## Introduction and Institutional Context

The Georgia Institute of Technology is one of the nation's top research universities, enrolling approximately 13,300 degree seeking undergraduates (as of Fall 2011). Between 2000 and 2012, Georgia Tech has produced 32,393 bachelor's degrees, approximately 74% of which were in STEM fields (Figure 1).

Figure 1: Bachelor's Degrees Awarded 2000-2012 (N = 32,393)
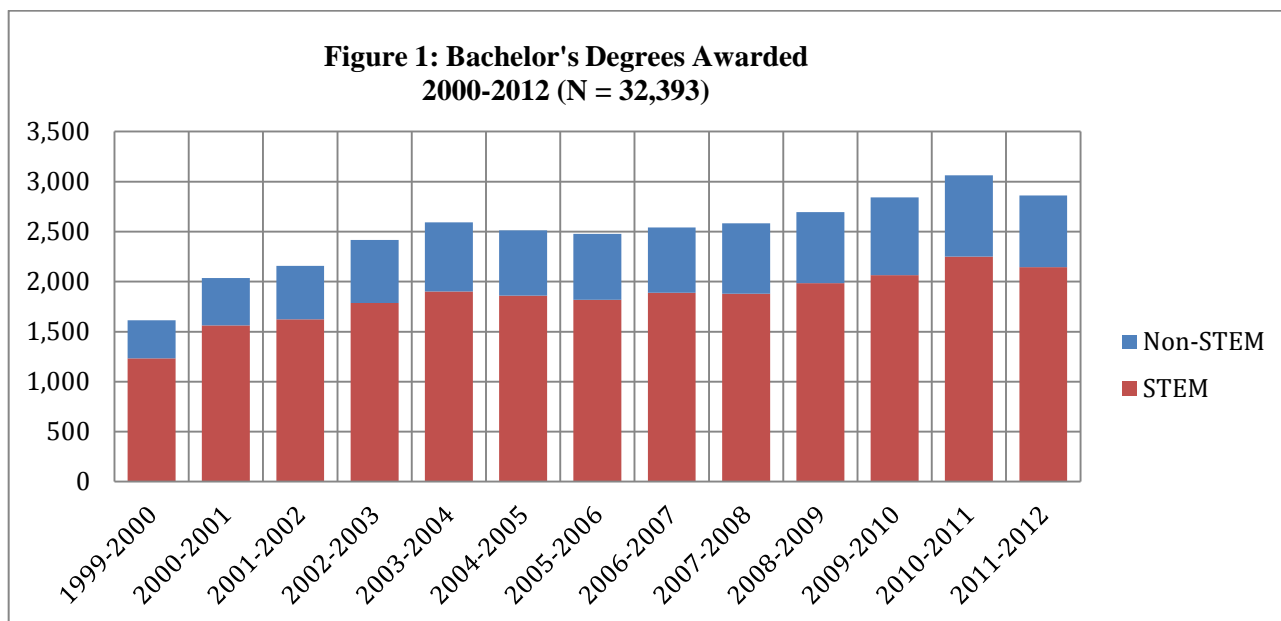
Graduating more students with STEM degrees is a national priority. In a recent briefing published by the U.S. Department of Commerce Economics and Statistics Administration, the authors write:[1]

> Science, technology, engineering and mathematics (STEM) workers drive our nation's innovation and competitiveness by generating new ideas, new companies and new industries. However, U.S. businesses frequently voice concerns over the supply and availability of STEM workers. Over the past 10 years, growth in STEM jobs was three times as fast as growth in non-STEM jobs. STEM workers are also less likely to experience joblessness than their non-STEM counterparts. Science, technology, engineering and mathematics workers play a key role in the sustained growth and stability of the U.S. economy, and are a critical component to helping the U.S. win the future.

The briefing continues to cite some facts related to job growth in STEM fields:

- In 2010, 7.6 million people or 1 in 18 workers held STEM jobs. STEM employment grew rapidly from 2000 to 2010, increasing 7.9 percent. In contrast, employment in non-STEM jobs grew just 2.6 percent over this period.
- STEM occupations are projected to grow by 17.0 percent from 2008 to 2018, compared to 9.8 percent growth for non-STEM occupations.
- STEM workers command higher wages, earning 26 percent more than their non- STEM counterparts.

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[1] http://www.esa.doc.gov/sites/default/files/reports/documents/stemfinaljuly14_1.pdf

Additional data point to strong growth in employment for degree areas represented at Georgia Tech. The U.S. Bureau of Labor Statistics (BLS) ranks Biomedical Engineering third in a list of occupations with the fastest percentage growth, projecting a 62% increase in the period 2010-20. The BLS also predicts strong growth in the following degree areas that are well-represented at Georgia Tech: Architecture and engineering (+10%); Business and Financial (+17%); Computer and Information Technology (+22%).[2]

At Georgia Tech, the increasing interest among employers in our students is evidenced by most of the metrics we use to analyze these trends. Compared to a year ago, the total number of employers recruiting on campus through our Career Services office increased by 13% in Fall 2011 and 20% in Spring 2012. Employers visited the campus more often and increased the number of schedules to meet their growing demand for students. The number of interviews was 15% higher than a year ago. In the commencement survey conducted by the Office of Assessment, students report employment rates equal to or exceeding pre-recession rates. These trends, combined with "sell out" demand for our campus career fairs, indicate a strong job market for Tech students.

To help meet the national priorities for more STEM degrees and to ensure that every student who matriculates at Tech, and wants to succeed, earns a degree, Georgia Tech has made undergraduate student success an Institute priority. Over the last decade, we have put considerable resources into programs and services that enhance student success, and we are already yielding results. We have maintained retention and graduation rates that are among the highest in the University System of Georgia (USG). Our freshman retention rate recently reached a record high of 95% (Fall 2010 freshman cohort), and our six-year graduation rate is at 79% (Fall 2005 freshman cohort). For our most recent transfer student cohorts, we retained 93% after the first year (2010-11 cohort), graduated 81% at the end of four years (2007-08 cohort), and graduated 85% at the end of six years (2005-06 cohort). Some of our accomplishments are further evident by the rankings below:

- *U.S. News & World Report* ranks Georgia Tech's undergraduate program as 7th among public universities and 36th overall in 2012. Georgia Tech's undergraduate engineering program was ranked 5th and undergraduate business program was ranked 38th.
- *Diverse: Issues in Higher Education* ranks Georgia Tech as 2nd in engineering undergraduate degrees awarded to overall minorities and 2nd in engineering undergraduate degrees awarded to African-American students.
- *Bloomberg/BusinessWeek* ranks Georgia Tech 2nd in the nation and first in the state of Georgia in annualized return on investment (ROI) based on the financial return graduates earn from their degree.

Even with these accomplishments, however, we can and will continue to work to improve student success, with a goal to achieve the retention and six-year graduation rates of our peers.

In conjunction with the implementation of our strategic plan, Provost Bras recently announced a new organizational structure for the Office of the Provost, primarily within the academic affairs units that provide leadership and services in support of academic programs, students, and faculty. Two outcomes of this restructuring will be central to our Complete College Georgia plan. First, a more focused and coordinated approach to the units that support undergraduate education has been established. A new Vice Provost for Undergraduate Education has been named and begins August 1, 2012. The units reporting to this division include the newly-established Center for Academic Success (tutoring, academic support, and GT1000 freshman seminar), Undergraduate Studies (academic advising, living learning programs), Athletics

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[2] http://www.bls.gov/ooh/about/projections-overview.htm

Academics, the Honors Program, the Division of Professional Practice (co-op and internship programs), and Undergraduate Research and Innovation.

