The University System of Georgia:

Total Impact on the State

The Total Impact Task Force

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Total Impact Task Force

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Executive Summary

The University System of Georgia (USG) is Georgia's best investment.

By the numbers
Each year, the USG adds more than $23 billion to Georgia's economy. This is 15 times the State of Georgia's annual allocation to the USG of $1.6 billion, a substantial return on the State's investment.

A task force commissioned in August 2005 by J. Timothy Shelnut, chairman of the Board of Regents, found that in FY 2004, the combined USG economic impact on Georgia was $23.3 billion. To get an idea of the size of this number, if the $23.3 billion were sales, the USG would be the third largest corporation in Georgia, after Home Depot and UPS.

FY 2004 USG Combined Total Economic Impact	
$1.6 billion	State investment (State funds appropriated)
$8.3 billion	Additional institutional revenues of $2.4 billion (Federal research grants, tuition, etc.) and the economic impact/multiplier effect of all USG spending ($5.9 billion) as it circulates through the economy
$2.9 billion	New sales and cost savings for Georgia companies because of USG technical assistance
$10.5 billion	Additional salary earned in Georgia because of the USG degree that graduates earned
$23.3 billion	Total

Jobs
Also in FY 2004:

- 107,202 Georgians were employed because of the business of USG institutions, either in on-campus jobs, or in off-campus public or private sector positions.

- an additional 23,016 Georgians were employed by Georgia companies because of USG technical assistance.

Thus, 130,000 jobs are attributable to the USG for the State's $1.6 billion annual investment.

Beyond the numbers

USG institutions make enormous contributions to Georgia that cannot be measured as easily as the number of jobs. The institutions of the USG affect virtually every person and community in Georgia.

Here are a few examples:

- 25% of the doctors and 33% of the dentists practicing in Georgia graduated from the Medical College of Georgia (MCG).

- In FY 2004, the following degrees were earned at USG institutions (with the majority of the graduates entering Georgia's workforce):
    - 8,637 business, management, marketing graduates
    - 6,286 teachers
    - 3,934 medical and health care professionals
    - 3,038 engineers and skilled technical workers
    - 1,897 scientists and mathematicians
    - 563 legal professionals

- MCG's Telemedicine Center and satellite clinics ensure that Georgians throughout the state have access to high-quality health care.

- Georgia Tech's Advanced Technology Development Center (ATDC) has business incubator locations in Atlanta, Columbus, Savannah and Warner Robins, bringing high-tech business development to communities across the state. More than 100 companies have graduated from ATDC since 1987. ATDC companies have created nearly 42,000 man-years of employment and have generated over $9.3 billion in revenue.

- Georgia's Centers of Innovation program was launched by Governor Sonny Perdue in 2003 and is a partnership of the Georgia Department of Economic Development, several USG institutions, Georgia Department of Technical and Adult Education, and other State agencies. The centers are located in Augusta, Columbus, Gainesville, Savannah, Tifton and Warner Robins. These incubators and innovation centers enable cities throughout Georgia to become players in today's emerging global innovation economy.

- Agents of the University of Georgia's Cooperative Extension Service are active in every Georgia county, helping farmers keep abreast of the latest agricultural technology, research and marketing strategies; helping parents cope with the pressures of balancing home, work and children; and helping families stay healthy with information on nutrition and food safety. In addition, each year approximately 200,000 Georgians participate in 4-H, a program of Cooperative Extension.

- Georgia State University's Bio Bus has brought expanded bio-science instruction to more than 70,000 students in 24 Georgia counties. Its Reading Recovery program (an early intervention program to prevent reading failure) has trained 566 teachers who have served more than 13,000 students in 32 Georgia counties.

- More than 1,300 Georgians are becoming licensed health professionals (registered nurses, pharmacists, medical technologists, imaging professionals) through Georgia's Intellectual Capital Partnership Program (ICAPP®) Health Professionals Initiative. Sixteen USG colleges and universities provide instruction in an accelerated curriculum that allows students to graduate from the programs in less than the usual time. Hospitals and other health care employers have committed to provide jobs for the graduates in more than 25 Georgia counties. The new positions are expected to generate an annual payroll of $45.2 million and an estimated $2.7 million each year in state income taxes.

- The partnership that Georgia Southern University and Georgia Southwestern State University have with NCR is helping to develop a high-tech software development industry in rural south Georgia that provides well-paying jobs for local residents. Currently, there are about 25 full- and part-time employees at the universities who provide NCR with a cost-effective source for updating its software. These jobs are the types of jobs that are being outsourced to lower-cost production centers such as India and Ireland. Instead, these jobs remain in Georgia.

- Georgia Tech's Economic Development and Technology Ventures has provided project assistance or training in community planning and economic development to local leaders and professionals in 154 of 159 counties in Georgia in the past five years.

- The University of Georgia's Carl Vinson Institute of Government provides workshops (such as the Biennial Institute for Georgia Legislators) for state and local officials on issues facing governments at all levels. In FY 2004, more than 23,000 of Georgia's state and local officials received training or other assistance from the Carl Vinson Institute of Government.

- Columbus State University received the city's first Renaissance Award in 2001 for igniting a rebirth of downtown Columbus, including its role in keeping TSYS in Columbus and constructing many new facilities downtown.

Introduction

Background

In the Chairman's Remarks on August 2, 2005, Board of Regents Chair J. Timothy Shelnut announced the launch of a comprehensive assessment of the total impact of the University System on the state of Georgia. President G. Wayne Clough of the Georgia Institute of Technology agreed to chair the Total Impact Task Force, and Joy Hymel, the Assistant Vice Chancellor of the USG Office of Economic Development, was appointed staff director.

The Intellectual Capital Partnership Program (ICAPP®) of the Office of Economic Development commissioned traditional economic development studies in 2000, 2002, and 2004 that measured the economic impact of the System's and each institution's spending and job creation in their local service areas. These traditional studies examine USG spending and its impact as it circulates through the Georgia economy. The jobs created as a result of this spending are also estimated. The work of the Total Impact Task Force starts with these ICAPP® studies in assessing the total impact of System institutions across a wide variety of impact measurements.

Because the Task Force was given only five months to complete its total assessment, it used only information that was already collected by USG institutions or the USG central office. Most of the information is for Fiscal Year 2004 (July 1, 2003 to June 30, 2004) because they were the most recent data available. This study is more than the traditional economic impact study because it attempts to provide a broader look at the many ways that Georgia's public colleges and universities impact the economy and change Georgia for the better. The study does this by assessing the value to Georgia's economy of the degrees earned at USG institutions, and estimating the value of USG public service and outreach activities to businesses, communities and individuals.

The study was divided into two phases when it began, with the first phase including only the impacts of USG's four research universities. Since the two largest economic impact numbers came from studies that captured information for all USG institutions, in November the study's scope was expanded to include all 35 USG institutions. Some information not captured by the ICAPP studies was collected by the central office of the USG for all institutions. The impact of the USG's public outreach and service programs is under-reported for the non-research institutions since there was insufficient time to collect this information from all 35 institutions. Even for some research institutions, programs were not captured because the data were not in the form needed for this study.

Existing Impact Studies

This Total Impact study builds on previous economic impact studies, in particular:

The Economic Impact of University System of Georgia Institutions on Their Regional Economies in FY 2004, Dr. Jeffrey M. Humphreys, Selig Center for Economic Growth, University of Georgia, February 2005.

Note: This study found that the combined economic impact of spending by the 34 USG institutions in FY 2004 was $9.7 billion. For the Total Impact study, Dr. Humphreys updated his figures for USG's four research institutions to include FY 2004 capital expenditures by private foundations and other private sources that were not included in the original study. The new total combined economic impact of USG spending for FY 2004 is $9.9 billion.

