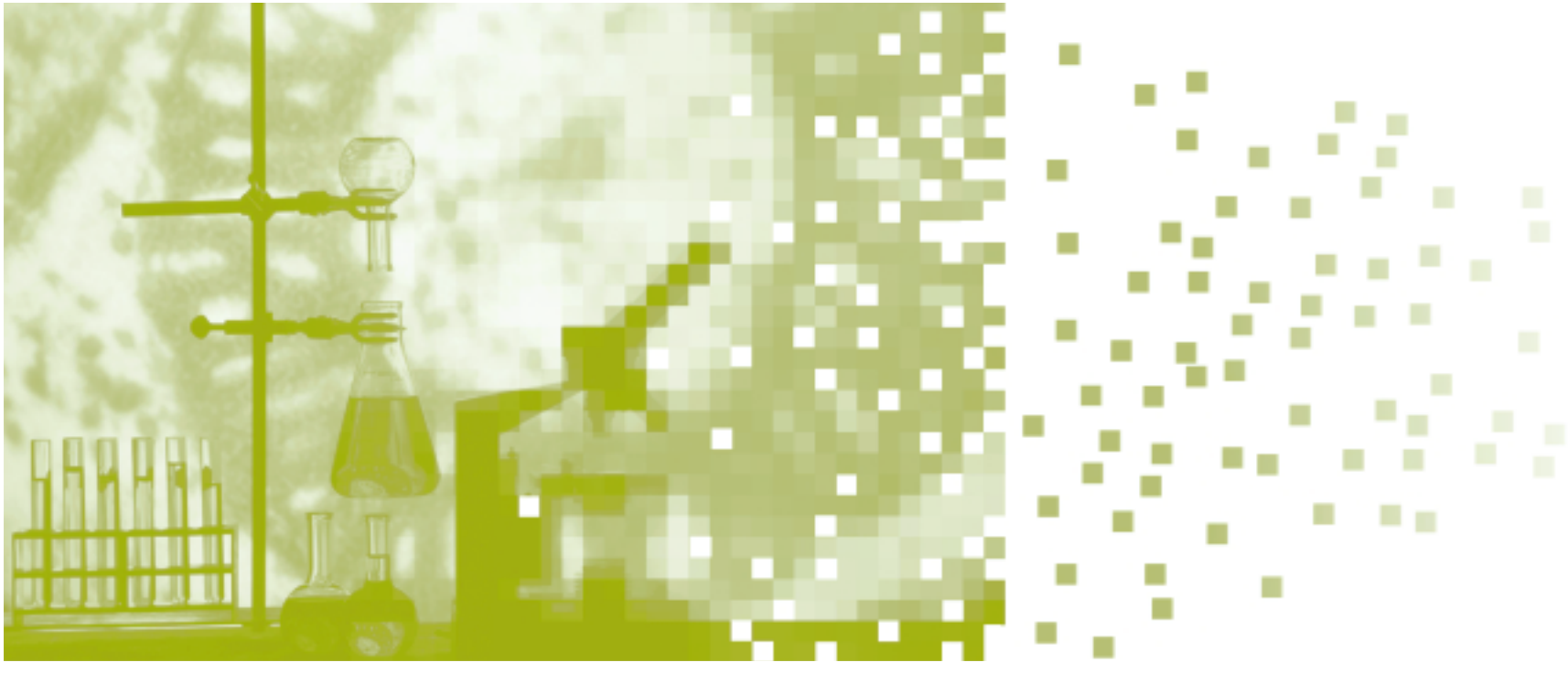
Invented Here:

Transforming the Southern Economy



The Southern Growth Policies Board 2001 Report on the Future of the South

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southern growth policies board

Invented Here: Transforming the Southern Economy

The 2001 Report on the Future of the South

A Strategic Plan

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to the Southern Growth Policies Board

SOUTHERN TECHNOLOGY COUNCIL
southern growth

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FOREWORD

Once a primarily agrarian economy, then a manufacturing powerhouse, the South has begun its transition to a knowledge economy leader. By understanding and using the power of innovation, the region can achieve an exemplary quality of life and it can substantially raise the level of economic involvement of all of its citizens and communities. *Invented Here: Transforming the Southern Economy* is a strategic plan for achieving these things.

Prepared under the aegis of South Carolina Governor Jim Hodges (chairman of the Southern Technology Council (STC)) and Arkansas Governor Mike Huckabee (chairman of Southern Growth Policies Board), this document is the 2001 Report on the Future of the South, the first in a new annual series of reports that build on previous Southern Growth initiatives and the work of the Commissions on the Future of the South convened by the Southern Growth over the past 30 years. The report was prepared under the watchful eye of the STC and with the involvement and contributions of stakeholders from all of Southern Growth's member states and Puerto Rico. The strategic plan is a direct successor of *Turning to Technology: A Strategic Plan for the 90's*, the influential report released by the STC in 1989.

In the following pages, the reader will find a description of the strategic planning process and a summary of its findings; a review of the region's progress since the release of *Turning to Technology*; explanations of each of the plan's goals and objectives; and performance benchmarks for each of the Southern Growth states. Scattered throughout the document are examples of innovative achievement in the South as well as potential strategies for success.

Following the release of *Invented Here*, STC and Southern Growth staff members will work with the states to set 10-year targets for success at the state level for each of the plan's benchmarks. Annual reports will be published detailing the progress of the states toward these targets. The results of the annual reports will provide guidance for the STC in setting priorities for best practices analyses and policy papers. This process of continuing monitoring and feedback and the unprecedented level of involvement by stakeholders from all of the Southern Growth states are the things that make *Invented Here* unique.

The publication of this report represents a commitment on the part of the STC, Southern Growth, and all of its member states to use the power of innovation to raise the quality of life for all who live and work in the South.

"After all, it wasn't so long ago that we in the South worked to get people to plow contours instead of straight up and down hills, that we were glad to bring one pants factory to town, much less an electronic component plant."

— *The Future of the South*
The report of the 1974 Commission on the Future of the South
Convened by Governor Jimmy Carter and Chaired by James E. Cushman

"Despite the mixed signs, the mood of the South is quietly optimistic at the outset of the 1980's. Awareness of the need for further growth is widespread, along with a determination to help it continue. There is also awareness, though, that it will not be the rapid, pell-mell growth of the past decade."

— The report of the 1980 Commission on the Future of the South
Convened by Governor James B. Hunt and Chaired by David F. Mathews

"Why are we taking so long to become fully at home in the modern global village? What has delayed the New South's transformation into the Promised Land it always seemed? For one thing, many Southerners have not even been making the journey."

— *Halfway Home & A Long Way to Go*
The report of the 1986 Commission on the Future of the South
Convened by Governor Bill Clinton and Chaired by Governor William F. Winter

"If each Southern state commits itself to raising its sights and assessing its progress, we will achieve as a region what few individual states have even attempted."

— *Measure by Measure: The South Will Lead the Nation*
The report of the 1992 Commission on the Future of the South
Convened by Governor Gaston Caperton and Chaired by Governor Ray Mabus

"The soul of the South is in our communities; these are the places where we find sustenance and renewal. But, in many communities, the continuous buffeting of economic change is causing suffering."

— *Southern Connections: Connecting with Each Other, Connecting with the Future*
The report of the 1998 Commission on the Future of the South
Convened by Governor Paul E. Patton and Chaired by Governor Martha Layne Collins

INTRODUCTION

For more than 15 years, the Southern Technology Council (STC) — Southern Growth's advisory arm for technology and innovation issues — has worked to build technological capacity in the South. In 1989, the STC released *Turning to Technology: A Strategic Plan for the 90's*, a report that was to provide inspiration and guidance to states and communities throughout the South in the ensuing decade. The STC published a series of reports benchmarking the ability of Southern universities to move technology into the market place, two influential reports on the migration patterns of science and engineering graduates, as well as reports on such varied subjects as technology in the classroom, advanced transportation, telecommunications, e-government, and venture capital.

Since 1974, Southern Growth has convened a Commission on the Future of the South every six years to issue long-term plans devoted to building a stronger, healthier, better-educated, economically more powerful region. The titles and language of those reports have become landmarks, informing, illuminating, and raising the level of public discourse in the South over the course of three decades. Over the years, the Commissions benefited from the direct involvement of both sitting and former governors, senators and congressmen, CEO's and entrepreneurs, university presidents and foundation directors, a future vice president and two future presidents of the United States.

Now, with the release of *Invented Here: Transforming the Southern Economy*, these two vital strands of Southern Growth's work reach a confluence. *Invented Here* is the first of what will be annual Reports on the Future of the South, and the first such report to be developed with the direct and full involvement of one of Southern Growth's standing advisory councils — in this case, the Southern Technology Council. Each year, Southern Growth will issue these long-term looks at the region's future in conjunction with its annual conference. Each report will emerge from an advisory council that will take responsibility for its implementation.

The success of the STC in developing reports and policy recommendations is the basis for this aggressive new commitment. Future Reports on the Future of the South will also be compiled under the guidance of advisory councils in Southern Growth's other interrelated areas of concern — globalization, workforce, and community — in addition to technology and innovation.

Inventing *Invented Here*

The STC kicked off the strategic planning process in June of 2000 by publishing *Measures of Southern Growth*. This exhaustive report collected information on all aspects of Southern states' technology-and-innovation performance. Available on CD-ROM or by download from the Southern Growth Web site (www.southern.org), the report provided a baseline for understanding the current position of the South and for developing a strategic plan.

In July 2000, the STC convened a strategic planning retreat in Research Triangle Park, N.C., with about 70 representatives from throughout the South. For two days, these volunteers discussed the possibilities for the future of the South, and hammered out a set of preliminary recommendations for a strategic plan. STC staff members took the results of those discussions and assembled a draft set of goals and objectives.

STC staff then began working with STC members to schedule focus groups in each state — meetings that included entrepreneurs, educators, elected leaders, economic developers, and other stakeholders. Invitees were given surveys to provide feedback on the draft goals and objectives and their input was solicited on potential benchmarks for the plan. Each meeting was facilitated by Southern Growth's executive director, deputy director, or the Invented Here program manager. After each focus group, the STC used the feedback to update and further refine the plan.

In the late spring of 2001, STC staff wrote a final draft of the goals and objectives and submitted it and a set of draft benchmarks to STC members for a final review. Comments and rec-

ommendations from this feedback process were incorporated in this final report. In all, more than 300 Southerners participated in the development of *Invented Here*.

Why *Invented Here*?

The transformation of the Southern economy following World War II had two primary causes: participation in the national post-war boom and the cost-driven recruitment of manufacturing facilities. Southern states were able to achieve fundamental conversions from agrarian economies to manufacturing-intensive economies by offering cheap land, low taxes, and inexpensive labor. This strategy resulted in the creation of millions of jobs and substantial increases in wealth and personal income in the region.

The limitations of the branch plant strategy were made evident by the relative shortage of headquarters operations and research and development facilities in the South. The absence of headquarters operations meant that much of the wealth created by a company did not stay in the South with the manufacturing operation. Another effect of the absence of headquarters operations, as well as an effect of the absence of industrial R&D operations, was the loss of many of the highest-paying jobs in the corporations.

Beginning in the 1980s, and highlighted by the release of *Turning to Technology* in 1989, Southern states began to turn their attention to building economies from within. Now, with a number of states beginning to show returns on their innovation investments, *Invented Here* is designed to help complete the transformation of the Southern economy. In the next economy, Southern states will create their own futures based on the innovative capacity of their citizens and businesses.

A vision of transformation

The Southern Technology Council began its strategic planning process by developing a vision — a statement that would describe in clear, concise terms a future to which all Southerners might aspire. The vision that underlies and informs all of the work that led to *Invented Here* is:

> All citizens of the South will experience an exemplary quality of life made possible by a dynamic, diversified, growing, sustainable, and competitive Southern economy.

The STC's choice of words here tells an important story. It is *all* citizens who are to experience the benefits of this work, not a chosen few, not even a majority, but *all* citizens. It is an exemplary *quality of life* that is desired, not money itself, not possessions, but a quality of life. And it is a dynamic, diversified, growing, sustainable, and competitive Southern *economy* that is to be the tool for fulfilling this vision, not government, not a policy, but an optimally functioning *economy*. Living up to this vision requires a strategic plan that helps to enable all Southerners to pursue the opportunities of the knowledge economy to the greatest extent possible.

Peter Drucker has written that in the 20th century, the pace of innovation increased exponentially, that it cut across business, technology, culture, and politics, and that it was both quantitatively and qualitatively different than any other period in human history. It is this process of innovation that is at the root of the dramatic economic growth of the past century and that continues to be the driving force in the knowledge economy. Understanding innovation and harnessing its great power are basic requirements of *Invented Here*.

The word "innovation" has a very specific meaning in the context of this report; it refers to the relentless, ever-changing, creative process of bringing products and services to the market. The intention of the innovation process is to create and add value to products and services or, more accurately, to create and increase gross profits. In the knowledge economy, the primary tools of the innovation process are technologies — the ideas, inventions, and know-how that make products and services more valuable.

To achieve its vision, the South must create and

maintain an environment for innovation — an environment that supports, encourages, and celebrates innovators. The innovators will, in turn, create the opportunity, wealth, and economic activity necessary to achieve the vision.

Three transforming goals

Invented Here is built around three simple, but powerful, goals. One seeks to raise the perceived value of education in the South. A second sets a course for harnessing the full potential of innovation. A third places quality of life in its heightened position in the knowledge economy. Each of the three affects and is dependent upon the other two.

Goal One states, "Create a culture of learning throughout the South, in which the acquisition, creation and application of knowledge is viewed as central to our health, happiness and prosperity." It is supported by six objectives and 33 benchmarks. Objectives one and two provide the framework for achieving the maximum performance out of our preschool through 12th grade (P-12) and post-secondary education systems. The third objective speaks to elevating the overall role of education in Southern society and to a commitment to lifelong learning for all Southerners. The fourth objective is a mandate to address shortages in areas such as teachers, scientists, engineers, and computer professionals. The fifth is a commitment to focus on segments of the population not fully participating in the knowledge economy. The sixth pushes for a population skilled in the tools of the information age. Goal One is necessary to the transformation of the Southern economy because a region's performance in the knowledge economy can rise no higher than the sum of knowledge of its people.

Goal Two states, "Encourage and support innovation and entrepreneurship." It is supported by four objectives and 23 benchmarks. Objective one calls for the infusion of an entrepreneurial culture throughout the South. Objective two calls for a significant increase in research and development activity in the region in both the public and private sectors. Objective three outlines the need for capital and technical and management assistance at all stages of business development. The fourth objective positions the South to take full advantage of the opportunities in the evolving global economy. Goal Two is necessary to the transformation of the Southern economy because innovation is the fundamental driver in the knowledge economy.

Goal Three states, "Create and sustain a quality of life that is attractive to globally competitive businesses and employees." It is supported by three objectives and 18 benchmarks. Objective one provides the basis for informed, balanced, inclusive decision making on growth issues at the community level. The second objective calls for building a stronger South by overcoming racial and cultural conflicts. The final objective provides a context for higher levels of civic engagement and social trust in the South. Goal Three is necessary to the transformation of the Southern economy because skilled knowledge economy workers are in demand everywhere. More and more often, they will make their decision on where to live based on quality of life. Similarly, knowledge economy businesses have wide discretion regarding location and are greatly influenced by quality of life issues.

Invented Here bases the transformation of the South's economy on one vision, three goals, 13 objectives, and 74 benchmarks. Success in the implementation of this plan will require leadership, commitment, and patience. Southern Growth's commitment is to provide policy recommendations, best practice reports, and performance monitoring on an ongoing basis.

State targets and the Southern Innovation Index

What happens next is the most crucial step in inventing a new future for the South. What happens next is what removes this report from the stack of other reports containing good recommendations but no ongoing mechanism for achieving results.

First, the STC will work with each member state to develop a set of state-specific 10-year targets for each of the benchmarks in this plan. Because each state will be responsible for

deciding what constitutes long-term success in each benchmark, no state will be surprised by reports on progress. Because of the states' hands-on involvement in the development of the plan, the benchmarks, and the targets, the level of commitment to the results is unprecedented.

Once the targets for each benchmark and each state are in place, the STC will publish a new document setting forth these specific targets for success for the region, and it will publish an update annually continuing to chronicle the progress. These reports constitute something entirely new created during the *Invented Here* process: the *Southern Innovation Index*.

Importantly, the benchmarks established for this process are composed of two discrete sets of data: direct performance information (e.g. R&D investments, new company starts) and measures of the perception of the Southern quality of life (e.g. what Southerners believe about the quality of the environment or the status of health care). These two very different approaches to measuring success will allow for comparisons between the reality of progress and the perception of progress. Since quality of life itself is often a matter of opinion and perception, survey results are of specific consequence in assessing quality of life.

The annual publication of the *Southern Innovation Index* will continue to shine a light on the progress of innovation in the South. It will provide support and documentation to those Southerners who will be most active in achieving its transformation. It will also serve as a continuous feedback loop to the STC, giving it and the Southern Growth Policies Board an ongoing source of guidance as to which policy areas need attention, what best practices reports will be most timely and relevant, and what new challenges are arising.

The publication of *Invented Here: Transforming the Southern Economy* is an important benchmark for the STC and Southern Growth. It signifies that a regional strategic plan can be developed with the broad involvement of stakeholders throughout the South, with bipartisan backing, and with the commitment of its member states to a sustainable process of benchmarking and progress. The document's publication, however, is not an end, but a milestone in a long-term effort to create the maximum level of opportunity for all citizens of the South.

TRUST, RECIPROCITY, RESULTS: THE VALUE OF PARTNERSHIPS

The 1998 Commission on the Future of the South's report said, "To build our competitive position, we need to build broader economic partnerships. No state, and certainly no community, can afford to go it alone."

In its Seeing the Future project, Southern Growth Policies Board said, "When we identify solutions and best practices in building capacity for the knowledge economy, we find that many share a common structure: that of the public-private partnership."

According to management guru Tom Peters, these partnerships must be built on sound principles, particularly trust, reciprocity, and results. Each partner must have confidence in the other participants in the partnership. Each partner must make an identifiable contribution and must receive a quantifiable benefit. The partners must identify in advance the benchmarks by which success will be measured, and they must insist on regular reports of the partnership's progress that are central to the ongoing decision-making process.

To be successful, partnerships should be dynamic, flexible, cross-domain, cross-jurisdictional, and inclusive. And they must go away when their purpose is served, instead of institutionalizing an organization that has achieved its goal.

These new partnerships can support entrepreneurship by teaching entrepreneurial skills, celebrating entrepreneurial behavior, and providing seamless delivery of business services. They can support the concept of lifelong learning with an awareness of new economic realities, new career training options, new education providers, processes, and structures. They can prepare knowledge workers. These partnerships can make wise investments in physical infrastructure, in capital, in knowledge.

Indeed, public-private partnerships can be beneficially employed for almost any of the tasks envisioned in *Invented Here*. In many ways, *Invented Here* itself is a product of one.

"We want to begin to envision a South whose strength is science - where science education is uniformly strong, where entrepreneurship flourishes, where technology reduces the divide between people, and where business and government work together."

- The Honorable Paul Patton, Governor of Kentucky and Chairman of Southern Growth Policies Board (1997-1998).

LOOKING BACK

TURNING TO TECHNOLOGY

To many of us the year 1989 still seems fresh. In 1989 President George Bush called for a "kindler, gentler nation." In 1989 the Chinese government cracked down on the students in Tianamen Square and the Berlin Wall still stood solid (at least until November). In 1989 Commodore Business Machines announced it had sold 1 million Amiga computers. In 1989 the National Center for Human Genome Research was created with James Watson at the helm and the stated goal of mapping and sequencing all human DNA by 2005. In 1989 Intel proudly announced a 25 MHz 486 microprocessor.

Also in 1989, U.S. Secretary of Commerce Robert Mosbacher called the Southern Technology Council report *Turning to Technology* "required reading for the rest of the country." The report was a strategic plan for supporting and advancing technology-based economic development in the South. For much of the decade following its release by STC Chairman Governor Buddy Roemer of Louisiana and Southern Growth Chairman Governor Carroll Campbell of South Carolina at the Southern Growth annual meeting in July 1989, *Turning to Technology* served as both the basis and spark for state-based plans throughout the South.

It was notable for at least three reasons.

It was the first regional plan of its type in the country. It served as a study in collaboration in the region of the country that pioneered industrial recruitment incentives and "invented" cut-throat industrial development competition between states.

It was one of the earliest plans to approach technology-based economic development in a comprehensive manner. Not only did it address issues and challenges associated with developing and commercializing technology, it also tackled the role, skills, and knowledge of the South's workforce as well as how to improve the region's capacity to use and adapt the most competitive technology.

It shifted the emphasis from industrial recruitment – especially high tech industrial recruitment – to indigenous development – growing from within.