Second, a new Division of Learning Excellence has been established under the leadership of the Dean of Libraries (whose title was expanded to include Vice Provost for Learning Excellence). This division includes the Center for the Enhancement of Teaching and Learning (CETL), Office of Assessment, and Program Review and Accreditation. The Dean of Libraries has also assumed primary operational responsibility for the G. Wayne Clough Undergraduate Learning Commons (Clough Commons), which opened in Fall 2011. The vision for Clough Commons is to be the academically-based center of gravity for undergraduate students, driving excellence in student learning, academic support, and curriculum innovations. As the central location for many of our undergraduate core science courses and labs, other "gateway" 1000- and 2000-level courses, and academic services (e.g., advising, tutoring, and academic support), Clough Commons will play a significant role in our completion plan.

While the divisions of Undergraduate Education and Learning Excellence will play important roles in this plan, improving retention and graduation rates must involve the entire campus. The team that developed our plan (Appendix A) was established by President Bud Peterson and Provost Rafael Bras and includes faculty, leaders from Student Affairs, the Office of Minority Education Development (OMED), Enrollment Services (Admissions, Financial Aid, and Registrar's Office), Government and Community Relations, Professional Education, and the Office of Institutional Research (IRP), which will continue to oversee data analysis and reporting. As further noted in Appendix A, the President's Chief of Staff and Assistant Vice President is an active member of our planning team, and there are three additional members of the President's Cabinet serving on this team as well. President Peterson will continue to lead the strategic development of our plan, and as the implementation gets underway, even more campus stakeholders will be engaged in the process.

The overarching vision of our plan is to increase degree attainment by focusing our priorities in three areas:

(1) Improving access and completion for certain populations of students, including low-income students, underrepresented minority students, and students who are academically "at risk" or "off course" for degree completion. We will also explore how we can improve our data collection on certain populations, such as veterans, first-generation students, and students with disabilities.
(2) Restructuring instructional delivery by leveraging the resources within our newest campus building, Clough Commons, to enhance undergraduate teaching and learning and to strengthen academic support and advising.
(3) Continuing partnerships with the K-12 community, primarily through programs that create pathways for Georgia Tech students to become K-12 teachers and that strengthen the pipeline of students into post-secondary STEM education.

Underlying our plan will be a continued use of data-driven strategies and metrics that that will inform our planning and decision-making.

Goals and Data Analysis

The overall goal of Georgia Tech's Complete College Georgia plan is to reach and consistently maintain an 80% six-year graduation rate and then work to increase this rate gradually to 84%, which is the average of our peer institutions. Since the initiatives outlined in our plan will have to be implemented, evaluated, and adjusted, this process will have to occur over an extended period of time, likely a minimum of five years.

While Georgia Tech has achieved an 80% six-year graduation rate, which we feel reflects good performance relative to national averages, we have been unable to sustain that level consistently. Therefore, before we set out to reach our peer

average of 84% as shown in Figure 2 below, our first priority is to attain a steady 80% rate. It should be noted that seven of Georgia Tech's peers are private institutions that typically have higher average graduation rates (91%) than their public counterparts (81%). In order to appreciate the value of having such aspirational peers, the private institutions were included in the calculation of this average as they provide us with a more challenging target.

Figure 2: 2009 Peer Institution Six-Year Graduation Rates
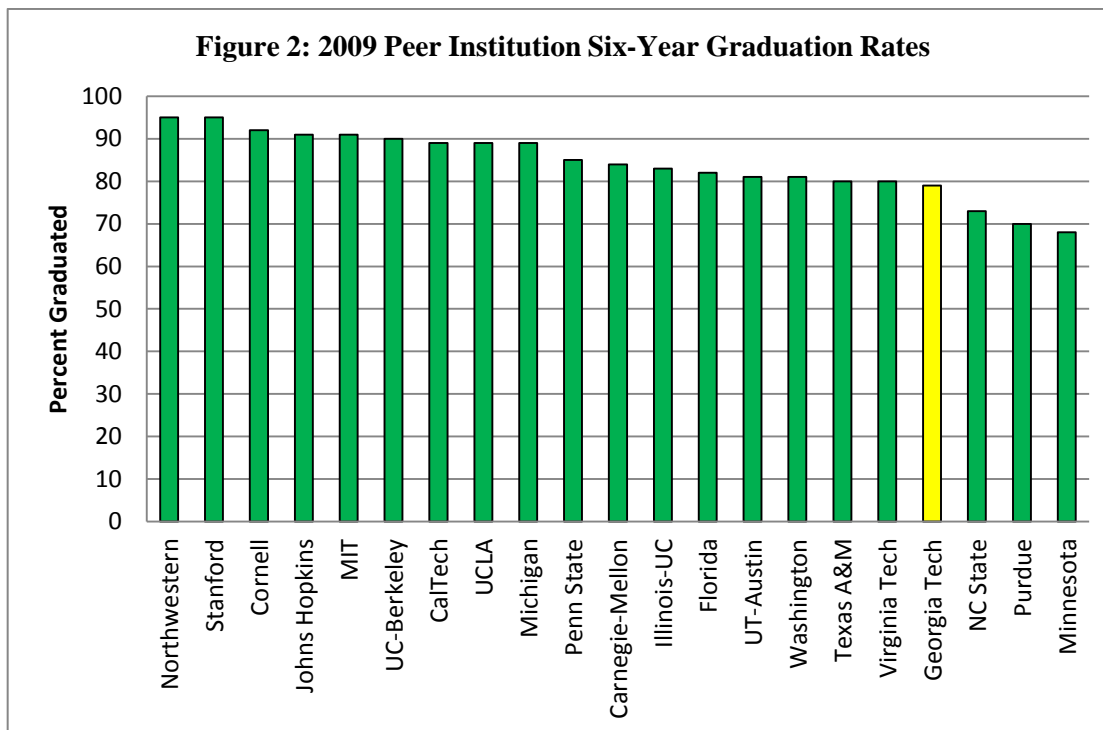
To achieve our goal of increasing our graduation rate, we must identify (1) target populations of enrolled students that *want* to graduate from Georgia Tech but are unsuccessful in achieving this goal and (2) populations of students who are experiencing lower rates of retention and graduation in order to identify factors that may be impeding their success. As a first step in this process, we completed a demographic analysis of our undergraduate student population, partially addressing the Complete College Georgia metrics. The results reveal that the majority of our students are initially enrolled either as part of traditional, degree seeking, first-time, full-time freshman (78%) or transfer (16%) cohorts. Some additional characteristics of our degree-seeking undergraduates as of Fall 2011 (N = 13,300) are shown in Appendix C. Of note are the following characteristics of our students:

- 92% (first-time and continuing) are enrolled full-time and are under the age of 25.
- 5% are first-time transfer students.
- 21% are Pell recipients (an indicator of financial need).
- Underrepresented minority students, including African-Americans, Hispanics, and Native Americans, comprise 12% of our student population.
- Fewer than 10 students are enrolled in remedial courses.
- Approximately 2% of our students have documented disabilities, but we need better data on this population.
- Based on responses to the CIRP survey (given to all freshman at orientation), we can estimate that approximately 4% - 7% of our students are first-generation. However, we need more reliable data.
- We do not have reliable data on military veteran status, but these numbers are likely small.

In analyzing our transfer student enrollment trends, we note that the majority of transfer students transfer into the College of Engineering (69%), Computing (10%) and Science (10%). In 2010, 57% of transfers came from USG schools. Georgia Perimeter College and Georgia Southern University are the largest feeder institutions of transfer students, while increasing numbers of transfers are from Georgia State University, Southern Polytechnic State University and Kennesaw State University.

Based on these characteristics, it is clear that our goals and strategies for increasing degree attainment must continue to focus on our full-time, traditional-aged students (both those entering as freshmen and those entering as transfers). Therefore, our approach to tracking and analyzing retention, progression, and graduation will not change significantly.

