

Assessment of 2004-05 Progress on Our Strategic Plan for Excellence

**College of Engineering & Applied Science
University of Colorado at Boulder**



**Robert H. Davis, Dean
September 2005**

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EXECUTIVE SUMMARY

Fiscal year 2005 (7/1/04-6/30/05) was the second year of implementation of a five-year strategic plan for the College of Engineering and Applied Science in the University of Colorado at Boulder. The plan has broad objectives of excellence in research, education and resources, with specific action items and measurable goals for each objective. Considerable progress has been made in all three areas (research, education and resources), though not all goals have been met.

Highlights in research progress during the past two years include the formation of new research centers in cybersecurity and unmanned vehicles, the launch of campus initiatives in biotechnology and nanotechnology, and increased university-industry collaborations. Highlights in educational programs during the past two years include piloting the Discovery Learning Program and the Earn-Learn Program in FY04, and involving more than one-third of our undergraduates in extracurricular active learning in FY05. Highlights in resource excellence during the past two years include 18 new faculty hires, including eight women, introduction of an engineering differential tuition and course-specific fees, expenditure of nearly \$3M for renovation of research and educational facilities, elections of George Born and Kaspar Willam to the National Academy of Engineering, selections of Frank Barnes for the NAE Gordon Prize and Kristi Anseth for the NSF Waterman Award, and establishment of five new endowed chairs or professorships.

On the other hand, progress has fallen short of goals in grant funding, student recruiting, and private giving. Looking ahead to FY06 and beyond, there are several areas of challenge where additional efforts and midcourse corrections to the strategic plan are needed:

- *Federal grant funding has become more competitive and applications-oriented*
- *Student diversity measures, quality measures, and interest in engineering have not shown significant improvements*
- *Graduate applications from domestic and foreign students have declined by a large amount*
- *State funding of higher education and future tuition levels are facing large uncertainties*
- *Private giving has been relatively low during this period between capital campaigns*

I. INTRODUCTION

In December 2003, the College of Engineering and Applied Science at CU-Boulder published *A Strategic Plan for Excellence 2003-2008*, to provide guidance over the five-year period of FY04-FY08, so that we make wise use of limited resources and focus on high-quality education and research programs that attract additional resources. Our broad vision is to be widely recognized for excellence and leadership in research and education, with an emphasis on active, discovery and service learning. The plan includes three broad objectives for the College (see http://engineering.colorado.edu/facultystaff/Strategic_Plan.htm):

- *Through interdisciplinary research excellence, develop new knowledge at the forefront of engineering and technology that enhances the well-being of individuals and society*
- *Through active engagement in discovery and service learning, provide educational excellence to recruit and prepare students for outstanding leadership and service*
- *Through outstanding faculty and staff, and enhanced facilities and funding, build resource excellence for supporting continued advancement in research and education*

Each of these objectives is accompanied by measurable goals and by action items to achieve these objectives and goals. An assessment of progress made on the proposed action items and quantifiable goals during FY05, covering the period 7/1/04 – 6/30/05, is provided in this report, along with data from the prior two years.

II. RESEARCH EXCELLENCE

Our vision of excellence in research is supported by initiatives to enhance both core and emerging areas of research distinction in four categories: (1) New research centers and initiatives, (2) External funding for research, (3) Corporate partnerships and support of research, and (4) Faculty research development and productivity. For each category, the goals and results are provided below, followed by an assessment of planned actions in support of the goals.

II.1 New Research Centers and Initiatives

Goal: *Addition of at least five interdisciplinary research centers during FY04-FY08.*

Result: Two centers have been established to date:

1. Computer and Communications Security Research and Education Center (approved June, 2003; Alex Wolf, Director)
2. Research and Engineering Center for Unmanned Vehicles (approved October 2003; Brian Argrow, Director)

Additional centers are in the planning stages.

Goal: *Establishment of three major initiatives during FY04-FY08 in areas of emerging distinction aligned with campus-wide or system-wide efforts.*

Result: Two initiatives were begun during the past two years, with campus support:

Biotechnology: Under the leadership of Leslie Leinwand (MCDB), Kristi Anseth (ChBE) and Natalie Ahn (Chem & Biochem), this initiative focused in FY04 and FY05 on the hiring of five biotechnology faculty (including Melissa Mahoney in ChBE) in growth positions provided by the Provost and Deans. Planning for a new building has also been initiated.

Nanotechnology: Under the leadership of Roop Mahajan (ME), this initiative focused in FY04 and FY05 on obtaining the first phases of federal funding (\$0.6M in FY04 and \$0.3M in FY05, with another \$4.1M pending) and college and campus support (\$1.5M over the next three years) to establish a Nanotechnology Laboratory and Characterization Facility in the Discovery Learning Center.

Action Planned and Assessed: *Submit campus-wide proposals to the Provost and Chancellor for support of initiatives in emerging areas.* Action was taken to establish two initiatives, with Kristi Anseth taking the college lead in biotechnology and Roop Mahajan taking the lead in micro/nanotechnology. A campus initiative in sustainable energy is in the planning stages.

Action Planned and Assessed: *Provide seed funding of \$10K each for new interdisciplinary research centers.* This action was taken by the College to help form the two new centers noted above.

II.2 External Funding for Research

Goal: *Increased contract and grant awards by 10% per year, to \$60M by FY08.*

Result: This goal for increased contract and grant awards was exceeded in FY04, with a record of \$42.8M in new funding, but new contracts and grants awarded declined to \$39.3M in FY05:

FY03: \$37.5M (baseline) contract and grant awards

FY04: \$42.8M (+14.1%) contract and grant awards

FY05: \$39.1M (-8.6%) contract and grant awards

These funds include only contracts and grants rostered in the College, and not those rostered in other units but involving college faculty, and it does not include private gifts or awards.