This number includes:

- $1.6 billion State appropriation
- $2.4 billion other revenues (research grants, tuition, etc.)
- $5.9 billion economic impact/multiplier effect of $4.0 billion in spending by USG institutions

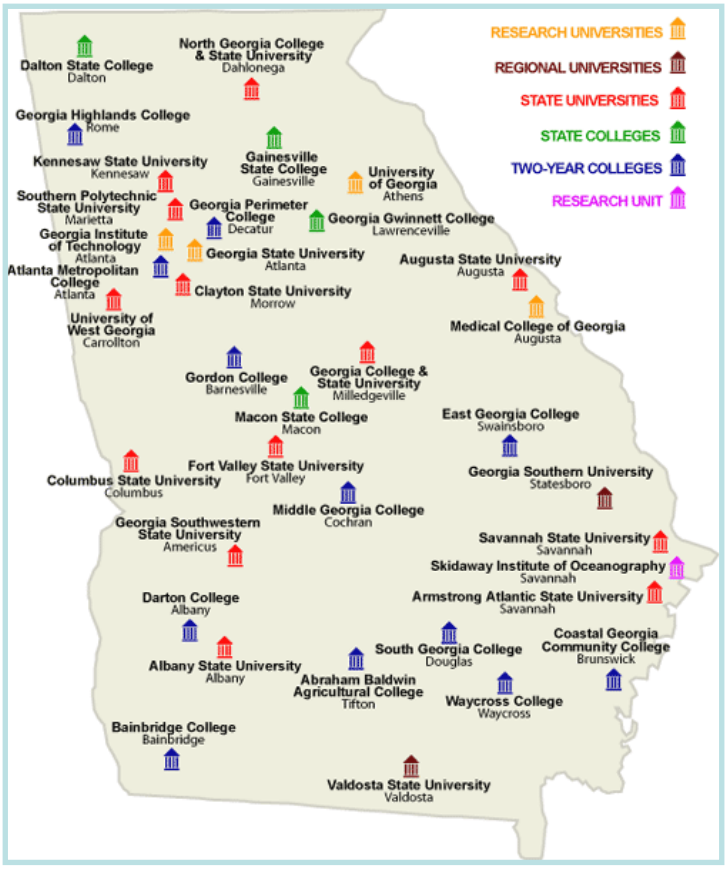
The Value of University System of Georgia Education, Dr. William J. Drummond and Dr. Jan L. Youtie, Georgia Institute of Technology, June 2003

Georgia's $10.5 Billion Payoff, Dr. William J. Drummond and Dr. Jan L. Youtie, Georgia Institute of Technology, August 2003 (follow-up to the previous study)

<u>The University System of Georgia</u>

The University System of Georgia includes 35 public colleges and universities with missions of:

- instruction
- research
- public service and outreach



The USG Mission Statement states:

> The mission of the University System of Georgia is to contribute to the educational, cultural, economic, and social advancement of Georgia by providing excellent undergraduate general education and first-rate programs leading to associate, baccalaureate, masters, professional, and doctorate degrees; by pursuing leading-edge basic and applied research,

> scholarly inquiry, and creative endeavors; and by bringing these intellectual resources, and those of the public libraries, to bear on the economic development of the State and the continuing education of its citizens.

The institutions are divided into five categories:

- Research universities
- Regional universities
- State universities
- State colleges
- Two-year colleges

There is also an independent research unit, the Skidaway Institute of Oceanography.

Research Universities and Their Statewide Service Mission

While each USG college and university is committed to public service and outreach in its local area of service, the four research universities have an additional statewide mission:

> "…a commitment to public service, economic development and technical assistance activities designed to address the strategic needs of the State of Georgia…"
>
> Source: Core Mission Statement for Research Universities in the University System of Georgia

For this reason, the impacts of the four USG research institutions – Georgia Institute of Technology (Georgia Tech), Georgia State University, Medical College of Georgia, and the University of Georgia (UGA) – are felt throughout the state. In addition, Georgia Tech and UGA have offices throughout the state to deliver their public services.

What this Report Can't Measure

Many impacts of the USG are not included quantitatively in this assessment, either because the data are not collected already, or because the impacts were difficult to measure in the available time (or cannot be quantified).

Some examples of data that were not available include:

- Economic contributions made by UGA's Cooperative Extension Service
- Economic contributions made by Georgia's Traditional Industries Program (TIP)
- Spending by visitors to USG institutions for athletic events, commencements, class reunions, etc.
- Spending by USG retirees who came to Georgia to work and decided to live here after retirement
- The future value of USG research on competitiveness of Georgia's industries

Examples of impacts that are difficult or impossible to quantify include:

- USG institutions provide cultural venues that serve their local communities. These include Spivy Hall at Clayton State University, State Botanical Garden at University of Georgia, Performing Arts Center at Georgia Southern University, Coca-Cola Space Science Center at Columbus State University, Valdosta Symphony Orchestra (which is headquartered at Valdosta State University), and Rialto Theatre at Georgia State University.

- In a recent survey, site location consultants (the people who help companies locate their facilities) said that their clients need universities "for their labs, facilities, and research capabilities, as well as the labor pool they provide."

- The Medical College of Georgia (MCG) focuses its research in areas that affect Georgians: cancer, cardiovascular disease, diabetes, obesity, neurological disease and infection/inflammation. MCG supports more than 60 clinics and outreach facilities in addition to services on its main campus in Augusta.

- Georgia State provides training and education to child protective services workers to help them handle the heavy caseloads of children in Georgia's child welfare system.

- Georgia is one of only four states in the nation with two or more institutions ranked among the top 20 public national universities (2006 *U.S. News & World Report* ranking). USG institutions bring favorable attention for Georgia in many ways that help raise Georgia's profile internationally.

- Many of Georgia's public servants were educated at USG institutions. Most of Georgia's governors were educated at USG institutions. Currently, both U.S. Senators and five of Georgia's U.S. Representatives were educated at USG institutions.

The Future and Its Requirements

The future will belong to states with strong knowledge-based economies, built on the successes of their universities as knowledge producers. The continued preeminence of Georgia's research universities is key to sustaining the state's economic strength. As Chairman of the Federal Reserve Board Alan Greenspan stated, "Our research universities are drivers of innovation and they are the nurturers of many of the most creative and productive minds of our day." (address to Institute of International Education, 2002)

All USG institutions nurture the talent who will drive Georgia's future economic growth. College-educated employees have the flexibility to adapt to changing economic realities, in part because they have "learned how to learn." In addition, continuing education at USG institutions provides lifelong learning opportunities that are essential for upgrading

skills through professional development and individual growth – almost 500,000 CEUs annually system-wide.

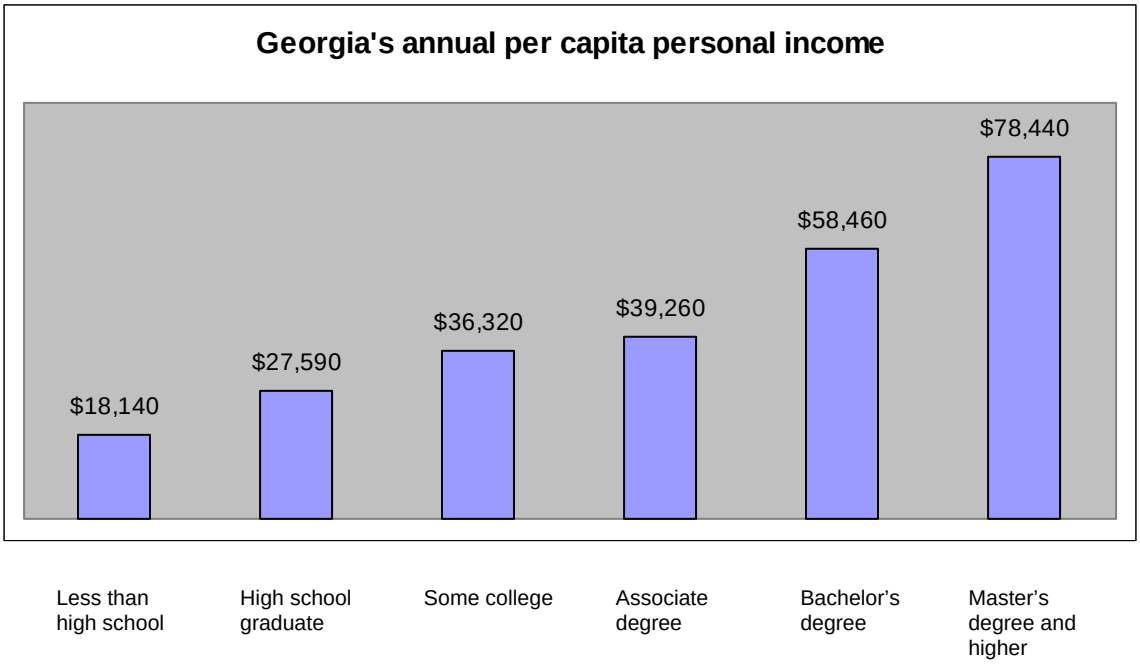
"Critical awareness and the ability to hypothesize, to interpret, and to communicate are essential elements of successful innovation in a conceptual-based economy." (Greenspan) If Georgia is to remain strong during a future of rapid innovation and accelerating change, Georgia must remain a leader in transforming knowledge into economic value. Our workforce must be able to think abstractly in a wide range of professions.

Georgia must also continue to lead in the creation of knowledge through investing in research. As we have seen, creating knowledge can lead to amazing economic returns. It also can help us solve critical problems that we face today, and that future generations will face tomorrow.

I. The Value of College-Educated Georgians to Georgia (Instruction)

$10.5 billion	Amount of additional salary earned in Georgia by one year of USG graduates during their careers

When people earn college degrees, their potential to earn goes up substantially over their working career. The amount varies by the degree that they earn, and whether they are male or female.