Data Analysis Plan and Key Findings Related to Retention and Graduation

Georgia Tech has a robust system of data collection and analysis currently in place. Our Office of Institutional Research and Planning (IRP) produces annual reports on retention and graduation for both freshmen and transfer students. The Office of Assessment partnered with Enrollment Services to conduct a survey of all non-returning students (the latest report on non-returning students was conducted in February 2004). We also monitor student success in 1000- and 2000-level courses, many of which are "gateway" courses for STEM disciplines, through a biannual analysis on midterm progress report grades.[3] Georgia Tech participates in programs such as the Freshman Survey (CIRP) through the Higher Education Research Institute at UCLA and the National Survey of Student Engagement (NSSE) in order to understand better our students' backgrounds, expectations and experiences. Special studies are also conducted on an as-needed basis by both IRP and the Office of Assessment. Appendix D summarizes Georgia Tech's current analysis plan for retention and graduation, and which metrics are tracked. We have also noted where we will work on revising some of these analyses to align with the Complete College Georgia metrics.

The figures shown in Appendix E illustrate our trends in first-year retention and six-year graduation rates for both freshmen and transfer students. From Fall 1994 to Fall 2010, Georgia Tech's first-year retention rates for first-time, full-time freshmen have steadily increased from 85% to 95%. Corresponding increases in retention for transfer students are seen between 2001 (89%) and 2010 (93%). Our six-year graduation rates have also steadily increased from 66% to 79% for freshmen entering in 1990 and 2005, and from 79% to 85% for transfer students entering in 2000-01 and 2005-06. Some additional findings are as follows:

First-Time Freshmen
- A record 95% of our freshman cohort from Fall 2010 was enrolled in Fall 2011. We have also observed historic high third-year (90%) and fifth-year (84%) retention rates for the 2009 and 2007 cohorts, respectively.
- Freshman program participation and academic standing were the characteristics most frequently observed to affect second-year retention differences among the five most recent cohorts.
- Georgia Tech's six-year graduation rate reached a record high for the Fall 2004 freshman cohort (80%), while the historic high for our four-year graduation rate was for the 2007 freshman cohort (41%). Our current six-year graduation rate for the Fall 2005 freshman cohort is at 79%, and five-year graduation rates for the 2007 cohort held steady at the record high of 72%.

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[3]Georgia Tech has a midterm progress report system in place. At mid-semester, prior to the course withdrawal date, all faculty teaching 1000- and 2000-level courses submit through Banner an "S" (satisfactory) or "U" (unsatisfactory) as an indicator of a student's performance in the course. The definition of an "S" or "U" is at the discretion of the faculty member, but many use a "C" or better to translate into an "S" and all lower grades translate into a "U."

- The most recent four- (30.4%), five- (74.0%), and six-year (79.6%) graduation rates for Hispanic students were among the lowest observed for this group in recent years. Although the five- and six-year rates are on par with Institute averages, they represent a decline for the group.

Transfers
- Retention to the second year rose from a low of 89% for the 2001 cohort to a high of 93% for the 2010 cohort. Approximately 85% of transfer students were retained through graduation, and 54% percent of those students not retained through graduation were in good academic standing when they left. Of all transfer students not retained over the past 10 years, approximately 60% left Georgia Tech during their first year, and over 59% of these students left in good academic standing.
- The 2005 transfer cohort experienced a record-high six-year graduation rate of 85%, and the 2007 transfer cohort had a record-high four-year graduation rate of 81%. Generally, graduation rates of transfer students are increasing and are on par with, or even exceed, traditional student graduation rates.

Within both our freshman and transfer student cohorts, we need better information on retention and graduation rates for students with disabilities, military veterans and first-generation students. Finally, we recognize that we need to learn more about what happens to our non-retained students. Accordingly, we conducted an analysis of our Fall 2005 freshman cohort, the most recent cohort for which six-year graduation rate data are available. As illustrated in Figure 3, of the 2,418 students in the 2005 cohort, 79% graduated within six years; 3% did not graduate and were still enrolled at Georgia Tech at the time of the study; and 18% (436) left the Institute. Of the 436 students who left, 58% had a cumulative GPA of 1.99 or lower, while 42% had a GPA above 2.00. This latter group represents the greatest opportunity for us to improve our retention and graduation rates (Figure 4).

Using data from the National Student Clearinghouse, we analyzed the 436 students who were not retained from the Fall 2005 freshman cohort. Some of our findings include:
- Degrees were attained by 157 students when they left Georgia Tech and enrolled at other schools (Bachelors: 86%; Associate/certificate: 12%; unspecified: 2%). Of the remaining 279 students, 41% were enrolled somewhere else during 2011, 57% eventually enrolled in another institution but not during 2011, and 2% had no record in the Clearinghouse after they left Georgia Tech.
- Focusing on the 134 known bachelor's degree recipients, 75% received bachelor's degrees in disciplines that were available in some form at Georgia Tech. Among the 25% earning a bachelor's degree in disciplines outside of those offered at Georgia Tech, they most often chose majors in English, education, art, communication, nursing, and religious studies. Among the bachelor's degree recipients, 66% left Georgia Tech with a GPA above the 2.00 required for graduation
- Within the 134 bachelor's recipients who left Georgia Tech, 51% were from out-of-state while the remaining 49% were from Georgia. Among the non-Georgia Residents, 86% returned to their home state, with 77% attending public institutions and 9% attending private institutions.

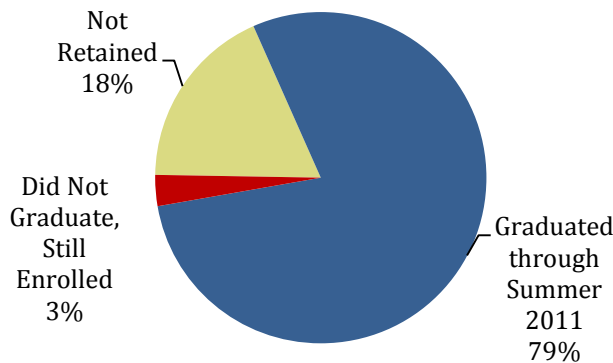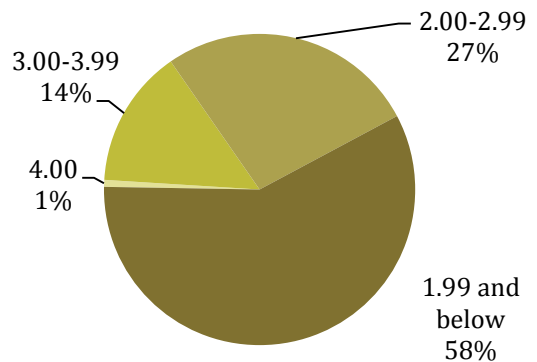**Figure 3: Status of the 2005 Entering Freshman Cohort (N=2418)**

Not Retained 18%

Did Not Graduate, Still Enrolled 3%

Graduated through Summer 2011 79%

Figure 4: Status of the 2005 Freshman Cohort GPA Ranges for Students who were Not Retained (N=436)

3.00-3.99 14%

2.00-2.99 27%

4.00 1%

1.99 and below 58%

Linking our Data to our Plan

Based on our review of our retention and graduation data, we have identified several subgroups of students that could be further studied to inform our future actions to achieve our goal. These groups include:

- Students who leave Georgia Tech in good academic standing (GPA of 2.00 or greater). As described previously, of the 436 students who were not retained from our Fall 2005 cohort, we know that 134 (31%) went on to obtain bachelor's degrees, of whom 101 (75%) received degrees in disciplines offered at Georgia Tech. We are particularly interested in the 67 students who had GPAs of 2.00 or higher who went on to earn a bachelor's degree from another institution. We would like to interview this subgroup to better understand why they left and how we might have retained them. If we had retained and graduated this group, our graduation rate would have been 84.7%.