Action Planned and Assessed: *Increase total number and value of research grant proposals by 10% per year, from the FY03 baseline of 554 proposals for \$273M.* The number and total value of proposals increased in FY04, but by less than the goal, and then decreased in FY05:

FY03: 554 (baseline) proposals totaling \$273M (baseline)

FY04: 577 (+4%) proposals totaling \$274M (+ 0.4%)

FY05: 553 (-4%) proposals totaling \$255M (-7%)

Action Planned and Assessed: Increase multi-investigator grant proposals of \$1M or more by 10% per year, from the FY03 baseline of 57 proposals. The number and total value of grant proposals of \$1M or more decreased in both FY04 and FY05:

FY03: 57 (baseline) proposals totaling \$160M (baseline)

FY04: 53 (-7%) proposals totaling \$146M (-9%)

FY05: 45 (-15%) proposals totaling \$132M (-10%)

Action Planned and Assessed: Fund a new college program at up to \$35K per year for faculty travel to funding agencies. This program was established in FY04 to support faculty travel to funding agencies. It is undersubscribed but growing:

FY04: 8 awards totaling \$3400

FY05: 13 awards totaling \$6900

II.3 Corporate Partnerships and Support of Research

Goal: Increased contracts and grants from industry by 10% per year, to \$6M in FY08.

Result: Substantial progress toward the goal of \$6M in annual corporate support was made in FY04, and then the goal was met in FY05:

FY03: \$4.2M (baseline) contracts and grants from industry

FY04: \$4.7M (+12%) contracts and grants from industry

FY05: \$6.4M (+36%) contracts and grants from industry

Action Planned and Assessed: Host at least 15 corporate visits per year to enhance partnerships and interdisciplinary research. The number of corporate visits to campus, each involving the Dean's office and/or Engineering Development, exceeded the target in FY04 and increased even further in FY05:

FY04: 20 corporate visits

FY05: 51 corporate visits

The FY05 visits to the College include Agilent Technologies (5x), Amgen, Black & Veatch, Boeing, Booz Allen Hamilton, Cargill, ChevronTexaco, Foster Miller, Gambro BCT, General Electric, Hewlett-Packard (5x), IBM (2x), Lexmark, Lockheed Martin (4x), Merck, MFG Tetra-Tec, Microsoft (2x), National Instruments (6x), Northrop Grumman, NSA Engineering, One Rain, OSRAM Sylvania, QualComm, Seagate Technology, Shell Oil (3x), Specialty Products, STS, SuperGen, URS, Wright Water Engineers, and Xilinx.

II.4 Faculty Research Development and Productivity

Goal: Increased faculty involvement in research, as measured by increases of 10% per year in the numbers of regular faculty with over \$50K, and over \$150K, in annual research expenditures.

Result: The results for faculty involvement in funded research in 2004 show substantial improvement over 2002 and 2003, with 59% of the tenured and tenure-track faculty having over \$50K in research expenditures and 38% having over \$150K in research expenditures:

2002: 86 of 168 over \$50K (baseline), and 49 over \$150K (baseline)
2003: 82 of 160 over \$50K (-5%), and 53 over \$150K (+8%)
2004: 97 of 164 over \$50K (+18%), and 62 over \$150K (+17%)

Goal: Average number of peer-reviewed publications increased by 5% per year, from 2.4 journal papers and 2.0 proceedings papers per faculty member in 2002 to 3.0 and 2.5, respectively, in 2007.

Result: Good progress toward the publication goal was made in 2004 (publications are counted on a calendar-year basis, as part of the annual faculty review):

2002 averages: 2.39 journals (baseline) and 1.99 proceedings (baseline)
2003 averages: 2.32 journals (-3%) and 1.93 proceedings (-3%)
2004 averages: 2.70 journals (+16%) and 2.28 proceedings (+15%)

Goal: Annual PhD degrees increased by 10% per year, to 100 by FY08.

Result: The number of PhD degrees awarded increased in FY04, but then decreased in FY05, falling well short of the goal:

FY03: 71 (baseline) PhD degrees
FY04: 74 (+4%) PhD degrees
FY05: 69 (-8%) PhD degrees

Action Planned and Assessed: Develop a culture of excellence, with expectations and incentives for increased faculty research productivity. In FY04, written expectations and guidelines on meritorious and excellent performance were provided to the faculty, along with updated procedures for annual and promotion reviews. A Faculty Excellence Program was established in FY05, and it includes \$75,000 budgeted annually for Dean's Faculty Fellowships, Dean's Performance Awards, and Dean's Seed Fund for Novel Ideas.

Action Planned and Assessed: Recruit faculty leaders in strategic research areas. While most searches in the past two years focused on junior candidates, more experienced candidates were considered where needed, leading to two senior and two mid-career hires:

David DiLaura, Professor, Civil, Environmental & Architectural Engineering, Lighting (previously Senior Instructor)
Al Gasiewski, Professor, Electrical & Computer Engineering, Environmental Technologies & Sensors (previously at NOAA)
Diane Sieber, Associate Professor, Herbst Program of Humanities, Spanish Literature (transfer from Spanish & Portuguese)
Jeff Thayer, Associate Professor, Aerospace Engineering Sciences, Remote Sensing (previously at SRI International)

II. 5 Discussion of Research Progress and Outlook

Good progress had been made in the past two years on launching new research centers in cybersecurity and unmanned vehicles and campus-wide initiatives in biotechnology and nanotechnology. However, these entities are in their early stages and will need nurturing and growth. Additional centers and initiatives are in their planning stages and need brought to the implementation stage.