Source: 2000 Census Public Use Microdata Sample, from Atlanta Regional Council for Higher Education (ARCHE)

More than 40,000 students earn degrees from USG institutions each year. For example, in FY 2004, the USG awarded:

- 6,087 associate degrees
- 23,612 bachelor's degrees
- 11,310 graduate/professional degrees

That additional earning potential creates a huge economic impact for Georgia. Georgia Tech researchers William J. Drummond and Jan L. Youtie studied this impact for students graduating from USG institutions in 2000. The results of their work (which includes adjustments for the number of USG graduates who move out of state to work) can be seen in two studies:

- *The Value of University System of Georgia Education*, June 2003

- *Georgia's $10.5 Billion Payoff,* August 2003

These studies found:

"The result shows that the career-long economic value of the 2000 USG class will be more than $10.5 billion. Since the USG annual budget is about $4.0 billion in FY 2004 (latest audited figures including the teaching, research, and service missions), the value of the USG's educational output alone is more than two and a half times the system's total annual budget." The State funding for the Board of Regents in FY 2004 was a little over $1.6 billion, so the educational output alone is about six-and-a-half times the State's investment.

Table 1 is from the *Georgia's $10.5 Billion Payoff* study, and shows how the 2000 USG graduates' impact was calculated.

Table1: Economic value of USG education

Education Level	Career Earnings (Ages 25-64)	Higher Education Increment	Increment Less 3% Outmigration	2000 USG Completions	Less Those Not in Workforce	Total Economic Impact
A-Less than HS	$ 498,932					
B-HS degree	$ 838,994					
C-Some college, no degree	$ 1,086,588	$ 247,594	$ 152,423	1,190	893	$ 136,000,000
D-Associate degree	$ 1,199,157	$ 360,162	$ 212,654	4,570	3,428	$ 729,000,000
E-Bachelors degree	$ 1,824,488	$ 985,494	$ 531,741	20,259	15,194	$ 8,079,000,000
F-Graduate degree	$ 2,306,906	$ 482,417	$ 244,360	8,570	6,428	$ 1,571,000,000
Total				34,589	25,942	$ 10,515,000,000

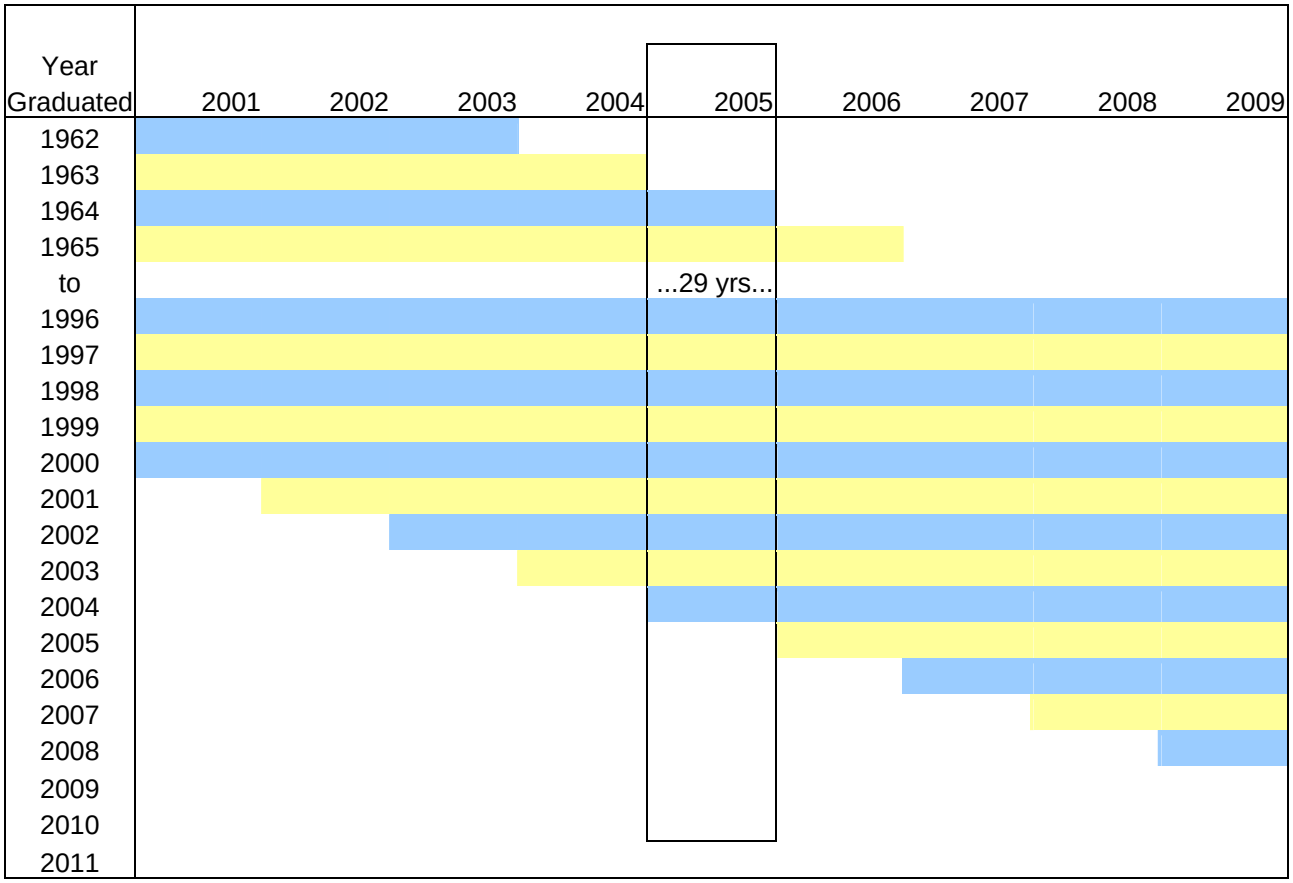
Source: *Georgia's $10.5 Billion Payoff*, August 2003

Cumulative economic impact

One year of USG graduates will add $10.5 billion to Georgia's economy over the next 40 years.

Each year, Georgia benefits from the last 40 years of USG graduates. For example, the USG classes of 1964 through 2004 were earning additional salaries in 2005 in Georgia because of their USG degrees.

Table 2:
Cumulative Economic Impact: The Year 2005
USG Graduating Classes of 1964 through 2004



Additional economic impact

In addition, Georgia's employers avoid a significant cost if they can hire a graduate from a Georgia college or university. The quote and table below are from *Georgia's $10.5 Billion Payoff*.

> "Table 3 shows the wage surcharge employers must pay to attract out-of-state graduates to work in Georgia. For holders of a Bachelor's degree, employers must pay an additional 14 percent (about $5,800) per year, and for holders of graduate degrees they must provide almost 16 percent more (about $7,550) per year."

Education Level	In-Migrants' Earnings	Out-Migrants' Earnings	Continuous Residents' Earnings	In-Migrants' Additional Earnings	In-Migrants' Earnings Surcharge
Less than high school	23,751	27,000	21,490	2,261	10.5%
High school degree	25,607	23,604	25,493	115	0.5%
Some college, no degree	28,900	26,638	28,432	468	1.6%
Associate degree	30,982	33,896	34,375	*	*
Bachelors degree	46,936	53,819	41,153	5,783	14.1%
Graduate degree	55,283	63,754	47,733	7,550	15.8%

Source: 2000 Census Public Use Microsample (PUMS) Data
Analysis includes full-time workers 23-30 years old.
Migration information based upon 1995-1999 period.
Earnings are for 1999 calendar year.

* Small sample size for persons with Associate degree

Table 3: Earnings Differences Between Georgia Full-time Workers Who Were In-Migrants, Out-Migrants, and Continuous Residents

This wage surcharge costs Georgia employers an estimated $48 million each year. This estimate comes from multiplying the number of people with college degrees who moved into Georgia to work in one year by the wage surcharge described above.

Here are the details. The *Georgia's $10.5 Billion Payoff* study found that the annual net in-migration rate for Bachelor-degreed employees was 4.7% (5,597 individuals in 1999) and for Graduate-degreed employees was 7.8% (2,118 individuals in 1999). Thus, the net annual wage surcharge Georgia employers must pay for Bachelor-degreed employees is $32,367,451 (5,597 x $5,783 wage surcharge) and for Graduate-degreed employees is $15,990,900 (2,118 x $7,550 wage surcharge) for a total of $48,358,351.

In addition, there are significant costs for a company to relocate an employee from another state. In 2004, the average cost to relocate each current employee homeowner was $63,794 (*2005 Transfer Volume and Cost Survey*, Employee Relocation Council).