In 1989 *Turning to Technology* placed what many considered "exotic" development issues and concepts squarely on the state policy debate table. Over 10 years later issues such as more enlightened university-based intellectual property policies, increasing minority participation in scientific and technical occupations, distance learning, technology transfer for existing manufacturers, and the public role in encouraging the formation of seed capital funds are subjects for everyday discussion. In 1989 the idea of integrating the role and power of technology into state policy goals and objectives was in itself a controversial subject. Now the debate more often than not centers on implementation issues rather than goals.

In the ensuing decade much of what was recommended in *Turning to Technology* has been tried in one form or another. There is now a body of experience and lessons learned replete with success and scar tissue. There are, no doubt, better ideas and new, more effective strategies and approaches. The world has indeed moved on. It is time for the South to craft a new and better understanding born out of lessons learned but grounded in the pace and complexity of new millennium global markets.

That was then. This is now.

Much of what were regarded as significant but emerging issues in 1989, such as globalization of local markets, new skill sets for new occupations, and computer-based learning, are now full-blown challenges. Certainly the technology landscape has shifted. In 1989 "IT" was a pronoun. The Internet was in a primitive form and virtually unknown outside of academia and a few federal agencies.

How has the South fared since *Turning to Technology* was issued? The remainder of this section offers a brief inspection of several key science- and technology-based economic development indicators that sketch out an answer to

this question. It is offered as a quick check-up on Southern progress in the years since the region released its first strategic plan for technology and innovation.

The performance indicators summarized below compare the 14 states of the South — Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, and West Virginia — with the other 36 states. Puerto Rico would normally be included as part of the South, but data weren't available. The various data series begin in 1989 and end in the most recent year for which data were available.

Southern technology capacity

A good portion of the *Turning to Technology* report focused directly on boosting the South's capacity to produce, commercialize, and use very competitive technology. Perhaps the best way to begin this check-up is to assess the most obvious indicator of our technology-based economic development health. Does the South's economy sport a greater share of technology-based companies and technology-based jobs than it did in 1989? Has the region gained any ground on the rest of the country? Once we have answered these questions we'll take a quick look at some of the other major technology capacity indicators to help us round out the picture including R&D levels, patents, and SBIR awards. It is important to note that one critical aspect of Southern technology progress will not be addressed because reliable data are not available on a state-by-state basis for the time period in question. That is, are minorities and women participating more fully in technology companies and other key capacity indicators than they were a decade ago? To this extent, then, we have a good picture but not a full one.

At a glance: *The Southern Technology Quotient*

In the spirit of this age of rankings, benchmarks, report cards and grade point averages, we begin this preface to our strategic plan with our own decidedly Southern benchmark summary. It has been over a decade since the Southern Technology Council issued *Turning to Technology*. When the report was issued it was widely acknowledged that the South was lagging the rest of the country when it came to technology-based economic development. Are we catching up?

Perhaps the quickest way to answer this question is to compare the percentage changes in Southern rates for the indicators offered in this section to those for the rest of the country. Are we adding technology jobs at a faster rate than the non-South? How about associate degrees or graduate degrees? Are we doing better in industrial R&D or Small Business Innovative Research awards relative to the rest of the country? The answer to these questions and more are presented in the Southern Technology Quotient chart (next page).

Table I offers two summary measures for each of the indicators, which are outlined in more detail further below. First, for the most recent year for which data were available, where does the South stand relative to the rest of the country? Second, did the South gain or lose ground since it issued its first strategic plan? The latter measure is dubbed the *Southern Technology Quotient* and it compares the percentage change in the rates for the South and the non-South. A *Southern Technology Quotient* value greater than one indicates the South gained ground while a value less than one means the South lost ground. All figures are normalized to adjust for size of population or the economy as appropriate.

The South gained ground on the rest of the country in all but two of the 13 measures used for this quick check-up on the region's technology-based economic development profile.

Perhaps the most worrisome decline is in industrial R&D as percent of economic output. While the non-South share declined slightly over the 10-year period, the South declined significantly. To compound the problem, the South's industrial R&D level normalized to economic output was only 36 percent of the level for the rest of the

Table I
The Southern Technology Quotient

	South/U.S.	Southern Technology Quotient
Technology-intensive employment**	86.0%	**
Technology-intensive establishments	84.0%	1.12
Industrial R&D*	35.9%	-1.70
Academic R&D	83.0%	2.83
Federal R&D	95.6%	8.54
Patents	43.7%	0.66
Inc. 500 firms	92.6%	**
SBIR grants (number)	48.0%	1.19
SBIR dollars	51.8%	1.00
Associate's degrees conferred	99.6%	2.09
Bachelor's degrees conferred	90.6%	2.48
Master's degrees conferred	79.9%	1.39
Doctoral degrees conferred	68.9%	1.57

** = positive South value/negative non-South value
* = negative South value/lesser negative non-South value

country. On the other hand, there was a major Southern gain in technology-intensive employment. In this instance, the South's share of technology-intensive employment within its economy increased while the share for the rest of the country decreased. Finally, it should be noted that the South remains behind the rest of the country for all the measurement levels with the exception of associate's degrees granted.

Southern technology companies

Has the South increased its share of technology intensive[1] employment and numbers of firms over the past decade relative to the rest of the nation? Technology-intensive employment in the South increased by 34.3 percent from 1.46 million in 1989 to 1.96 million in 1997. This compares to a 7.6 percent employment increase for the rest of the nation. The South also outpaced the rest of the nation in terms of growth in the number of technology-intensive firms. Between 1988 and 1997 the number of establishments in technology-intensive industries in the South increased by 70.4 percent from 44,993 to 76,687. The number of technology firms in the rest of the nation increased by 57.7 percent over the same period.

Figures 1 and 2 show technology-intensive employment and establishments as a percentage of total employment and all establishments for the South and the rest of the nation. These figures tell us two things. First, the South gained ground on the rest of the country in its share of technology-intensive employment and firms within its economy. Second, even though the South gained ground, it still lags behind the rest of the country. As a share of total employment, technology-intensive employment increased from 8.1 percent in 1989 to 8.6 percent in 1997. For the rest of the nation, the percentage of tech-intensive employment, while still higher than the South, actually declined from 11.4 percent to 10.4 percent. The percentage of technology-intensive firms increased for both the South and the rest of the nation.

Figure 1
Technology-intensive employment as a percent of total employment

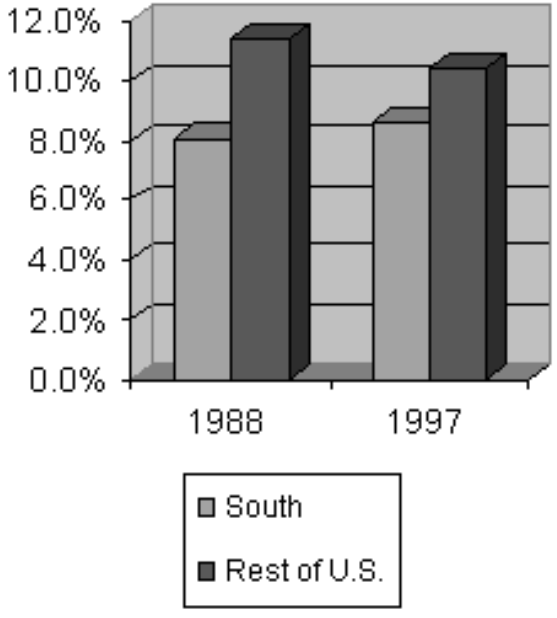
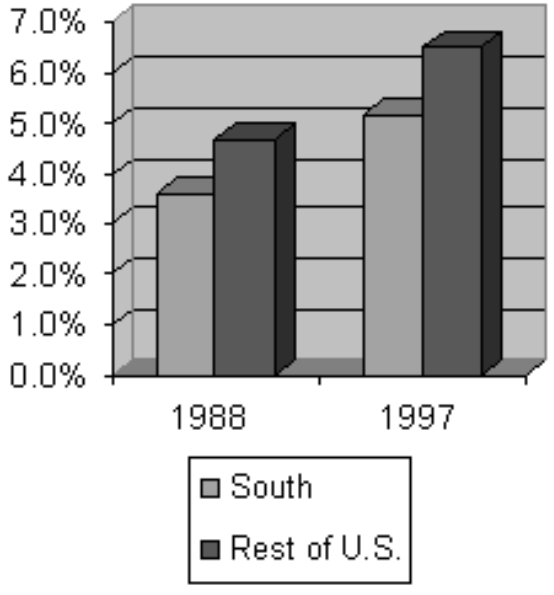


Figure 2
Number of tech-intensive firms as a percent of all firms



Research and development

This measure summarizes the performance of the three dimensions of Southern R&D performance: industrial R&D, academic R&D, and federal R&D.

Industrial R&D

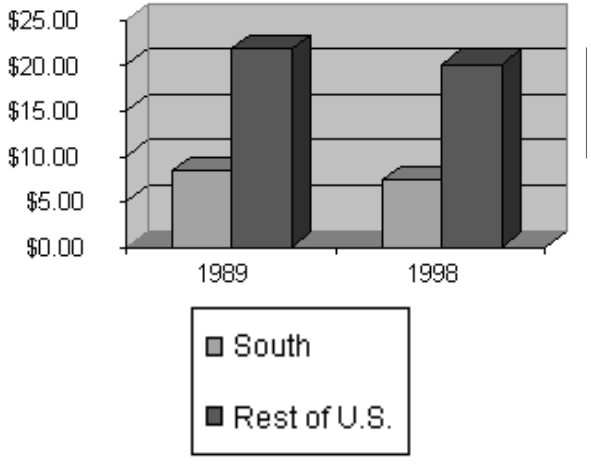
In much of the literature examining industrial performance, the terms "Innovation" and "R&D" are used interchangeably. While these two terms are clearly connected, they are not synonymous. Innovation is a concept, while R&D is a measurable, observable activity. Not all firms or industries engaging in R&D are innovative. It's certain, however, that any firm or industry that is successfully reaping the benefits of innovation is investing in research and development.

Because it is directly tied to productivity growth and competitive advantage, industrial R&D is one of the best indicators of a region's capacity to innovate. Industry performs over 75 percent of all R&D in the U.S. and funds 65 percent of all R&D. The private sector also funds 85 percent of industrial R&D.[2]

As might be expected, both the South and the rest of the country experienced large nominal dollar increases in industrial R&D performed from 1989 to 1998. However, when the value of industrial R&D is expressed as a percent of the sum of the gross state products (output of goods and services produced by labor and property within each state) for each region, the story is quite different. As shown in Figure 3,

both the South and the rest of the U.S. experienced decreases in R&D per $1,000 of gross state product from 1989 to 1998. The South declined 13.3 percent from $8.31 to $7.20 while the rest of the country decreased 7.8 percent from $21.76 per $1,000 output to $20.05. For both years, the South's industrial R&D funding level compared to the value of its overall economic output was under 40 percent of the level of the rest of the country.

Figure 3
Industrial R&D per $1,000 gross state product

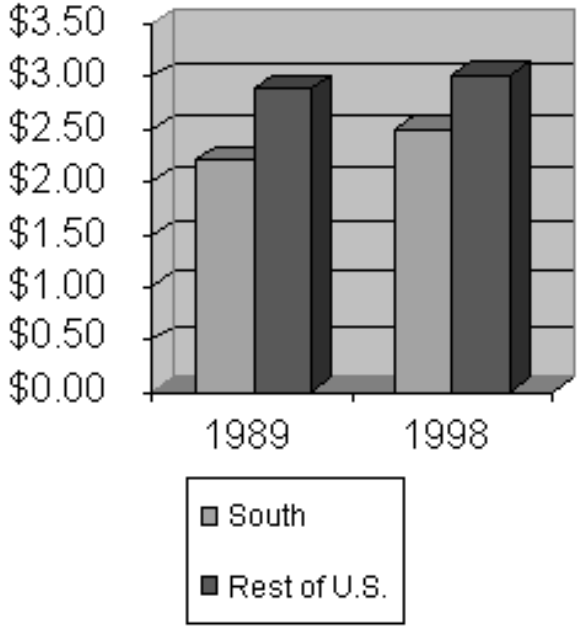


Academic R&D

Academic R&D makes a substantial contribution to a state's or a region's technology asset base in at least four ways. First, universities with strong research profiles are often cited as major contributors to the kind of progressive economic development milieu that attracts and supports technology intensive companies. Second, their basic and applied research activities help build a knowledge base that in turn can lead to long-term technological innovation opportunities. Third, universities are beginning to perform more company-specific or sector-specific sponsored research that can lead to shorter-term competitiveness impacts for industries and firms. Fourth, in many communities, universities provide valuable support for technology commercialization programs, new business formation activities, and intellectual property development efforts as part of their community service mission and also to advance their intellectual property portfolios.

Both the South and the non-South experienced large nominal dollar increases in academic research from 1989 to 1998. However, in contrast to industrial R&D, both regions also experienced increases in academic R&D when expressed as a share of the sum of their gross state products. Though still performing at levels below those for the rest of the county, the South gained ground with a 13.6 percent increase in academic research per $1,000 of economic output compared to 4.8 percent gain for the non-South for the same 10-year period.

Figure 4
Academic R&D per $1,000 gross state product



Federal R&D obligations

Federal R&D research obligations for R&D can support states' technology-based economic development activities in several ways. They provide direct, high-level impact in terms of techni-

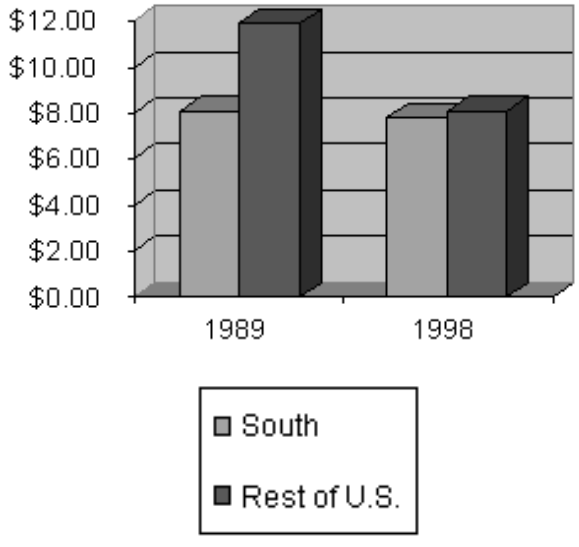
cal jobs and facilities. The technology transfer dimension within the missions of the various federal programs that obligate the R&D funds may encourage or prompt licenses, cooperative agreements, and ultimately new technologies, products, services, improvements, and firms. Finally, the ability to attract competitively awarded, federal R&D dollars reflects well on the capabilities of a state's or a region's research institutions.

As shown in Figure 5, when indexed against economic output, the South gained considerable ground on the rest of the country by the end of the 10-year period, moving from 67.9 percent of the federal obligations level per $1,000 of output for the non-South to 95.6 percent. While both "regions" experienced nominal dollar increases in federal obligations for the 1989-1998 period, the South experienced a slight decrease in obligations per $1,000 of economic output (3.7 percent) while the non-South experienced a significant decrease (31.5 percent).

Patents awarded per million residents

Patents represent the formal registry of a process or idea – an invention. More importantly, they define the boundaries of intellectual property in a manner that can be protected and built upon. Patent award measures such as the one offered in Figure 6 can also yield indications

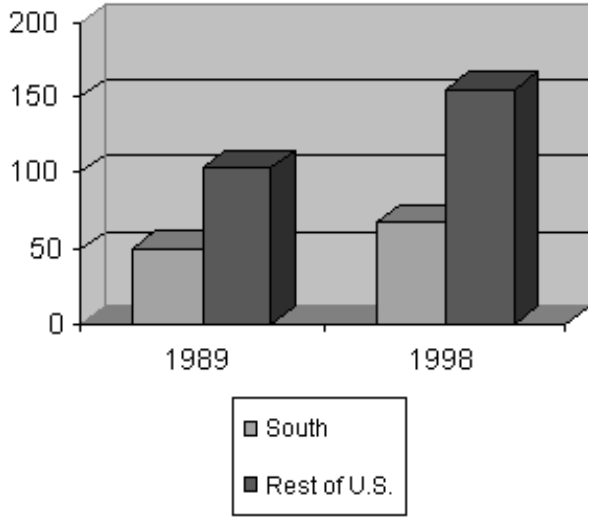
Figure 5
Federal R&D obligations per $1,000 gross state product



of the rate at which a state or region is creating "protectable" intellectual property. However, it should be noted these data are biased toward states with large corporate and/or government R&D centers. It is also important to note that patents are credited to the geographic location where the inventor resides. The economic benefits associated with the competitive advantage created by the patent may well be generated at other locations.

As Figure 6 shows, while both "regions" realized notable gains in their patenting rates (per

Figure 6
Patents per 10,000 establishments



10,000 establishments) between 1989 and 1998, the Southern rate was less than half that of the rest of the country for both years; the South also lost ground in a relative sense.

Small Business Innovative Research(SBIR) grants

The federal government awards grants each year to companies pursuing technological innovation opportunities. The grants are awarded on the basis of technical merit and commercial viability. A snapshot of the Southern SBIR performance for the 1989-1998 period is presented in Figures 7 and 8. Both the South and the non-

South experienced large nominal gains in the number of awards and the award dollar amounts. And, though the South gained a little ground in its award rate, its award levels per 1 million establishments and SBIR dollars awarded per $1,000 of economic output remained about half those of the rest of the country.

Figure 7
SBIR grant awards per 1 million establishments

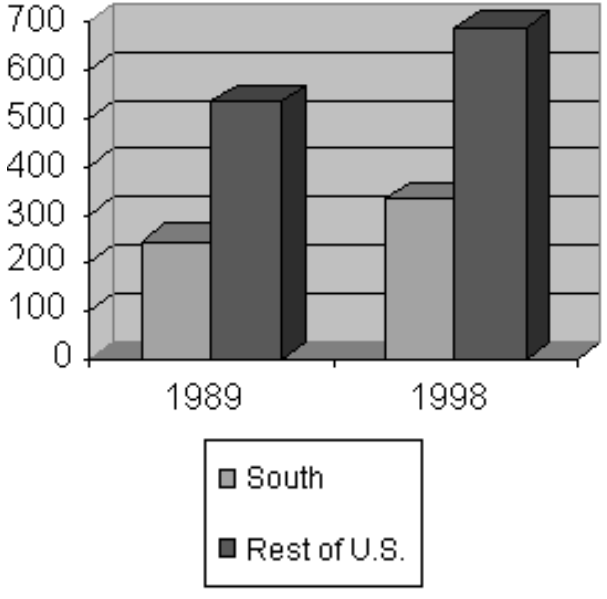
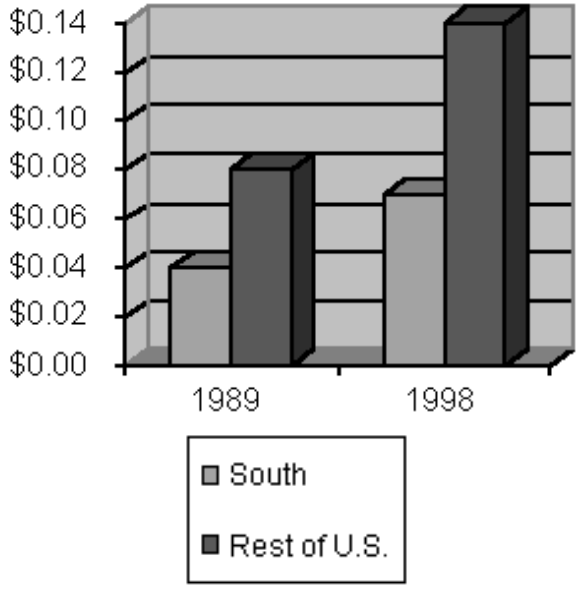


Figure 8
SBIR dollars awarded per $1,000 gross state product

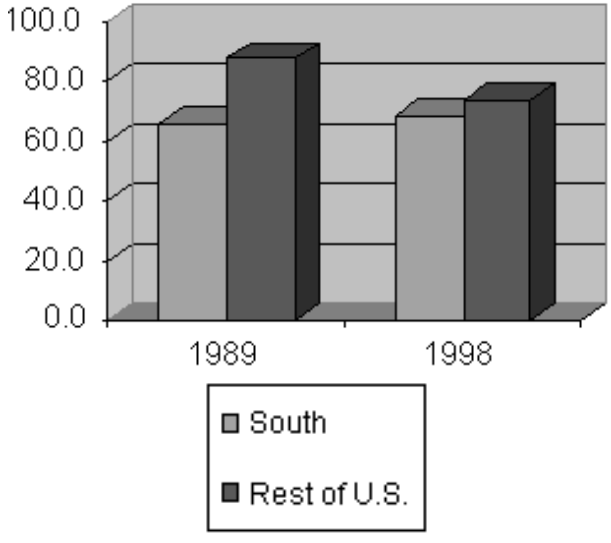


Inc. 500 firms per 1 million business establishments

Every year *Inc.* publishes a list of their rankings for the top 500 privately held, fastest growing companies in the U.S. The rankings are based strictly on net sales growth and the companies must apply for consideration. These rankings do not represent an independent assessment in that the overall pool from which the finalists are chosen is self-selected; however, it nonetheless offers an interesting snapshot of where some of the country's fastest growing firms are located. When the count for each state is normalized to some measure of the size of the state's business base then these rankings can deliver some insight into where the highest concentrations of fastest growing companies are located. Figure 9 does this for the South versus the non-South.

