It is an honor to be with a group that is instrumental in creating the new economy of the State of Georgia. Each and every one of you deserves our thanks for your willingness to take the risk that is inherent in creating new business. Many years ago when I graduated from Georgia Tech, I left the state because there were no job opportunities for me. Today, thanks to folks like yourselves, Georgia Tech graduates have the opportunity to stay home and help you create a dynamic economy for this region’s future.

I was asked to speak today to the issue of economic development, a subject I spend a lot of time thinking about and working to assist. During the course of my career I have had the opportunity to live and work in Silicon Valley, the Research Triangle Park, and Seattle. All of these locations have vibrant economies, and while there are some differences in why they are successful, the common factor in each case is the presence of strong research universities that reach out to the community. Such institutions are the source of research, talented graduates and knowledge workers, and innovation, which today are the drivers of our economy.

Atlanta is blessed to have a strong economy, and this I believe can be partially attributed to the presence of a group of fine research universities: Emory, Georgia State, the University of Georgia, Clark-Atlanta, and Georgia Tech. The latest figures show that the Metro Atlanta area created 106,000 new jobs, more than any other region in the nation, and venture capital is flowing at record levels. Just when we thought the last quarter of 1999 was so big because it was larger than any previous year, the first quarter of 2000 was twice as big, reaching over $700 million and placing Georgia fifth in the nation.

When I came here in 1994 as president of Georgia Tech, the entire southeast was reported to have only 2 percent of the nation’s venture capital investment. What a change! Things look good, but I would argue it is crucial for us not to become complacent. More than ever, we must sharpen our strategy and keep our focus if we are to continue our success.

We need to remember that our region is only in the early stages of developing a high-tech economy, and while we are doing well, we are now competing with other cities and regions that are stronger and more advanced than we are. While
our growth is impressive, let’s remember that venture investments in California for the first quarter of this year were over $7 billion, compared to our best of $700 million.

Our research universities have only recently come into prominence in research, and they still need to mature and develop strengths in areas like the sciences. At Georgia Tech, this is true. Our Engineering College is now ranked in the top five of the nation, but not long ago we were ranked 20th. In spite of this improvement, our sciences are not where we have to be, and this is true for all of our research universities in Georgia. To put it in perspective, there are no Nobel Prize winners at any of Georgia’s universities or anywhere in the state of Georgia, but there are 20 at UC-Berkeley alone. At MIT, over 100 faculty are members of the National Academy of Science, but there are only 20 in the entire state of Georgia. We have come a long way, but we have a long way to go.

There are many missteps that can occur to cause a new kid on the block to lose momentum quickly, and we must avoid them. So, I would like to share my thoughts with you about what we have to do to keep our momentum going and succeed at the next level. To set the stage, I want to talk about our changing context.

As we enter a new century, the nature of the economic development process has changed dramatically. During the 20th century, many states, particularly in the South, followed a simple formula for economic development. They sought to attract companies from other states or countries by offering simple, bottom-line inducements – tax breaks, freeports, subsidies, and site-specific incentives like water and sewer lines, access roads, and rail sidings. This policy was based on the idea of attracting “big industry,” and while it had its merits, it was based on a premise whose time is now past.

First, what drives the best of industry today is innovation, and innovation comes from the best talent. The place with the best ideas, the largest supply of talent, and the conditions that make that talent want to stay, has the key ingredients to attract or grow any business, large or small. Second, as much attention has to be paid to growing companies as to attracting them – something we are only beginning to understand. After all, Silicon Valley did not attract Hewlett Packard or Cisco with any sort of inducements. It home grew them. Seattle did not attract Microsoft, it grew it. Until a region shows itself capable of growing a company like HP, Cisco, or Microsoft, it is not ready to compete in the economic world of this new century.
Another change in the landscape relates to funding for research and development, which is another key to innovation. Following World War II, the federal government began to invest seriously in R&D, and was the principal source of funding until the early 1990s. Much of the funding went to defense research, but seeded within it was the majority of the support that was available for important fields like electrical and computer engineering. It was ARPA and the National Science Foundation that provided the funding to create the Internet in the last 60s and 70s that we have gained so much from today.

In the heyday of defense research, the federal government accounted for 70 percent of national R&D funding. Today this figure has fallen to only slightly over 30 percent. Today, federal funding for R&D has fallen below 1 percent of the Gross National Product, its lowest level since the 1950s.

Much of the slowing of federal support for R&D can be attributed to the end of the Cold War. Without an enemy to motivate us, only health problems are a sure thing, and the National Institute of Health has tripled its research budget over the past decade, while the National Science Foundation budget held about constant and the Department of Defense budget declined. This approach will not work in the long run, since NIH research is dependent on that of basic science and engineering. This decline in federal support for research is a problem that hurts universities like those in our region that have only recently climbed into the heart of the competition for such funds.