II. The Value of Research to Georgia

$13.4 million	Revenue earned in FY 2004 by licensing technology created at the four USG research institutions
$718.2 million	Income from non-State sources that was spent in FY 2004 on research by the four USG research institutions
211	Patents applied for by the four USG research institutions in FY 2004
68	Patents awarded to the four USG research institutions in FY 2004

The research activities of Georgia's universities have substantial economic impact on the state. The Georgia Research Alliance (GRA) reports that the impact of university research is similar to the impact of the U.S. Centers for Disease Control and Prevention (CDC) in Georgia. In 2002, research expenditures by the six Georgia research universities that are GRA members totaled $1.1 billion. (The GRA universities include the four USG research universities, plus Clark Atlanta University and Emory University.) This investment generated:

- $1.9 billion in additional sales of goods and services;
- 27,000 additional jobs; and
- $0.9 billion in additional earnings.

In FY 2004, the four USG research universities earned $13.4 million in licensing revenues for research developed by USG faculty, staff and students. Research activity at the four USG research universities also attracted $718.2 million from non-State sources that was spent on research during FY 2004.

Georgia's research universities are critically important as the world's economy becomes more dependent on innovation that is supported by cutting-edge research and development. Georgia ranks 12th in the nation in academic research and development (R&D) spending. However, the state's ranking drops to 21st when academic and industrial R&D are combined. (Source: *Science and Engineering State Profiles, 2001-2003*, U.S. National Science Foundation, NSF 05-301) This clearly indicates the importance of university research as a complement to corporate research.

The economic activity derived from USG research has created jobs, attracted capital investment (public and private), and created high paying jobs. In 2003, the average annual wages of R&D occupations was about $70,000, almost double the average annual wages for manufacturing jobs. Also, from 1999 to 2003, the average nominal wages for R&D occupations grew 20%, while the growth for all occupations was 15%. (Source: *Innovation, R&D and Off-shoring*, Ashok D. Bardhan and Dwight M. Jaffee, Fisher Center for Real Estate and Urban Economics, University of California, Berkeley, 2005)

The Total Impact Task Force chose to examine research funds expended rather than grant awards announced or received because:

1) "Funds expended" is a sure reflection of money received. Sometimes grants that are announced or awarded are not actually received, or the award/grant is for several years.
2) By showing when the funds were expended, we see when the funds actually entered the Georgia economy.

Here are a few of the companies that have grown from research at USG institutions.

Scientific Atlanta, which began at Georgia Tech, has 6,500 employees in 70 countries worldwide. Scientific Atlanta is a leading global manufacturer and supplier of products, systems and services that help cable operators connect consumers with integrated, interactive video, data and voice services.

Ratio Design Lab graduated from Georgia Tech's Advanced Technology Development Center (ATDC) in 1995 and has evolved into AppForge, an Atlanta-based provider of software tools for developing applications for mobile devices.

CardioMEMS, a 2005 graduate of ATDC, is pioneering a new breed of testing devices to monitor heart patients. The devices combine wireless communication with microelectromechanical systems (MEMS) fabrication to provide physicians with more information, while making testing less invasive for the patient.

Apgen (Applied PhytoGenetics, Inc.) is currently located at UGA's Georgia BioBusiness Center. The company uses plants, trees and grasses, through the process of phytoremediation, to remove or degrade hazardous materials from the environment. Apgen is also developing genetically modified plants to remediate mercury, arsenic and other elemental contaminants.

Enzymatic Deinking Technologies, LLC makes industrial enzyme applications available to the mill operations of pulp and paper companies. The company's Enzynk process, based on technology developed at UGA, leads to more cost efficient and environmental paper recycling.

Abeome is an Athens-based start-up company based on research from the laboratory of UGA's Richard B. Meagher. The company commercializes the GAP platform developed by Dr. Meagher, which rapidly produces monoclonal antibodies to meet the demands of the biomedical and agricultural industries.

Zygogen, an Atlanta-based company, is based in part on a Medical College of Georgia (MCG) scientist's invention related to the fluorescent tag in specific organs of zebrafish. Zygogen uses zebrafish and fluorescent

tagging technology to provide integrated programs of target identification, validation, and drug screening in order to optimize drug discovery.

CyberCare, the network-based telehealth solutions company that improves delivery of care with Internet technology, is the result of collaborative science conducted by MCG and Georgia Tech researchers.

Accelerated Pharmaceuticals—an Augusta-based company now poised to offer high-tech services to the pharmaceutical industry—was founded by an MCG researcher using technology licensed by the institution.

Calorie & Pulse Technologies, LLC is developing leading-edge products and services for the sports nutrition market based on patent-pending technologies researched at Georgia State University. The company will launch an interactive Web application, SportsNutritionClinic.com, in February 2006.

NDP Optronics, LLC was established in 2003 to develop and market Infrared Detector technology developed at the Georgia State University Optoelectronics Laboratory. NDP receives R&D funding from the U.S. Air Force.

Georgia Research Alliance

The State of Georgia has made significant contributions to research at USG's four research institutions through the Georgia Research Alliance (GRA). GRA is an internationally acclaimed model for bringing business, research universities and state government together to create and sustain a vibrant, technology-driven economy for the state. (The GRA universities include the four USG research universities, plus Clark Atlanta University and Emory University).

The Alliance achieves its goals through strategic investments at the state's leading research universities in four programs: eminent scholars, research laboratories and equipment, national centers for research and innovation, and technology transfer.

To date, Georgia has invested some $400 million through the Alliance, which has helped to:

- attract more than 50 Eminent Scholars and an additional 70 world class researchers,
- leverage an additional $2 billion in federal and private funding,
- create more than 5,000 new technology jobs,
- generate some 120 new technology companies, and
- allow established Georgia companies to expand into new markets.

Research important to Georgia's future

USG research is important for Georgia's future economy. It contains the seeds of new companies and new economic growth for Georgia from commercializing the research developed by USG faculty, staff, and students.

Investment in research and the creation of knowledge will be more and more important in tomorrow's economy. The ability to create knowledge and transform it into economic value will be a major factor in Georgia's economic future. This type of research happens in Georgia's universities.

USG has more than 400 centers, institutes and special programs on its 35 campuses. Many of them conduct research. The ICAPP Catalog of USG Centers, Institutes and Special Programs is available at www.icapp.org/catalog.

Health Care Research

Research can also improve the lives of Georgians in other ways. For example:

How genetics and the environment collide to cause **type 1 diabetes** is the focus of Dr. Jin-Xiong She, director of the Center for Biotechnology and Genomic Medicine at the Medical College of Georgia and Georgia Research Alliance Eminent Scholar in Genomic Medicine. His work includes participation in a worldwide, four-year process to identify about 13,000 babies with at-risk genes. About half of the babies will be monitored for 15 years – from the water they drink to the foods they eat to the infections and vaccines they get. Dr. She and his colleagues already have contributed to better understanding the causes of this lifelong illness, including the 2004 discovery that having the SUMO-4 gene increases a child's risk of developing type 1 diabetes tenfold.

What began as desire on the part of Dr. Virgil C. McKie, MCG Professor Emeritus of Pediatrics, to help his young **sickle cell anemia** patients who were having strokes, has revolutionized the care of these at-risk children. Dr. McKie and colleague Dr. Robert J. Adams, adult stroke specialist, first found the painless transcranial Doppler could be used to determine which children were at risk for strokes. In 1995, they led a study following 130 at-risk children age 2-16 at 14 sites in the United States and Canada that found regular blood transfusions resulted in a 90 percent reduction in strokes. This prompted the National Institutes of Health to halt the $12.1 million study 16 months early so that doctors and consumers could get the news. In July 2004, California researchers reported the incidence of first stroke in children with sickle cell disease in their state had taken a nose-dive since 1998. The likely reason – the program MCG developed to identify and treat kids who are at risk.

About 700,000 **strokes** occur annually in the U.S., with a disproportionately high number of them in Georgia. About 80 percent of those strokes are caused by clots. Nearly 10 years ago the Food and Drug Administration approved the first stroke treatment, the clot-buster tPA, or tissue plasminogen activator, that can help reduce stroke damage. Unfortunately, many stroke patients who qualify for the medication still do not get it because they do not get to a hospital within the three-hour treatment window, or because their hospital does not have a stroke team.

A research team led by Dr. David Hess, chair of the MCG Department of Neurology, has developed an Internet-based examination system that addresses access problems. A recent study published in the journal *Stroke* showed that most of 194 stroke patients in

eight rural Georgia hospitals seen via the REACH system by MCG stroke team members got the drug in less than two hours. REACH – Remote Evaluation for Acute Ischemic Stroke – system has a portable station at the remote site and can be accessed by a stroke specialist from any computer with Internet access. MCG is working with the Southeast Affiliate of the American Heart Association to help develop a statewide stroke plan for Georgia. The national association wants every state to have such a plan. The Georgia Research Alliance helped MCG develop a business plan that could make REACH available to other states as well.