Figure 9 presents the number of *Inc.* 500 firms per 1 million business establishments for the South and the non-South for the years 1989 and 2000. While the South's concentration of *Inc.* 500 firms is still less than the rest of the country, it did make considerable progress in closing the gap. In nominal terms, the South had 106 *Inc.* 500 firms in 1989 and 129 firms in 2000. When normalized to the business base, this translates into a 3.2 percent increase in its share of *Inc.* 500 firms for the South while the rest of the U.S. experienced a 16 percent decrease in share.

Figure 9
Inc. 500 firms per 1 million business establishments



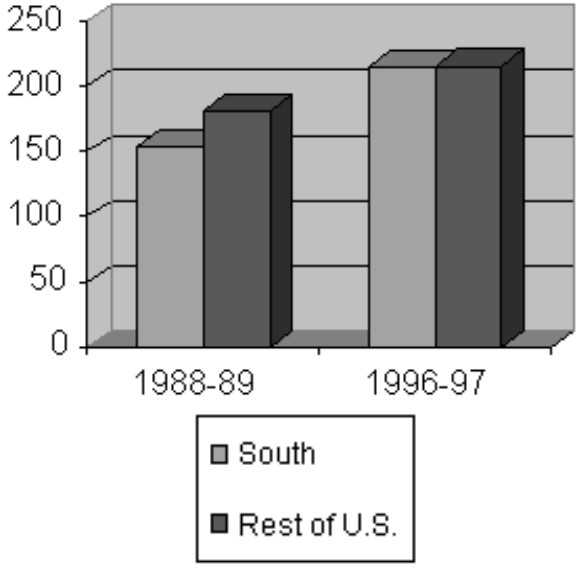
Education

"Of all the conditions for technology-based development, the skills and the knowledge base of the workforce is widely considered the most important – and the most problematic."
Turning to Technology: A Strategic Plan for the Nineties (Research Triangle Park, N.C., Southern Growth Policies Board, 1989)

True then. More true now. Our capacity to educate our people is our foundation and our biggest concern. Perhaps the quickest way to assess our progress here is to examine the performance of the South's degree granting institutions. This type of measure addresses two important aspects of the region's higher education system. First, are we educating greater numbers of people and how does the rate at which we are conferring degrees compare with that of the rest of the country? This is especially important at the associate's degree level and, to a large extent, the bachelor's degree level because these graduates tend to stay in the region. Second, for the master's and doctoral levels, are we gaining ground in improving our advanced degree education capacity? Are we better able to attract graduate students to Southern institutions than we were in 1989?

Associate's degrees conferred by higher education institutions for the South versus non-South for the 1988-89 and 1996-97 academic years are presented in Figure 10. For the 1988-89 academic year, the South's associate's degree granting rate was 15 percent below the rate for the rest of country. The South conferred about 155 associate's degrees per 100,000 people compared to about 182 for the non-South. By the 1996-97 academic year the South and the non-South associate's degree granting rates were virtually the same at about 215 degrees conferred per 100,000 population. The percent change in the degree granting rate for 1989 compared to 1997 for the South was over twice that of the rest of the country.

Figure 10
Associate's degrees granted per 100,000 population



As indicated in Figure 11, the South also gained ground in bachelor's degrees granted per 100,000 people during this period, but not in as dramatic a fashion. The South advanced from 361 bachelor's degrees per 100,000 population in the 1988-89 academic year to a rate of about 411 for the 1996-97 academic year. This represents a gain in the degree-granting rate of 13.8 percent while the rest of the country experienced a rate gain of 5.6 percent. The South's bachelor's degree granting rate was 16 percent below the rest of the country at the beginning

Figure 11
Bachelor's degrees granted per 100,000 population

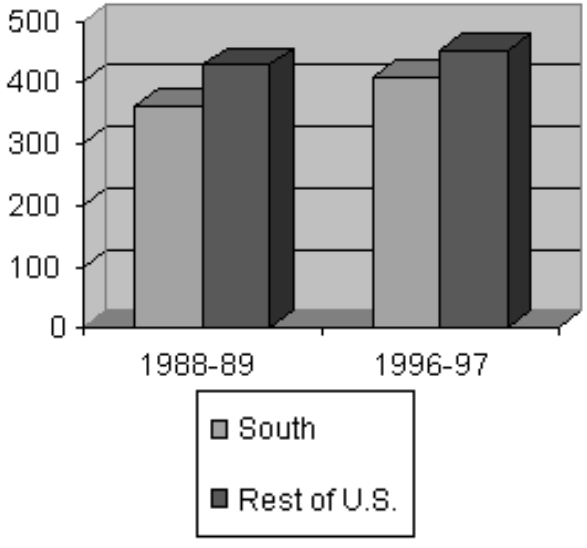


Figure 12
Master's degrees granted per 100,000 population

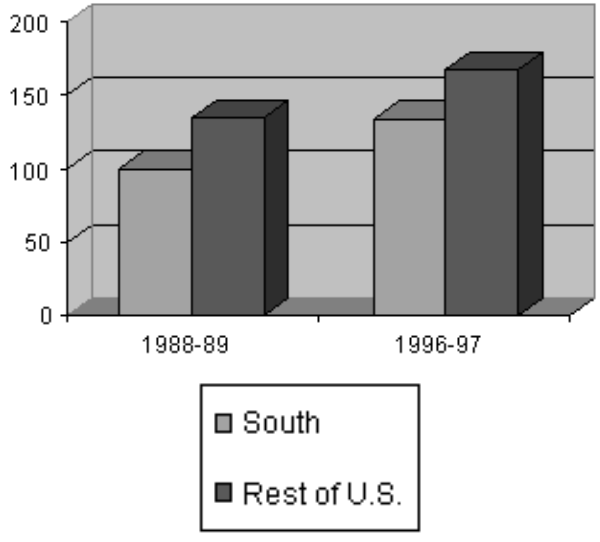
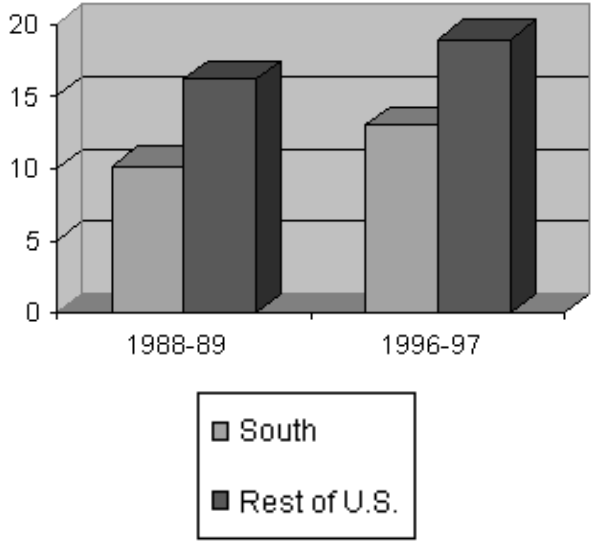


Figure 13
Doctoral degrees granted per 100,000 population



of the period but closed to a 9.4 percent deficit by the end of the period

The South also gained ground in its graduate degree granting rates. Nonetheless, the region's granting rates for master's degrees was about 20 percent below, and for doctorates 30 percent below, the rates for the non-South at the end of the period. (Figures 12 and 13).

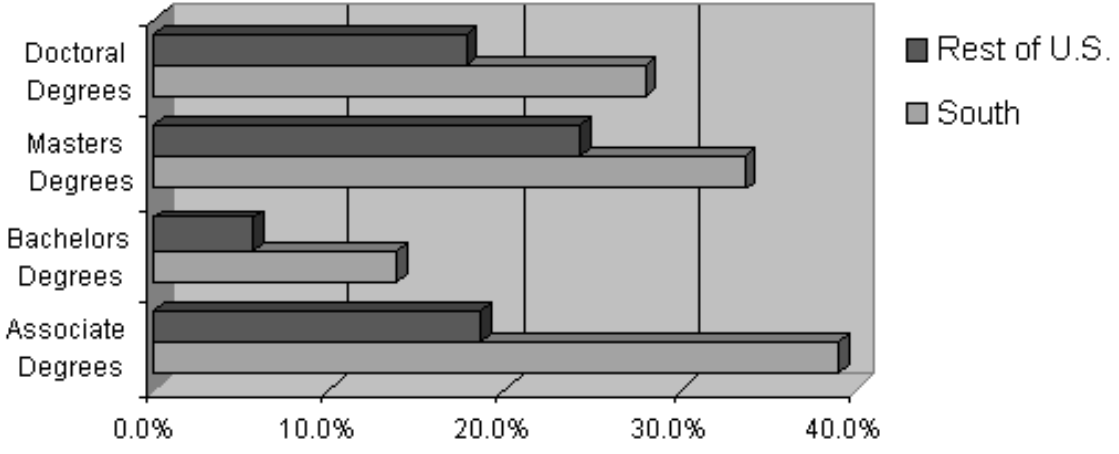
In summary, the South lags behind the rest of the country in the rate at which it grants doctoral, master's, and bachelor's degrees. It is now virtually tied with the non-South in associate's degree granting rates. For all four degree levels, (Figure 14) the South's degree granting rate increased faster than the rate for the rest of county for the 1989-1997 time period; i.e., the South gained ground across the board.

Where do we go from here?

The years since *Turning to Technology* was released have produced a number of hard-won gains, some setbacks, and a body of Southern experience and knowledge — amassed state-by-state — in dealing with the knowledge economy. The data offered in this preface paint both a brighter and more somber picture. We are gaining ground but we are still behind — in some instances, we are still way behind.

The world has changed since 1989. The Southern response has been strong but much work remains. It is time for a new plan that can speak to the region and to each state's own unique culture and assets. A plan based on what we have learned and what we aspire to be.

Figure 14
Percent change in degrees granted per 100,000 population, 1989-1997



1 Technology-intensive is defined here based on the Bureau of Labor Statistics (BLS) high technology definition. See Paul Hadlock et al., "High technology employment: another view," *Monthly Labor Review*, July 1991. The BLS high-tech definition includes 30 R&D-intensive three digit SIC groups (Level I) and 10 R&D-moderate (Level II) industries.

2 *The Dynamics of Technology-Based Economic Development: State Science and Technology Indicators*, Office of Technology Policy, Technology Administration, U.S. Department of Commerce, 2000

GOAL 1

Create a culture of learning throughout the South, in which the acquisition, creation, and application of knowledge is viewed as central to our health, happiness, and prosperity.

"Learn or perish" is the mantra of the 21st century. People and institutions must keep pace with scientific and technological advances if they wish to thrive in today's globally competitive economy. Those who upgrade their skills and embrace the notion of continuous learning will prosper. In contrast, those who don't will see their options dwindle, and in some cases, disappear. Acquisition of knowledge can improve one's standard of living, quality of life, and job prospects, and the application and creation of knowledge can increase regional and national competitiveness and further innovation. Knowledge is now an indispensable commodity.

However, in order for the South to truly reap the benefits of the knowledge economy, all Southerners must perceive knowledge as integral to their happiness and prosperity. They must also actively seek opportunities to improve their situation in life through its acquisition. Although there are numerous rewards involved in the acquisition, creation and application of knowledge, the ultimate goal is the creation of a "culture of learning" throughout the South, where people seek knowledge for its intrinsic value, regardless of the payback.

Creating a "culture of learning" is not the sole responsibility of government; rather, individuals, family, and society must elevate the importance of knowledge in their daily lives. In a "culture of learning" families will encourage their children to view education as a crowning achievement and to regard intellectual accomplishment in the same manner as victories in sports or entertainment. This intellectual environment will, in turn, attract and retain a highly educated workforce and elevate the quality of life for all.

Objective 1.1: Make P-12 education efficient and effective in educating our children.

More will be required of workers in the 21st century than has been in the past. As a result, improving the quality of preschool to 12th grade (P-12) education is a major concern across the nation and the South. Despite improvements over the years, many Southern states lag the nation in reading, math, and science scores, as evidenced by the results from the National Assessment of Educational Progress (NAEP).[1] For example, eighth graders in the South did not fare well on the last NAEP report cards — only two states in the South had higher scores than the national average in reading; no Southern state exceeded the national average in math; and only four Southern states graded at or above the national average in science. In order to raise the bar for education in the South, creative solutions must be

Alabama Technology Network (ATN)

Because of ATN, Alabama companies increased their sales by $28 million and investments by $11 million. ATN provides companies with technical assistance, workforce training, and technology transfer services. The network, a partnership among the University of Alabama System, Auburn University, the Economic Development Partnership of Alabama, and two-year colleges, consists of seven centers at community college campuses, the Center for Automation and Robotics, the Alabama Productivity Center, and the Auburn Industrial Extension Service.

Birmingham, Ala.
(205) 943-4805
www.atn.org

found that fit today's rapidly changing economic environment.

Grade 12 must no longer be viewed as the end of the line — for anybody. P-12 education must give today's youth the skills needed to succeed in a two-year or four-year college or university. The good news first: In 2000, Scholastic Achievement Test (SAT) scores in most of the Southern states mirrored or exceeded those of the nation. In addition, more than half of these states scored within one point of the U.S. average on the American College Testing (ACT) exam. Although the South's scores on these two tests, for the most part, rivaled the rest of the country, steps must be taken to ensure that more high school graduates take the test. For example, in 2000, 44 percent of U.S. high school graduates took the SAT. The Southern average, in contrast, was 21 percent, or slightly less than half the U.S. rate. In some states, the percentage of test takers was as low as 4 percent. The SAT and ACT are used across the nation[2] to determine what a student knows before entering college. Competitive scores on these tests will help guarantee that high school juniors and seniors in the South gain admission to and succeed in some of the South's, and the nation's, most prestigious colleges and universities.

In today's economy, it is no longer sufficient to merely attend college. There is a much greater emphasis on degree attainment, with the recognition that the more education one receives, the better the options he or she has. The South must continuously strive to guarantee that students get as much education as they can and show them the benefits of lifelong learning. Increasing the number of people in the South who receive a high-school diploma, associate's degree, bachelor's degree, or higher will increase regional competitiveness and improve the quality of life for all.

Making P-12 education efficient and effective in educating the youth of the South calls for, among other things, attracting and retaining excellent teachers. A skilled and knowledgeable teacher makes an enormous difference in how students perform. One Tennessee study found that students who had good teachers three years in a row scored significantly higher on state tests and made far greater gains in achievement than students with a series of ineffective teachers.[3] "Good teachers" are not just the ones who are certified, but those who are knowledgeable in their subject, since a "dearth of content knowledge is a major problem in teaching."[4] An uncertified scientist who leaves the laboratory for the classroom, for example, is a very valuable asset to public schools because he or she has real world experience as well as a strong knowledge base in science. Because of the looming teacher shortage, especially in math and science, where graduates can make more money in industry than in the classroom, steps must be taken to ensure that those teaching math and science specifically have the knowledge to do so, since jobs requiring a strong foundation in both subjects will be in great demand for years to come.

Making P-12 education effective will also entail showing young people the benefits of higher education, and creating policy that embraces the notion that all children can learn and have the right to a quality education. Public schools cannot write off the potential of poor and minority students[5] without harming the economic and social viability of the region.

Objective 1.2: Make post-secondary education effective in continually raising the level of educational achievement in the South.

For many, postsecondary education is the "great equalizer," in that it allows people from all walks of life to improve their social and class standing. Like P-12, post-secondary education has an important role in shaping the future workforce. Institutions of higher learning are required to make sure students are prepared for the workforce; they must ensure that students have the opportunity to afford and participate in postsecondary education; they must monitor how many students receive degrees and certificates; and they must continuously examine the economic, social and civic gains a state receives from its college-educated population.[6]

Given the importance of higher education in the 21st century, the South must work harder to increase the number of people going into post-secondary education and the quality of what it teaches students to prepare them for the workforce. The South can begin by focusing on its standing in a number of higher education indicators. As it currently stands, the South is not competitive in the number of 18-24 year olds who enroll in college or the percentage of first-time, full-time students who receive bachelor's degrees in five years. In addition, only a few Southern states exceed the U.S. average in the percentage of people 25 years old and over with a high school diploma. Seeing that high school is the gateway to college, this particular statistic must be improved in order to increase other higher education benchmarks.

Center for Semiconductor Physics in Nanostructures

A new research center, managed by the Universities of Arkansas and Oklahoma, will research nanostructures - sub-microscopic groupings assembled atom by atom - with potential for future technology applications. In addition to a $4.5 million grant from the National Science Foundation, the center is also supported by $2.25 million in state funds. The center will also develop extensive Internet-accessible educational materials for students. Through outreach, the center will commercialize its technological innovations.

University of Arkansas/University of Oklahoma
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In order for postsecondary education in the South to rival that of the nation, serious steps must also be taken to ensure that all people (minorities, immigrants, first generation students, etc.) are in the college pipeline. As former North Carolina Gov. James Hunt eloquently stated: "Despite the accomplishments of American higher education, its benefits are unevenly and often unfairly distributed and do not reflect the distribution of talent in America."[7] To illustrate his point, statistics show that, in the year 2000, 24-year-old white Americans were twice as likely as blacks and three times more likely than Hispanics to get a college degree.[8] In today's knowledge-driven society, where high-tech and high-skill jobs outpace the supply, higher education cannot be the domain of a privileged few. The gates to higher education must be widened to allow full participation of all citizens of the South.

The evolving roles of two-year schools and community colleges must also be factored into the successful post-secondary equation. These schools provide much of the mid-level technical training that is vital in the knowledge economy. For many students, they also represent a less intimidating initial higher education experience. States must assure that two-year and community college curricula are fully coordinated with colleges and universities to achieve a seamless system of higher education and maximize the value of all of these investments.

Objective 1.3:
Elevate the value placed on education and significantly increase the percentage of Southerners actively engaged in the process of lifelong learning.

The greatest asset the U.S. will ever have is the brainpower of its people, hence, the need for lifelong learning, or the never-ending quest for knowledge. The underlying premise of lifelong learning is that expanding one's knowledge benefits both the individual and the larger society. In today's fast-paced economic environment, lifelong learning should not be viewed as a luxury, but as necessity to keep up with new advances in fields such as technology and health care, as well as burgeoning disciplines such as genomics and photonics.

In 2002, Southern Growth will release results from its nationwide poll created to gauge Southerners' attitudes about lifelong learning, and measure any steps they have made to improve their knowledge base, through traditional or nontraditional avenues. The poll will ascertain the numbers of Southerners, 25 years old and above, who have participated in an organized learning program. It will also find out how many Southern residents rank education high on their list of things important to their success and well being. Other useful indicators in the area of lifelong learning include educational attainment levels. How many adults, for example, have high-school diplomas? The U.S. average for this indicator was 82.8 percent in 2000; however, only a few Southern states exceeded the national average in this benchmark. As more people recognize the need for more and more education to succeed professionally, the hope is that they will return later in life to obtain their high school diploma, then their bachelor's degree, and so forth. The South must make a commitment to help all citizens acquire the skills and training they need to advance in the workplace and participate in the knowledge economy.

Georgia Research Alliance (GRA)

In 10 years, GRA has invested $276 million to create the innovation infrastructure needed for economic growth. Its Eminent Scholar Endowment program brings world-class researchers to endowed positions in Georgia's universities. The Research Infrastructure Development program provides funds for research facilities and equipment. The Technology Development Partnership invests in university-based research projects that have matching corporate support and has passed the program's review process. GRA focuses its investments in three areas: advanced communications, biotechnology, and environmental technologies.

Atlanta, Ga.
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www.gra.org

Objective 1.4: Overcome the skill shortages in the following fields: science, engineering, information technology (IT), and math.

In order to remain competitive, the South must find ways to overcome skills shortages in the fields that will fuel economic growth in the 21st century, namely science, engineering, information technology, and math. Computer scientists, computer engineers, systems analysts, and computer programmers are among the fastest growing occupations in the U.S.[9] The U.S. desperately needs to fill these jobs, but cannot find enough workers for available positions. Add to this bleak picture, projections from 1996 to 2006 that show the South falling short of anticipated national growth in these four core IT occupations in all but three states: Georgia, Virginia, and North Carolina.[10] In their study, "The Supply of Information Technology Workers in the United States," Freeman and Aspray cite possible consequences of an IT worker shortage: decreased competitiveness as these industries grow more slowly; a slowdown in innovation and product development which would harm exports and U.S. wealth creation; or companies moving jobs abroad in the face of diminishing or expensive American talent.[11]

The ill effects of the shortage are not just felt in industry either. Strong math and science skills, which are needed to succeed in these in-demand fields, will not improve without the presence of excellent math and science teachers. According to a Midwest think tank, 60 percent of all new jobs in the early 21st century will require skills that are possessed by only 20 percent of the current workforce.[12] Given this statistic, it is no wonder that stellar math and science teachers are desperately needed to equip their students with the requisite knowledge for the 21st century work force. Besides

having the important role of educating young people, math and science teachers have the power to spark children's interests in these subjects so that they might choose to pursue these degrees at the college level. The demand for these professionals will continue to rise as more jobs require employees to have solid groundwork in math and science.