- Students who receive 3 or more unsatisfactory ("U") grades on their midterm progress reports. Our studies of midterm progress reports show that the retention of students is negatively impacted by the number of "U" grades. For example, in Spring 2009, 28.7% of students who received three U's were not retained. These percentages have remained fairly consistent (mid-to-low 20% range) over the past few years. These studies also allow us to identify those courses with higher than usual percentages of unsatisfactory progress reports and subsequent failing grades.

- Students who are on probation or who are readmitted to Georgia Tech on academic contract. As of Fall 2011, there were 432 students on academic probation, and 117 students who were academically dismissed. Despite their high academic qualifications, these students struggled academically at Georgia Tech. Our most recent study of readmitted students found that 550 academically-dismissed students returned to Georgia Tech with academic contracts between 2006 and 2010. While 81% of these students achieved an average GPA of 2.29 during their first term back, only 14% went on to graduate from Georgia Tech.

- Students who leave Georgia Tech after attaining senior status or 90 hours. In 2007, an analysis of Georgia Tech students who attained the level of senior (i.e. 90 hours or greater) but did not earn a bachelor's degree from Georgia Tech was conducted. A total of 15,954 students attained the level of senior by accumulating at least 90

hours between Fall 1998 and Spring 2005, of which 8% did not graduate. Among those who did not graduate, 913 (73%) had GPAs that would make them eligible to earn a degree had they completed their requirements. Importantly, had all the members of the 1999 first-time freshman cohort who made it to the senior level graduated, our six-year graduation rate would have risen from 76% to approximately 79%.

- <u>Other Student Populations.</u>   African-American students have lower retention and graduation rates than students of other ethnic backgrounds. For the Fall 2010 cohort, African-American retention to the second year was 92.4%, compared to the overall 95% retention rate. The six-year graduation rate of African-Americans was 61.3% for the Fall 2005 cohort, compared to an overall 79% graduation rate. OMED is working to identify and to implement programs and services to address this discrepancy. Further, as stated, we do not have good data on military veterans, students with disabilities, first-generation students, or students who participate in some of our student affairs programs. These will be areas for exploration in our strategies.

Strategies and Objectives

The strategies achieve our goal of an 84% graduation rate will fall into three categories: (1) Improving access and completion for target student populations; (2) Restructuring instructional delivery; and (3) Continuing partnerships with K-12. An overview of these strategies is included in this section, followed by specific implementation plans in the next.

Strategy #1: Improving Access and Completion for Target Populations
Primary Metrics Addressed: Graduation and Retention Rates, Increased Access

As the majority of our undergraduate students are enrolled in one of our ABET accredited and highly ranked engineering programs, they are working through a full and demanding curriculum. Although we are committed to shortening the time to degree completion wherever possible, we do not wish to impact in a negative way the value of our degree programs. Programs such as the International Plan, Undergraduate Research Option and Co-op and Internship programs may increase the time to graduation, but they contribute positively to the student's overall educational experience. Therefore, our strategies for improving access and completion will focus on aligning our resources where we feel that we can make an impact on access and completion for specific populations. These are as follows:

- *Low-Income Students:* We believe that Georgia students from all economic backgrounds should have the opportunity to attend Georgia Tech. Committed to providing access to financially challenged students, Georgia Tech launched the G. Wayne Clough Georgia Tech Promise Scholarship Program in 2007. The program is designed to help academically-qualified, dependent Georgia residents whose family income falls below 150% of the federal poverty level pursue their first undergraduate degree. Since the program's inception, 539 students representing 86 Georgia counties have received Tech Promise funding, and as of Spring 2012, more than 200 Tech Promise students have graduated. In addition, we have committed to matching the state's newest need-based scholarship, REACH (Realizing Education Achievement Can Happen), for any REACH scholar who is accepted and enrolls at Georgia Tech.

- *Underrepresented Minority Students*: We continue to examine how we support students who are traditionally underrepresented, especially within STEM disciplines. These include African-American, Hispanic, and Native American students. As the unit charged with the retention, development, and performance of these students, OMED is engaged in significant work to increase their retention and graduation rates.

- *Students who are Academically "At Risk" or "Off Course" for Degree Completion:* Perhaps one of the largest opportunities for increased degree attainment involves examining our academic support and advising systems and policies for these students. Included in this category are students receiving three or more unsatisfactory midterm progress report grades; students on probation or readmitted on contract after dismissal; and students earning 90 credit hours at Georgia Tech who are not progressing to graduation.

- *Other Populations*: Other undergraduate student populations, in particular military veterans, first generation and students with disabilities, have not been fully studied with regards to retention and graduation. We have also not fully studied how participation in student affairs programming impacts retention. One final population we may examine are students who are taking six years to graduate to see if there are factors which might decrease their time to degree completion. For example, for the 2005 freshman cohort, the 5-year graduation rate was 72%, compared to 79% for the 6-year graduation rate. While shortening time to degree completion is not necessarily a high priority at Tech, we may explore whether there were there factors which might have led to that additional 7% graduating closer to 5 years.

Strategy #2 Restructuring Instructional Delivery
Primary Metrics Addressed: Quality, Course Completion Ratio

Many of these initiatives will connect with our new learning center, the G. Wayne Clough Undergraduate Learning Commons (or "Clough Commons") that opened in August 2011. Encompassing 220,000 square feet, Clough Commons includes modern and innovative laboratories for our "gateway" science courses; technologically-advanced classrooms ranging from small seminar settings to large tiered lecture halls; presentation rehearsal studios; an academic help desk that provides general academic advising services; and several departments that support teaching, learning, and student success. There are also "collaboration spaces" which have the potential to provide opportunities for informal teaching and learning as well as flexible, adaptable spaces accommodating individual and collaborative study and small group work. Two new academic support units were specifically created to support the mission of this building. The Center for Academic Success coordinates content/subject tutoring, supplemental instruction, academic coaching, GT1000 freshman seminar, Tech PrEP Pre-Calculus Enrichment program, and other academic support programs. The Communication Center (CommLab), which is part of the School of Literature, Communication, and Culture (LCC), provides tutoring and student support across the disciplines for all forms of communication (written, oral, verbal, electronic, and nonverbal). Finally Georgia Tech's Center for the Enhancement of Teaching and Learning (CETL) is located in Clough Commons. CETL is charged with supporting innovative pedagogy and educational technology that enhances student learning.

Another component of instructional delivery will involve providing academic support for courses that are traditionally challenging. Many of these are "gateway" courses for STEM majors. The Center for Academic Success offers PLUS (Peer-Led Undergraduate Study) sessions. Based on the Supplemental Instruction (SI) model, PLUS sessions help students develop study skills and strategies and learn difficult material in a relaxed and collaborative environment. In general, students who participate in PLUS sessions earn fewer D's, F's, or W's than those who do not. We will explore other possible courses, particularly those with high DFW rates, to pilot and implement PLUS sessions contingent on the availability of resources. Another program we hope to expand is our Tech PrEP program. Tech PrEP is a partnership between the School of Mathematics and Center for Academic Success. It is a non-credit, intensive, residential summer program for entering Georgia Tech freshmen that reviews fundamental pre-calculus concepts as well as introduces strategies critical for academic success in calculus and other first-year courses. In its first two years, students who have completed the program have performed academically better, on average, in introductory calculus than those who did not participate.

Georgia Tech, through the leadership of the Dean of Professional Education, will have preliminary discussions to determine whether offering certain undergraduate courses online for Tech students may be possible. This would particularly benefit our undergraduates who are co-oping or interning out-of-state or abroad (approximately 29% of placements over the past three semesters have been outside the state of Georgia), students studying overseas, athletes, and out-of-state students who return home for the summer break but want to take Tech courses. This has potential to impact time to degree completion as well. We may also explore the development of online tools for enhancing study skills.