Pioneering research is making the joint Georgia Tech/Emory Wallace H. Coulter School of Biomedical Engineering a recognized leader in nanomedicine. Georgia Tech and Emory University have received $19 million from the National Cancer Institute to establish the new Emory-Georgia Tech Nanotechnology Center for Personalized and Predictive Oncology. The center will step up efforts to integrate nanotechnology into personalized **cancer** treatments and early detection.

III. The Value of Public Service and Outreach to Georgia

Colleges and universities not only create knowledge (research) and share it (instruction), they also apply knowledge through public service and outreach.

A. Helping Georgia's Companies Succeed and Grow

$2.9 billion	Total new value (new sales and cost savings) from existing and start-up companies in FY 2004 because of technical assistance from the four USG research universities
$186.5 million	Total non-State funds (venture capital, etc.) leveraged by technical assistance from the four USG research universities in FY 2004
23,016	Jobs created or saved in FY 2004 because of technical assistance from the four USG research universities to existing and start-up companies
7,588	Number of existing and start-up companies assisted by the four USG research universities in FY 2004

The various USG programs that provide technical assistance to Georgia's businesses track their impact by asking the companies that they help to report the results of the technical assistance.

By applying knowledge, USG technical assistance programs help companies:

- become more efficient,
- enter new markets,
- adopt and develop new technologies and products,
- save money on energy costs, and
- a host of other results that help the companies to succeed.

Some of the largest USG technical assistance programs are:

- Small Business Development Center (University of Georgia)
  - statewide network of 19 offices assisting any small business or entrepreneur
  - houses the state Office of Minority Business Development

- Economic Development Institute (Georgia Tech)
  - statewide network of 18 offices focusing on assistance to manufacturing and technology companies
  - houses the eight-state Southeastern Trade Adjustment Assistance Center (SETAAC), which provides assistance to companies experiencing heightened competition from imports

- Advanced Technology Development Center (Georgia Tech)
  - located in Atlanta, Columbus, Savannah and Warner Robins
  - focuses on helping new technology companies and entrepreneurs launch successful business enterprises
  - supports VentureLab (in partnership with the Georgia Research Alliance) to help commercialize innovative technology developed by university faculty

These three outreach programs combined produce the numbers shown at the beginning of this section:

- $2.9 billion in new sales or cost savings, and
- 30,000 jobs.

More amazingly, the State appropriations for these programs combined total about $10 million.

Other USG Technical Assistance

There are other programs at the research universities that did not have data that were comparable to the sales and jobs numbers shown above but their impact is significant. The Cooperative Extension Service and the Agricultural Experiment Stations at the University of Georgia have a significant impact on Georgia's agricultural economy in rural communities throughout the state. One of the main purposes of the Cooperative Extension Service and the Agricultural Experiment Stations is to help farmers in Georgia increase the value they receive for their commodities. The "farm gate value" of these commodities in 2004 was $10.3 billion. While up only 4% from 2003, that value was 25% above the $8.3 billion value of 2000. The Traditional Industries Program (in which both the University of Georgia and Georgia Tech participate) applies research to problems in the textile, pulp & paper and food processing industries that are identified by leaders in those industries. These industries make up about 40% of Georgia's manufacturing base.

The 31 USG colleges and universities that are not classified as research institutions also provide significant technical assistance to existing and start-up businesses. Because of the changing scope of this study, those economic impacts are not reflected in the new value, funds leveraged, jobs created or saved, or number of companies served statistics at the beginning of this section. However, these impacts are also significant.

For example, the partnership that Georgia Southern University and Georgia Southwestern State University have with NCR is helping to develop a high-tech software development industry in rural south Georgia that will provide well-paying jobs for local residents. Currently, there are about 25 full- and part-time employees at the universities who provide NCR with a cost-effective source for updating its software. These jobs are the types of jobs that are being outsourced to lower-cost production centers such as India and Ireland. Instead, these jobs remain in Georgia.

The universities receive licensing fees for the redeveloped products. Students gain invaluable real-world experience and learn about technologies beyond those in the traditional curriculum, as well as product development, including standards, documentation, verification and project planning. The enterprises generated $180,000 in royalties and fees during FY 2005, and this number is expected to grow significantly each year.

The Family Enterprise Center at Kennesaw State University is one of the world's leading resources for family business education and research. Principal programs include: The Family Business Forum; The Family Business Academy; and the Georgia Family Business-of-the-Year program. Research includes the annual Family Business Bibliography, editorship of Family Business Review (the field's leading scholarly journal), and extensive work in the area of the social and economic consequences of estate and gift taxes.

Georgia Southern University's Center for Entrepreneurial Studies is used to foster entrepreneurship both in the classroom and among the regional community. It conducts about 10 comprehensive small business consulting projects for local businesses annually and recognizes small business achievers in the annual Spring Small Business Appreciation Meeting, a meeting involving alumni, students, regional entrepreneurs, and small business owners. The Center also oversees, through a Board of Advisors, the Entrepreneurship/Small Business curriculum.

Helping Companies Connect with USG Graduates

USG has a system-wide online recruiting service that helps employers find college-educated talent. At GeorgiaHIRE.com, companies can use an easy 10-point search engine to search through more than 12,000 resumes of college-educated students and alumni who are actively looking for work. Employers can search by keywords, type of position and employer the student seeks, major, and graduation date. Another few clicks will send job information and an invitation to apply to the people selected in the search.

Students and alumni can post resumes (and Georgia companies can search them) for free. Resumes are automatically archived after 180 days to ensure that the resumes are current and candidates are still in the job market. Companies can also post job listings for a small fee. All of Georgia's 35 public -- and 23 of the 25 private -- colleges and universities are part of GeorgiaHIRE.com. In July 2006, the Georgia Department of Technical and Adult Education's 34 technical colleges will go online with GeorgiaHIRE.

Each USG institution has services to connect its students and alumni with employers. In addition, institutions may host special events. For example, Armstrong Atlantic State University (AASU) hosted Regional TechFest 2005, where students from AASU, Georgia Southern University, Georgia Tech Savannah, Savannah State University and South University could network with project managers, owners and CEOs of local knowledge-based businesses. The event was the brainchild of AASU professor Chris McCarthy, and will rotate among other regional universities in the future.

B. Helping Georgia's K-12 Students and Teachers

6,286	Number of education degrees awarded in FY 2004 by all USG institutions
324,123	K-12 students served directly in FY 2004 by the four USG research universities
10,947	K-12 teachers served directly in FY 2004 by the four USG research universities

The 35 institutions in the USG graduated 6,286 students with degrees in education during FY 2004:

- 2,572 undergraduate degrees
- 3,714 graduate degrees

Of these graduates, 3,157 were prepared to become new teachers. The other graduates were current teachers improving their skills. The Board of Regents' P-16 Initiative estimates that Georgia will need approximately 14,500 new teachers by 2010.

P-16 has many programs to promote educational improvements by working with USG institutions. For example, the "Double the Number and Double the Diversity of Teachers Prepared by the University System of Georgia" program aims to increase the number of new teachers prepared each year by USG institutions from 3,157 in 2004 to 7,000 by 2010, and to increase the number of teachers of color from 601 in 2004 to 1,555 by 2010.

Serving K-12 Students and Teachers

The four USG research universities served more than 324,123 K-12 students and 10,947 K-12 teachers during FY 2004 through programs such as:

Bio Bus – Georgia State University students, under the direction of a Georgia State biology professor, visit schools and organizations across Georgia in a 30-foot long mobile laboratory to teach on topics ranging from animal diversity for the younger grades, to the biotechnology of forensics and criminology for high school students. Recently, a National Science Foundation grant provided the funding for a second Bio Bus and a van to expand Georgia State's effort to bring relevant and fun science presentations in which Georgia's students can participate. Thanks to support from Georgia State and the National Science Foundation, the Bio Bus's programs are offered for free to Georgia schools and organizations. Since 1999, Georgia State's Bio Bus has served more than 70,000 students in 24 Georgia counties.

Reading Recovery is an early intervention program for first grade students to prevent reading failure. Part of Georgia State's College of Education, the program has operated since 1991, training 39 teacher leaders and 527 teachers who have served more than 13,000 children in 32 counties throughout Georgia.

Although their results are not included in the numbers at the beginning of this section, the 31 non-research USG institutions also serve K-12 students and teachers. For example:

- Waycross College faculty members provide summer workshops for area teachers, including "Amusement Park Physics" and writing workshops.

- The Georgia College & State University Community Action Team for Service (CATS) designs and conducts academic, team building and enrichment activities in schools, camps, through clubs and after-school programs to encourage young people to achieve academically and set their goals for higher education.