Even as the economy cools down from red hot to lukewarm, high-skill and high-tech workers remain in demand because they possess skills that are invaluable to their employers. Those who were laid off when the dot-com bubble burst find that their skills are also an asset in "brick and mortar" companies. However, talks of a real slowdown in the hiring of IT workers are not fiction. Large employers, for example, plan to hire 900,000 technical workers in 2001, compared to 1.6 million in 2000.[13]

Nevertheless, technology workers and information technology are still in demand and should remain so in the future.

The South must work to increase the number of students who obtain degrees in these fields and participate in the Southern labor market. In order to participate in the IT workforce, high skills are required. Two-thirds of all IT workers have at least a bachelor's degree. Of those with a bachelor's degree, 46 percent have degrees, minors or second majors in computer science or engineering — 86 percent of degree holders have a degree in a science or engineering discipline.[14] Close to half of all Southern states are competitive with the U.S. average in the percentage of bachelor's degrees granted in science and engineering as well as the percentage of recent science and engineering graduates in the workforce. These numbers must increase so that all states in the South perform at or above the national average. Today's economy demands it.

The Advanced Placement (AP) Exam is another useful indicator of how proficient students are in science and math before entering college. The AP Exam allows students to take university-level courses in high school. College faculty report that AP test takers are often far better prepared for serious academic coursework.[15] Most students receive college credit for scores of three and above. In 2000, most juniors in the South who took the exam in math and/or science,[16] received scores of 3 or higher. More attempts should be made to get students who are interested in math, science, and IT fields to take the AP exams to get college credit as well as prepare them for the rigorous demands of these fields.

Objective 1.5: Educate those left behind in the knowledge economy, targeting minorities, immigrants and their children.

In order for the South to reach its full potential, it must use all of its talent. This calls for reaching out to groups that have often been "left behind" or overlooked. Efforts to integrate these groups into mainstream society should begin with education, because of its ability to even the playing field and open the doors of opportunity.

African-Americans, Asian-Americans,[17] Hispanics and Native Americans make up a significant share of the South's population. African-Americans, for example, made up 12.3 percent of the U.S. population in 2000. Most Southern states,[18] however, have African-American populations that well exceed the national average. In Mississippi, for example, 36.3 percent of the population is African-American, almost three times the U.S. average. Hispanics,[19] although traditionally represented heavily in states such as California and Texas, are now making their presence known in the South. As this group increases its numbers, efforts to integrate them into the community and into postsecondary institutions must increase as well. This sentiment also

rings true for Native Americans, who make up only 0.9 percent of the U.S. population, but 7.9 percent of Oklahoma's population, and 1.2 percent of North Carolina's population.

In order to incorporate these groups into society, the South must first work to improve P-12 education, especially in math and science, as well as increase the participation of these populations in four-year colleges and universities. As mentioned earlier, the South lags the nation in standardized test scores in math and science. Minorities fare even worse in math and science education, with their scores, in some cases, falling lower than the Southern average. Many minority students have lower achievement levels than their white Southern counterparts,[20] and in some cases, the gaps among students within the states are larger than the gaps between Southern states and national averages.[21]

Although minorities represent a sizable percentage of the Southern workforce, they comprise a small percentage of its science, engineering, and technology (SET) labor force. Although there is little state level data on minority graduates in SET fields, it is not hard to infer that they probably lag the nation in this measure, given that their math and science scores (the building blocks of SET fields at the postsecondary level) lag behind their white Southern peers. Swift action must be taken to ensure these students have solid preparation in math, science, and reading. Their K-12 education must adequately prepare them for college-level work, and give them a strong foundation in math and science so they can succeed in SET fields at the college level.

These populations must also increase their educational attainment levels. Indicators such as attainment of a high school diploma, a bachelor's degree or higher, will help illustrate the effectiveness of their P-12 training. African-Americans and Native Americans in many states in the South are less likely to get their high school diploma compared to their peers in other parts of the nation. On a positive note, Hispanics fare much better in the South in high school diploma attainment than their Hispanic peers outside the South. This same pattern holds true for bachelor's degree attainment, as African-Americans and Native Americans (with few exceptions) lag behind their peers outside the South, while Hispanics fare better in this indicator than their peers in other parts of the country.

Kentucky Innovation Act

The Kentucky Innovation Act allocated more than $50 million for several new economic development, research, and technology transfer programs and initiatives. The act also created the Kentucky Innovation Commission, a 15-member independent advisory council including the governor, executive cabinet officials, legislative representatives, and private sector members. The commission provides information to the governor and legislature regarding the status of business, research and development, and high technology training within the state.

Kentucky Science and Technology Corp.
Lexington, Ky.
(606) 233-3502
www.kstc.org

Objective 1.6: Ensure basic competency in the tools of the Information Age.

Computers and the Internet are the essential tools of the Information Age. Because of this, it is imperative that all Southerners, especially young people, are trained to use these 21st century devices to stay abreast of changes in the workforce and participate in the knowledge economy. According to some experts in the field of education and technology, the Digital Divide still exists, but trends may indicate that it is closing.[22] The Digital Divide is often framed in terms of physical access to computing technologies, but can also include computer literacy, information literacy, and appropriate content.[23]

Certain statistics seem to suggest that the Digital Divide is coming to an end in the area of access. As of fall 2000, 98 percent of all public schools in the U.S. were connected to the Internet, and unlike in previous years, there were no differences in school access by school characteristics (e.g. poverty level and metropolitan status[24]).

Looking at the Digital Divide in terms of access to computers one finds good news, as illustrated by the prior statistic. However, as access becomes less important in the debate, more sophisticated questions arise, such as: What is the ratio of students to computers? How often are students using the Internet and other computer resources for high-level, rather than rote, activities? Do rural areas in the South have the ability to participate in distance learning or other activities that demand high-speed service? Are teachers being trained to instruct students with technology? And, do low-income communities have the resources to benefit equally from technology in schools? These are but a few of the questions that add complexity to the Digital Divide discussion.

In most of the Southern states, the ratio of students to computers is above the national average of 7.9 and much higher than the recommended ratio of 5 to 1.[25] Also, the percentage of households with Internet connectivity or high-speed service is, with few exceptions, lower than the U.S. average. Because the South has traditionally had a large share of the U.S. African-American and rural population (two groups still affected by the Digital Divide), this may, to a degree, explain the region's low percentages in these Digital Divide benchmarks. For example, although the national gap in Internet connectivity between whites and blacks is about 15.6 percentage points, in the South, the same gap is 18.3 percentage points.[26] And the gap between rural and urban areas in Internet connectivity is greater in the South than in the U.S. (17 percentage points versus about 14 percentage points).[27]

Although some argue that the Internet is not a real resource for users and that its benefits are solely entertainment and e-mail, others argue, quite eloquently, that the value of the Internet lies in its ability to provide necessary information (e.g. job ads, financial planning information).[28] For example, the National Telecommunications and Information Administration reports that low-income users (more than any other user group) use the Internet as an employment and educational resource that helps them find jobs and take classes[29] to improve their station in life. The South must take steps to increase the number of its residents who are plugged in to the tools necessary for full participation in the 21st century.

Louisiana Technology Park

The Louisiana Technology Park is a private-public alliance formed to create the most active and innovative atmosphere for e-business between Houston and Atlanta. The State of Louisiana and Solid Systems Inc. have joined with the ECOstructure alliance of EMC, Cisco Systems, and Oracle to focus on growing Internet-based startup companies by providing Tier 1 high-speed, high-volume commercial data storage and transmission.

Baton Rouge, La.
(225) 218-1100
www.latechpark.com

Missouri Innovation Centers

The Missouri Innovation Centers offer a comprehensive set of services to new technology businesses: market research, technology assessment, business planning and management, financial assistance, research and development including prototype development, SBIR/STTR consultation, patent and licensing consulting, and business incubation. The four innovation centers assure full access for businesses throughout the state. The centers, which charge for their services, are funded through state, federal, and private sector funds.

Jefferson City, Mo.
(573) 526-1366
www.ecodev.state.mo.us/technology/

"As we make strides in the new economy, we must make sure that those employed in the old economy aren't left behind. We need to make sure that all of our communities share in our prosperity - especially our rural communities."

- The Honorable Jim Hodges, Governor of South Carolina, Chairman of the Southern Technology Council and Chairman-Elect, Southern Growth Policies Board

Virtual Entrepreneurial Education & Training Project

The Mississippi State University Extension Service addresses the needs of small businesses through the Virtual Entrepreneurial Education & Training Project. The project has adult and youth entrepreneurial objectives, and targets entrepreneurs with an emphasis on business and e-commerce skill development. Program components include workshops, conferences (transmitted live by interactive video throughout the state), Web sites, and the Entrepreneurship Corps, composed of students who meet to learn technology and entrepreneurial skills.

The Mississippi State University Extension Service
Starkville, Miss.
(662) 325-2160
http://msucares.msstate.edu/

Encourage and support innovation and entrepreneurship.

Innovation, or the application of new ideas to products and processes in the pursuit of profits, creates wealth, opportunity and a rising standard of living. Innovation creates wealth by making companies more profitable. This ability to increase or preserve profits spurs a rising standard of living. Several ingredients are necessary for innovation: human capital, intellectual capital, financial capital, and social capital. The human capital provides both the workforce and the entrepreneurs. Intellectual capital contributes the ideas, inventions, technologies, and know-how. Financial capital includes not just the money but all the support services necessary for businesses to thrive. Social capital provides the networks of human and organizational interaction that are found in all dynamic entrepreneurial communities. With the presence of these ingredients, communities tend to respect those who behave entrepreneurially, those willing to take chances and work hard to build growing enterprises. To be effective in its role, political leadership should create the optimal regulatory and investment environment. The numerous benefits of innovation to the economy include the creation of new businesses and jobs, as well maintaining the competitiveness of existing businesses.

The focus on innovation is also a commitment to competitiveness. The South must constantly examine its competitive position and never be content with yesterday's victories. Just as every individual business must be aware of its competitive position — its strengths, weaknesses, threats, and opportunities — so the communities and states of the South must be ever vigilant to emerging threats and ever alert to emerging opportunities. To raise its level of competitiveness, the region must make a full commitment to the knowledge economy and not seek comfort in anti-competitive strategies.

Objective2.1: Infuse an entrepreneurial culture throughout the South.

According to the National Commission on Entrepreneurship, a "successful entrepreneurial community depends on a local business culture that embraces and nurtures entrepreneurs."[30] This entrepreneurial environment should have, as a minimum, a highly skilled workforce, access to capital, and strong political and institutional support.[31]

Entrepreneurs contribute greatly to U.S. economic success and they play a crucial role in the innovation process. Through their businesses, they turn innovation into wealth. Entrepreneurship, in turn, drives U.S. economic growth and has fueled new wealth creation that has produced unprecedented levels of investment in new companies, innovative products and business practices.[32] Areas that celebrate and support entrepreneurship will reap its many benefits.

Because technology is a primary tool of innovation, the South must increase its share of technology employment and establishments, since many states fall below the U.S. average in both indicators, despite overall gains in the past decade. "Gazelle"[33] firms, new business starts, and Small Business Innovative Research (SBIR) awards are also useful indicators for measuring the entrepreneurial climate of a region. Gazelle firms are responsible for a significant share of job growth in the U.S. SBIR awards help fill small gaps in scientific research, development and education by providing money for research that private investors may not have an interest in.[34] In addition, new business starts illustrate the level of business activity and growth in a state.

Gazelle employment in the South overall is slightly lower than the U.S. average, although half of the states' gazelle employment exceeds, or barely falls short of, the national average. The South could stand to improve in the number of new businesses started each year as well as the average number of SBIR awards received, since only a few states exceed the national average. The solution to many of the region's problems

lies in building a stronger entrepreneurial class.[35] In order to innovate, the South must create strategies to support these pioneers by providing them with the resources they need to thrive.

The Rural Internet Access Authority (RIAA)

The North Carolina General Assembly created RIAA to provide rural areas with high-speed Internet access. This means ensuring local dial-up Internet access from every telephone exchange in North Carolina within one year, and providing high-speed Internet access at competitive prices to all North Carolinians within three years. Members of state government, business and education leaders, members of MCNC, and representatives from the state's telecommunications companies govern the authority.

Raleigh, N.C.
(919) 250-4314
www.ruralcenter.org

Objective 2.2: Increase significantly public and private R&D in the South.

Comprising less than 3 percent of the U.S. economy,[36] research and development expenditures are nevertheless a key component of innovation and a vital ingredient for economic growth in the U.S. R&D is the amount of money spent on the creation of new products (or new knowledge) and on improvements on existing products. R&D funding is necessary to support groundbreaking scientific and technological research; therefore, the demand for it is relatively high. Firms that reap the benefits of innovation are most likely investing significantly in R&D.

Federal, industrial, and university R&D all have different functions. Federal R&D, for instance, furthers licenses and cooperative agreements, and ultimately, helps create new technologies. Industrial R&D, the largest performer of the three, is directly tied to productivity growth and competitive advantage. And finally, basic and applied university R&D centers on "long-term, fundamental knowledge and discoveries of new underlying principles." [37] This research, among other things, supports the process of "business formation based on intellectual property developed at the university" by faculty staff and students.[38] Although different in nature and scope, these three types of R&D are important factors in economic growth and innovation.

In 1998,[39] R&D spending was largely concentrated in a small number of states. California, for example, had the highest level of R&D expenditures in the country and one-fifth of all R&D in the U.S. And the top six states in R&D performance accounted for close to half of the entire national R&D effort.[40] Given this, it should come as no surprise that the South lags the nation in R&D expenditures by the federal government, universities, and industry. Some Southern states, however, are top 10 performers nationwide in certain areas: North Carolina in university-performed R&D and Virginia and Alabama in federally performed R&D,[41]

In order to innovate, industrial, federal, and university R&D expenditures as a share of gross state product must increase. These indicators measure the "importance of R&D activities to the industry sector of a state's economy," the importance of federal R&D performance to state economies, and the importance of university research on a state's economy.[42] The South could stand to improve in all three areas, especially in industrial R&D, arguably the most important indicator of a region's ability to innovate. Many Southern states performed well below the U.S. average in this benchmark.

Other useful indicators for R&D performance include patent performance and the number of doctoral scientists and engineers in the work-

force. The level of patent activity is one indicator of the amount of intellectual property being created in a state.[43] Doctoral scientists and engineers are vital to the creation of new technologies as well as to the building of technology-driven businesses. Research performed by scientists and engineers drives innovation.

Hispanic Educational Telecommunications System (HETS)

HETS uses telecommunications to increases Hispanic access to higher education and training opportunities. A consortium of about 20 colleges and universities, HETS is currently completing the Virtual Learning and Support Plaza, a bilingual interactive portal for online learning, faculty collaboration, career exploration, and mentoring support. Courses are ready for delivery through the Virtual Plaza and are available from an online catalog, together with dozens of other courses offered by HETS member institutions.

San Juan, P.R.
(787) 250-0000
www.hets.org

The average number of patents issued in 1998 per 10,000 business establishments was 110. All of the Southern states fell below this average. Patent attorneys help inventors navigate the intellectual property process, and thus, are important to the patent process. The presence of patent attorneys in the South is somewhat low, and the South must improve in this measure. The South fared a bit better as more states reached, but did not exceed, the U.S. average in the percentage of recent science and engineering Ph.D.s in the workforce. In order for the South to compete against other states and nations, it must increase its R&D levels and improve the infrastructure that supports R&D in order to create the technologies and jobs that fuel economic growth.

Objective 2.3:
Ensure access to capital and technical and management assistance at all stages of business development, paying particular attention to underserved groups.

No business can grow without the capital resources to finance the development and launching of new products, movement from pilot scale to full production, expansion of market, new locations or other critical business tactics. While venture capital has a particularly high profile in the knowledge economy, this objective recognizes that a business needs financial support of many different types during the different phases of business expansion. It also recognizes that a business that is unable to write a business plan, develop a loan request, properly account for its past and future funds, or clearly describe its business opportunities will not get the funds it needs even if they are readily available in the community. As such, the objective calls for a fully integrated system of technical and management assistance to entrepreneurs.

The South is home to some of the nation's strongest financial institutions and, as such, does not appear to lack for traditional sources of business credit. However, in the area of equity capital, the type of capital high-growth enterprises seek, the South does not fare so well. High-growth, high-wealth enterprises, such as technology firms, are breeding grounds for innovation.

The budding entrepreneur needs money for various stages of business development. They need "seed" money to develop an idea or business plan. They need start-up money to create the beginnings of the business or finance the final development of a product. First-stage financing allows him or her to sustain the business at times when it may or may not be

making profits. Second stage and mezzanine funding is useful when the company is making a profit and trying to expand.[44] Without business creation, there is no job creation, higher wages, or rising standard of life. Providing entrepreneurs with access to capital will allow them to create the businesses that the region needs to sustain its vitality.

Venture capital is a key factor in the growth of high-tech industries in the South and the creation of a technology-intensive business climate. It is also an important source of equity for new companies. "Angel" investors, or individuals who invest their own money in private enterprises run by friends or family, are also important sources of capital, and in some cases, provide more money than venture capitalists. Venture capitalists help the entrepreneur by providing him or her with funding and business acumen. Venture capitalists often fund the high-risk, new and rapidly growing companies that are responsible for much of the nation's wealth and economic growth. With the exception of Georgia and Virginia, venture capital disbursements in the South did not meet the U.S. state average of $924 million in 1999.

The Small Business Administration's Small Business Investment Company (SBIC) program is another great source of capital for the small business owner. The SBIC program provides significant leverage to local lenders and investors, thereby helping to fill the gap between available sources of venture capital and the needs of small business in start-up and growth situations.[45] SBIC licensees provide equity capital, long-term loans, debt equity and investments, and management assistance to qualifying small businesses. The state average for SBIC awards in 1998 was 243, and only Georgia among the Southern Growth states exceeded this average with 246 awards. Because SBIC awards play a critical role in alleviating the capital gap, Southern states should seek to increase the number of SBIC licensees in the region and the total funds under management by these organizations. The same logic applies for SBA 7(a) business loans, where again, most states in the South fall below the U.S. average.

Along with providing capital, the right infrastructure must be in place to support businesses. Small Business Development Centers provide owners of small businesses with the technical and management support that they need to succeed. This is a very important function, since small businesses account for 99 percent of all businesses in the nation, employ 53 percent of the private workforce and contribute more than half of U.S. gross domestic product.[46] The good news is that the presence of these centers throughout the South mirrors or exceeds the U.S. average. Increasing the number of centers in all of the Southern states will increase the likelihood that more entrepreneurs will get the assistance they need to develop their businesses.

Finally, in order to reap the benefits that new businesses bring to a state, special attempts must be made to ensure that all citizens of the South are given equal opportunity to start their businesses. Economic growth can be significantly enhanced with full participation of women and minority-owned businesses.[47] As demographics continue to change the face of America, the labor force will, in the coming years, rely heavily on the participation of nonwhites.

Minority firms are an important contributer to U.S. wealth. In the decade of 1987-1997, they surpassed the average growth rate of all U.S. businesses by growing at 17 percent annually, which is six times faster than the annual growth rate for all businesses during the same decade.[48] Despite their obvious contributions to the U.S. economy, minority firms receive only 2 percent of all private equity investments and only 3 percent of all SBIC investment dollars.[49] In addition, their participation rates lag their representation in the population. This is especially true for African-Americans, who make up 12.5 percent of the population, but only 3.6 percent of firm owners.

In most of the South, there are fewer minority businesses than the U.S. average, although some fall only slightly behind the nation. The good news is that women fare somewhat better in this measure, as most Southern states are at the national average in women-owned firms, or a few percentage points behind. Tapping into this underutilized human capital will only make the South stronger.

Ultimately, the region needs comprehensive financial systems that support innovative companies at every phase of their life cycle. Underlying these systems must be a supportive environment for capital formation, such as through tax policies and securities laws; motivating and educating "angels" and other private and institutional investors; using incentives to catalyze private investment; and creating direct financing programs. Special attention must also be made to make sure that minorities and women are given the same opportunities to access capital and technical assistance.

Objective 2.4: Take advantage of the growing commercial and intellectual potential in the global community.

Innovation and globalization are powerful, related drivers of the modern economy. In short, technology and innovation make firms more productive and competitive, while globalization provides the consumer base and competitive pressure that push firms to innovate and focus on core competencies in pursuit of the most profitable opportunities.