As for business, the paradigm of the 1980s was to be competitive, and hopefully to find a way to meet the challenge of Japan Inc. During the late 80s and early 90s, we won this battle. And while being a tough competitor is still important, today’s winners are those companies that are nimble and know how to build alliances in the world of competing technologies. The key today is innovation, and getting a new product to market before the other guy. Hewlett Packard reports that 60 percent of their sales come from products developed in the last two years. Even the biggest companies must have an entrepreneurial mindset.

What does all of this mean for economic development at the onset of a new century? The winners will be those who understand that the techniques of the past will not suffice for the future. It comes down to having an integrated and strategic view of how to apply your resources, and creating an environment where entrepreneurism prevails and innovation is the name of the game. It involves building alliances between great research universities, government, and industry. It requires enlightened state and local government policies. And it
requires that we hold our focus while we gain on the competition and never allow our small successes today to interfere with a more far-reaching view of how far we have to go.

In metro Atlanta, we have a lot going for us, and we have done a lot of things right. We have to hold onto what we have built while insuring that we are aligned correctly for the future. My recommendations on how to do this include:

1) Continue to build collaboration between industry, government, and our universities. Good examples are the Georgia Research Alliance and Yamacraw. Both are built on the principle that government, universities, and industry should work together on strategic initiatives, and both are working. Universities are asked to set aside petty views of competition and to collaborate, something that is not always easy to do in an institution with a deep-seated tradition of academic freedom. At Georgia Tech we take our mandate a step further in that our alliance with government includes both state and federal agencies. We use every state dollar we get for research to leverage federal dollars.

2) Build closer linkages between industry and universities, with these linkages held together at the highest levels, so that a common vision is maintained and any problems can be quickly solved.

3) Develop common strategies between organizations charged with the responsibility for economic development.

4) Support the research universities in their efforts to maintain federal R&D funding and in doing what is needed to attract top research scholars.

5) Create a deep pool of venture and angel funding to allow entrepreneurs the chance to fail on their way to success.

6) Have in place policies to help all segments of society to benefit from the economic success that comes.

How are we doing? The answer is mostly positive. In fact, in all of the places I have lived, I have never seen the civic, university, business, and government forces more closely aligned than here in Georgia. As to state alliances, we have the Georgia Research Alliance and Yamacraw as models. At the regional level, the Metro Atlanta Chamber has courageously taken a strategic direction that
supports the new economy through its focus on Industries of the Mind, quality of life, education, and the development of international markets. Organizations like the Technology Association of Georgia are working to create a cohesive community of folks who are spread out over a large geographic region. We have created some substantive home-grown venture and angel firms and have attracted a lot of venture capital from other regions. We have some excellent research universities that are now more willing than ever to reach out to the business community. There is a lot going on.

So what is left to be done, and what is missing?

First, we are on the early cusp of our new economic trajectory, and we need to understand more about what we need to add to make our economy whole. We cannot simply rely on things to happen of their own initiative.

High-tech companies cluster where they do because of many factors interacting in a complex environment. The National Council on Competitiveness has launched a study of six of cities, including Atlanta, that have clusters of technology-based industry, to learn more about what these factors are and how they interact. The goal is to develop a national high-tech development model, and in the process to help these six communities understand the dynamics of their own high-tech industry clusters, and how to enhance and strengthen their development. Georgia Tech is in the thick of this cluster study. I serve on the Council’s executive committee, and our dean of management, Dr. Terry Blum is involved firsthand in the study.

Atlanta is the second of the six sites to be studied, and our study is presently underway. It will enable us to take a more holistic approach to developing our high-tech industry clusters. We will be able to see the big picture and develop programs that fill in the gaps and give us all the components we need for our industry clusters to grow.

For example, health and medical industries are clustering in Atlanta. We have Emory University’s medical school and the Centers for Disease Control, and Georgia Tech and Emory have a joint research and education program in biotechnology. Tomorrow Governor Roy Barnes will announce a major cancer program for Georgia, funded by tobacco settlement money, and that represents a gap in our health industry cluster that needs to be filled. He was influenced by the experience of former White House chief of staff Hamilton Jordan, who has needed cancer treatment three times and each time he has had to leave to state to
get it. That shouldn’t happen in the tenth largest state in the nation, and a state that already has a strong cluster of medical and health industries.

Second, our research universities must mature and develop stronger programs across the board in science, computing, management, and engineering. Georgia Tech is doing its part here. If you spend a little time with us on campus, you will see a consistent pattern of major investments in new facilities and programs for the physical and life sciences, computer sciences, technology-based management, and engineering.