C. Serving Georgians' Health Care Needs

158	MD degrees awarded in FY 2004 (only Medical College of Georgia offers this degree among USG institutions)
130	Pharmacist degrees (PharmD) awarded in FY 2004 (only University of Georgia offers this degree among USG institutions)
35	Dentistry degrees awarded in FY 2004 (only Medical College of Georgia offers this degree among USG institutions)
1,837	Number of RN nursing degrees awarded by all USG institutions in FY 2004
73,196	Students served by health care services in FY 2004 at the four USG research universities
13,871	Paying non-student patients served by health care services in FY 2004 at the four USG research universities
10,019	Non-paying non-student patients served by health care services in FY 2004 at the four USG research universities

Preparing Medical Personnel

The institutions of the USG prepare a large number of Georgia's health care providers – in fact, 32 of the 35 institutions have programs to educate health care professionals.

The Medical College of Georgia has produced approximately 25 percent of Georgia's practicing doctors and dentists. USG institutions also produce nurses, pharmacists, med techs, nurse practitioners, and other allied health professionals.

One of the biggest threats facing health care in Georgia is the growing shortage of qualified health care professionals. According to the Georgia Department of Community Health, Georgia's hospitals have a vacancy rate for nurses of 12 percent, and the nursing homes are even higher---16 percent. And it is just going to get worse. Georgia is projected to have a 23 percent vacancy rate for nurses by 2010, going to 40 percent by 2020. That's higher than the national average of 29 percent vacancy rate for nurses in 2020.

Several USG institutions have developed innovative programs to meet the critical shortage of health care personnel through the Intellectual Capital Partnership Program's (ICAPP®) Health Professionals Initiative. Here are some examples:

- Through Kennesaw State University's program, students who already hold a Bachelor's degree can earn a Bachelor of Science in Nursing in 15 months.

- The program at Abraham Baldwin Agricultural College enables paramedics and LPNs to earn an Associate degree in nursing by attending classes one day per week for a year, which allows them to continue working while earning their degrees.

- The University of Georgia's pharmacy program created a partnership with Albany State College that expands the number of students in the pharmacy program by 25 percent and places a higher number of pharmacy students in southwest Georgia for their clinical experiences. More graduates are returning to work in southwest Georgia after graduation because of this experience, which helps meet the critical need for pharmacists in this region. UGA also works with Albany State faculty to encourage and prepare local students to study pharmacy at UGA.

Even when a college or university does not have a medical program of study, it may provide the early higher education of a student who goes on to become a health professional. For example:

> Robert Patrick Lucas, MD, began his college career at Middle Georgia College, where he earned an Associate of Science in Pre-Medicine in 1996. From there, he studied at the University of Georgia, then the Medical College of Georgia, where he graduated in 2002. Today he practices medicine at Hawthorne Medical Associates in Athens, Georgia.

<u>Providing Health Care Services</u>

The 35 institutions of the USG provide health care services to their students. Many also provide services to members of the public, some of whom are unable to pay. MCG Health System is the second largest provider of indigent care in Georgia, after Grady Health System.

- The Medical College of Georgia offers many free or reduced-cost services to those in the Augusta area and beyond. Its Telemedicine Center and satellite clinics help ensure that every Georgian has access to high-quality health care. MCG Health System supports more than 60 clinics and outreach facilities.

  In addition to producing a quarter of Georgia's doctors, a third of its dentists, and many of its other health care professionals, Medical College of Georgia attacks the diseases that affect Georgia families the most – cancer, cardiovascular disease, neurological disease, diabetes and obesity, infection and inflammation – through its clinical and research initiatives.

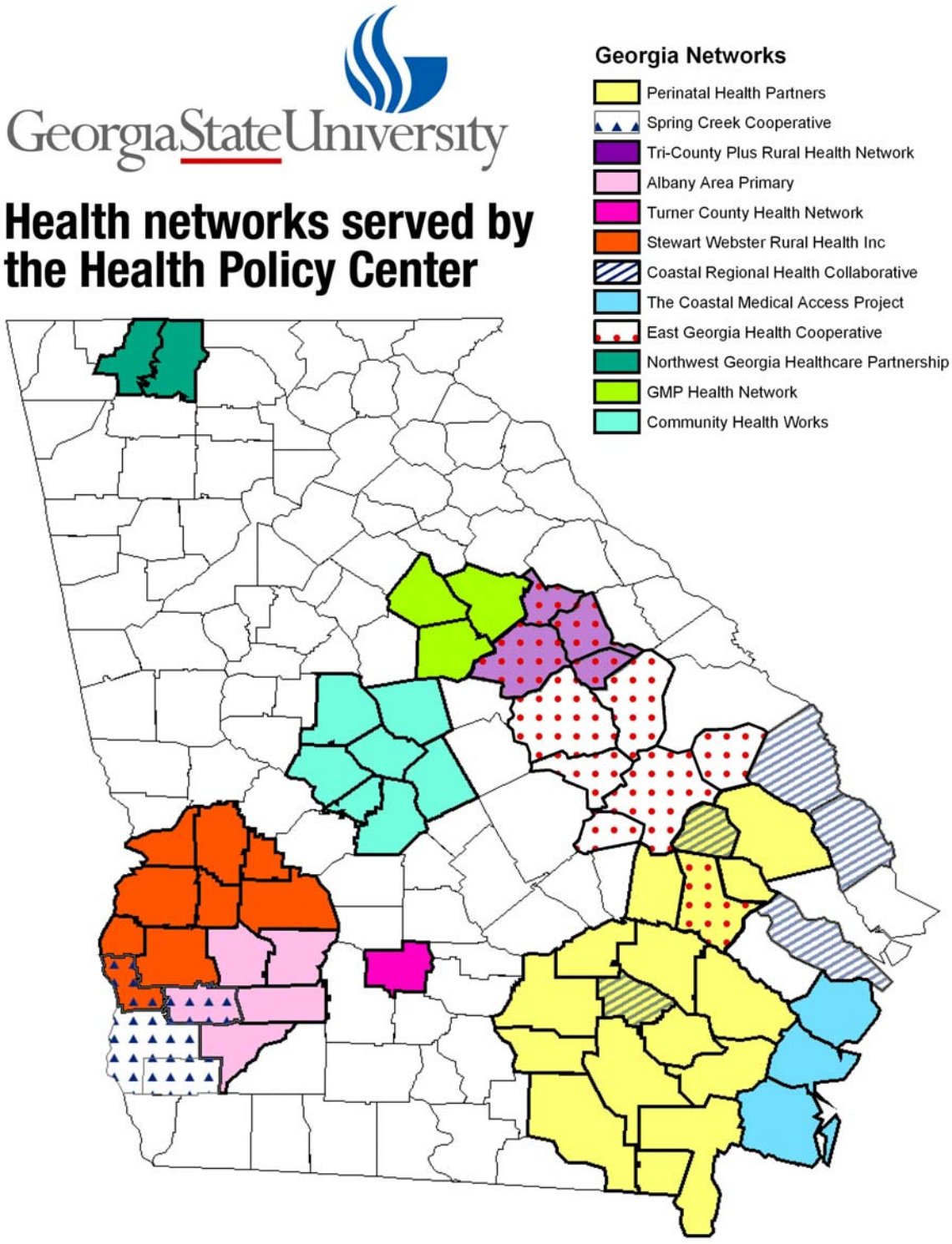
- A faculty member at Kennesaw State University founded Project IDEAL, which has helped hundreds of Latino diabetics in north Georgia to recognize and manage

their disease. The U.S. Centers for Disease Control recently expanded the program.

- Georgia Highlands College and the National College Athletic Association (NCAA) sponsored the 33rd annual National Youth Sports Program (NYSP) during Summer 2005. More than 10,000 disadvantaged youth have participated over the years, getting a chance to play sports, learn, visit a college campus, and hear NYSP alumni talk about leadership, individuality, gangs, drugs, and alternatives to poverty. NYSP has provided more than 13,500 free medical physicals and 1,000 free dental screenings. NYSP at Georgia Highlands College has been recognized nationally as one of the 10 best programs in the country six times during its 33-year history.

- Georgia State's Health Policy Center works to improve the health status of all Georgians through research, policy development, and program design and evaluation. In one of its programs, the Center has worked with more than 74 rural Georgia counties to help improve local health care. One of its projects is Rural Health Networks. Georgia State is working with the 12 regions shown on the map below to create more than 50 new jobs and save local health care providers more than $18 million through free care clinics, prescription assistance and care management for those who are chronically ill.

  The federal Office of Rural Health Policy announced recently that it was awarding the Health Policy Center $1 million to improve availability of health and human services in some of the United States' most rural and medically-underserved areas. The federal grant may be renewed for five more years, bringing the total to $6 million. This award is a sign of the rising national prominence of Georgia State and the Health Policy Center.