New research grants and proposals were up in FY04 but slipped in FY05, falling well short of the goal of 10% annual growth. With increasing competition for external funding, and a shifting of some federal agencies from fundamentals to applications, meeting the stated goals will be difficult. Faculty will need to diversify their efforts and seek more partnerships with industry, government labs, and other academic institutions. Large increases in corporate visits to the College and in the amount of contracts and grants from industry in FY05 are positive steps in this regard.

Other indications of progress are increases this past year in the number of peer-reviewed publications per faculty member and in the fraction of faculty members with substantial grant funding. On the other hand, the number of PhD degrees granted remains well short of the annual goal and will need to be increased if the College is to be competitive.

New guidelines were established on faculty recruitment and evaluations, to enhance quality, and a Faculty Excellence Program was developed. In FY06, a major focus of the Research and Corporate/Government Relations Subcommittee of the Engineering Advisory Council and of the Faculty Research Council will be to promote industry-university collaboration in support of major proposals. Also, college leadership will work with campus leadership on a revised graduate tuition policy to help with graduate recruitment, and the Administrative Council of the College will consider financial incentives to encourage recruitment of PhD students.

III. EDUCATIONAL EXCELLENCE

Our vision of excellence in education is supported by initiatives to enhance student learning in four categories: (1) Enhanced courses and curricula, (2) Extracurricular enrichment experiences, (3) Student recruitment and outreach, and (4) Improved communications, advising and assessment. For each category, the goals and results are provided below, followed by an assessment of planned actions in support of the goals.

III.1 Courses and Curricula

***Goal:** Enriched curricula so that all undergraduate students take at least two courses in which oral and written communication constitutes a significant learning objective, two courses where team-based learning is emphasized, and a meaningful capstone design experience, in addition to humanities and core subjects in math, science, and engineering.*

***Result:** All 11 undergraduate degree programs, except Engineering Physics, reported in FY04 that they have at least two required courses where communication is emphasized, at least two required courses where team-based learning is emphasized, and at least one required course*

with a capstone design experience. In FY05, the College sponsored a new course in Engineering Communications, which was developed and taught in Spring 2005 by the CU Boulder Program in Writing and Rhetoric.

Goal: *Increased number of instructor ratings (by students via the Faculty Course Questionnaire) above 3.0/4.0 and decreased number of instructor ratings below 2.0/4.0, to more than 75% above 3.0 and less than 3.5% below 2.0 by FY08.*

Result: The fraction of instructor ratings above 3.0 has increased since FY03, and that below 2.0 has decreased, as desired, though the goal is not yet met (see table below). It is interesting to also add that the average class size in FY05 of courses rated below 2.0 is 77 students, whereas the average size of all classes is only 31 students.

Year	FY03	FY04	FY05	FY06	FY07	FY08
# rated	578	667	632			
>3.0	397 (68.7%)	469 (70.3%)	444 (70.3%)			
<2.0	27 (4.7%)	23 (3.4%)	26 (4.1%)			

Action Planned and Assessed: *Enhance student learning by design of curricula enriched in the humanities, writing, ethics, hands-on learning, team-based projects, and capstone design.* In addition to the highly successful GEEN 1400 “Engineering Projects,” in which team-based, open-ended design projects are the norm, all departments in the College offer discipline-specific, project-oriented courses. In FY05, the College developed a proposal to assess course fees in those courses having a substantial laboratory component. These fees were approved effective Fall 2005 and will help ensure that our students have access to modern laboratory facilities in their courses. In FY06, the faculty of the Herbst Humanities Program will lead a critical review by the Undergraduate Education Council of the options available to engineering undergraduates to meet their humanities and social science elective requirements.

Action Planned and Assessed: *Establish a faculty subcommittee to consider the appropriate role of biology in the undergraduate curriculum, and make recommendations to the college faculty for implementation.* While a College Committee on Bioengineering has been established, it was decided to not make a college-wide recommendation on the role of biology in the undergraduate curriculum at this time, but instead to leave this issue to the individual departments. The Department of Chemical and Biological Engineering in FY04 established a course in Biology for Engineers, which is required for its majors and elective for other majors. It will also offer a new elective course in Foundations of Bioengineering, starting in Fall 2005.

Action Planned and Assessed: *Establish a New Faculty Program and Faculty Excellence Program to assist faculty in teaching and research.* The New Faculty Program was established in FY04, and the Faculty Excellence Program was established in FY05.

III.2 Extracurricular Educational Enrichment

Goal: Expanded opportunities for extracurricular enrichment experiences, with the fraction of undergraduate students participating in discovery, professional or service learning each year reaching one-third by FY08.

Result: FY04 was the first year that metrics for extracurricular enrichment have been determined; even with the low number of professional-learning activities (internships and co-op experiences in industry) reported, good progress was made toward the goal in FY04, and then the goal was exceeded in FY05 (see table below). The College also introduced the Active Learning Award during FY05. This award is given at graduation to those students who can demonstrate their participation in all three forms of extracurricular active learning (discovery, professional and service) during their undergraduate years. The first award was made to one student graduating in December 2004. At the May 2005 commencement, twenty-one students received the award, accounting for approximately 5% of the graduating class.

Year	FY04	FY05	FY06	FY07	FY08
Discovery Learning	492	636			
Professional Learning	137	357			
Service Learning	265	488			
Total Participating	618	1014			
Total Undergraduates	2667	2736			
% Participation	23.2%	37.1%			

The total participating is less than the sum of discovery, professional and service learning, because students participating in two or more activities are counted only once in the total.

Action Planned and Assessed: Establish a college-wide Discovery Learning Initiative to expand undergraduate research. Since piloting the Discovery Learning Program Spring 2004 with 12 students, this program to promote undergraduate research was expanded to support about twice as many students during Spring 2005 and for the 2005-06 academic year (see table below). The program has moved from a semester-long opportunity to a year-long opportunity, based on feedback from students and professors indicating that more in-depth research could be accomplished over the course of a full academic year. While initially restricted to faculty with research programs in the Discovery Learning Center, faculty across the entire college are now invited to participate. The Dean's Fund for Excellence continues to support the program by paying 60% of each student's funding; the other 40% is covered by the hiring faculty member.

