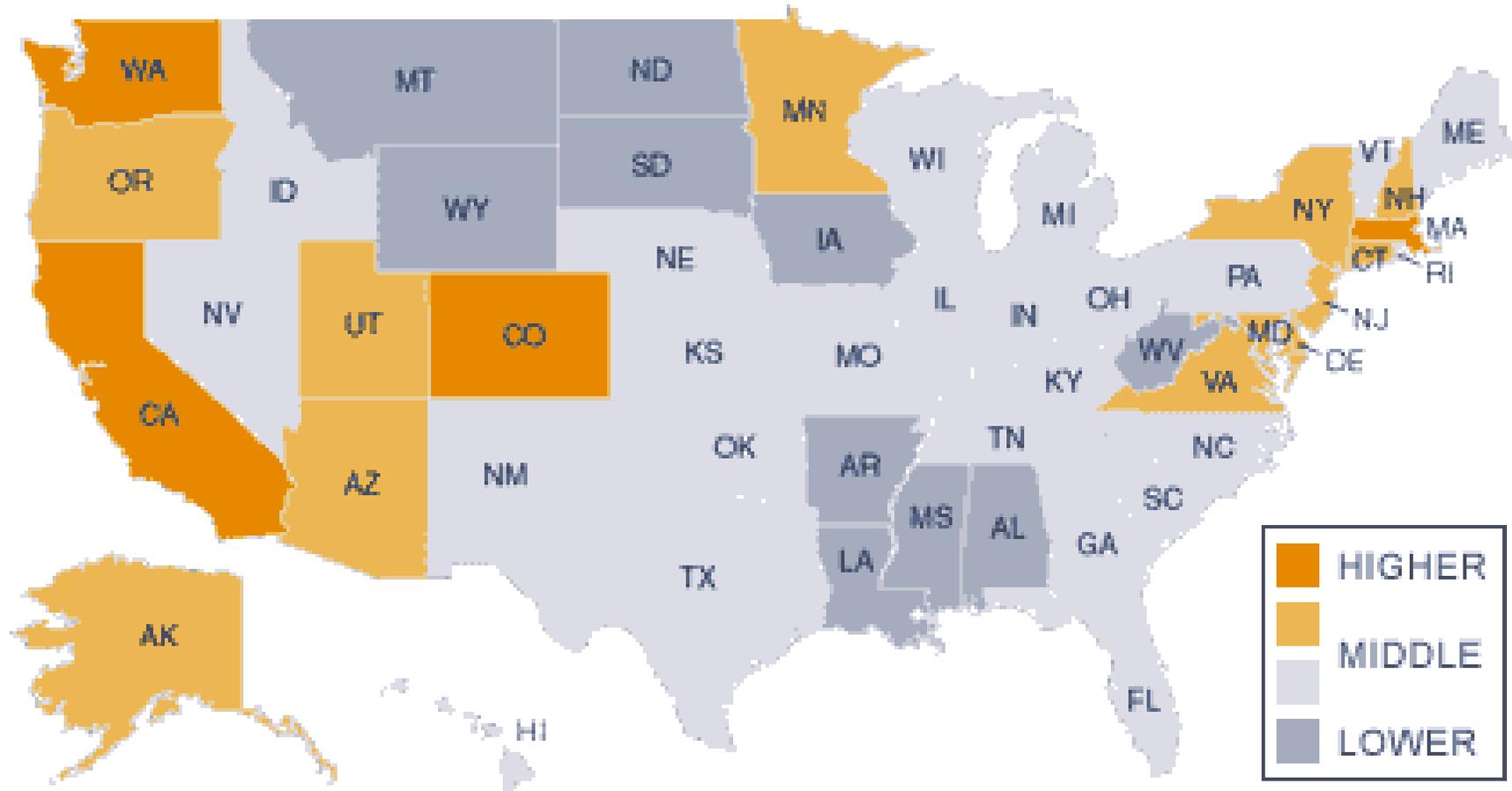


Figure 3



The State New Economy Index Overall Scores

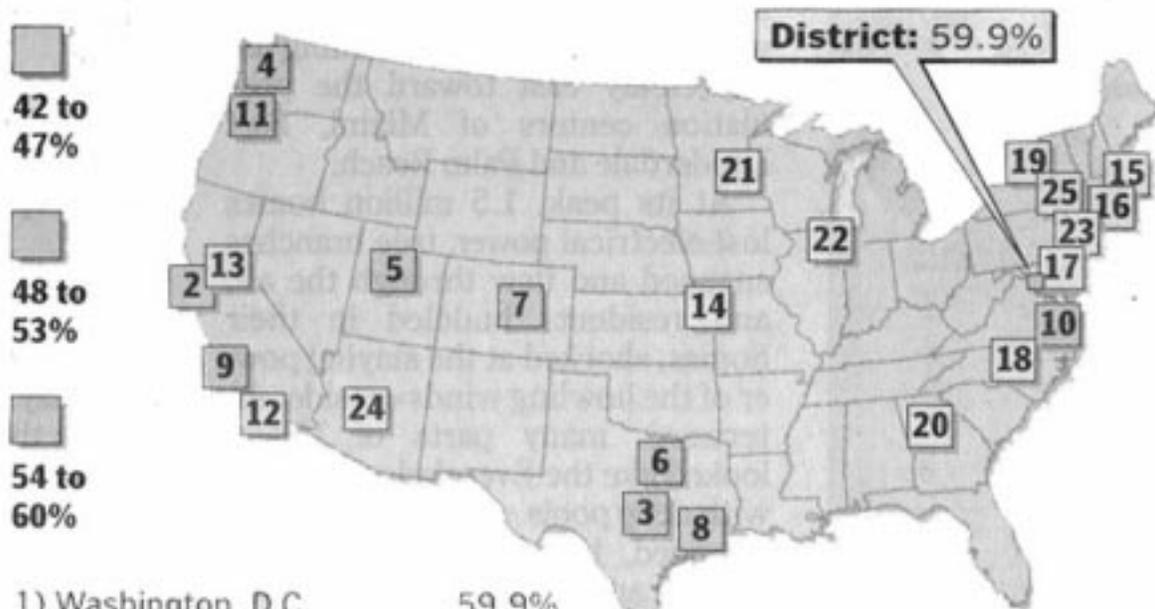


Source: <http://www.neweconomyindex.org/states/rankings.html>

Figure 4

Figure 5

The Top 25 Markets for Internet Penetration



1) Washington, D.C.	59.9%		
2) San Francisco	56.1	14) Kansas City	46.1
3) Austin, Texas	55.5	15) Boston	46.0
4) Seattle/Tacoma, Wash.	53.3	16) Providence/New Bedford	46.0
5) Salt Lake City	50.0	17) Baltimore	45.7
6) Dallas/Ft. Worth	49.6	18) Raleigh/Durham, N.C.	45.7
7) Denver	49.0	19) Syracuse, N.Y.	45.5
8) Houston	48.8	20) Atlanta	45.1
9) Los Angeles	48.7	21) Minneapolis/St. Paul	45.0
10) Norfolk/Newport News	48.5	22) Chicago	44.8
11) Portland, Ore.	48.1	23) New York City	43.7
12) San Diego	46.8	24) Phoenix	43.4
13) Sacramento/Stockton	46.3	25) Albany/Troy, N.Y.	43.1

SOURCE: 1999 Scarborough Report

THE WASHINGTON POST

The New Map of High Tech

*From Billville to Silicon Alley,
The 13 Hottest Regions in America*



Figure 6

Source: Wall Street Journal