Specifically, innovation and technology create the products and services the rest of the world wants to buy — often at a premium. Much of what the South exports is high-tech in content (e.g., software), or technology-intensive in the production process (e.g. pharmaceuticals). Innovation also makes firms more efficient, allowing American firms to beat out foreign competitors as the lowest cost producer. At the same time, technology is reducing the transaction costs of trade. Modern transportation and communication systems move people, goods, money, images, data, and ideas at a fraction of the cost and risk of a generation ago. The rich network of global connections is, in turn, fueling harmonization of industrial standards and business practices, and, to some extent, the acceptance of English as the language of global business. All this has created not just a global village, but also a global laboratory. The number of foreign students and scholars studying and working in the U.S. has been on the rise, and the percent of internationally coauthored U.S. scientific and technical articles has roughly doubled in the past decade, to over 18 percent. This connectedness in the scientific community also translates into new wealth, with the global sharing of ideas adding as much as one percent to the rate of global growth.

But globalization also affects innovation. International competition forces companies to innovate to stay alive, and to focus on what they do best. Trade revenues also provide the means to pay for innovation. For example, a global customer base is often needed to justify the creation of a new product or service, such as a highly specialized piece of equipment or medical research. Trade also gives U.S. firms access to science and innovations generated in foreign universities and companies, as well as access to

The South Carolina Technology Alliance (SCTA)

The public-private, nonprofit SCTA is a leading advocate for the adoption of new technology policies. It was instrumental in developing the Technology Act of 1999 that suggested policies for improving the workforce, stimulating high-growth businesses, improving linkages between research and industry, and changing tax and regulatory policy. It developed the South Carolina Technology Initiative 2000 - a comprehensive plan addressing policy legislation and funding initiatives. SCTA received the Vision 2000 Models of Excellence Award from the Small Business Administration.

Columbia, S.C.
(803) 748-1323
www.sctech.org

exotic materials, such as eucalyptus bark, that lead to product innovations.

Because of the increasing importance of globalization in the U.S., the South should create strategies to increase its effectiveness in the global marketplace. The South has fared well in the percentage of manufacturing firms that export, with half of the Southern states well exceeding the U.S. average in this indicator. However, there is room for improvement. First, many exporters are shipping to just one or two foreign markets, and are selling only a fraction of what they could. The relatively low effort at exporting is reflected in merchandise exports as a share of gross state product. This measure illustrates that only a modest fraction of the state's economy is tied to exporting, especially considering that in many other industrialized countries, such as Canada and most of the European countries, the percentage of gross domestic product exported is typically in the double digits.

As global economic and political boundaries disappear, the importance of cooperation and understanding among nations rises. For example, a Booz Allen & Hamilton study found that corporate alliances have grown by 25 percent each year since 1987,[50] due in large part to the rapid changes brought about by globalization. Business alliances help firms pool expertise, share technology, enter new markets, and get products and services to market faster, among other things.[51] Education is another area where international cooperation is essential. Not only do our students need the experience, skills, and contacts acquired through global educational exchange, foreign students bring billions of dollars into the university economy and supply valued brainpower for graduate departments and businesses. As such, the South should place high importance on international exchange opportunities and foreign language training (even down into the elementary and secondary level) in order to forge a greater understanding of other nations and cultures. In the 1998-99 school year, over 490,000 international students enrolled in U.S. colleges, or roughly 18.1 international students per 10,000-student population. In the South, this average was roughly 11.7 students per 10,000-student population. In addition, the South lags the U.S. in the average number of students per 10,000 population in study abroad programs for the 1997-98 school year. Increasing the number of Southern students who study abroad and vice versa will only increase the quality and diversity of postsecondary education in the U.S. and enhance understanding of our trade partners.

Center for Entrepreneurial Growth

The Center for Entrepreneurial Growth promotes entrepreneurship and improves dissemination of Oak Ridge National Laboratory technology to small and medium businesses. Activities of the CEG include identifying and marketing technologies with commercial potential, conducting workshops and seminars, and providing access to financial resources, including its own commercialization fund. Technology 2020 has developed a Virtual Business Resource Center that provides primers in business practices and links to hundreds of Internet sites that deal with small business issues

Technology 2020
Sponsored by University of Tennessee and Battelle
Oak Ridge, TN
(865) 220-2020
www.tech2020.org

Create and sustain a quality of life that is attractive to globally competitive businesses and employees.

For much of the 20th century, to include quality of life issues in discussions on economic development was a step towards political suicide or an irresolvable confrontation. At the local, regional, and state levels, it was widely assumed that a development discussion should focus on just that: growth and job creation. Most citizens, politicians, and the professional economic development community believed that discussions regarding any aspect of quality of life other than the creation and exploitation of economic opportunity should be part of some other conversation.

Unfortunately, this set of assumptions too often limited us to debates of extremes: pro-growth vs. anti-growth, development vs. preservation, conservation vs. exploitation, incentives vs. restraints, flexibility vs. control, the economy vs. the environment. Moreover, the polarizing characteristics of the debate obliterated any chance to focus on the potentially unifying, underlying reality: We all want a high quality of life. No one actually wants to live in a community with polluted air and water, traffic gridlock, high crime, agonizing racial and ethnic conflict, dysfunctional educational institutions, and limited recreational opportunities. Yet we (understandably) often have succumbed to a Maslow-like hierarchy of concerns where each extreme is viewed as transcending the other, depending on one's personal point of view.

In practice, this has meant that quality of life discussions in the South have risen to critical mass only in the wake of growth and development. In Southern Growth's poorest regions and communities, growth is still viewed as invaluable and is not to be questioned. In areas where we have achieved the greatest success, such as the Research Triangle Park area of North Carolina and the Atlanta corridor, rapid growth has generated traffic congestion and other quality of life concerns that are now matters of real consequence in the public eye. Clearly, both sets of concerns should be addressed, and whenever possible, they should be addressed in tandem as part of an informed public conversation.

Now, in the early years of a new century, a new reality disrupts our hierarchal formula, and finding a better way to engage these issues becomes even more important to the future of the South. With our inexorable movement towards a knowledge economy, our most important economic development assets become knowledge workers and knowledge businesses — people and firms with a growing ability to choose their own location. Because knowledge workers are aware of their options, aware that they can work and live almost anywhere, quality of life issues are of paramount importance to them in making location decisions. Similarly, the owners of knowledge businesses know that they have many location options. Quality of life issues are at the top of their criteria for two reasons: the comfort and

Office of the Secretary of Technology

The cabinet-level Secretary of Technology helps develop the optimal technology environment for businesses and government, and acts as the state's chief technology strategist in developing policies, plans, programs, and budget proposals that enhance research and development in industry, academia, and government. A few of the initiatives coming from the secretary's office are the Commission on Information Technology, the Virginia Research and Technology Advisory Commission, the Digital Opportunity Task Force, and Virginia's Information Provider's Network Authority.

State of Virginia
Richmond, Va.
(804) 786-9579
www.sotech.state.va.us

well-being of the owners and key executives and the ability to draw upon an educated, trained workforce — the kind of workforce that is attracted to locations with a high quality of life.

Once a business or worker adjusts to the reality that the home or business location is a matter of real choice, quality of life issues rise from background noise to dominate the conversation. Economic developers and policy makers must, in turn, realize that low taxes, cheap land, and cheap labor are not optimal tools in a knowledge economy. Environmental quality, cultural diversity, recreational opportunities, the actual touch, feel, and smell of the place — these are the things that matter more and more to knowledge-economy decision makers. In this dynamic environment, communities and regions committed to building and maintaining a high quality of life enjoy a competitive advantage. The implications of this shift in priorities cannot be underestimated when devising economic development strategies. For these reasons and at this time, the third goal of *Invented Here* addresses the need to create and sustain a quality of life that is attractive to globally competitive workers and businesses.

Technology Opportunity Centers

West Virginia is addressing its Digital Divide by offering training for adults and students in Technology Opportunity Centers. These centers offer computer and Internet training at no charge. Eighteen school-based centers are now in operation, each consisting of 10 to 20 computers, a server, and printers. During the school day, students and teachers use the labs to learn basic computer skills and develop career decision-making skills. In the evenings, students and adults take basic computer or career-oriented classes.

West Virginia High Tech Consortium Foundation
Fairmont, W.V.
(304) 366-2577
www.wvhtf.org

Objective 3.1:
Use Wise Growth principles to ensure that a high quality of life accompanies economic progress in the South.

This first objective for Goal Three addresses the ways in which communities, states, and regions deliberate and make decisions regarding economic development and growth. It does not suggest that the best approach to growth in a community should be decided by anyone outside the community. It is intended to encourage a process by which each community can decide upon and implement strategies that are attuned to its particular needs and desires.

What, then, does the term "wise growth" mean? Southern Growth Policies Board uses the term to describe an approach to decision making at the community level that is inclusive, informed, balanced, and open.

An inclusive approach means that stakeholders from all segments of the community play an active role. The views of developers, investors, civic leaders, community groups, and ordinary citizens are solicited and given a full airing. Decisions and strategies that emerge from such a process should then have broader public support, thereby enabling more rapid and efficient implementation.

An informed approach means that all of the stakeholder groups are given the best and most complete information available in order to strengthen public discourse. Case studies from other communities and regions are disseminated and the news media is encouraged to fully examine all related issues. While community decisions of this sort are necessarily speculative, a more knowledgeable decision is a somewhat less risky one for all parties. The greater amount of knowledge also means that participants are able to raise relevant concerns during the

course of the deliberations rather than after the fact. This builds trust among the parties and increases a community's reservoir of social capital.

A balanced approach means that growth and development decisions are made with the specific intent of improving the community's quality of life. This will usually mean that discussion regarding development become broader and more complete. It could mean, for example, that an infrastructure project is accelerated in order to assure that a specific development becomes more of an asset than a liability for the community. It should reduce the number of surprises with regard to the negative effects of development projects. A balanced approach to development discourse means that decisions will be made in a more holistic environment and with a better-informed view of the total potential consequences of actions.

An open approach means that the community is functioning as a strong, effective partnership. It means that no party or set of parties distrusts others enough to dishonor or misuse the process. It means that community decisions are made as if all the participants are neighbors and wish to remain so. Meetings and forums are publicized before and after the fact. Affected parties are kept fully informed. As with other aspects of "wise growth," an open process builds trust and social capital in the community.

Benchmarks for Objective 3.1 include poll questions on environmental quality, traffic and congestion, crime, cultural climate, health care, and recreational opportunities as well as specific targets relating to violent crime, and air and water quality. The answers to the poll questions will provide an ongoing evaluation of the perception of those living in the South regarding quality of life issues. The specific air, water, and crime statistics assure a balanced set of indicators.

Objective 3.2:
Build on the potential strengths inherent in our cultural diversity by overcoming our historic racial and cultural divisions.

This document is a strategic plan about using the power of technology and innovation to maximize economic opportunity. That point made, it follows that this objective is not a sop to political correctness or to any particularly political philosophy. It is not about doing the right thing. Instead, this objective is about need — in fact, it is about necessity.

A history of the South or one, for that matter, of Europe will reveal in short order that recognition of diversity does not guarantee wonderful outcomes. The operative word in this objective then is "potential." The South has diversity and is acquiring more of it every day. Is it possible to employ the strengths inherent in diversity to achieve positive outcomes? What are the consequences of failing to do so?

Our specific regional history, of course, bears the scar tissue of slavery, civil war, reconstruction, the Jim Crow era, painful and often ineffective attempts at public school desegregation, and subsequent white flight. The recent debates over flags in a number of states serve as reminders of the unfinished business of healing. The fact that a description of poverty in the South may be drawn so strikingly along racial lines underscores the dimensions and implications of the failure to turn diversity's strength to societal advantage.

This objective is need-driven for reasons relating to both reality and perception. The internal reality is that the region has lingering racial and cultural barriers, while a new wave of immigration adds language to the list of potentially divisive elements. The external reality is that the South is still often perceived as a land of racial and cultural conflict, an image not enhanced by the tendency to cling to archaic and divisive symbols.

Southern Growth Policies Board and the Southern Technology Council fully recognize

that inclusion of one objective in a technology and innovation plan will not bring the changes that are needed. Throughout the many meetings, focus groups, and discussions that led to this plan, however, came a clear and consistent message: To fail at this objective is to fail at achieving the quality of life that is the ultimate reason for the plan's existence.

For this reason, this objective serves as a reminder and a commitment. Utilizing an interracial trust quotient from Harvard University's Saguaro Seminar and polling data compiled for Southern Growth, progress towards the elusive objective of extracting strength from diversity will be benchmarked and reported as a part of an annual report on technology and innovation. Southern Growth is committed to the continuing search for successful strategies to achieve racial harmony and cultural vitality through all of its standing advisory councils.

Objective 3.3: Increase the South's levels of civic engagement.

Since the publication of Alexis de Tocqueville's *Democracy in America* in 1835, scholars have debated "the American difference," the aspects of the American experience that made the nation and the structure of democracy so well suited to each other. Harvey C. Mansfield and Delba Winthrop, recent Tocqueville translators, credit the Frenchman for not only writing a masterpiece, but also for having discovered new features of political science — the concept of the "social state," among them. According to Gordon S. Wood, the social state is "…both product and cause of the laws, customs, and ideas of nations." Tocqueville built a case that democracy blurs the distinction between state and society so that the social state becomes all encompassing. In such a state, the ways in which citizens engage each other, both individually and as groups, demand rigorous scrutiny.

Building on Tocqueville's insights, Robert D. Putnam and others have developed the concept of "social capital," which Putnam defines as "…connections among individuals — social networks and the norms of reciprocity and trustworthiness that arise from them." In his book, *Bowling Alone*, Putnam explains the critical role of social capital in building this nation. He also mounts an extensive, exhaustively documented argument that social capital is in serious decline and that we are imperiled by this trend. The result of this work and the many responses to it is a vibrant debate over the nature and role of social capital in America and elsewhere.

In a recent symposium, the University of Minnesota's Wendy Rahn divided social capital into two parts: civic engagement and widespread social trust. Rahn is uncommitted as to the decline of civic engagement but says that the decline in social trust is "incontrovertible." She cites polls that found that the number of Americans answering "yes" to the question "Can you trust most people?" dropped from 55 percent in 1960 to 35 percent in 1995. She argues that widespread social trust is an indicator of social cohesion, solidarity, and prosperity. Following Putnam, Rahn, and others then, it is worth considering that the "American difference" may be in trouble.

In focus groups conducted throughout the South over the past two years, Southern Growth Policies Board researchers have encountered a phenomenon that might be described as the "Southern difference." Responding to a question about what strengths a state or community might build on, group after group identified "a sense of community" as a strength. Groups saw this as a strength both at the community and regional level. Moreover, observers working outside the region have marveled at the ability and inclination of Southern states to work together, a phenomenon attested to by the existence of Southern Growth, the Southern Technology Council, and other strong regional organizations. Most focus group participants agreed that this sense of community could be an important asset for the future of the South.

The Southern states do not fare particularly well, however, in the social capital ratings

devised and reported by Putnam in *Bowling Alone* and elsewhere. His composite social capital index includes such factors as participation in civic and political activities, group membership, attendance at town meetings or school functions, volunteer work, socializing, and election participation. No Southern state rates highly in this index, and only a handful rank near the national average. Putnam cites observations by Tocqueville during his travels in America that communities in the South had, at that time, "a less active municipal life." The region's history of slavery and racial conflict may also be seen as reasons for low reservoirs of social capital.

Why the contrast between the social capital ratings (low) and the focus groups' belief in a Southern sense of community (high)? While this dichotomy must be the focus of extended study, it may be fairly observed that the sense of community that Southerners feel is not uniformly shared. Specifically, it may be that there is one sense of community that is experienced by white Southerners and a quite different sense of community that is experienced by African-American Southerners. These radically different points of view would in fact compromise the region's ability to build widespread social trust and civic engagement across racial and cultural lines.

Understanding this dichotomy and the importance of social capital may, however, provide the basis for substantial and sustained progress in this area. For that reason, benchmarks for civic leadership, giving and volunteering, social trust, and associations involvement will be developed and reported as a part of the Southern Technology Council's ongoing *Invented Here* effort. Southern Growth will also call upon its other standing advisory councils, particularly its soon to be formed Council on the Southern Community, to focus attention on the challenges and opportunities of social capital in the South.

IS IT POSSIBLE TO INVENT IT HERE?

An odd mixture of hope and frustration sometimes surfaced in the focus groups conducted by the STC for *Invented Here*. Southern leaders know that it is possible to transform the economy through technology and innovation, but there is frustration just below the surface — why has the South not made it fully into the knowledge economy? Why do we often seem, to paraphrase the report of the 1986 Commission on the Future of the South, still only halfway home?

Sometimes the frustration leads to a sense of futility, particularly in areas of the South that have benefited little from the nation's most recent economic boom. "Can it really work for us?" they ask. The best answer to this question is found by identifying particular success stories that have taken place in the South.

Hot Southern companies

For starters, the South has its share of marquee new economy companies. America Online, for example, a Virginia-based company, blazed the trail for Internet service providers everywhere and emerged as one of the most potent corporate forces in the world.

Mississippi's WorldCom now operates in more than 65 countries, with 2000 revenues of approximately $40 billion. Arkansas's Wal-Mart grew from a rural dime store in 1962 to become the poster child for retail success with 2001 fiscal year revenues exceeding $191 billion. Less well known are the revolutionary changes Wal-Mart has applied to its buying and distribution systems through creative use of the Internet. The financial success and continuing commitment to innovation resulted in *Fortune* magazine naming the company as the third most admired in the U.S. and the fifth most admired in the world. Add to this list such Southern icons as Georgia-based Coca-Cola, Missouri's Monsanto, and Tennessee's Federal Express, and it is obvious that hugely successful, globally powerful companies can be built in the South.

The big names are by no means the whole story, however. North Carolina's Red Hat is a phenomenon in the development of Linux and open source solutions for Internet infrastructure. E-intelligence software expert, SAS Institute — also a North Carolina company — provides its products and services to 98 of the *Fortune 100* companies and boasts 24 straight years of double-digit growth. Missouri's World Wide Technology Inc. generated over $800 million in revenues last year and expects to hit $1.5 billion this year by helping transform old economy businesses with cutting-edge inventory, purchasing, and supplier tracking systems.

WorldCom and BellSouth don't have Southern telecommunications to themselves as this lively regional sector also includes such players as Arkansas's ALLTEL ($7 billion in annual revenues, 26,000 employees in 55 countries) and Louisiana's CenturyTel (nearly 3 million customers in 21 states). Another Louisiana company, The Shaw Group Inc., has moved from start-up stage in 1987 to $762 million in 2000 revenues while becoming the largest provider of integrated industrial piping systems in the U.S. Meanwhile, West Virginia's Touchstone Research Laboratory Ltd. has twice landed on *Inc.* magazine's list of fastest-growing private companies in America with a remarkable, multi-disciplinary capability for industrial problem solving and applied research.

Some Southern companies have been built on opportunities arising out of the nation's investments in aerospace and defense. Virginia's Orbital Sciences Corp. manufactures low-cost space systems, including satellites, launch vehicles, and satellite ground systems. Orbital now has 4,200 employees and $725 million in annual revenues. Another Virginia company, Arrowhead Space & Telecommunications Inc., provides satellite telecommunications services to a variety of clients. Arrowhead's founder and CEO, Mary Ann Elliot, was one of only two women to make *Defense Daily's* list of the 40 most influential people in defense, aerospace, and national security.

Oklahoma's ZymeTX Inc. is one of the region's emerging biotechnology companies, developing such products as ZstatFLU, the world's first point-of-care influenza test that can reliably and quickly diagnose all strains of influenza A and B. Also in the medical field, Tennessee's CTI Inc. is the leading worldwide supplier of products and services for the positron emission tomography (PET) market. In Alabama, Shearwater Polymers Inc. focuses on healthcare applications of polyethylene glycol (PEG). Shearwater has 10 PEG-related products in 14 current clinical trials.

The South also features growing ranks of small technology-based companies positioning themselves for rapid growth. Kentucky's Archvision has launched a 3-D technology that allows users to view and analyze complex objects in three dimensions. Mississippi's MPI Software Technology Inc., which began in the Golden Triangle Enterprise Center, makes software to help high-performance clusters of computers work together. South Carolina's Conita Technologies is poised to revolutionize the interface between personal digital assistants, computers, and telephones.

Avant Technologies, based in Caguas, P.R., is using the island as a beachhead for delivering Internet, networking, and software solutions throughout Latin America.

Hot Southern technologies

Southern laboratories continue to be among the most creative in the world, spinning off new ideas that have enormous potential for transforming how we live and building new economic opportunities. *Invented Here's* call to expand R&D capacity means building on the successes that have already been achieved in the South.

Among the exciting new work ongoing in Southern laboratories is a project at the University of Oklahoma to develop a new fuel mixture with natural gas. This mixed hydrocarbon fuel will give greater vehicle range, safer fueling, better acceleration and power, and cost savings. LexCarb, a graduate of the University of Kentucky's incubator, develops and manufactures specialty carbon materials with applications in gas and liquid separation, energy conversion systems, and military and industrial protective filters, among others.

Georgia Tech's Dr. Sundaresan Jayaraman has invented the Smart Shirt — a wearable motherboard that provides a systematic means of monitoring a patient's vital signs without restricting the patient. The Smart Shirt can also be used in combat situations to monitor fatigue and even detect bullet wounds. Additional applications include monitoring babies for signs of Sudden Infant Death Syndrome, as well as monitoring astronauts, law enforcement personnel, and athletes.