Semester	# of Projects Offered	# of Students Applied	# of Students Accepted
Spring 2004	26	46	12
Fall 2004	21	28	12
Spring 2005	38	28	23
AY 2005-06	37	48	25

Action Planned and Assessed: *Establish a college-wide Service Learning Initiative to expand undergraduate involvement in K-12 outreach, Engineering for Developing Communities, course assistance, etc.* Since piloting the Earn-Learn Program in Spring 2004 with 15 students, this program to support student employment in service to the College was expanded to support nearly twice as many students during Fall 2004 (28) and doubled again in Spring 2005 (60), helping to catalyze service learning in the College. The program is expected to continue at the current level until additional funding sources are available. Students in the Earn-Learn Program receive half of their support from the hiring department or program, with the remainder coming from contributions from donors or Dean's funds. Since hired as Program Coordinator in February 2005, Robyn Sandekian has further supported service learning through Engineering for Developing Communities (EDC), expanding its reach through improved marketing to both prospective students (new brochures, news updates and website improvements), and potential funding agencies (NSF, NCIIA, First Data, campus outreach committee, etc.).

Action Planned and Assessed: *Establish a college-wide Professional Learning Initiative to expand professional opportunities (internships, co-op, etc.) and career advising for students and to better prepare them for engineering practice.* Two departments (ECE and ChBE) in the College now have active co-op programs, and another department (AES) is in the process of developing a formalized co-op program. A few students in other departments have participated in co-op programs largely through their own initiative. Our goal is to make formal co-op opportunities available through every department, with college-level coordination and oversight. The College is also partnering with Career Services, five other engineering schools in the state, and the Colorado Institute of Technology to increase the number of co-op opportunities available to our students. College-level coordination and oversight of internships are still needed.

Action Planned and Assessed: *Establish and fill a new position: Director of Academic Programs and Assessment.* A Director of Academic Programs and Assessment, Terry Mayes, was hired in February 2004 to coordinate discovery, service and professional learning.

Action Planned and Assessed: *Establish a college-wide Engineering Honors Program.* In FY05, an ad-hoc committee consisting of faculty and students met over a period of several months and developed a detailed outline for the Engineering Honors Program. In late Spring 2005, this outline was presented to the Undergraduate Education Council, the Administrative Council, and the Engineering Advisory Council. The committee is now preparing a final draft of the proposal, taking into account the feedback received.

III.3 Student Recruitment and Outreach

Goal: *Number of undergraduate applicants increased by 5% per year, without increased enrollments, and with improved quality of the entering class.*

Result: The Fall 2003 baseline data for undergraduate enrollments are shown below, as well as data for Fall 2004 and Fall 2005. While the number of applicants declined for Fall 2005, and the fraction admitted was reduced proportionately to maintain admission standards, the percentage of students who accepted the offers of admission increased. Quality measures of

the entering class declined slightly. Not shown in these data are large changes in the distribution of students among majors, which has led to some departments (AES and ME, in particular) having large classes and overcapacity laboratories.

Year (Fall)	2003	2004	2005	2006	2007
Tot. BS students	2667	2736	2739		
# applied	2154	2212	2022		
# offered adm.	1890	1956	1781		
# new enrolled	610	633	669		
Avg. HS gpa ¹	3.69	3.72	3.71		
Avg. class rank	84%	85%	82%		
ACT Math	29	29	29		
ACT English	28	28	27		
SAT Math	670	660	650		
SAT Verbal	610	600	590		

¹Weighted grade-point-average with a maximum of 4.0

Goal: Increased PhD enrollments by 5% per year, to 600 by Fall 2007, with MS enrollments holding steady, and improved quality measures of incoming graduate students to 3.6 average undergraduate GPA and 765 average quantitative GRE, while increasing applicant pool so that 30% or less are offered admission.

Result: The Fall 2003 baseline data for graduate enrollments are given below. The Fall 2004 data show a 3% increase in PhD students, but then there is a 2% decrease in Fall 2005. The number of MS students also decreased. The number of new graduate students is down about 8% over the past two years, with quality measures also showing a small decline. Of particular concern are the large decrease in the size of the applicant pool and the increase in the fraction offered admission. The percentage of graduate students who are from foreign countries declined from 36% in Fall 2003 to 27% in Fall 2005, reflecting a national trend.

Year (Fall)	2003	2004	2005	2006	2007
Tot. PhD students	485	500	491		
Tot. MS students ¹	461	461	399		
# applied ¹	2087	1666	1359		
# offered adm. ¹	1149	931	840		
# new enrolled ¹	289	244	265		
Avg. ugrad. gpa ¹	3.45	3.54	3.43		
Avg. quant. GRE ¹	753	757	744		
# Prof. Study MS	N/A	197	165		

¹Data do not include professional studies students, primarily in Eng. Man. & Telecom.

Goal: Increased diversity of student population by 10% per year, to 7.5% and 10% underrepresented minorities (black, Hispanic, Native American) and 30% and 25% women at the graduate and undergraduate levels, respectively, by Fall 2007.

Result: The Fall 2003 baseline data for diversity metrics are shown below, along with corresponding data for diversity of regular faculty. Also provided are data for Fall 2004 and

Fall 2005, which show increases in diversity of both faculty and new students, though overall diversity measures of the undergraduate student population declined. National trends also show a slight decline in the diversity of engineering undergraduates.