Finally, Georgia Tech has recently joined peers such as CalTech, Duke, Stanford, Washington and Michigan and entered into a partnership with Coursera to put our web-based courses online and create new opportunities for learning. This partnership will provide another means for delivering instruction off campus. By joining Coursera, Georgia Tech is capitalizing on an already-robust offering of online courses and education. Coursera will enable us to expand our presence, provide increased global access to our excellent educational products, experiment with new methods and ideas in the delivery of education and, most importantly, enhance the learning options and convenience for our own students.

Strategy #3: Enhancing Partnerships with K-12
Primary Metrics Addressed: Increased Access

Although Georgia Tech does not have a College of Education, it does consider it a part of its mission to help serve the K-12 educational community of the State of Georgia, particularly in supporting STEM education. These initiatives will not have an immediate impact on Georgia Tech's degree completion rates, but they are clearly important for statewide access. One area is *Tech to Teaching*, which is a broad umbrella of programs partially supported through a National Science Foundation grant. This includes a variety of initiatives that provide pathways for Tech students who want to pursue K-12 teaching as a career option by allowing students to complete a rigorous undergraduate degree program at Georgia Tech and then enroll in a teacher preparation graduate program in another USG school, such as Kennesaw State University or Georgia State University. This program further benefits the state by providing teachers who are well qualified to meet the high demand for K-12 teaching positions in STEM disciplines. In addition, through a new joint BS/MAT degree program between Georgia Tech and Georgia State University, students can receive their BS and MAT in five years.

Currently, there are in excess of 10 funded Georgia Tech projects that interface with the K-12 community, and the principal investigators meet annually to discuss synergies and further collaborations. Through the Race to the Top STEM Innovation Grant, the *Teach for Georgia* program, modeled after the national Teach for America program, has the explicit goal of placing Georgia Tech graduates as teachers in rural Georgia secondary science and math classrooms. GoSTEM is a collaboration between Georgia Tech and the Gwinnett County Public School district aimed at enhancing the educational experience of Latino/Hispanic students in Georgia and strengthens the pipeline of these students into post-secondary STEM education. This program was recently funded through a five-year grant from the Goizueta Foundation.

The other strategy that Georgia Tech pursues with respect to pre-college students is through summer camps and enrichment programs. These fall into three basic categories: summer STEM camps, research experiences for high school students, and connections between Georgia Tech labs and rural high schools. CEISMC (the Center for Education Integrating Science, Mathematics, and Computing) offers summer week-long camps in a variety of STEM topics ranging from Robotics to Astrobiology (approximately 600 middle and high school students participated during summer 2012). These camps represent a partnership between Georgia Tech faculty and graduate students who provide the content expertise and passion with CEISMC who organizes and manages the camp process. There are opportunities for teachers who participate in the GIFT (Georgia Internships For Teachers) program (also facilitated by CEISMC) to bring a team of three high school students to campus to perform STEM research for a 5 week period during the summer. The students

receive a small stipend and then a follow up reward when they submit their results to the Siemans Science Competition and their local science fair. GTRI (Georgia Tech Research Institute) and OIT (Office of Information Technology) partner to offer the D2D (Direct to Discovery) program to a variety of (primarily rural) school districts. Through this program, classrooms connect to Georgia Tech research labs to experience the authentic research environment without the expense and time commitment of a distant field trip. Georgia Tech faculty provide instruction about the work being done in their labs and demonstrate how real scientific research is performed. All of these programs have a similar goal – provide the secondary students in the State of Georgia with authentic experiences in STEM disciplines in order to encourage them and provide them with the necessary background to pursue postsecondary education and careers in the STEM fields.

Planning and Implementation

Because our plan will require collaboration and coordination among many campus units and academic departments, a "Complete College Georgia Tech" steering committee will be established. While Georgia Tech has been studying its retention and graduation rates extensively, it does not currently have a formal retention and graduation committee. This steering committee, appointed by the Provost, and likely chaired by the newly appointed Vice Provost for Undergraduate Education, will be charged with overseeing the implementation of our Complete College Georgia plan. It will include faculty, students, and senior administrators from Undergraduate Education, Learning Excellence and the Libraries, Student Affairs, Enrollment Services, OMED, IRP, Government and Community Relations, Communications and Marketing, Campus Services, and faculty from each of our six colleges who are in leadership roles related to undergraduate education. In addition to implementing our Complete College Georgia plan, it will provide guidance for our overall retention and graduation strategies, including reviewing data, analyzing policies, requesting special studies, preparing reports, coordinating with other institute committees and groups, and making recommendations on issues that impact retention and graduation.

In the first year of the implementation of our plan, we will focus on researching many of the issues that impact our retention and graduation. This work will help us to learn the issues and challenges behind these subgroups' lower retention and identify possible resources and interventions. We also plan to continue programs and services that are already having a positive impact on our retention. Below, we describe specific actions for implementation. Lead units (specified with each area) will ensure appropriate action is taken and will report updates, progress, and findings to the Complete College Georgia Tech steering committee.

1. **Replicate (and expand) our study of non-returning students to learn more about our non-retained students.** (*Lead Unit: IRP)*

   The latest report on non-returning students was conducted in February 2004. If resources are available, IRP plans to replicate and possibly broaden the scope of this study in 2012. Populations include the 67 students identified in our National Student Clearinghouse analysis who left Georgia Tech in good standing but graduated from other institutions as well as students who left Georgia Tech after attaining senior status (90 hours or greater) who were in good academic standing. Other populations may also be included. The goals of this study will be to identify why these students left and what we might have been done to retain them. Resources have been allocated to hire a Graduate Research Assistant to work with IRP and conduct this study.

2. Propose changes in academic advising and academic support systems, particularly for students who may be academically "at risk" (*Lead Units: Undergraduate Education, Enrollment Services*)

The Center for Academic Success, a unit in Undergraduate Education, has recently hired a Senior Assistant Director to coordinate outreach and intervention efforts for "at risk" students, including students who receive multiple unsatisfactory progress report grades, students on probation, and students who are readmitted to Georgia Tech on academic contracts. Current programs include academic coaching, academic success workshops, and a structured cohort program for first- and second- year students who are at or below a cumulative GPA of 2.2. These are all voluntary programs, however, and there are currently no mandatory interventions required at the Institute level. For example, one of the most effective interventions for students who are "at risk" for not being retained for academic reasons is a mandatory, for-credit course designed to help students change their behaviors and attitudes related to academic success.[4]

Another project that we will consider this year is a review and analysis of our academic advising system and how this connects with supporting students who are "at risk." Georgia Tech's academic advising system is decentralized (advisors are housed in and report to the academic departments), and the demand on advisors for general academic advising is significant. Furthermore, advisor-student ratios and advisor responsibilities and expectations vary across departments. When a student is struggling academically, advisors often do not have the time or resources to provide timely, consistent, and meaningful intervention and support. While we have conducted surveys on advising in the past, we have not conducted a full analysis of the strengths and weaknesses of our advising system.

Despite the fact that new resources remain very limited in the upcoming academic year, we have allocated new resources towards both of these priorities. First, funding has been allocated to hire a new Academic Success Coach to expand our efforts in academic coaching and intervention of students who are "off-course" or "at risk." A search will begin this year, and our hope is to hire someone with additional background and experience working with students with learning disabilities, particularly those who are STEM students. Second, the Vice Provost for Undergraduate Education has restructured and will be hiring a new "Director of Advising" and expanding the role of this position to include efforts related to retention, student success, and college completion. As we explore the relationships between advising and academic support, it is likely that we will see an integration of our academic advising and academic support units.