In Virginia, the Southeastern Universities Research Association's Jefferson Lab has licensed a new technology to Dilon

Technologies that will lead to the development of a gamma camera — a nuclear medicine technique that images the metabolic activity of breast lesions in a non-invasive manner. Researchers at West Virginia University have developed a tactually accurate polymer breast model along with a fiber-optic, solid-state sensing touch pad device that is being hailed as the next generation in breast care instruction. Dr. Michael Zemel at the University of Tennessee has achieved a breakthrough in obesity treatment by using calcium in an innovative weight loss regimen.

Alabama's Pursell Technologies has developed Polyon, a unique polymer-coated fertilizer that allows for 100 percent controlled release. This technology not only significantly increases application efficiency, it also drastically reduces runoff and its effect as a groundwater contaminant. In Arkansas, Acxiom has developed a data integration product called AbiliTec, established on a knowledge base of consumer data and providing the ability to validate and link records from many sources for relationship management purposes.

Researchers at the University of North Carolina at Chapel Hill have created what they believe is the world's first DNA in liquid form, a discovery that could provide a breakthrough in gene therapy methodology. The University of South Carolina has pioneered alternative techniques for monitoring the progress of biological decontamination of groundwater aquifers.

In New Orleans, Tulane University is working with one of its inventors to start a company based on cancer therapeutics breakthroughs. The company will use novel peptides as cell-targeting agents, or vectors, in a way that allows release of drugs in close proximity to tumors. At the University of Mississippi, a system for detecting distant nuclear blasts based on infrasound technology may find broad application for improving aircraft safety, weather forecasting, and monitoring of natural events. And Puerto Rico is using the National Science Foundation's EPSCoR program to build much-needed R&D infrastructure.

This brief look at research and development in the South provides ready evidence of the quality, depth, and diversity of intellectual property in the region. Clearly, the basis for economic transformation is in place. Southern states must work to nurture and leverage the considerable resources that our people, businesses, and laboratories already display.

"We need to increase the quality of life for our people more than we need to increase the quantity of people in our life. We want to build our economy and we want to do it wisely. We want to see a change in our attitude about what kind of industry and business and person that we recruit so that the net result is increased educational opportunities, decreased demand and taxation, and less of a strain on our infrastructure."

- The Honorable Mike Huckabee, Governor of Arkansas and Chairman of Southern Growth Policies Board (2000-2001)

THE SOUTHERN INNOVATION INDEX

The benchmarks

All of the benchmarks established by the *Invented Here* strategic planning process are presented by state in the following pages. For all of the benchmarks where current information is available, each state's performance is included.

A number of the benchmarks, especially those relating to Goal Three of the plan, do not have current performance information because no organization is collecting that information at this time. These indicators fall into two categories: those quotients designed by Robert Putnam's Saguaro Seminar to measure social capital and the results of polls to be conducted by Southern Growth.

Dr. Putnam's quotients are not available at this time at the state level, although the methodology for achieving such results is in place. Southern Growth will work with the Saguaro Seminar to develop these results at the state level, and will then work with the states to set baseline numbers and target projections.

For the other category, Southern Growth will conduct a poll of Southern residents to establish baseline numbers for each of the benchmarks. The poll will be repeated a number of times during the next decade to assure continuous feedback as to how the states and region are doing in approaching the benchmark targets. In developing the poll, Southern Growth follows the lead of the Southern Governors' Association (SGA), which published a Southern Quality of Life poll in 2000 as part of Governor Mike Huckabee's SGA chairman's initiative, "From Fiber Optics to Fly Fishing," which focused on quality of life and technology.

In a number of cases, the benchmarks for a particular objective are composed of polling or quotient data plus a single separately reported indicator, e.g., the infant mortality rate as a health care indicator. None of these quality of life indicators should be interpreted as an accurate barometer for the whole of the subject area. That is, the infant mortality rate should not be treated as synonymous with a state's full health care performance. Rather, these indicators should be used along with all of the other quality of life indicators to make an assessment of how well a state is doing overall. Southern Growth is confident that, taken as a whole, this set of benchmarks gives the reader a fair and useful snapshot of a state's progress in building its knowledge economy. Single indicators taken out of that collective context will not do so and should not be used that way.

The Benchamarks are identified with numbers that correspond to the objectives they're meant to measure. So, for instance, Benchmark 1.4.B corresponds to Objective 1.4

What happens next?

The release of this report is an important benchmark in the *Invented Here* process, but it is by no means the end. Immediately following its release, Southern Growth and STC staff members will begin working with individual states to establish 10-year targets for each state for each benchmark. When that process is complete, Southern Growth will publish the first annual, freestanding *Southern Innovation Index*, showing complete baseline data and complete targets for each state. Each year, the data will be updated and a new report will be issued showing the region's progress towards the 10-year targets by state. This will provide a new round of attention on the need for commitments to the knowledge economy each year. It will also provide direct feedback to the STC as to how the states are doing and where additional help may be needed. This continuous feedback loop will assure that the STC's efforts are directed at the policy work and best practice analyses that are most needed by the member states.

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	75%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	77%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	24%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	21%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	11%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	12%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	17%
1.1.I	Average SAT scores — verbal	559
1.1.J	Average SAT scores — math	555
1.1.K	Average composite scores on the ACT	20.2
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	4.62%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.76%
1.2.C	18-24 year olds enrolling in college	33%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	45%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	78.8%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	25%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	15.9%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	0.74%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.1
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	54.6%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	73.8%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	64.9%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	9.3%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	20.1%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	11.6%
1.6.A	Students per Internet-connected computer	11.6
1.6.B	Percentage of households with computers	44.2%
1.6.C	Percentage of households with Internet access	35.5%
1.6.D	Percentage of households with broadband access	52%
2.1.A	Percentage of total employment in "gazelle" firms	13.9%
2.1.B	New business starts	2176
2.1.C	Technology-intensive employment as a percentage of total employment	6.4%
2.1.D	Technology-intensive establishments as a percentage of total establishments	3.8%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	7.0
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.5
2.2.A	Industry-performed R&D per $1,000 gross state product	$6.44
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$18.33
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$4.03
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.09%
2.2.E	Number of patents issued per 10,000 business establishments	37
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	6.30
2.3.A	Venture capital disbursements, in millions	$57.80
2.3.B	SBIC awards	156
2.3.C	SBA 7(a) business loans	356
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.1
2.3.E	Minority-owned firms as a percentage of total firms	10%
2.3.F	Women-owned firms as a percentage of total firms	24%
2.4.A	Merchandise exports as a share of gross state product	6.4
2.4.B	Firms that export, per 1,000 firms	27.1
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	12.3
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	2.6
2.4.E	Foreign direct investment per capita	$2,989
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	18.5
3.1.H	Percentage of population with access to drinking water meeting water quality standards	98%
3.1.I	Violent crimes committed per 100,000 population	490.2
3.1.J	Infant mortality rate	9.5
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	70%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	90%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	23%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	23%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	13%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	13%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	13%
1.1.I	Average SAT scores — verbal	563
1.1.J	Average SAT scores — math	554
1.1.K	Average composite scores on the ACT	20.3
1.1.L	Fall enrollment rates, as a percentage of total population.	4%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.34%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	3.70%
1.2.C	18-24 year olds enrolling in college	26%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	32%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	76.8%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	22%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	14.6%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	0.24%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.0
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	51.5%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	59.1%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	65.4%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	8.4%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	11.1%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	9.8%
1.6.A	Students per Internet-connected computer	8.1
1.6.B	Percentage of households with computers	37.3%
1.6.C	Percentage of households with Internet access	26.5%
1.6.D	Percentage of households with broadband access	27%
2.1.A	Percentage of total employment in "gazelle" firms	11.8%
2.1.B	New business starts	1069
2.1.C	Technology-intensive employment as a percentage of total employment	5.3%
2.1.D	Technology-intensive establishments as a percentage of total establishments	3.2%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	0.5
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.0
2.2.A	Industry-performed R&D per $1,000 gross state product	$1.91
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$1.57
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$1.89
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.06%
2.2.E	Number of patents issued per 10,000 business establishments	27
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	4.30
2.3.A	Venture capital disbursements, in millions	$17.50
2.3.B	SBIC awards	19
2.3.C	SBA 7(a) business loans	378
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.6
2.3.E	Minority-owned firms as a percentage of total firms	7%
2.3.F	Women-owned firms as a percentage of total firms	22%
2.4.A	Merchandise exports as a share of gross state product	4.1
2.4.B	Firms that export, per 1,000 firms	27.6
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	9.8
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	2.9
2.4.E	Foreign direct investment per capita	$1,550
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	0.0
3.1.H	Percentage of population with access to drinking water meeting water quality standards	92%
3.1.I	Violent crimes committed per 100,000 population	425.2
3.1.J	Infant mortality rate	8.7
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	77%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	82%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	24%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	25%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	13%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	16%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	23%
1.1.I	Average SAT scores — verbal	488
1.1.J	Average SAT scores — math	486
1.1.K	Average composite scores on the ACT	19.9
1.1.L	Fall enrollment rates, as a percentage of total population.	4%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.24%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	3.73%
1.2.C	18-24 year olds enrolling in college	26%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	46%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	80.0%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	23%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	18.0%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	1.15%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.1
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	58.6%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	66.2%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	71.6%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	11.0%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	20.5%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	12.5%
1.6.A	Students per Internet-connected computer	8.3
1.6.B	Percentage of households with computers	47.1%
1.6.C	Percentage of households with Internet access	43.0%
1.6.D	Percentage of households with broadband access	56%
2.1.A	Percentage of total employment in "gazelle" firms	13.3%
2.1.B	New business starts	5087
2.1.C	Technology-intensive employment as a percentage of total employment	6.3%
2.1.D	Technology-intensive establishments as a percentage of total establishments	5.8%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	2.2
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	1.3
2.2.A	Industry-performed R&D per $1,000 gross state product	$5.69
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$13.57
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$3.16
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.07%
2.2.E	Number of patents issued per 10,000 business establishments	64
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	14.8
2.3.A	Venture capital disbursements, in millions	$1033.00
2.3.B	SBIC awards	246
2.3.C	SBA 7(a) business loans	1067
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.0
2.3.E	Minority-owned firms as a percentage of total firms	16%
2.3.F	Women-owned firms as a percentage of total firms	26%
2.4.A	Merchandise exports as a share of gross state product	5.9
2.4.B	Firms that export, per 1,000 firms	43.4
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	12.1
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	3.8
2.4.E	Foreign direct investment per capita	$1,985
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	19.5
3.1.H	Percentage of population with access to drinking water meeting water quality standards	99%
3.1.I	Violent crimes committed per 100,000 population	534.0
3.1.J	Infant mortality rate	8.6
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	72%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	84%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	29%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	29%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	16%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	16%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	AT OR ABOVE
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	21%
1.1.I	Average SAT scores — verbal	548
1.1.J	Average SAT scores — math	550
1.1.K	Average composite scores on the ACT	20.1
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.71%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	3.71%
1.2.C	18-24 year olds enrolling in college	31%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	37%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	77.9%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	19%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	15.3%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	0.66%
1.4.C	Average scores for 11th graders on AP exams in math and science	2.7
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	61.7%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	74.0%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	59.8%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	7.7%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	18.9%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	8.0%
1.6.A	Students per Internet-connected computer	7.1
1.6.B	Percentage of households with computers	46.2%
1.6.C	Percentage of households with Internet access	36.6%
1.6.D	Percentage of households with broadband access	35%
2.1.A	Percentage of total employment in "gazelle" firms	13.5%
2.1.B	New business starts	1518
2.1.C	Technology-intensive employment as a percentage of total employment	6.9%
2.1.D	Technology-intensive establishments as a percentage of total establishments	3.6%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	0.8
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.9
2.2.A	Industry-performed R&D per $1,000 gross state product	$3.98
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$1.76
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$1.96
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.06%
2.2.E	Number of patents issued per 10,000 business establishments	43
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	6.60
2.3.A	Venture capital disbursements, in millions	$122.80
2.3.B	SBIC awards	116
2.3.C	SBA 7(a) business loans	386
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.7
2.3.E	Minority-owned firms as a percentage of total firms	5%
2.3.F	Women-owned firms as a percentage of total firms	23%
2.4.A	Merchandise exports as a share of gross state product	8.2
2.4.B	Firms that export, per 1,000 firms	34.0
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	10.7
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	4.0
2.4.E	Foreign direct investment per capita	$4,298
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	23.3
3.1.H	Percentage of population with access to drinking water meeting water quality standards	97%
3.1.I	Violent crimes committed per 100,000 population	300.6
3.1.J	Infant mortality rate	7.3
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	67%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	70%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	19%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	18%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	8%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	7%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	12%
1.1.I	Average SAT scores — verbal	562
1.1.J	Average SAT scores — math	558
1.1.K	Average composite scores on the ACT	19.6
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.22%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	3.77%
1.2.C	18-24 year olds enrolling in college	32%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	28%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	78.6%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	28%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	17.3%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	0.66%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.2
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	53.1%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	67.7%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	49.1%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	9.1%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	16.6%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	5.5%
1.6.A	Students per Internet-connected computer	11.4
1.6.B	Percentage of households with computers	41.2%
1.6.C	Percentage of households with Internet access	30.2%
1.6.D	Percentage of households with broadband access	57%
2.1.A	Percentage of total employment in "gazelle" firms	13.8%
2.1.B	New business starts	1735
2.1.C	Technology-intensive employment as a percentage of total employment	5.7%
2.1.D	Technology-intensive establishments as a percentage of total establishments	4.3%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	0.9
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.3
2.2.A	Industry-performed R&D per $1,000 gross state product	$0.79
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$1.73
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.72
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.08%
2.2.E	Number of patents issued per 10,000 business establishments	46
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	8.20
2.3.A	Venture capital disbursements, in millions	$109.90
2.3.B	SBIC awards	101
2.3.C	SBA 7(a) business loans	495
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.7
2.3.E	Minority-owned firms as a percentage of total firms	14%
2.3.F	Women-owned firms as a percentage of total firms	24%
2.4.A	Merchandise exports as a share of gross state product	14.2
2.4.B	Firms that export, per 1,000 firms	29.5
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	14.7
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	2.0
2.4.E	Foreign direct investment per capita	$5,765
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	12.8
3.1.H	Percentage of population with access to drinking water meeting water quality standards	94%
3.1.I	Violent crimes committed per 100,000 population	732.7
3.1.J	Infant mortality rate	9.5
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	82%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	79%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	18%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	19%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	8%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	7%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	11%
1.1.I	Average SAT scores — verbal	562
1.1.J	Average SAT scores — math	549
1.1.K	Average composite scores on the ACT	18.7
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.94%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	3.45%
1.2.C	18-24 year olds enrolling in college	32%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	45%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	77.3%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	30%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	16.2%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	0.87%
1.4.C	Average scores for 11th graders on AP exams in math and science	2.5
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	47.3%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	67.7%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	57.4%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	8.8%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	17.1%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	8.1%
1.6.A	Students per Internet-connected computer	11.1
1.6.B	Percentage of households with computers	37.2%
1.6.C	Percentage of households with Internet access	26.3%
1.6.D	Percentage of households with broadband access	49%
2.1.A	Percentage of total employment in "gazelle" firms	13.7%
2.1.B	New business starts	1205
2.1.C	Technology-intensive employment as a percentage of total employment	4.3%
2.1.D	Technology-intensive establishments as a percentage of total establishments	3.0%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	0.3
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.2
2.2.A	Industry-performed R&D per $1,000 gross state product	$1.17
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$4.51
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.45
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.07%
2.2.E	Number of patents issued per 10,000 business establishments	31
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	1.80
2.3.A	Venture capital disbursements, in millions	$266.80
2.3.B	SBIC awards	32
2.3.C	SBA 7(a) business loans	361
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	4.5
2.3.E	Minority-owned firms as a percentage of total firms	7%
2.3.F	Women-owned firms as a percentage of total firms	23%
2.4.A	Merchandise exports as a share of gross state product	4.1
2.4.B	Firms that export, per 1,000 firms	29.8
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	7.7
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	3.6
2.4.E	Foreign direct investment per capita	$1,078
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	3.2
3.1.H	Percentage of population with access to drinking water meeting water quality standards	91%
3.1.I	Violent crimes committed per 100,000 population	349.3
3.1.J	Infant mortality rate	10.6
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	91%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	79%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	29%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	29%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	20%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	22%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	AT OR
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	ABOVE
1.1.I	Average SAT scores — verbal	17%
1.1.J	Average SAT scores — math	572
1.1.K	Average composite scores on the ACT	577
1.1.L	Fall enrollment rates, as a percentage of total population.	21.6
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	6%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	1.94%
1.2.C	18-24 year olds enrolling in college	5.62%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	30%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	46%
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	TBD
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	82.9%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	17%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	15.6%
1.4.C	Average scores for 11th graders on AP exams in math and science	0.91%
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	3.6
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	65.1%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	71.0%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	65.1%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	11.2%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	18.0%
1.6.A	Students per Internet-connected computer	11.0%
1.6.B	Percentage of households with computers	6.6
1.6.C	Percentage of households with Internet access	52.6%
1.6.D	Percentage of households with broadband access	42.5%
2.1.A	Percentage of total employment in "gazelle" firms	37%
2.1.B	New business starts	12.8%
2.1.C	Technology-intensive employment as a percentage of total employment	2290
2.1.D	Technology-intensive establishments as a percentage of total establishments	4.6%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	1.6
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.2
2.2.A	Industry-performed R&D per $1,000 gross state product	$8.07
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$5.72
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.97
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.10%
2.2.E	Number of patents issued per 10,000 business establishments	62
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	19.9
2.3.A	Venture capital disbursements, in millions	$364.00
2.3.B	SBIC awards	139
2.3.C	SBA 7(a) business loans	760
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.4
2.3.E	Minority-owned firms as a percentage of total firms	11%
2.3.F	Women-owned firms as a percentage of total firms	25%
2.4.A	Merchandise exports as a share of gross state product	3.9
2.4.B	Firms that export, per 1,000 firms	32.1
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	16.4
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	4.1
2.4.E	Foreign direct investment per capita	$2,013
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	41.3
3.1.H	Percentage of population with access to drinking water meeting water quality standards	98%
3.1.I	Violent crimes committed per 100,000 population	500.2
3.1.J	Infant mortality rate	7.6
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	77%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	77%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	28%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	31%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	21%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	20%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	AT OR
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	ABOVE
1.1.I	Average SAT scores — verbal	27%
1.1.J	Average SAT scores — math	492
1.1.K	Average composite scores on the ACT	496
1.1.L	Fall enrollment rates, as a percentage of total population.	19.5
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	5%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	2.25%
1.2.C	18-24 year olds enrolling in college	4.92%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	32%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	56%
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	TBD
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	81.4%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	22%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	18.8%
1.4.C	Average scores for 11th graders on AP exams in math and science	1.86%
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	3.1
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	58.1%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	71.0%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	51.5%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	9.5%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	17.9%
1.6.A	Students per Internet-connected computer	7.9%
1.6.B	Percentage of households with computers	11.0
1.6.C	Percentage of households with Internet access	45.3%
1.6.D	Percentage of households with broadband access	35.3%
2.1.A	Percentage of total employment in "gazelle" firms	75%
2.1.B	New business starts	12.9%
2.1.C	Technology-intensive employment as a percentage of total employment	4209
2.1.D	Technology-intensive establishments as a percentage of total establishments	7.9%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	2.9
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.6
2.2.A	Industry-performed R&D per $1,000 gross state product	$14.26
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$3.92
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$3.81
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.10%
2.2.E	Number of patents issued per 10,000 business establishments	80
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	16.8
2.3.A	Venture capital disbursements, in millions	$813.50
2.3.B	SBIC awards	185
2.3.C	SBA 7(a) business loans	537
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	0.8
2.3.E	Minority-owned firms as a percentage of total firms	11%
2.3.F	Women-owned firms as a percentage of total firms	25%
2.4.A	Merchandise exports as a share of gross state product	7.3
2.4.B	Firms that export, per 1,000 firms	38.7
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	9.2
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	6.1
2.4.E	Foreign direct investment per capita	$3,183
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	18.9
3.1.H	Percentage of population with access to drinking water meeting water quality standards	96%
3.1.I	Violent crimes committed per 100,000 population	542.1
3.1.J	Infant mortality rate	9.2
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	69%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	84%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	30%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	29%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	N/A
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	N/A
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	N/A
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	25%
1.1.I	Average SAT scores — verbal	563
1.1.J	Average SAT scores — math	560
1.1.K	Average composite scores on the ACT	20.8
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.98%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.56%
1.2.C	18-24 year olds enrolling in college	N/A
1.2.D	First-time, full-time students completing a bachelor's degree within five years	N/A
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	84.6%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	18%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	17.0%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	1.27%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.1
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	70.1%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	55.9%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	68.1%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	12.0%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	10.5%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	10.8%
1.6.A	Students per Internet-connected computer	7.0
1.6.B	Percentage of households with computers	41.5%
1.6.C	Percentage of households with Internet access	34.3%
1.6.D	Percentage of households with broadband access	37%
2.1.A	Percentage of total employment in "gazelle" firms	13.3%
2.1.B	New business starts	1282
2.1.C	Technology-intensive employment as a percentage of total employment	5.9%
2.1.D	Technology-intensive establishments as a percentage of total establishments	5.1%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	2.0
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.4
2.2.A	Industry-performed R&D per $1,000 gross state product	$3.00
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$2.15
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.56
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.08%
2.2.E	Number of patents issued per 10,000 business establishments	60
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	14.5
2.3.A	Venture capital disbursements, in millions	$81.20
2.3.B	SBIC awards	50
2.3.C	SBA 7(a) business loans	491
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.9
2.3.E	Minority-owned firms as a percentage of total firms	10%
2.3.F	Women-owned firms as a percentage of total firms	24%
2.4.A	Merchandise exports as a share of gross state product	3.8
2.4.B	Firms that export, per 1,000 firms	26.5
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	24.1
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	2.4
2.4.E	Foreign direct investment per capita	$1,713
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	16.1
3.1.H	Percentage of population with access to drinking water meeting water quality standards	94%
3.1.I	Violent crimes committed per 100,000 population	508.2
3.1.J	Infant mortality rate	7.5
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark

		Baseline
1.3.A	Percentage of 25-plus population participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering.	0.56%
1.6.D	Percentage of households with broadband access	82%
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.02%
2.3.C	SBA 7(a) business loans	598
2.4.A	Merchandise exports as a share of gross state product	19.3
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.H	Percentage of population with access to drinking water meeting water quality standards	18%
3.1.I	Violent crimes committed per 100,000 population	364.7
3.2.A	Inter-racial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD

Note: Much of the data used for benchmarking in Invented Here is not available for Puerto Rico.