Georgia State University
Health networks served by the Health Policy Center
Georgia Networks
Perinatal Health Partners
Spring Creek Cooperative
Tri-County Plus Rural Health Network
Albany Area Primary
Turner County Health Network
Stewart Webster Rural Health Inc
Coastal Regional Health Collaborative
The Coastal Medical Access Project
East Georgia Health Cooperative
Northwest Georgia Healthcare Partnership
GMP Health Network
Community Health Works

Preparing for Disaster

The Medical College of Georgia Center for Operational Medicine works with colleagues at the University of Georgia, the University of Texas Southwestern Medical Center at Dallas, the University of Texas at Houston School of Public Health and the American Medical Association to design courses that better prepare the nation for natural and manmade disasters. These National Disaster Life Support Courses, much like Advanced Cardiac Life Support for heart patients, are becoming the national training standard for health care providers who might treat victims of natural or manmade disasters. MCG also has developed classes that focus on first responders, such as police and firefighters, to help insure that services are coordinated in the event of a major disaster.

In September 2005, MCG was awarded a $398,000 Georgia Department of Human Resources grant to teach these courses throughout Georgia's eight health districts. A few weeks later, MCG received a $4.5 million grant from the U.S. Department of Health and Human Services to expand bioterrorism training and curriculum development in the state.

In addition, several states are testing RealOpt, a logistics program developed at Georgia Tech to help city, county and state health departments mount a rapid response to the outbreak of an infectious disease.

D. Preparing Georgia's Leaders

23,677	Number of State and local elected and appointed officials assisted by the four USG research universities in FY 2004
8,936	Number of Georgians served by USG leadership development programs at the four USG research universities in FY 2004
197,659	Number of Georgians participating in FY 2004 in 4-H, a program of the University of Georgia's Cooperative Extension System

USG has a profound impact on developing Georgia's leaders. In fact, 22 of the last 25 Georgia governors are University of Georgia graduates. USG graduates are found throughout the Georgia General Assembly. Both U.S. Senators and five of Georgia's U.S. Representatives were educated at USG institutions.

USG institutions provide technical support to Georgia's elected and appointed officials. The University of Georgia's Carl Vinson Institute of Government provides state policymakers with objective research, technical assistance, and instruction so they can meet the challenges involved in governing our state. The Institute also provides this type of service for local officials, state agencies and educators. In FY 2004, the Institute served 23,677 State and local elected and appointed officials. This work takes various forms, such as providing research expertise to a legislative committee charged with developing Georgia's future water policy, training newly elected lawmakers in rules of procedure and leadership skills, or surveying the general public on education issues.

- The Institute conducts instruction and professional development activities for members of the Georgia General Assembly. The Georgia Legislative Leadership Institute helps newer lawmakers enhance their leadership skills, while the Biennial Institute for Georgia Legislators provides both an orientation to the legislative process for new lawmakers and policy sessions for all attendees on critical issues facing the state.

- The Peach State Poll is a quarterly survey of public opinion in Georgia that helps policymakers understand what Georgians think about current issues.

- The Institute provides technical support and hosts the legislative reapportionment site for the Legislative Reapportionment Services Office in Atlanta.

UGA's Fanning Institute helps develop leadership skills in Georgians of all ages, in all communities, from all walks of life. In FY 2004, the Fanning Institute provided leadership training for 8,936 people.

A total of 197,659 Georgians participated in Georgia 4-H during FY 2004. Georgia 4-H is a program of the University of Georgia College of Agricultural and Environmental Sciences Cooperative Extension System.

Georgia State's Georgia International Law Enforcement Exchange (GILEE) provides training and networking opportunities to top law enforcement officials from across the state. Since it was established in 1992, GILEE has held 76 exchange programs for 369 individuals.

Georgia State's Fiscal Research Center (FRC) provides nonpartisan research, technical assistance and education in evaluating and designing state and local fiscal and economic policy, including tax and expenditure issues. The FRC is responsible for preparing revenue estimates of proposed legislation and the revenue forecast for the State government. The FRC staff and faculty have provided technical assistance to many government officials and agencies, including:

- Georgia Governor's Office
- Senate Research Office
- Georgia Department of Human Resources
- Georgia Department of Labor
- Georgia Department of Revenue
- Georgia Department of Economic Development
- Senate Insurance Committee
- House Insurance Committee
- House Ways and Means Committee
- Senate Finance Committee
- Senate Appropriations Committee

Many of Georgia's business leaders were educated at one of the 13 Master of Business Administration (MBA) programs at USG institutions across the state.

USG institutions have proven to be instrumental in the lives of prominent Georgians, sometimes in unexpected ways.

As Georgia Highlands College President Dr. J. Randy Pierce grew up in a blue-collar neighborhood in Hapeville, Georgia, college was never presented to him as an option. His mother had a high school diploma and his father completed only the eighth grade. Dr. Pierce sold his car after high school to afford tuition at Middle Georgia College. When the money ran out, he transferred to Georgia Perimeter College. "Georgia Perimeter helped me define my dream, one that in my childhood I had consistently believed was unattainable," he says. "There's not very much in my life after I began attending there that can't be attributed to Georgia Perimeter College." He earned his bachelor's degree, master's degree, and Ph.D. from Georgia State University.

Pulitzer Prize winner Gene Patterson credits North Georgia College & State University for his military and journalism careers. Mr. Patterson was a tank platoon commander with General George S. Patton's Third Army in Europe during World War II, where

Patterson earned the Silver Star for gallantry in action and the Bronze Star with Oak Leaf Cluster and Combat V for heroic achievement.

Mr. Patterson won the Pulitzer Prize for editorial writing in 1967 for his columns and editorials championing civil rights as editor of the *Atlanta Constitution*. "I was prepared for my military career and my journalism career by what I got here at this wonderful place," says Mr. Patterson.

E. Developing Georgia's Communities

USG institutions have a huge impact on Georgia's communities. For example, South Georgia College hosts regional swim meets three times per year and invites the community to swim year-round at its indoor Aquatic Center. South Georgia College Elderhostel programs bring more than 500 people to the area each year, each spending five nights in local hotels. The College also coordinates summer camps for 500 high school students each year.

Other examples include:

Columbus State University received the city's first Renaissance Award in 2001 for igniting a rebirth of downtown Columbus, including:

- Columbus State's role in keeping TSYS in Columbus
- Columbus State's Schwob School of Music located in the RiverCenter performing arts center
- Downtown's renovated Rankin Hotel houses continuing education arts facility and deluxe loft apartments for 108 students
- Columbus State's departments of art and theatre will move to new world-class facilities along the Chattahoochee River in Fall 2006
- Two new student apartment buildings will open in Fall 2006 in the heart of downtown Columbus, housing about 250 students in the top four floors of two five-story buildings, and creating new retail space on the street level

Southern Polytechnic State University and the City of Marietta created the Research and Design Collaborative in 2002, which allows students and faculty in the School of Architecture, Civil Engineering Technology and Construction to work on real-life redevelopment projects. The projects are presented to community leaders, council members, developers and architects. Some project examples are:

- Revitalization of the Allgood Neighborhood at North 120
- Urban Revitalization of Franklin Road Corridor
- Urban Redevelopment of the Business District of Roswell Corridor

Students in Georgia College & State University's J. Whitney Bunting School of Business developed a marketing study for Eatonton in 2004, and are creating an integrated marketing communications campaign. The study helped community leaders raise funds to renovate the historic jail, develop two parks in downtown, and more.

The Community Policy and Research Services (CPRS) Program at Georgia Tech's Economic Development Institute (EDI) provides a multitude of services to help communities with issues related to planning, economic development, and quality of life. In the past five years, CPRS services were provided to communities and individuals in 154 of Georgia's 159 counties. CPRS also develops economic impact software tools that can be used by all cities and counties. It developed a fiscal impact software tool known as LOCI (LOCal Impact) to help local decision makers assess the economic and tax

benefits and government costs of the incentives offered to a company to locate in the community.

During the 2004-2005 school year, 851 Georgia College & State University student volunteers contributed more than 15,000 hours of service to the local community, valued at nearly $300,000.

Georgia State University has made a significant impact on the growth of Atlanta, sparking the revitalization of the city's downtown community. Although development decisions are made by the university to further its mission of teaching, research and service, campus growth has helped boost the quality of life in the heart of Atlanta. Following the creation of a strategic plan in the 1990s, the university developed and began implementing a master plan that has guided the physical growth of the campus. A dozen newly built or significantly renovated facilities have increased the university's imprint in the city, beginning with the transformation of the Rialto Center for the Performing Arts into a first-class performance venue in early 1996.