3. **Review enrollment management procedures and policies to identify possible sources of sophomore to junior year attrition and potential barriers to timely degree completion** (*Lead Unit: Enrollment Services*)

In an effort to improve sophomore to junior retention rates and help more students earn their degree "on-time," Enrollment Services, which includes the Registrar's Office, Office of Scholarships and Financial Aid (OSFA), and Undergraduate Admission, will research policies and issues that may lead to possible intervention. First, the Registrar's Office will determine the feasibility of reporting mechanisms and channels for identifying (a) sophomores who request transcripts be sent to other post-secondary institutions; (b) undergraduates who have not declared degree candidacy but who fail to register for the subsequent fall semester by the end of Phase 1 Registration in April; and (c) students above 90 credit hours who do not enroll for two semesters in a row. In this latter case, these students are of particular concern to us because at 90 credits, they are within one year from earning a Georgia Tech degree.

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[4] Lindsay, Dawn (2000). A Study to Determine the Characteristics of Effective Intervention Programs for Students on Probation. Ed. D. Dissertation, Pepperdine University.

We will also research students who use grade substitution[5] and eventually go on academic dismissal. The Registrar will review the data on the issues surrounding the application of the grade substitution policy. Since the policy was put into effect in Fall 2005, approximately 200 students who have invoked it have subsequently moved to academic drop status.

Finally, the Registar's office will work with Undergraduate Education and the Georgia Tech Academic Advising Network (GTAAN) to offer workshops on interpreting DegreeWorks reports. Other institutions have found that misunderstanding these reports can impede progress towards graduation. These workshops will also include training in how to use the "what if" option in DegreeWorks to explore the implications of pursuing other majors and the "planned courses" feature to guide better course selection and give students a sense of when they could complete degree requirements.

OSFA will continue to offer programs that support retention. The office provides personalized counseling services to students referred to them and has designated advisers who routinely serve as "ombudspersons," referring students to support services. OSFA will continue to administer an emergency student loan fund to help students temporarily meet tuition expenses. Approximately 125 students per term receive emergency funds. Another smaller short-term loan fund is available to help students with funds for rent, food, and books while they wait for other financial resources. Approximately 25 students per term receive these funds.

Finally, to understand better the reasons some of our sophomores do not return to Georgia Tech, Undergraduate Admission plans to implement a system whereby these students are contacted by phone early in the fall semester to determine their reasons for not returning and, if appropriate, attempt to help them plan for a future return.

4. **Continue initiatives and programs that target retention and graduation of underrepresented students**
   (Lead Unit: Student Diversity & Inclusion; a unit of Institute Diversity)

The Student Diversity and Inclusion division (consisting of OMED and the Office of Hispanic Initiatives (OHI)) in the Office of Institute Diversity focuses on the access, retention and graduation of students who are traditionally underrepresented: African American, Hispanic, and Native American. Retention and performance efforts for these students focus on the freshman and sophomore years. Some programs that will continue to be offered include: (1) Challenge- a summer bridge program that introduces incoming underrepresented minority freshmen to Georgia Tech and provides them with the necessary skills and knowledge to succeed during their first academic year. It is a five-week, intensive program where students are immersed in the Georgia Tech environment; they live in a residence hall, take typical freshman classes taught by Georgia Tech professors, and participate in social and academic workshop facilitated by upperclassmen, alumni, corporate representatives and OMED staff; (2) Team Coach- a yearlong peer mentoring programs that focuses on academic, personal development, and social topics; (3) GT-PRIME- a new initiative aimed to address the retention and academic performance issues of African-American males at Georgia Tech. GT-PRIME is Georgia Tech's version of the Board of Regent's African American Male Initiative (AAMI), designed to provide resources, motivation, and leadership training for African American males. This is achieved through a schedule of workshops, speaker series, competitions, mentor activities, and tutoring throughout each semester, beginning with the Challenge program; and (4) Goizueta Scholarship program is an endowed scholarship initiative designed to increase Hispanic/Latino student access to a Georgia Tech education. The scholarship was

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[5]First-time freshman students who receive a grade of "D" or "F" in a course within their first two terms in residence (first three terms for those who begin in the Freshman Summer Session) are eligible to repeat the course and have the original grade excluded from the computation of the academic average. Grade substitution may be used only once per course, with a maximum of two courses total.

established at Georgia Tech by the Goizueta Foundation. All recipients of this scholarship are required to get involved in other Georgia Tech activities, and participate in mentoring events sponsored by OHI.

Institutional resources have been committed to all four initiatives listed above. Both the Challenge Program and Team Coach programs receive programmatic priority on available funds, along with dedicated staff with primary focus on these programs. GT-PRIME is part of the Board of Regents African American Male Initiative (AAMI), which provides university systems funds that are matched by the Institution. The Goizueta Scholarship program consists of an established endowment. The program manager that was initially paid half time by the Goizueta Foundation is now a full-time fully encumbered GT employee.

5. **Review student affairs programming to determine correlations between participation in specific programs and retention and graduation rates (***Lead Unit: Division of Student Affairs***)**

    The Division of Student Affairs (SA) plans to engage in a retention study to determine the extent to which students who are engaged with a particular program and/or service are retained at a higher rate and/or have a greater likelihood to graduate. The overarching question of this study is "What effects do programs and services provided by the Division of Student Affairs have on student retention?" Eight units in the Division of Student Affairs will be charged with researching potential correlations between a program, service or activity in their unit and retention and/or graduation rates. The units consist of the Campus Recreation Center, Career Services, Greek Affairs, Office of the Dean of Students, Ferst Center for the Arts, Counseling Center, Leadership, Education, and Development (LEAD) program, and the Parents Program.

    The Division of Student Affairs also supports efforts to improve sophomore retention. In 2011, in part due to a reorganization, a new office, New Student and Sophomore Programs, was established within the Office of the Dean of Students. This office is currently conducting a search for a Sophomore Programs Coordinator who will continue to expand and initiate new programs designed to address sophomore retention. The office will analyze the impact of these programs on retention and graduation.

    Finally, the Dean of Students recently began an online referral form on its website. An email from the Provost is sent each semester to encourage faculty to refer students they may be concerned about to the Office of the Dean of Students using this online form. Staff from the Dean's office meet with students, and, if needed, make referrals to other appropriate offices (e.g., Counseling Center, Career Services, Center for Academic Success, Academic Advisors, Faculty member, etc.).

6. **Improve Data on Military Veterans, Students with Disabilities, and First-Generation Students**
    (Lead Units: Enrollment Services, Division of Student Affairs)

    Enrollment services will begin adding questions on our admission application to collect data on military veterans and first-generation students starting in Fall 2012. This will allow us to begin tracking and analyzing these student populations, and they will be included in our first-year and transfer student retention and graduation studies starting in 2013.

    The Division of Student Affairs at Georgia Tech plans to conduct a needs assessment to learn more about student military veterans in an effort to: (1) Identify enrollment numbers of student veterans; (2) Examine their retention and graduation rates; and (3) Learn about their opinions and attitudes with respect to how the institution might improve their degree of engagement both inside and outside of the classroom. Student Affairs is considering creating a

"Director of Veterans Affairs" position for Georgia Tech and will be leading the efforts to improve data collection efforts, starting this year.

The population of students with disabilities has grown significantly in the past decade. The number of students registered with the Access Disabled Assistance Program for Tech Students (ADAPTS) has increased from 184 in 2001-2002 to 563 in 2011-2012— a 206% increase in the last 10 years. More than 400 students with chronic disabilities are served through the ADAPTS program. We have begun collecting data on these students by identifying them in BANNER, and we will also track these students in our first-year and transfer student retention studies starting in 2013. In addition, Student Affairs has purchased a new software management system from AMAC (Alernative Media Access Center), which is now housed at Georgia Tech. This software will enable us to track retention and graduation rates.

Should fiscal resources become available, the Division of Student Affairs plans to conduct a needs assessment to learn more about student with disabilities in an effort to realize the extent to which difficulties that students with disabilities experience may impede their ability to succeed and to ascertain any differences in retention and graduation rates between students with disabilities and their non-disabled peers. Finally, we will be conducing a program review on Disability Services to determine how we can improve our service to these students.