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	81%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	77%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	22%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	22%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	12%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	14%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	15
1.1.I	Average SAT scores — verbal	484
1.1.J	Average SAT scores — math	482
1.1.K	Average composite scores on the ACT	19.3
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.69%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.02%
1.2.C	18-24 year olds enrolling in college	N/A
1.2.D	First-time, full-time students completing a bachelor's degree within five years	N/A
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	78.6%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	25%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	17.9%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	1.05%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.0
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	53.3%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	71.8%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	62.5%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	7.6%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	19.8%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	10.9%
1.6.A	Students per Internet-connected computer	7.1
1.6.B	Percentage of households with computers	43.3%
1.6.C	Percentage of households with Internet access	32.0%
1.6.D	Percentage of households with broadband access	67%
2.1.A	Percentage of total employment in "gazelle" firms	11.7%
2.1.B	New business starts	1990
2.1.C	Technology-intensive employment as a percentage of total employment	7.1%
2.1.D	Technology-intensive establishments as a percentage of total establishments	3.7%

Benchmark

2.1.E	Number of SBIR awards per 10,000 business establishments	1.1
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.3
2.2.A	Industry-performed R&D per $1,000 gross state product	$6.93
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$1.86
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.45
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.07%
2.2.E	Number of patents issued per 10,000 business establishments	60
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	10.0
2.3.A	Venture capital disbursements, in millions	$90.20
2.3.B	SBIC awards	64
2.3.C	SBA 7(a) business loans	290
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	2.1
2.3.E	Minority-owned firms as a percentage of total firms	12%
2.3.F	Women-owned firms as a percentage of total firms	25%
2.4.A	Merchandise exports as a share of gross state product	8.5
2.4.B	Firms that export, per 1,000 firms	40.1
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	8.6
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	3.7
2.4.E	Foreign direct investment per capita	$4,388
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	1.4
3.1.H	Percentage of population with access to drinking water meeting water quality standards	78%
3.1.I	Violent crimes committed per 100,000 population	847.1
3.1.J	Infant mortality rate	9.6
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	73%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	72%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	25%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	26%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	17%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	15%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	24%
1.1.I	Average SAT scores — verbal	563
1.1.J	Average SAT scores — math	553
1.1.K	Average composite scores on the ACT	20.0
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.43%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.16%
1.2.C	18-24 year olds enrolling in college	27%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	45%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	76.9%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	21%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	15.6%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	1.85%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.4
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	59.4%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	71.5%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	63.1%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	10.2%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	21.9%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	10.5%
1.6.A	Students per Internet-connected computer	9.0
1.6.B	Percentage of households with computers	45.7%
1.6.C	Percentage of households with Internet access	36.3%
1.6.D	Percentage of households with broadband access	65%
2.1.A	Percentage of total employment in "gazelle" firms	12.9%
2.1.B	New business starts	2642
2.1.C	Technology-intensive employment as a percentage of total employment	7.9%
2.1.D	Technology-intensive establishments as a percentage of total establishments	4.0%

Benchmark

2.1.E	Number of SBIR awards per 10,000 business establishments	3.0
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.5
2.2.A	Industry-performed R&D per $1,000 gross state product	$12.78
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$3.89
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.17
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.07%
2.2.E	Number of patents issued per 10,000 business establishments	60
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	9.40
2.3.A	Venture capital disbursements, in millions	$196.60
2.3.B	SBIC awards	128
2.3.C	SBA 7(a) business loans	410
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	0.9
2.3.E	Minority-owned firms as a percentage of total firms	8%
2.3.F	Women-owned firms as a percentage of total firms	24%
2.4.A	Merchandise exports as a share of gross state product	6.6
2.4.B	Firms that export, per 1,000 firms	38.2
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	9.4
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	2.4
2.4.E	Foreign direct investment per capita	$3,150
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	41.8
3.1.H	Percentage of population with access to drinking water meeting water quality standards	97%
3.1.I	Violent crimes committed per 100,000 population	694.9
3.1.J	Infant mortality rate	8.6
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	68%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	91%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	30%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	33%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	19%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	21%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	AT OR ABOVE
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	27%
1.1.I	Average SAT scores — verbal	509
1.1.J	Average SAT scores — math	500
1.1.K	Average composite scores on the ACT	20.5
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	1.79%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.75%
1.2.C	18-24 year olds enrolling in college	34%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	59%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	82.6%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	19%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	18.3%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	1.37%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.3
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	60.3%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	70.5%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	70.5%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	11.1%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	22.4%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	14.7%
1.6.A	Students per Internet-connected computer	7.5
1.6.B	Percentage of households with computers	53.9%
1.6.C	Percentage of households with Internet access	44.3%
1.6.D	Percentage of households with broadband access	72%
2.1.A	Percentage of total employment in "gazelle" firms	13.9%
2.1.B	New business starts	3179
2.1.C	Technology-intensive employment as a percentage of total employment	10.5%
2.1.D	Technology-intensive establishments as a percentage of total establishments	7.1%

Benchmark

2.1.E	Number of SBIR awards per 10,000 business establishments	15.1
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	1.7
2.2.A	Industry-performed R&D per $1,000 gross state product	$11.73
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$20.22
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.13
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.10%
2.2.E	Number of patents issued per 10,000 business establishments	59
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	67.8
2.3.A	Venture capital disbursements, in millions	$1386.10
2.3.B	SBIC awards	156
2.3.C	SBA 7(a) business loans	590
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.5
2.3.E	Minority-owned firms as a percentage of total firms	15%
2.3.F	Women-owned firms as a percentage of total firms	28%
2.4.A	Merchandise exports as a share of gross state product	5.9
2.4.B	Firms that export, per 1,000 firms	29.6
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	16.5
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	5.9
2.4.E	Foreign direct investment per capita	$2,969
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	13.5
3.1.H	Percentage of population with access to drinking water meeting water quality standards	97%
3.1.I	Violent crimes committed per 100,000 population	314.7
3.1.J	Infant mortality rate	7.8
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	61%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	74%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	29%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	27%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	19%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	14%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	BELOW
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	18%
1.1.I	Average SAT scores — verbal	526
1.1.J	Average SAT scores — math	511
1.1.K	Average composite scores on the ACT	20.2
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population	2.04%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.45%
1.2.C	18-24 year olds enrolling in college	35%
1.2.D	First-time, full-time students completing a bachelor's degree within five years	44%
1.3.A	Percentage of population 25 years old and older participating in an organized learning program within the previous 12 months	TBD
1.3.B	Rating (1-10) of Southern residents on the importance of education to our success	TBD
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	76.4%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	20%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	13.8%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	0.41%
1.4.C	Average scores for 11th graders on AP exams in math and science	3.2
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	64.7%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	70.3%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	70.3%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	10.9%
1.5.E	Percentage of Hispanic population 25 years old or older with a bachelor's degree or higher	17.6%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	6.5%
1.6.A	Students per Internet-connected computer	6.3
1.6.B	Percentage of households with computers	42.8%
1.6.C	Percentage of households with Internet access	34.3%
1.6.D	Percentage of households with broadband access	71%
2.1.A	Percentage of total employment in "gazelle" firms	11.5%
2.1.B	New business starts	0470
2.1.C	Technology-intensive employment as a percentage of total employment	5.1%
2.1.D	Technology-intensive establishments as a percentage of total establishments	3.3%

Benchmark		Baseline
2.1.E	Number of SBIR awards per 10,000 business establishments	1.2
2.1.F	Number of Inc. 500 companies per 10,000 business establishments	0.0
2.2.A	Industry-performed R&D per $1,000 gross state product	$5.63
2.2.B	Federally-performed R&D expenditures per $1,000 gross state product	$6.08
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$1.59
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.07%
2.2.E	Number of patents issued per 10,000 business establishments	41
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	2.90
2.3.A	Venture capital disbursements, in millions	$13.50
2.3.B	SBIC awards	04
2.3.C	SBA 7(a) business loans	181
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.7
2.3.E	Minority-owned firms as a percentage of total firms	4%
2.3.F	Women-owned firms as a percentage of total firms	27%
2.4.A	Merchandise exports as a share of gross state product	5.7
2.4.B	Firms that export, per 1,000 firms	18.7
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	11.6
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	2.0
2.4.E	Foreign direct investment per capita	$3,706
3.1.A	Rating (1-10) of Southern residents regarding environmental quality in the South	TBD
3.1.B	Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.	TBD
3.1.C	Rating (1-10) of Southern residents regarding crime in the South	TBD
3.1.D	Rating (1-10) of Southern residents regarding the cultural climate in the South	TBD
3.1.E	Rating (1-10) of Southern residents regarding recreational opportunities in the South	TBD
3.1.F	Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South	TBD
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	1.9
3.1.H	Percentage of population with access to drinking water meeting water quality standards	95%
3.1.I	Violent crimes committed per 100,000 population	350.6
3.1.J	Infant mortality rate	9.6
3.2.A	Interracial trust quotient	TBD
3.2.B	Rating (1-10) of white Southern residents with regard to the racial climate in the South	TBD
3.2.C	Rating (1-10) of African-American Southern residents with regard to the racial climate in the South	TBD
3.2.D	Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South	TBD
3.3.A	Civic leadership quotient	TBD
3.3.B	Giving and volunteering quotient	TBD
3.3.C	Social trust quotient	TBD
3.3.D	Associations involvement quotient	TBD

Benchmark		Baseline
1.1.A	Percentage of math teachers with major or minor in assigned field, grades 9-12	72%
1.1.B	Percentage of science teachers with major or minor in assigned field, grades 9-12	82%
1.1.C	Percentage of fourth graders at or above the proficient standard in reading on the NAEP	29%
1.1.D	Percentage of eighth graders at or above the proficient standard in reading on the NAEP	30%
1.1.E	Percentage of fourth graders at or above the proficient standard in math on the NAEP	20%
1.1.F	Percentage of eighth graders at or above the proficient standard in math on the NAEP	23%
1.1.G	Majority of eight graders at or above the U.S. average in science on the NAEP	148
1.1.H	Percentage of eighth graders at or above the proficient standard in writing on the NAEP	24%
1.1.I	Average SAT scores — verball	505
1.1.J	Average SAT scores — mathh	514
1.1.K	Average composite scores on the ACT	21.0
1.1.L	Fall enrollment rates, as a percentage of total population.	5%
1.2.A	Associate's degrees granted as a percentage of the 18-24-year-old population.	2.29%
1.2.B	Bachelor's degrees granted as a percentage of the 18-24-year-old population	4.76%
1.3.C	Percentage of population 25 years old and older with a high-school diploma or higher	82.8%
1.3.D	Percent of population scoring at Level 1 on National Adult Literacy Survey	22%
1.4.A	Percentage of bachelor's degrees granted in science and engineering	16.4%
1.4.B	Percentage of civilian workforce with a recent bachelor's degree in science or engineering	1.06%
1.5.A	Percentage of African-American population 25 years old or older with a high school diploma or higher	63.1%
1.5.B	Percentage of Hispanic population 25 years old and older with a high school diploma or higher	49.8%
1.5.C	Percentage of Native American population 25 years old and older with a high school diploma or higher	65.5%
1.5.D	Percentage of African-American population 25 years old and older with a bachelor's degree or higher	11.4%
1.5.E	Percentage of Hispanic population 25 years old and older with a bachelor's degree or higher	9.2%
1.5.F	Percentage of Native American population 25 years old and older with a bachelor's degree or higher	9.3%
1.6.A	Students per Internet-connected computer	7.9
1.6.B	Percentage of households with computers	51.5%
1.6.C	Percentage of households with Internet access	41.4%
1.6.D	Percentage of households with broadband access	59%
2.1.A	Percentage of total employment in "gazelle" firms	13.6%
2.1.B	New business starts	3020
2.1.C	Technology-intensive employment as a percentage of total employment	8.4%
2.1.D	Technology-intensive establishments as a percentage of total establishments	5.2%
2.1.E	Number of SBIR awards per 10,000 business establishments	6.1
2.1.F	Number of *Inc.* 500 companies per 10,000 business establishments	0.7
2.2.A	Industry-performed R&D per $1,000 gross state product	$19.35
2.2.B	Federally performed R&D expenditures per $1,000 gross state product	$8.04

Benchmark		Baseline
2.2.C	University-performed R&D expenditures per $1,000 gross state product	$2.94
2.2.D	Percentage of recent science and engineering Ph.D.s in the workforce	0.10%
2.2.E	Number of patents issued per 10,000 business establishments	110
2.2.F	Number of patent attorneys and agents per 10,000 business establishments	29.0
2.3.A	Venture capital disbursements, in millions	$924.00
2.3.B	SBIC awards	243
2.3.C	SBA 7(a) business loans	840
2.3.D	Number of Small Business Development Centers, per 10,000 establishments	1.2
2.3.E	Minority-owned firms as a percentage of total firms	15%
2.3.F	Women-owned firms as a percentage of total firms	26%
2.4.A	Merchandise exports as a share of gross state product	7.8
2.4.B	Firms that export, per 1,000 firms	29.6
2.4.C	Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population	18.1
2.4.D	Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population	4.2
2.4.E	Foreign direct investment per capita	$2,947
3.1.G	Proportion of persons living in counties exceeding any U.S. EPA National Ambient Air Quality Standard during the previous year	33.3
3.1.H	Percentage of population with access to drinking water meeting water quality standards	91%
3.1.I	Violent crimes committed per 100,000 population	524.7
3.1.J	Infant mortality rate	7.2
3.2.A	Interracial trust quotient	TBD

BENCHMARK SOURCES

GOAL 1

Objective 1.1. Make P-12 education efficient and effective in educating our children.

1.1.A Percentage of math teachers with major or minor in assigned field, grades 9-12

1.1.B Percentage of science teachers with major or minor in assigned field, grades 9-12
Base performance figures are rounded.
Education Week. *Out-of-Field Teaching*, March 31, 1999. (http://www.edweek.org/ew/vol-18/29outs1.h18). Last accessed: 5/23/01.

1.1.C Percentage of fourth graders at or above the proficient standard in reading on the NAEP
The base performance is derived by combining proficient and advanced scores. "Proficient" means that students have demonstrated competency over challenging subject matter.
National Assessment of Educational Progress (NAEP). *Achievement Level Results for the States*. (http://nces.ed.gov/nationsreportcard/reading/statesachlvls.asp).
Last accessed: 5/10/01. **(1998 data)**

1.1.D Percentage of eighth graders at or above the proficient standard in reading on the NAEP

The base performance is derived by combining proficient and advanced scores. "Proficient" means that students have demonstrated competency over challenging subject matter.
National Assessment of Educational Progress (NAEP). *Achievement Level Results for the States*. (http://nces.ed.gov/nationsreportcard/reading/statesachlvls.asp). Last accessed: 5/10/01. **(1998 data)**

1.1.E Percentage of fourth graders at or above the proficient standard in math on the NAEP

1.1.F Percentage of eighth graders at or above the proficient standard in math on the NAEP
"Proficient" means that students have demonstrated competency over challenging subject matter.
National Assessment of Educational Progress. *NAEP 1996 Math Report Card for the Nation and the States: Findings from the NAEP*, 1997. (http://nces.gov/pubsearch/pubsinfo.asp?pubid=97488). Last accessed: 5/10/01.

National Assessment of Educational Progress. *NAEP 1996 Math Report Card for the Nation and the States: Findings from the NAEP*, 1997. (http://nces.gov/pubsearch/pubsinfo.asp?pubid=97488). Last accessed: 5/10/01.

1.1.G Majority of eighth graders at or above the U.S. average in science on the NAEP
The three possible categories include: Above the U.S. average; at or above the U.S. average; and, below the U.S. average.
National Assessment of Educational Progress (NAEP). *NAEP 1996 Science Report Card for the Nation and the States*, 1997. (http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=97497). Last accessed: 5/10/01.

1.1.H Percentage of eighth graders at or above the proficient standard in writing on the NAEP
"Proficient" means that students have demonstrated competency over challenging subject matter.
National Assessment of Education Progress (NAEP). *NAEP 1998 Writing: Report Card for the Nation*, 1997. (http://nces.gov.ed/nationsreportcard/pdf/main/1998/1999462.pdf). Last accessed: 5/10/01.

1.1.I Average SAT scores — Verbal

1.1.J Average SAT scores — Math
A perfect verbal or math score on the SAT is 800.
The College Board. The College Board, News 2000-2001. "*SAT averages by state for 1990 and 1997-2000*," 2001. **(2000 data)**

1.1.K Average composite scores on the ACT
A perfect score on the ACT exam is 36
ACT. *2000 ACT National and State Scores: ACT Average Composite Scores by State*, 2001. (http://www.act.org/news/data/00/00states.html). Last accessed: 5/10/01.

1.1.L Fall enrollment rates, as a percentage of total population
National Center for Education Statistics. *Digest of Education Statistics 2000*, January 2001 Compendium. (http://www.nces.ed.gov/pubsearch/pubsinfo.asp?Pubid=2001034). Last Accessed: 5/11/01. **(1998 data)**
United States Census Bureau. "*State Population Estimates and Demographic Components of Population Change — July 1, 1998-July 1, 1999*. (http://www.census.gov/population/estimates/state/st-99-1.txt). Last accessed: 5/21/01. **(1998 data)**

Objective 1.2. Make post-secondary education effective in continually raising the level of educational achievement in the South.

1.2.A Associate's degrees granted as a percentage of the 18-24 year old population

1.2.B Bachelor's degrees granted as a percentage of the 18-24 year old population
Office of Technology Policy. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000. **(1996-97 data)**

1.2.C 18-24 year olds enrolling in college

1.2.D First-time, full-time students completing a bachelor's degree within 5 years

National Center for Public Policy and Higher Education. *Measuring Up 2000*. (http://measuringup2000.highereducation.org). Last Accessed: 5/24/01.

This measure uses the average of the top states, rather than the U.S. average, as a benchmark

Objective 1.3. Elevate the value placed on education and significantly increase the percentage of Southerners actively engaged in the process of lifelong learning.

1.3.A Percentage of population 25 years or older participating in an organized learning program within previous 12 months

1.3.B Rating (1-10) of Southern residents on the importance of education to our success and well-being

Southern Growth Poll (2002) — to be developed

1.3.C Percentage of population 25 years or older with high school diploma or higher

National Center for Education Statistics. *Digest of Education Statistics 2000*, January 2001 Compendium. (http://www.nces.ed.gov/pubsearch/pubsinfo.asp?Pubid=2001034). Last accessed: 5/11/01. **(2000 data)**

1.3.D Percent of population scoring at Level 1 on National Adult Literacy Survey

According to the National Institute for Literacy, those scoring at Level 1 (the lowest level) are not "illiterate," but are urgently in need of national attention. They do not have the full range of economic, social, and personal options that are open to Americans with high literacy levels. Nearly half (43 percent) of all adults in Level 1 live in poverty.

National Institute for Literacy. *The State of Literacy in America*. (http://www.nifl.gov/reders/reder.htm). Last accessed: 5/29/01. **(1990 data)**

The U.S. average is an average of the given range (21-23 percent) for the U.S. average.

Objective 1.4. Overcome the skill shortages in the following fields: science, math engineering and information technology (IT).