Year (Fall)	2003	2004	2005	2006	2007
% women ugrads	17.5%	17.2%	16.9%		
% women 1 st yr	14.1%	17.3%	18.0%		
% women grads ¹	23.6%	21.8%	23.1%		
% minority ugrads	7.3%	7.1%	7.4%		
% minority 1 st yr	5.7%	6.5%	9.0%		
% minority grads ¹	5.0%	5.6%	4.4%		
% women faculty	10.0%	10.4%	12.8%		
% minority faculty	5.6%	4.9%	5.5%		

Minority refers to black, Hispanic, and Native American.

¹Data do not include professional studies students, primarily in Eng. Man. & Telecom.

Action Planned and Assessed: *Improve student recruiting efforts to enhance the quality and diversity of entering students, through a proactive role of college personnel.* As in 2003, a survey of students offered admission to the Fall 2004 class was performed in the summer of 2004. Adequacy of financial aid was cited as the area needing the most improvement by students who did not come to CU. Efforts to increase financial aid for both undergraduate and graduate students are part of the resource portion of the Strategic Plan. A database of prospective students is now in use by all departments and programs to track and manage undergraduate recruiting efforts. This database is updated weekly from admissions data. We have taken a more strategic approach to our merit-based scholarship awards, increasing both the award amounts and the award durations. Most awards are now for four years, depending upon continued academic achievement. Twice in FY05, representatives of the College (Bennett, Sherman and Germain) traveled to selected cities around the country as part of campus recruitment efforts. These visits will be repeated in FY06. In March 2005, the first ever “Explore CU Engineering Day” was held for admitted students and their parents. This event was a major success. Of the 246 prospective students who attended (about 400 family members and friends also attended), 72% overall confirmed their intent to enroll in CU Engineering, 81% of the women who attended confirmed, and 92% of the non-Asian minority students who attended confirmed. Additional undergraduate recruiting efforts, particularly those undertaken by our Integrated Teaching and Learning Laboratory, Multicultural Engineering Program, and Women in Engineering Program, were integrated with K-12 outreach programs and are described below.

Action Planned and Assessed: *Establish an Engineering Outreach Program to K-12 students and teachers.* The key K-12 outreach programs of the College during FY05 are listed below. In addition, Jackie Sullivan, Co-Director of the ITLL, and other college personnel were instrumental in the recent creation of a pre-collegiate division of the American Society for Engineering Education. Since the student diversity measures have not increased substantially, and have declined in some cases, a process to review our outreach programs was initiated in FY05, with the goal of tracking individual students over time and determining the fractions of participants in different programs who later apply to and enroll in the College. For example, 247 (28% female, 10% underrepresented minority) high school students with June 2004

graduation dates attended our High School Honors Institute in Summer 2002 or Summer 2003. Of these students, 98 applied to our college and 52 (22% female, 12% underrepresented minority) enrolled in the College in Fall 2004.

- Admitted Students Day (AY 2004-2005), 246 high-school students
- Boettcher Scholars Day (AY2004-2005), 7 high-school students
- Butterfly Hope educational-enrichment program for low-income elementary school children in Denver (Summer 2005, 4 days over 4 weeks), 30 students
- Colorado Space Grant Consortium (AY2004-2005, numerous 1-day activities), approx. 2500 students of all ages
- Denver School of Science and Technology (AY2004-2005, 2 days), deep-dive at CU, 122 high-school students
- Dragon Discovery engineering program for low-income children at Sanchez Elementary School (primarily Latino) in Lafayette (Summer 2005, 3 weeks), 59 students
- Engineer for a Day - part of the CU Student for a Day (AY 2004-2005), 250 high-school students
- Engineering Career Day for Women (Spring 2005), 45 high-school students
- Engineering Honors Day for top-ranked students (AY 2004-2005), 25 high-school students
- Engineering Open House (AY 2004-2005, 1 day), 282 high-school students
- EXITE (Exploring Interests in Technology and Engineering) (AY 2004-2005, 1 week), 26 middle-school girls
- Girl Scout Badge Days (AY 2004-2005, 10 half-days), 300 elementary, middle and high-school students
- Girls Embrace Technology (Summer 2005, 6 weeks), 26 high-school students
- High School Honors Institute (Summer 2005, 4 days), 200 high-school students
- MESA Fall Fling for (AY 2004-2005, 2 days), 163 high-school students
- MESA Mark for science and math teachers (AY 2004-2005, 1 day), 72 teachers
- Native American Pre-Engineering Program (Summer 2005, 6 weeks), 14 high-school students (40 students total in science and engineering)
- Pre-collegiate engineering summer programs in the ITLL (Summer 2005, 5 weeks), 77 high-school students
- Success Institute (Summer 2005, 2-5 days), 80 high-school students
- Summer Bridge for minority students (Summer 2005, 4 weeks), 26 high-school students
- Teach Engineering Digital Library coordinated by ITLL to develop standards-based K-12 engineering curricula accessible on the web (on going)
- Teacher workshops in K-12 engineering curricula (Summer 2005, 2-10 days), 39 teachers
- Technology and Engineering to Advance Math and Science (TEAMS): Hands-on curricula taught to schools with high minority enrollment in Lafayette and Denver (AY2004-2005, weekly), 1,350 elementary, middle and high-school students in Lafayette, and 83 9th graders in the Denver School of Science and Technology
- Western Slope Math and Science Center (Summer 2005, 12 weeks), 2 CU Engineering students working with approx. 1500 elementary-school students

To help support these programs, external grants and private gifts have been received from J.D. Abrams (Native American Pre-engineering Program), Bechtel (rural outreach), NSF (GK-12 Outreach, TeachEngineering digital library), Daniels Fund (TeachEngineering digital library), U.S. Department of Energy (Success Institute), U.S. Department of Education (Dragon Discovery, Butterfly Hope, TEAMS), Gates Family Foundation (Teacher Workshops,

TEAMS), NASA (Colorado Space Grant Consortium), U.S. Air Force (Colorado Space Grant Consortium), and S. Archuleta (interns at Western Slope Math & Science Center).