7. **Analyze the impact of Clough Commons on enhancing student success**
   (Lead Units: Learning Excellence, Units located in Clough Commons)

The Divisions of Learning Excellence and the Libraries, which oversees the operation and management of Clough Commons, has begun a comprehensive study examining the impact of Clough Commons on teaching and learning. Some areas it plans to study include:
- Comparison between 2010-11 and 2011-12 grades in courses that are currently being offered in Clough Commons
- How are teaching and learning in Clough Commons different from teaching and learning in other buildings?
- How does the Clough Commons facilitate interactions between faculty and students?

The utilization of tutoring and academic support services- and their impact on student success- will also be studied by the various units that offer these programs. In particular, the Center for Academic Success provides content tutoring and academic support programs for many of our core STEM courses (calculus, chemistry, physics, etc.), and our Communication Center provides support for all forms of communication across the disciplines. These units currently track student usage through a program called "TutorTrac" which collects student information and links it to academic information. Both units are working on enhancing their comprehensive assessment plans that examine several outcomes for these programs.

8. **Continuing pre-teaching support for GT Students and K-12 outreach efforts** (*Lead Unit: Learning Excellence*)

CETL has recently hired a new Pre-Teaching Advisor/Coordinator. This individual will work collaboratively with campus partners involved in K-12 programs and take the lead on moving our pre-teaching support and K-12 outreach programs to the next level. Some of these programs include coordinating and teaching our pre-teaching courses offered through CETL and running PT-SURE, our Pre-Teaching Summer Undergraduate Research Experience program where Georgia Tech undergraduate students who are interested in pursuing a teaching career may apply for a summer research position in a lab at Georgia Tech that also hosts a secondary math or science teacher through the

Georgia Internship Fellowship for Teachers (GIFT) program. A challenge moving forward with all of our pre-teaching and K-12 programs is to reach more students – by the very nature of our student body, the individual advising needs are very specific and varied, and we don't necessarily have undergraduates who come to Tech focused on pursuing teaching careers.

The GoSTEM initiative, based in CETL as well as the Center for Education Integrating Science, Mathematics, and Computing (CEISMC) will also be moving forward this year and will work closely with the Pre-Teaching Advisor. The GoSTEM initiative builds upon our existing K-12 initiatives. We are currently working with a cluster of schools in Gwinnett County Public schools and employ a model which maximizes the impact of our interventions within the population of students in this particular cluster. This strategy allows us to track concentrated effects on students who simultaneously participate in more than one initiative at a time within the cluster, and sustainability effects on those students who participate in one initiative at each grade level over time. As a result, we will be able to reach elementary, middle, and high school Hispanic students, parents, and teachers within the cluster and engage Georgia Tech undergraduate students, graduate students, and faculty and the broader community in our efforts to expand the horizons of Latino/Hispanic students.

Ongoing Feedback and Evaluation

Our Complete College Georgia Tech steering committee will be charged with overseeing our plan and disseminating information to the campus. The committee will liaison with and provide feedback to other Institute standing committees and groups, such as the President's Cabinet, Enrollment Management Advisory Board (EMAG), Deans' and Associate Deans' meetings, and the Institute Undergraduate Curriculum Committee (IUCC). Representation on the committee will include staff from Communications and Marketing to ensure that we are promoting and sharing our work on retention and graduation. The Office of Institutional Research and Planning will continue to oversee the retention, progression, and graduation data analysis plan described previously and outlined in Appendix D. We will review these studies, however, to determine what additional information may inform our completion plan and align with the USG and CCA metrics.

Appendix A: Georgia Tech's Complete College Georgia Planning Team

Dr. Nelson Baker	Dean, Professional Education/Associate Professor in the School of Civil & Environmental Engineering
Ms. Cassandra Belton	Associate Director of Institutional Research & Planning/Decision Support Services
Ms. Sandi Bramblett	Executive Director of Institutional Research & Planning/Decision Support Services
Ms. Lynn Durham	Assistant Vice President and Chief of Staff, Office of the President*
Dr. Steven P. Girardot	Assistant Vice Provost for Undergraduate Education & Director, Center for Academic Success
Dr. Dana Hartley	Undergraduate Coordinator, School of Earth and Atmospheric Sciences
Dr. Paul Kohn	Vice Provost for Enrollment Services
Dr. Donna Llewellyn	Associate Vice Provost for Learning Excellence & Director, Center for the Enhancement of Teaching and Learning (CETL)
Mr. S. Gordon Moore	Executive Director for Student Diversity and Inclusion
Dr. Usha Nair-Reichart	Associate Professor, School of Economics
Dr. Caroline Noyes	Assistant Director, Office of Assessment
Ms. Reta Pikowsky	Registrar
Dr. Colin Potts	Vice Provost for Undergraduate Education/Associate Professor, College of Computing*
Dr. William Schafer	Vice President for Student Affairs*
Mr. Dene Sheheane	Executive Director of Government and Community Relations*
Dr. Anderson Smith	Special Assistant to the Provost/Regents' Professor of Psychology
Ms. Beth Spencer	Interim Associate Director, Center for Academic Success