1.4.A Percentage of bachelor's degrees granted in science and engineering

Office of Technology Policy. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000. **(1996-97 data)**

1.4.B Percentage of civilian workforce with a recent bachelor's degree in science or engineering

Office of Technology Policy. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000. **(1997 data)**

1.4.C Average scores for 11th graders on AP exams in math and science

The AP Assessment is graded on a scale from 1-5. 5=extremely qualified; 4=well qualified; 3=qualified. Students must score a 3 or above to receive college credit for the exam.

The base performance is the average of the average state scores for the following exams: biology, chemistry, computer science, calculus, physics and statistics.

Advanced Placement Program. *AP Library: 2000 State and National Summary Reports*, 2001. (http://www.collegeboard.org/ap/library/state_nat_rpts.00.html). Last accessed: 5/10/01.

Objective 1.5. Educate those left behind in the knowledge economy (targeting minorities and immigrants and their children).

1.5.A Percentage of African-American population 25 years old and over, with high school diploma or higher.

1.5.B Percentage of Hispanic population 25 years old and over, with high school diploma or higher (Persons of Hispanic origin can be of any race.)

1.5.C Percentage of Native American population 25 years old and over, with high school diploma or higher

1.5.D Percentage of African-American population 25 years old and over, with bachelor's degree or higher

1.5.E Percentage of Hispanic population 25 years old and over, with bachelor's degree or higher (Persons of Hispanic origin can be of any race.)

1.5.F Percentage of Native American population 25 years and over, with a bachelor's degree or higher

National Center for Education Statistics. *Digest of Education Statistics 2000*, January 2001 Compendium. (http://www.nces.ed.gov/pubsearch/pubsinfo.asp?Pubid=2001034). Last accessed: 5/11/01. **(1990 data)**

Objective 1.6. Ensure basic competency in the tools of the Information Age.

1.6.A Students per Internet-connected computer

A recent report by the National Center for Education Statistics (NCES) calls a ratio of 5 to 1 a "reasonable level for the effective use of computers." NCES. *Internet Access in U.S. Public Schools and Classrooms: 1994-2000*, May 2001. (http://www.nces.ed.gov/pubs2001/2001071.pdf). Last Accessed: 5/14/01.

Education Week on the Web. *Technology Counts 2001: The New Divides*. (http://www.edweek.org/sreports/tc01/tables/35access-tld.h20). Last Accessed: May 14, 2001. **(2000 data)**

1.6.B Percentage of households with computers

1.6.C Percentage of households with Internet access

U.S. Department of Commerce, Economics and Statistics

Administration, National Telecommunications and Information Adminstration (NTIA). *Falling Through the Net: Toward Digital Inclusion*. (http://www.ntia.doc.gov/ntia-home/fttn00/contents00.html). Last accessed: 5/15/01. **(2000 data)**

1.6.D Percentage of households with broadband access

Broadband access refers to the percentage of zip codes with high-speed service

Federal Communications Commission. *Deployment of Advanced Telecommunications Capability: Second Report*, August 2000. (http://www.fcc.gov/broadband). **(1999 data)**

GOAL 2

Objective 2.1. Infuse an entrepreneurial culture throughout the South

2.1.A Percentage of total employment in "gazelle" firms

"Gazelles," a term coined by Cognetics, refers to companies that have achieved revenue growth of at least 20 percent per year over four years. These firms are responsible for a very significant share of job growth across the U.S.

Birch, David, et al. 1999. *Corporate Almanac*. Cambridge, Mass.: Cognetics Inc. **(1998 data)**

2.1.B New business starts

Dun & Bradstreet. Press Release: "*U.S. Business Starts Decline in 1999, But More New Jobs are Created*," March 22, 2000. (http://www.dnb.com/newsview/0300econ1.htm). Last accessed: 5/17/01.

2.1.C Technology-intensive employment as a percentage of total employment

Refers to the percentage of the total number of employees within a state that fall into one of the 28 three-digit SIC codes included in the Bureau of Labor Statistics' definition of high-technology industries (refer to chart below).

U.S. Census Bureau. *1997 Economic Census: Comparative Statistics for U.S .— 1987 SIC Basis*, last updated 10/15/00. (http://www.census.gov/epcd/ec97sic/E97SUS.HTM). Last accessed: 5/26/01. **(1997 data)**

Bureau of Labor Statistics R&D Intensive High-Technology Industries

Source: Paul Hadlock, Daniel Hecker, and Joseph Gannon, "*High Technology Employment: Another View*." Monthly Labor Review, July 1991, pp.26-30. (http://stats.bls.gov/opub/mlr/1991/07/contents.htm).

Note: SIC 899 (Services, nec) is omitted because publishable data is not available.

SIC Code	Industry
131	Crude petroleum and natural gas operations
211	Cigarettes
281	Industrial organic chemicals
282	Plastic materials and synthetics
283	Drugs
284	Soap, cleaners, and toilet goods
285	Paints and allied products
286	Industrial organic chemicals
287	Agricultural chemicals
289	Miscellaneous chemical products
291	Petroleum refining
299	Miscellaneous petroleum and coal products
335	Nonferrous rolling and drawing
355	Special-industry machinery
357	Computer and office equipment
362	Electrical industrial apparatus
366	Communications equipment
367	Electronic components and accessories
371	Motor vehicles and equipment
373	Aircraft and parts
376	Guided missiles and space vehicles, and parts
381	Search and navigation equipment
382	Measuring and controlling devices
384	Medical instruments and supplies
386	Photographic equipment and supplies
737	Computer and data processing services
871	Engineering and architectural services
873	Research and testing services
874	Management and public relations services

2.1.D Technology-intensive establishments as a percentage of total establishments

Refers to the percentage of the total number of establishments within a state that fall into one of the 28 three-digit SIC codes included in the Bureau of Labor Statistics' definition of high-technology industries (refer to chart)

U.S. Census Bureau. *1997 Economic Census: Comparative Statistics for U.S. — 1987 SIC Basis*, last updated 10/15/00. (http://www.census.gov/epcd/ec97sic/E97SUS.HTM). Last Accessed: 5/26/01. **(1997 data)**

U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: 5/14/01. **(1997 data)**

2.1.E Average annual number of SBIR awards per 10,000 business establishments

Phase I and Phase II awards were combined for this benchmark.

Small Business Administration. *1998 SBIR State Rank*, last modified 11-1-99. (http://www.sbaonline.sba.gov/SBIR/98sbirrank.html). Last Accessed: 5/15/01

U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: 5/14/01. **(1998 data)**

2.1.F Number of *Inc.* 500 companies per 10,000 business establishments

Data limitations: Companies on the *Inc.* 500 had to apply for the ranking. Mismatched data years: 2000, *Inc.* 500 winners and 1999 CBP data.

Inc. magazine. *Inc. 500*, 2000. (http://www.inc.com/500)

U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: 5/14/01. **(1999 data)**

Objective 2.2. Increase significantly public and private R&D in the South.

2.2.A Industry-performed R&D per $1,000 Gross

State Product (GSP)
Gross State Product is the market value of all goods and services produced in a state (http://www.dismal.com/cgi/dict_criteria.stm?GSP).
National Science Foundation, Division of Science Resource Studies. *Research and Development in Industry: 1998*, January 1999. (http://www.nsf.gov/sbe/srs/nsf01315/start.htm). Last accessed: 5/16/01.
U.S. Department of Commerce, Bureau of Economic Analysis. "Gross State Product Data." (http://www.bea.doc.gov/bea/regional/gsp/). Last accessed: 5/16/01. **(1998 data)**

2.2.B Federally-performed R&D expenditures per $1,000 of GSP
National Science Foundation, Division of Science Resource Studies. *Revised: Federal Funds for Research and Development: Fiscal Years 1998, 1999, 2000*, several tables revised, October 2000. (http://www.nsf.gov/sbe/srs/nsf00317/start.htm). Last accessed: 5/16/01. **(1998 data)**
U.S. Department of Commerce, Bureau of Economic Analysis. *Gross State Product Data*" (http://www.bea.doc.gov/bea/regional/gsp/). Last accessed: 5/16/01. **(1998 data)**

2.2.C University-performed R&D expenditures per $1,000 of GSP
National Science Foundation, Division of Science Resource Studies. *Academic Research and Development Expenditures: Fiscal Year 1998*, last modified September 2000. (http://www.nsf.gov/sbe/srs/nsf00330/start.htm). Last accessed: 5/16/01.
U.S. Department of Commerce, Bureau of Economic Analysis. *Gross State Product Data*. (http://www.bea.doc.gov/bea/regional/gsp/). Last accessed: 5/16/01. **(1998 data)**

2.2.D Percentage of recent science and engineering Ph.D.s in the workforce
Office of Technology Policy. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000. **(1997 data)**

2.2.E Number of patents issued per 10,000 business establishments
Office of Technology Policy. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000. **(1996-98 data)**
U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: May 14, 2001. **(1998 data)**

2.2.F Number of patent attorneys and agents per 10,000 business establishments
U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: May 14, 2001. **(1999 data)**
Office of Technology Policy. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000. **(1999 data)**

Objective 2.3. Ensure access to capital and technical and management assistance at all stages of business development, paying particular attention to underserved groups.

2.3.A Venture capital disbursements, in millions
National Venture Capital Association. *National Venture Capital Association Yearbook 2000*, 2000. Arlington, Va. **(1999 data)**

2.3. B SBIC Awards
Small Business Administration. *All SBIC Program Licencees: Financing to Small Businesses by State*, 1998. (http://www.sba.gov/INV/tables/1998/pdf/table8.pdf). Last accessed: 5/17/01.

2.3.C SBA 7(a) Business Loans
Small Business Administration. *SBA FY 2000 7(a) and 504 Approval Volume by State*. Source: Chris McKeehan, SBA. **(2000 data)**

2.3.D Number of Small Business Development Centers, per 10,000 establishments
Data limitations: Used 1999 CBP data with 2001 count of Small Business Development Centers by state.
U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: May 14, 2001. **(1999 data)**
Association of Small Business Development. (http://www.asbdc-us.org). Called (703) 764-9850 to receive the most recent count of Small Business Development Centers by state. **(2001 data)**

Objective 2.3. Ensure access to capital and technical and management assistance at all stages of business development, paying particular attention to underserved groups.

2.3.E Minority-owned firms as a percentage of total firms
"Minority" includes African-Americans, Asian-Americans, Hispanics, and Native Americans.
United States Census Bureau. *U.S. Census Bureau, 1997 Economic Census, Minority and Women-Owned Businesses*. (http://www.census.gov/epcd/mwb97/us/us.html). Last accessed: 5/16/01.

2.3.F Women-owned firms as a percentage of total firms
United States Census Bureau. *U.S. Census Bureau, 1997 Economic Census, Minority and Women-Owned Businesses*. (http://www.census.gov/epcd/mwb97/us/us.html). Last accessed: 5/16/01.

Objective 2.4. Take advantage of the growing commercial and intellectual potential in the global community

2.4.A Merchandise exports as a share of GSP
U.S. Department of Commerce, Bureau of Economic Analysis. *Gross State Product Data*. (http://www.bea.doc.gov/bea/regional/gsp/). Last accessed: 5/16/01. **(1998 data)**
Office of Trade and Economic Analysis, International Trade Administration. *State Merchandise Export Totals to the World, 1993-98, Ranked by 1998 Export Value*. (http://www.bea.doc.gov/bea/di/ppe.exe). **(1998 data)**

2.4.B Firms that export, per 1,000 firms
U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division. *A Profile of U.S. Exporting Companies, 1997-1998.* **(1998 data)**
U.S. Census Bureau. County Business Patterns. (http://www.census.gov/prod/www/abs/cbptotal.html). Last accessed: 5/14/01. **(1998 data)**

2.4.C Number of foreign students enrolled in U.S. colleges and universities, per 10,000 student population
Davis, Todd M. December 8, 1999. *Open Doors Report on International Educational Exchange, 1998-99.* . New York, NY: Institute for International Education.

2.4.D Number of U.S. college and university students enrolled in foreign study programs, per 10,000 population
Institute for International Education. *U.S. Study Abroad Enrollment by Institution*, 1997/98.
Davis, Todd M. December 8, 1999. *Open Doors Report on International Educational Exchange, 1998-99.* . New York, NY: Institute for International Education. **(1997-98 data)**

2.4.E Foreign direct investment per capita
Southern Technology Council. *Invented Here: Measures of Southern Growth*, 2000. (http://www.southern.org/main/stc/projects/invented/invented.shtml).
Last accessed: 5/26/01. **(1997 data)**

GOAL 3

Objective 3.1. Use Wise Growth principles to ensure that a high quality of life accompanies economic progress in the South.

3.1.A Rating (1-10) of Southern residents regarding environmental quality in the South.

3.1.B Rating (1-10) of Southern residents regarding growth-related issues (traffic, etc.) in the South.

3.1.C Rating (1-10) of Southern residents regarding crime in the South.

3.1.D Rating (1-10) of Southern residents regarding the cultural climate in the South.

3.1.E Rating (1-10) of Southern residents regarding recreational opportunities in the South.

3.1.F Rating (1-10) of Southern residents as to the quality, access, and cost of health care services in the South.
Southern Growth poll (2002) — to be developed

3.1.G Proportion of persons living in counties exceeding any U.S. Environmental Protection Agency National Ambient Air Quality Standard during the previous year
AIRS World Wide Web Data, Office of Air and Radiation, United States Environmental Protection Agency. **(1996 data)**

3.1.H Percentage of population with access to drinking water meeting water quality standards.
Measures the percent of population served by water systems without reported health-based violations during the year. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water, Safe Drinking Water Information System, Pivot Table 4, downloadable from (http://www.epa.gov/safewater/data/pivottables.html). **(FY 2000 data)**

3.1.I Violent crimes committed per 100,000 population.
U.S. Federal Bureau of Investigation, *Crime in the United States*; 1999. Downloadable from (http://www.fbi.gov/ucr/Cius_99/w99tbl05.xls).

3.1.J Infant Mortality Rates
U.S. National Center for Health Statistics, Vital Statistics of the United States; annual and unpublished data. **(1997 data)**

Objective 3.2. Build on the potential strengths inherent in our cultural diversity by overcoming our historic racial and cultural divisions.

3.2.A Interracial trust quotient
The Saguaro Seminar/Southern Growth (2002) — to be developed

3.2.B Rating (1-10) of white Southern residents with regard to the racial climate in the South

3.2.C Rating (1-10) of African-American Southern residents with regard to the racial climate in the South

3.2.D Rating (1-10) of Hispanic Southern residents with regard to the racial climate in the South
Southern Growth poll (2002) — to be developed

Objective 3.3. Increase the South's levels of civic engagement.

3.3.A Civic leadership quotient

3.3.B Giving and volunteering quotient

3.3.C Social trust quotient

3.3.D Associations involvement quotient
The Saguaro Seminar/Southern Growth (2002) — to be developed

END NOTES

1 According to the Southern Region Education Board, The National Assessment of Educational Progress is the most credible source of information to compare student achievement in different states.
2 Some states have discussed eliminating the use of standardized tests such as the SAT or ACT in college admissions decisions.
3 *Education Week*. "Teacher Quality," May 1, 2001. (http://www.edweek.org/context/topics/issuepage.cfm?id=50. Last accessed: 5/23/01).
4 *Education Week*. "Out-of-Field Teaching is Hard to Curb," March 31, 1999. (http://www.edweek.org/ew/vol-18/29out.h18). Last accessed: 5/23/01.
5 Cinque, Ann Marie. "Passing." The Pew Charitable Trusts. *Trust*, Summer 2000.
6 Christopher Connell, "Grades that Get Attention." The Pew Charitable Trusts. *Trust*, Volume 4/Number 1/ Winter 2001.
7 North Carolina Governor James B. Hunt, Jr., as cited in Christopher Connell's, "Grades that Get Attention." The Pew Charitable Trusts. *Trust*, Volume 4/Number 1/ Winter 2001.
8 Cinque, Ann Marie. "Passing." The Pew Charitable Trusts. *Trust*, Summer 2000.
9 MDC, Inc. *The State of the South 2000*. Chapel Hill, North Carolina. MDC, Inc., 2000
10 This projection includes the states of Florida and Texas.
11 Freeman, Peter and William Aspray. *The Supply of Information Technology Workers in the United States, 1999*. Computing Research Association.
12 Interview with Richard W. Judy, Hudson Institute, Indianapolis, April 19, 2000, as cited in *Before it's Too Late: A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century*, National Commission on Mathematics & Science Teaching for the 21st Century (http://www.ed.gov/americacounts/glenn/)
13 Johnson, Carrie. "Tech Sector Cuts Back Its Demand for Workers," April 2, 2001. *Washtech.com*. (http://www.washtech.com/).
14 Carnes, Kelly. "Hearing Archives," March 29, 2000. Office of Technology Policy, U.S. Department of Commerce. (http://www.workforce21.org/archive_va_carnes.htm). Last accessed: 5/15/01.
15 The College Board. Advanced Placement Program. (http://www.collegeboard.org). Last accessed: 5/25/01.
16 This figure includes the average of the average state scores for all sections of the following exams: biology, chemistry, computer science, calculus, physics, and statistics.
17 Asian-Americans are not included in any of the benchmarks of the "left-behind" populations for a number of reasons: their overrepresentation in postsecondary education and high test scores that mirror or exceed that of the white population.
18 With the exception of Kentucky, Missouri, Oklahoma, Puerto Rico and West Virginia.
19 Persons of Hispanic origin can be of any race.
20 SREB, *Student Achievement in SREB States*, Educational Benchmark 2000 Series.
21 ibid.
22 *Education Week*. "Technology Counts 2001: Looking Beneath the Numbers to Reveal Digital Inequities." (http://www.edweek.org/sreports/tc01/). Last accessed: 5/25/01.
23 Virginia Polytechnic Institute and State University. *Creating the CyberSouth*, September 2000. Prepared for the Southern Growth Policies Board.
24 National Center For Education Statistics. *Internet Access in U.S. Public Schools and Classrooms: 1994-2000*, May 2001. (http://nces.edu/gov/pubs2001/2001-071.pdf). Last accessed: 5/15/01.
25 ibid.
26 Virginia Polytechnic Institute and State University. *Creating the CyberSouth*, September 2000. Prepared for the Southern Growth Policies Board.
27 *Education Week*. "Technology Counts 2001: Looking Beneath the Numbers to Reveal Digital Inequities." (http://www.edweek.org/sreports/tc01/). Last accessed: 5/25/01.
28 Virginia Polytechnic Institute and State University. *Creating the CyberSouth*, September 2000. Prepared for the Southern Growth Policies Board.
29 ibid.
30 The National Commission on Entrepreneurship. *Building Companies, Building Communities: Entrepreneurs in the New Economy*, July 2000.
31 ibid.
32 The National Commission on Entrepreneurship, *NCOE Update*. No. 28, April 17, 2001.
33 Gazelles, a term coined by Cognetics Inc., refers to companies that have achieved revenue growth of at least 20 percent per year over four years. These firms are responsible for a very significant share of job growth.
34 Young, Paul A. *Two Types of SBIR awards*, July 21, 2000. National Institutes of Health, Office of Extramural Research. (http://grants.nih.gov/grants/funding/SBIRConf2000/Youn g/). Last accessed: 5/29/01.
35 Direct quote from Kelvin Boston, as cited in *Summary Proceedings from a Regional Conference on Financing High-Growth Entrepreneurialism*, Charlotte, N.C., June 20-21, 1996. Southern Growth Policies Board.
36 Payson, Steven, et. al. *Sixth Year of Unprecedented Growth Expected in 2000*, November 29, 2001. Division of Science and Resource Studies, National Science Foundation. (http://www.nsf.gov/sbe/srs/databrf/nsf01310/sdb01310.ht m). Last accessed: 5/30/01.
37 Office of Technology Policy, U.S. Department of Commerce. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000.
38 Office of Technology Policy, U.S. Department of Commerce. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000.
39 The most current calendar year for R&D at the state level
40 Bennof, Richard J. *R&D Spending is Highly Concentrated in a Small Number of States*, March 23,

2001. Division of Science Resource Studies, National Science Foundation.
41 ibid.
42 Office of Technology Policy, U.S. Department of Commerce. *The Dynamics of Technology-based Economic Development: State Science and Technology Indicators*, June 2000.
43 ibid.
44 Luthar, S.B. "Venture Capital." In *Financing Economic Development: An Institutional Response*, edited by Richard Bingham, Edward Hill and Sammis White. Newbury Park, CA: Sage, p.257-265.
45 Small Business Administration. *Small Business Investment Company.* (http://www.sba.gov/INV/textonly/). Last accessed: 5/31/01.
46 Association of Small Business Development Centers. *About the ASBDC.* (http://www.asbdc-us.org/about.html). Last accessed: 5/31/01.
47 Yago, Glenn and Aaron Pankratz. *The Minority Challenge: Democratizing Capital for Emerging Domestic Markets*, September 25, 2000. Milken Institute and the Minority Business Development Agency
48 ibid.
49 ibid.
50 CIO.com. "Getting Together," December 15, 1998/January 1, 1999 Issue of CIO magazine. (http://www.cio.com/archive/010199_part_content.html). Last accessed: 5/30/01.
51 ibid.

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