Action Planned and Assessed: *Establish and fill a new position: Director of Outreach and Education.* A Director of Outreach and Education, Kristin Germain, was hired in October 2003 to coordinate college outreach and recruiting efforts.

Action Planned and Assessed: *Increase graduate training support by submitting at least ten graduate training proposals per year.* In FY04, six proposals were submitted for graduate training programs, defined as programs that provide financial support (including stipend and tuition) and education and research training of a group of graduate students in a common area. The number of proposals was increased to 11 in FY05, meeting the target.

III.4 Communications, Advising and Assessment

Goal: *Full accreditation of undergraduate engineering programs, with effective assessment strategies and continued improvement, including preparation for professional licenses where appropriate.*

Result: Several standardized measurement tools have been developed and implemented at the college level to assist in our assessment efforts, including senior and alumni surveys. In addition, the College has implemented a standardized method for reporting the results of the Fundamentals of Engineering exam. Our Environmental Engineering major was accredited in FY04, so that 8 of 11 undergraduate majors are now accredited by the Accreditation Board for Engineering Technology (ABET). The exceptions are Applied Mathematics, which is not eligible for accreditation through ABET, and Computer Science and Engineering Physics, which have not sought accreditation. In the most recent ABET general review (FY99), one program received accreditation until the next general review (best), two were required to submit interim reports, three were required to have interim visits, and one required a show-cause visit (worst). All of the ABET-accredited degree programs in the College are undergoing a General Review during the 2005-2006 academic year. Each degree program has prepared and submitted a comprehensive self-study report in support of this review. A college-wide document providing an overview of the College was also submitted. The Director of Academic Programs and Assessment, Terry Mayes, was hired in Spring 2004 and has overseen preparations for the upcoming ABET accreditation visit.

Goal: *Improved ranking of our undergraduate program to the top 30 in 2005 and the top 25 in 2007.*

Result: Using the *U.S. News & World Report* undergraduate program rankings, the initial goal was achieved in FY04, but the rankings have subsequently slipped:

- 8/02 Undergraduate Program Ranking: 31 (17 among publics)
- 8/03 Undergraduate Program Ranking: 29 (17 among publics)
- 8/04 Undergraduate Program Ranking: 33 (18 among publics)
- 8/05 Undergraduate Program Ranking: 36 (21 among publics)

Goal: Improved ranking of our graduate program to the top 30 in 2007 and the top 25 in 2009.

Result: Good progress toward the initial goal for our graduate program has been achieved, using the *U.S. News & World Report* rankings:

4/03 Graduate Program Ranking: 37 (21 among publics)

4/04 Graduate Program Ranking: 33 (19 among publics)

4/05 Graduate program Ranking: 33 (19 among publics)

Goal: Improved quality of undergraduate advising, as measured by surveys of graduating seniors, with a goal of 100% rating their advising experiences as satisfactory or better within three years.

Result: To effectively assess opportunities for improvement in advising, the College is currently measuring several key dimensions of our students' advising experience, including advisor availability, accuracy, awareness of opportunities, advisor interest in the student, and quality of career advice. These dimensions are measured for both staff and faculty advisors. Gathering data at this level of detail allows us to more easily spot areas of concern and implement improvements. Currently our graduating seniors are surveyed regarding their advising experience, although we expect to include other classes in the future, as well as "point of service" advising surveys. The following results are from the May 2005 senior survey (1 = very dissatisfied, 3 = satisfied, 5 = very satisfied):

Dimension of advising	Satisfactory or Better	Mean Score
Availability of staff advisor	91%	4.03
Accuracy of staff advisor	90%	4.03
Staff advisor's awareness of opportunities	77%	3.52
Staff advisor's interest in the students	86%	3.96
Career advising provided by staff advisor	62%	3.04
Availability of faculty advisor	86%	3.73
Accuracy of faculty advisor	85%	3.65
Faculty advisor's awareness of opportunities	74%	3.34
Faculty advisor's interest in the students	79%	3.55
Career advising provided by faculty advisor	65%	3.04

The overall mean score of 3.6 represents an improvement over 3.3 from a prior senior survey performed in 2001. On most dimensions, staff advisors tend to score higher than faculty advisors. The exception is career advising, which offers the most opportunity for improvement by both faculty and staff advisors.

Action Planned and Assessed: Establish a college-wide Engineering Advising Program. The college administration is now providing coordination and assistance to improve advising of undergraduate students by the departments and programs. Starting in FY05, the undergraduate advisors meet monthly to agree upon common approaches and to share information on best practices. New advising guides are under development for all eleven programs, which include

clearly stated expectations and standard wording on several topics. Beginning in Fall 2005, the College will offer students the opportunity to use an on-line degree audit system in evaluating their progress towards meeting degree requirements. During the coming year, advisors will be provided with additional tools and training to improve their effectiveness.