Serves on President's Cabinet

Appendix B: Peer First-Year Retention and Graduation Rates

Figure B1: 2009 Peer Institution Freshman Retention Rates

Figure B2: 2009 Peer Institution Six-Year Graduation Rates
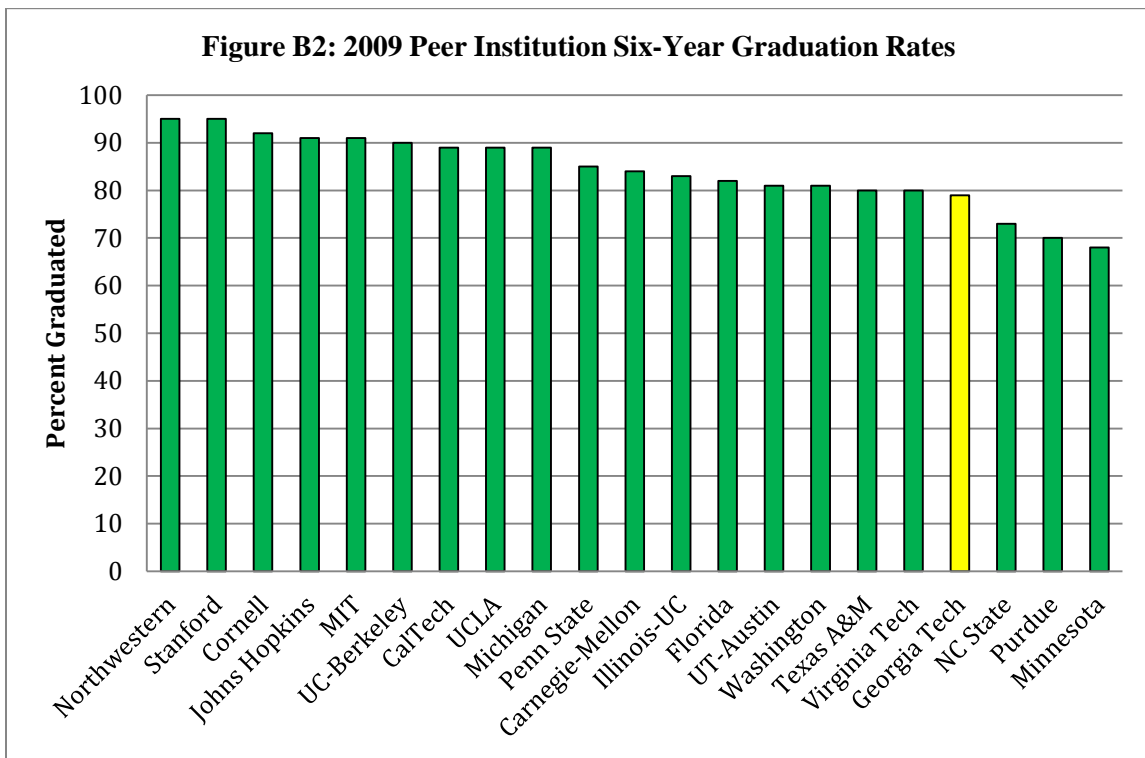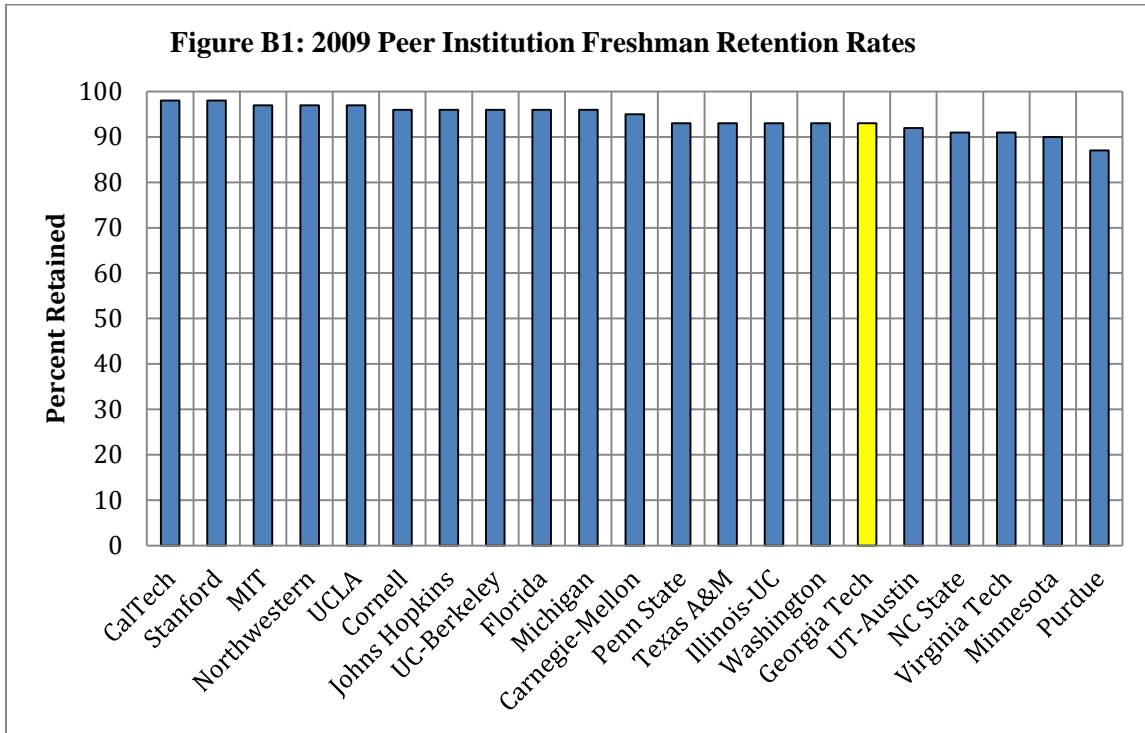
Appendix C: Undergraduate, Degree Seeking Student Profile (as of Fall 2011)

	Degree Seeking Undergraduate Population[1]	Full-Time First-Time	Part-Time First-Time	Full-Time First-Time Transfer	Part-Time First Time Transfer	Full-Time Continuing	Part-Time Continuing	Total Degree Seeking	Total Degree Seeking %
Total	Total Students	2,692	3	654	38	9,271	642	13,300	100%
Race/ Ethnicity	Hispanic	159	1	54	4	511	40	769	6%
	Black/African-American	167		69	2	564	47	849	6%
	White	1,576	1	358	18	5,638	399	7,990	60%
	Asian	444	1	88	13	1,582	111	2,239	17%
	Native Hawaiian/Pacific Islander	2	-	-	-	8	3	13	0%
	American Indian/Alaska Native	2	-	1	-	18	-	21	0%
	Two or More Races	88	-	22	1	216	18	345	3%
	Unknown	18	-	5	-	53	4	80	1%
	Non-resident Alien	236	-	57	-	681	20	994	7%
Gender	Male	1,677	2	515	28	6,322	476	9,020	68%
	Female	1,015	1	139	10	2,949	166	4,280	32%
Age	19 and under	2,667	3	153	1	2,222	9	5,055	38%
	20-24	25	-	434	19	6,701	498	7,677	58%
	25 and over	-	-	67	18	348	135	568	4%
Class	Freshman (0-29 Hours)	2,467	3	8		253	4	2,735	21%
	Sophomore (30-59 Hours)	212		285	8	2,473	28	3,006	23%
	Junior (60-89 Hours)	12		314	24	2,882	101	3,333	25%
	Senior (90+ Hours)	1		47	6	3,663	509	4,226	32%
Academic Standing[2]	Good Standing	2,568	3	588	30	8,358	531	12,078	91%
	Review/Warning	94		46	4	489	40	673	5%
	Probation	30		18	4	331	49	432	3%
	Academic Dismissal	-		2	-	93	22	117	1%
Other	Pell Recipient	454	1	242	18	1,935	137	2,787	21%
	Remedial Courses	**	**	**	**	**	**	**	**
	Military Veterans	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	First Generation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Disability	13	-	4	-	215	32	264	2%

1- Georgia Tech's total undergraduate population was 13,948 for Fall 2011; 648 students were non-degree seeking (5%); **2-** Standing as of the end of Fall 2011; ****-** Less than 10; **N/A** = Data not available.

Appendix D: Georgia Tech Data Analysis for Retention, Graduation, and other Student Outcomes

GT Report	Publication Frequency	Population	Metrics Tracked	Additional Analyses to be considered for CCG
First-Time, Freshman Retention Study	Annually	First-Time Freshmen	• 4-, 6-, and 8- year graduation rates • Year to year retention rates	• Stratification by federal financial aid (Pell eligible) status • Veterans • Disability status
Transfer Student Retention Study	Annually	Transfer Students	• 4-, 6-, and 8- year graduation rates • Year to year retention rates	• Stratification by federal financial aid (Pell eligible) status • Veterans • Disability status
Mid-Term Progress Report Study	Bi-annually	Students Enrolled in 1000- and 2000- level courses	• Success in "gateway" courses (beyond English & Math)	• Course completion ratio • Additional factors may be added
Survey of non-returning students	As requested	All non-returning undergraduates in good academic standing	• Qualitative study to determine reasons for departure from Georgia Tech	• Class standing (90 plus hours may require a different survey)
Sophomore Retention Study	As requested	Continuing freshman cohorts who were full-time in their second fall term	• Characteristics of those students retained through the second year of study at GT	
CIRP/BSSE	Annually	Entering freshmen and transfer students	• Student background and expectations	
National Survey of Student Engagement	Approx. Every three years	First-year and senior students	• Student satisfaction with the GT experience	

Appendix E: Longitudinal Trends in First-Year Retention and Six-Year Graduation Rates for Entering

First Year Retention Rate
For Freshmen Entering Fall 1994 through Fall 2010

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Percent Retained	85%	85%	85%	86%	86%	90%	90%	91%	90%	92%	92%	92%	92%	93%	93%	94%	95%

Six-Year Graduation Rates
For Freshmen entering Fall 1990-2005

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Percent Graduated	66%	68%	69%	69%	69%	68%	68%	69%	72%	76%	77%	78%	77%	79%	80%	79%

First Year Retention Rate
For Transfer Students Entering 2001-2002 through 2010-2011

	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
Percent Retained	89%	91%	91%	90%	91%	90%	93%	93%	92%	93%

Six-Year Graduation Rates
For Transfer Students entering 2000-2001 through 2005-2006

	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Percent Graduated	79%	78%	79%	83%	82%	85%