We are also seeking to drive interdisciplinary research and education. For example, we have created degree programs in emerging interdisciplinary fields like biotechnology, human-computer interaction, and bioinformatics.

We are in the final phase of a capital campaign in which we are raising $600 million, and it has funded 40 new faculty chairs endowed at $1.5 million each. We are using these chairs to recruit an incredible array of talent to our campus in cutting edge fields to help Tech and this region to compete at the next higher level. For example, one of the new chairs will be held by Dr. Dick Lipton, a world-recognized expert in the new field of bioinformatics. This interdisciplinary field that uses mathematics, statistics, and computing methods to analyze biological, biochemical, and biophysical data. A great deal of attention has been given to the mapping of the human genome, which is almost complete. But that is only the beginning. Bioinformatics uses mathematical and computing models to explore how the thousands of components of the genome interact. That is the basis not only for understanding how human genetics works, but also for modeling the impact of genetic engineering.

Third, we need to do more to nurture our ability to grow companies. Georgia Tech’s Advanced Technology Development Center is celebrating its 20th anniversary as the nation’s first university-based incubator for high-tech businesses. It has graduated 50 successful start-up companies and has another 60 companies in its care. Now that we have developed a model of how to do a successful university-based incubator, we are expanding our effort. Georgia Tech and Emory University are cooperating on EmTech Bio, a business park for biomedical companies, which will include an incubator run by the Advanced Technology Development Center.

Fourth, we need to educate a generation of graduates who think like entrepreneurs. At Georgia Tech we are bringing entrepreneurs into the
classroom and linking our students with activities in the Advanced Technology Development Center. Imagine being a management student at Georgia Tech, and taking a class in entrepreneurship taught by a professor who has started a successful high-tech company, or doing an internship with a new company housed at the incubator. Imagine being an engineering student with a good idea and taking classes that will give you the management skills you need to start a new business.

Dean Terry Blum of the DuPree College of Management and Dean Jean-Lou Chameau of the College of Engineering and working together to make those things happen at Georgia Tech. The DuPree Center for Entrepreneurism offers those classes, and they are taught by professors like David Ku, who holds the Huang Chair in Engineering Entrepreneurship. He is an M.D., holds a Ph.D. in engineering, and has started a biotechnology company.

Fifth, we as a community need to take an interest in helping create congressional support for federal research and development funding, which is the foundation for building a technology economy. Some months ago I went to Washington, D.C., with leaders from of a number of major research universities to lobby Congress and the White House about research funding for science and engineering. The delegation from Boston included not only leaders from Harvard and MIT, but also a representative from the Chamber of Commerce. Two weeks later I was in Boston, and when I opened the Boston Globe, the banner headline on the front page announced that Congress had saved the research funds in the federal budget. That is a community that understands the economic importance of federal research funds. Atlanta is not there yet.

Finally, we have to do more to make sure more of the citizens of this region are engaged in the new economy and are winners in it. A great economy does not leave part of its people behind, but finds ways to bring them all along. This problem is named in various ways, but the most common is probably the term “digital divide.” Even as Georgia Tech presses ahead on the cutting edge of technology, we are aware of the need to reach out to constituencies who are in danger of falling behind. We are a national leader in graduating minority and women engineers, and we work at it very deliberately. We also want to be active in our own community. We are partners with an elementary school near our campus in creating a model math, science and technology education program, and we have a student working there full-time, keeping the computers up and running and helping students and teachers learn how to use them. I serve on the Mayor’s Blue Ribbon Digital Divide Committee, enabling Georgia Tech to be part
of the city’s broader efforts to address this problem. And I keep this concern in mind as I participate on the executive committee of the National Council on Competitiveness and co-chair the Internet Policy Institute. We are trying to keep national bodies like this sensitive to the digital divide as they work to develop the new economy.

I believe that Atlanta is on the cusp of something remarkable, but we need to realize that we are still in the early stages of it. We are setting records for venture capital investment. The fourth quarter of last year was larger that any single prior year, and just when we were taking pride in that, we learned that the first quarter of this year was even higher. But Georgia’s $700 million in venture capital is still only a small fraction of the venture capital investment California sees.

When you are the new kid on the block, it is so easy to make mistakes, and mistakes at this stage can have a more devastating impact that later on. If we are not careful, we could be our own worst enemy. So we need to realize that we are really in the early stages as a high-tech hot-spot, and that successes that look big to us are really small compared to high-tech powerhouses. But if we can keep these things in perspective and stay focused on building our technology economy for the long term, then Atlanta can realize its potential and emerge as one of the nation’s leading technology hubs.