Action Planned and Assessed: *Develop effective marketing tools for the College to its constituents.* In addition to ongoing publications (such as *CUEngineering*, *Alumni Focus*, and *Corporate Partner*), several new or revised marketing tools were introduced in FY05:

- Graduate Reputational Fliers (7 new fliers, including one for each department and the College as a whole, produced and sent to deans and department chairs in advance of the annual ratings survey; also used by the departments in graduate student recruiting)
- Undergraduate Reputational Flier (updated flier produced and sent to deans in advance of ratings survey and used by the dean's office in student recruiting)
- Marketing Pieces (10 additional one-page marketing fliers on departments and college initiatives produced for distribution to donors, for a total of 18 now available)
- Undergraduate Program Brochure (redesigned to better engage and inform prospective students, as well as parents and high school teachers and counselors)
- Web Site (the college web site continues to be updated and improved to make it more attractive, informative and user-friendly; 18 profiles of alumni, students and faculty added to inform prospective students and other constituents)

III.5 Discussion of Educational Progress and Outlook

Active and team-based learning has been included throughout the curricula, starting with engineering projects in the freshmen year and continuing through capstone design in the senior year, with significant facilitation by the Integrated Teaching and Learning Laboratory. Piloting of the Discovery Learning Program and the Earn-Learn Program in FY04 was very successful, and these programs have helped catalyze extracurricular active-learning experiences for our students. In FY05, over one-third of our undergraduates participated in one or more discovery, professional and service learning experiences.

Initiatives on undergraduate advising have led to improved survey results on student satisfaction with advising. These surveys also point to the need for improved career advising, which will be an emphasis in the coming years.

Undergraduate enrollments have increased slightly, even though the number of applications declined in FY05. Recruitment and communication efforts have contributed to the increased acceptance rate of students offered admission. However, student quality measures have declined rather than improved. Moreover, diversity measures of our student population have shown only modest change. While it is expected that our increased K-12 outreach efforts to strengthen the pipeline of young students with interests in math, science and engineering may take several years to show results, especially for students from groups traditionally underrepresented in these areas, assessment will be needed to focus efforts on the most successful programs. Another concern is that the College's undergraduate program rankings have slipped in the past two years, which is also true of the campus as a whole and may be tied to negative publicity.

In looking ahead, major undertakings in FY06 will include an accreditation review, establishment of an Engineering Honors Program to help attract and challenge top students, further development of a college-wide Engineering Advising Program to support and strengthen current department-based advising and improve career advising, and implementation of an enrollment-management system to help with the distribution of students among the different majors. Further efforts will be undertaken in FY06 to partner with industry and provide more professional learning opportunities (internships, co-ops) for students. In addition, our assessment of outreach programs will be continued, to help identify those programs with greatest impact and identify those areas where integration and improvements are needed.

IV. RESOURCE EXCELLENCE

Our vision for resource excellence is to facilitate the ambitious goals and plans for educational and research excellence, by generating the necessary supporting resources and employing these with wise stewardship in four categories: (1) Faculty, (2) Facilities, (3) Institutional funds, and (4) Private giving. For each category, the goals and results are provided below, followed by an assessment of planned actions in support of the goals.

IV.1 Faculty Resources

Goal: Hiring of outstanding faculty, with increased diversity and competitive salaries and startup packages.

Result: During FY04 and FY05, 18 regular faculty were hired, including eight women and seven persons of color. The average starting salary for the 14 Assistant Professors is \$74K (compared to the national average of \$70K in FY04), and the average startup package is \$310K (national data not available). Two of the hires are part of the campus-wide nanotechnology initiative, and two are part of the campus-wide biotechnology initiative.

Goal: Retention of top faculty, with competitive salaries, endowed positions, and at least one-half of retention offers accepted.

Result: Faculty raise pools in the College of 2.6% for raises effective in FY04, 2.8% for FY05, and 3.3% for FY06 have outpaced inflation (1.9% for 2002, 1.1% for 2003, and 0.1% for 2004), despite reductions in state funding. The average faculty salaries in the College exceeded the AAU averages in FY04 by 3.7, 1.9 and 1.7% at the Assistant, Associate and Full Professor levels, respectively (FY05 data not available). Nevertheless, our top faculty continue to receive attractive offers from other institutions. During FY04 and FY05, nine retention offers were made, with four accepted, one pending, and four faculty moving to other institutions. To help with retention, five new endowed chairs and professorships were established in FY05.

Goal: At least three faculty elected to the National Academy of Engineering in the next five years, and at least one major national or international society award received by a faculty member in each department each year.

Result: In FY04, two faculty (George Born and Kaspar Willam) were elected to the National Academy of Engineering (NAE) and one or more major awards (not including several NSF CAREER and other new investigator grants) were received by faculty in five of the six departments. The Gordon Prize to Frank Barnes and the Waterman Award to Kristi Anseth are of particularly high distinction. In FY05, there were no college faculty elected to NAE, and major awards were received by faculty in four of the six departments (see below). In addition, Jackie Sullivan (co-director of the Integrated Teaching and Learning Laboratory) received the 2005 Lifetime Achievement Award from the K-12 Engineering Division of the American Society for Engineering Education.

Selected Faculty Awards in FY05

Aerospace Engineering Sciences

David Klaus, AIAA Rocky Mountain Educator of the Year

Chemical & Biological Engineering

Christopher Bowman, Society for Biomaterials' Clemson Award

Steven George & Alan Weimer, R&D 100 Award

Civil, Environmental & Architectural Engineering

Bernard Amadei, AAES Norm Augustine Award

Angela Bielefeldt, Assoc. of Environmental Engineering & Science Professors' Outstanding Teaching Award

Dan Frangopol, ASCE Nathan Newmark Medal

Mechanical Engineering

Ken Gall, ASM Bradley Stoughton Award

Ken Gall, ASME Pi Tau Sigma Gold Medal

Robin Shandas, Inst. Physics & Eng. in Medicine Nightingale Prize

Action Planned and Assessed: *Form an Engineering Awards Committee, in addition to departmental awards committees, and actively nominate top faculty for campus and national awards.* In FY04, awards liaisons were identified for each department, and the Dean's office provided information on various opportunities to these liaisons. Starting in FY05, the Faculty Research Council is serving in the role of an awards committee. However, nomination of faculty for appropriate awards remains non-uniform across the departments.