The Georgia State campus now offers student housing and recreation options, modern classrooms and meeting spaces. Plans are underway for new science teaching and research space, increased program space and additional housing options. All of the new campus facilities will continue to include a greater connection with the surrounding community, adding vitality to the streets of the city through street level retail and large windows. Once an isolated commuter campus separated from the city, Georgia State University is now one of the nation's leading urban research universities, actively involved as a part of the city where students can live learn and work.

Armstrong Atlantic State University (AASU) has committed leadership and resources in a number of significant ways to Step Up – Savannah's Poverty Reduction Initiative. AASU faculty and staff are volunteering in health care policy, communications and overall program evaluation, as well as serving on the advisory board. In addition, faculty and students from the College of Education and the College of Health Professions provide health care and adult education classes for the Cuyler Brownsville neighborhood through the St. Mary's Community Center.

A national panel of judges selected The Latino Initiative of the University of West Georgia (UWG) as winner of the 2003 Jimmy and Rosalynn Carter Partnership Award for Campus-Community Collaboration. In the project, UWG, in a formal collaboration with Latinos United of Carroll County, is providing services to the growing Hispanic population at the same time that UWG nursing and social sciences students are getting real world experience.

Latino Initiative Services

Health care
Personal finance
Family planning
Child care
Substance abuse
English language

F. Preserving a Quality Environment in Georgia

Programs at many USG institutions help Georgians achieve their goals while preserving the state's quality environment.

The Skidaway Institute of Oceanography (SkIO) is an autonomous research unit of the University System of Georgia. More than $6.2 million of SkIO's FY 2004 budget of $8.4 million came from grants, contracts, royalties and other non-State funding.

SkIO's mission is to provide Georgia with a nationally and internationally recognized center of excellence in marine science through strong internal research programs across a broad range of sub-disciplines. For example, SkIO scientists are monitoring Georgia's coastal salt marshes, which had seen large portions become mudflats as the salt marsh grasses began dying around 2002. The marsh grasses seem to be recovering since the region's long drought ended in 2004, and researchers are now developing a health index to recognize unhealthy marshes and identify recovery in sick ones.

Researchers are also studying an old rice impoundment near Savannah to learn what happens when a fresh-water rice field returns to its natural state as a salt marsh. The Georgia Department of Transportation found it necessary to destroy some marshland in order to widen a local highway. To meet the requirement of making up for that destruction, DOT bought an old, 400-acre freshwater rice impoundment about a mile downstream and breached the dikes to allow the saltier Ogeechee River water to flow in.

In addition to their environmental importance, Georgia's coastal salt marshes are also important to the productivity of shrimp, crab and other commercial fishing industries, since the marshes provide critical nursery grounds, food sources and habitat.

The Center for Water Resources at the University of West Georgia (UWG) solved a problem for Cave Springs when the huge swimming pool that holds the overflow from the famous spring faced closure because the pool's discharge was killing fish in Little Cedar Creek. UWG professor Jim Mayer did a water quality study and worked with city and Georgia Environmental Protection Division officials to stop chlorination in the pool and change its classification from swimming pool to lake. Officials, swimmers and fish were all happy with the solution.

In addition to locating high yield wells for individuals, towns, schools, and colleges throughout rural north Georgia, UWG faculty and students are studying changing sediment loads and their effects on the usable lifespan of water sources such as the Snake Creek Reservoir, Tallapoosa River and Little Tallapoosa River.

Georgia State University's Environmental Policy Center conducts research that focuses on the design and assessment of alternative policies for managing natural resources and environmental systems. Major areas of research include:

(1) conflict management related to interstate water resources;
(2) developing management principles for managing groundwater resources;

(3) developing new methods for measuring damages from environmental degradation;
(4) developing optimal investment strategies for resource systems characterized by uncertainty; and
(5) designing systems for privatizing federal activities related to the management of toxic materials.

The Environmental and Experimental Economics Laboratory is a state-of-the-art research facility unique to the Southeast. It contains 24 subject computer stations with Ethernet connections linked to the TCP/IP Internet system and has the capability of providing multimedia presentations and economic experiments to other locations. With its 30-notebook station portable laboratory, staff can easily conduct economic experiments at sites throughout the nation. The Laboratory supports research, testing, and training in experimental economics, focusing on primary issues regarding pollution control, and water and natural resource management.

Gainesville College was recently approved to establish the Institute for Environmental and Spatial Analysis (IESA). This Institute is a collaborative effort of the Social Sciences, Business, and the Science, Engineering and Technology Divisions at Gainesville College, the School of Natural and Health Sciences at North Georgia College & State University, and the Department of Biological and Agricultural Engineering at the University of Georgia. The Institute is a partnership, co-directed by the affiliated schools.

The main focus of the IESA is the development of an in-depth scientific understanding of water quality, watershed integrity, and land use impacts within the Chattahoochee River Basin and other basins in northeast Georgia. The IESA will participate in collaborative course development within the environmental and spatial analysis areas, in particular water quality analysis, watershed assessment, source water assessment, spatial data analysis, and hydrologic modeling. Course development will evolve as a result of applied research within the Chattahoochee River Basin involving faculty, graduate and undergraduate students to ensure currency and relevance of course work.

G. Other Impacts

$101.5 million	Total individual and corporate giving to the four USG research institutions in FY 2004 (does not include giving to athletic programs)
86	Doctor of Veterinary Medicine degrees awarded in FY 2004 (only University of Georgia offers this degree among USG institutions)

People and companies across the country decide to give to USG institutions – some are alumni, some just want to support their local college, and some give for specific programs. Their gifts help support a wide range of programs, for example:

Augusta State's main Literacy Center on campus helps more than 425 clients each week. Satellite centers at East Augusta Middle School and Norris Elementary School in McDuffie County serve additional functionally illiterate adults. The centers are staffed by students majoring in education, as well as community volunteers who have been trained as tutors. According to Dr. Paulette Harris, founder of the Center and member of the Governor's task force on literacy, about one in seven Georgians is functionally illiterate.

Georgia State University's Project Healthy Grandparents has helped more than 500 families and 1,200 children in the state, saving Georgia over $6 million in foster care costs. This program helps grandparents who are raising their children's children, because the children's parents are unwilling or unable to do so. Core services include monthly home visits for one year by social workers and nurses, support groups, parent education workshops, and legal services. This program began in 1995 at Georgia State, and became a national center in 2001.

Veterinary Programs

The University of Georgia graduated 86 students who earned a Doctor of Veterinary Medicine in FY 2004, another 19 students with other graduate degrees in veterinary medicine, and an additional seven with undergraduate degrees in Veterinary/Animal Health Technology/Technician. Here is one graduate's story:

> Brian Barrs, D.V.M. graduated from Middle Georgia College in 1996 with an Associate of Science in Pre-Veterinary Medicine. He transferred to the University of Georgia, earned his bachelor's degree, and was admitted to UGA's School of Veterinary Science. He was the valedictorian of his graduating class, and today practices veterinary medicine at Barrs-Hall Animal Clinic in Wilkinson County.

In addition, USG institutions perform research and provide services in the animal sciences. For example, the University of Georgia Vet Diagnostic Lab System consists of

two labs located in Athens and Tifton. It performs more than 300,000 tests each year for vets, farmers, pet owners, scientists and regulatory officials on farm and food animals, pets, and sometimes wildlife/exotic animals.

The Institute of Arthropodology and Parasitology (IAP) at Georgia Southern University is an interdepartmental organization whose members consist of faculty and students from several departments, including biology, geology, geography, history, and psychology. Membership is open to researchers with an interest in arthropods (insects, mites, ticks, spiders, crabs, and other joint-legged animals) and parasites (viruses, bacteria, fungi, protozoa, worms, etc.). Several members are especially interested in diseases of humans, livestock, wildlife, and plants. Many of these diseases are caused or transmitted by arthropods and other parasites. The IAP's major research thrust deals with local, national, and worldwide questions concerning major arthropod pests, vectors of diseases, and other parasites.

University of Georgia professor and Georgia Research Alliance Eminent Scholar Steven L. Stice has pioneered research in developmental biology and genetics to advance agriculture and human medicine. His discoveries help develop “platform” technologies that serve as the basis for a range of combined and individual advances and applications in both fields.

An international cloning expert, Dr. Stice began developing cloning technology to improve livestock breeding in the mid-1980s, a decade before the birth of Dolly, the first mammal cloned from an adult cell. Eleven months after Dolly’s birth, he successfully cloned the first cattle, George and Charlie, in December 1997. He also showed that genes could be transferred from one organism to another during the cloning process. The process, called transgenics, can be harnessed to breed “pharm” animals that can produce a range of biomedically important products. The technology holds promise for increasing genetic diversity among livestock and preserving endangered wildlife.