Action Planned and Assessed: *Develop a culture of excellence through high standards in hiring, annual reviews, appointment/promotion/tenure reviews, and post-tenure reviews, and by establishing a New Faculty Program.* Faculty search committees and the Dean's office carefully reviewed finalists for faculty openings, with offers made only to those showing excellent potential in both teaching and research. The performance standards for annual faculty reviews were revised in FY04 by the Administrative Council. The updated document on *Policies, Procedures and Criteria for Reappointment, Promotion and Tenure* was approved by the Administrative Council in Fall 2003, and in revised form in Fall 2005, and a new document on *Advice for Reappointment, Promotion and Tenure* was issued by the Dean's office in Spring 2004. A New Faculty Program was also established in FY04 and includes

workshops on career planning mentoring, research, teaching, and reappointment, promotion and tenure.

IV.2 Facility Resources

***Goal:** Expansion of the Engineering Center by 40,000-60,000 square feet by FY08.*

Result: Feasibility studies for two wing expansions were completed in FY04, but funding and approval to proceed have not been secured. Given the length of time required for planning, design and construction, it appears unlikely that the goal will be met by FY08. However, as noted below, a biotechnology building on east campus has been proposed and it would include at least one department in our college.

***Goal:** More effective use of current building, with at least \$500K per year spent on renovations.*

Result: \$1.5M in FY04 and \$1.4M in FY05 were spent on renovations of the current building. These expenditures exceed the goal due to an investment of \$380K by the campus in FY05 and the decision by college leadership to invest in making more effective use of available space while expansion plans are on hold due to the lack of state funding.

***Goal:** At least two college research facilities established by FY08.*

Result: Renovations are underway to establish a Nanotechnology Laboratory and Characterization Facility and a High Performance Computing Facility, well in advance of FY08. However, only about 20% of the \$5 million goal for nanotechnology equipment has been raised to-date.

***Action Planned and Assessed:** Develop feasibility assessments, program plans, and fundraising efforts to expand at least three wings of the Engineering Center by 10,000-30,000 sq. ft. each.* Formal feasibility studies were done in cooperation with Facilities Management in FY04 for two wing expansions (CS and ChBE). The cost estimates are much higher (\$400-\$500 per square foot) than expected. An alternative of building on the east campus (about a half mile away) at about 25% less cost per square foot was proposed. The CS Department has expressed a strong preference to stay on the main campus, while the ChBE Department has expressed a desire to move to the east campus along with the campus biotechnology initiative. In FY05, a feasibility study was initiated for an interdisciplinary biotechnology building on the east campus.

***Action Planned and Assessed:** Request proposals and allocate funds annually to renovate research and educational space in the Engineering Center for more effective use.* Proposals for renovation projects were requested, and \$2.9M was allocated in the past two years by the College (including campus and departmental matching funds) for a total of 40 remodeling and renovation projects. The FY05 projects include

- Remodeling the college lobby, with new furniture to promote study and teamwork
- Development of AES microfluidics and satellite navigation labs
- New AES graduate-student offices and work space
- Establishment of molecular biotechnology labs for new ChBE faculty
- Expansion of the lighting laboratory in CEAE
- Systems lab remodel in CS
- Upgrade of the ECE transmission & fields teaching lab
- Development of a materials research lab for new ME faculty
- New ME faculty and staff offices and conference room

Action Planned and Assessed: *Complete needs assessment and plans for at least two college research facilities.* In FY04 and FY05, progress was made on two college research facilities:

- *Nanotechnology Laboratory and Characterization Facility* – Under the leadership of Roop Mahajan, \$0.9M in federal funding was obtained in FY04 and FY05, and another \$4.1M request is pending, with matching funds committed by the college and campus. A college committee has designed a facility of 2000 sq. ft. and selected the initial equipment purchases. The facility, which is being constructed in the DLC sub-basement, is expected to open in Fall 2005.
- *High-Performance Computing Facility* – During FY04, plans were made to remodel 1400 sq. ft. of the ECE sub-basement (ECEE 2B80) as a college research computing facility, with the necessary power, cooling and security. \$200K for remodeling was provided by the college and campus. This facility is currently under construction and expected to open in Spring or Summer 2006.

Action Planned and Assessed: *Move two college tenants to the nearby Exabyte building.* In June 2004, the Center for Advanced Decision Support for Water & Environmental Systems (CADSWES) and the Hydroclimate Laboratory from CEAE moved to 7000 sq. ft. of remodeled space in the Exabyte building (about one mile northeast of the main campus). In addition, Unix Ops was moved from the Engineering Center to 1500 sq. ft. of remodeled space in the Stadium.

IV.3 Institutional Financial Resources

Goal: *Increased continuing annual institutional support to the College by \$7M by FY08 (from \$23M in FY03, after a 6% cut), requiring 5-6% growth per year.*

Result: *As seen in the table below, we have made good progress toward this goal to-date, though the future outlook is unclear because of uncertainties in state funding of higher education and in future tuition increases. The state appropriation to CU-Boulder has been flat for the past two years, after being cut by approximately one third in FY03. The continuing budget for FY04 increased by 5.7% from that at the end of FY03 (after cuts), with about one-third of the increase being a change in accounting for the nonresident tuition differential for graduate teaching assistants. The continuing budget increased by another 5.7% for FY05, in*

part due to the differential tuition. A second step in differential tuition was deferred in FY06, due to large increases in the base tuition. However, a suite of course-specific fees (primarily for laboratory and design courses) was approved for the College of Engineering and Applied Science, starting in FY06.

FY03: \$23,179,295 (baseline, after cuts) continuing institutional support

FY04: \$24,499,249 (+5.7%) continuing institutional support

FY05: \$25,896,905 (+5.7%) continuing institutional support

Goal: \$1.0M in new continuing annual institutional funds by FY08 for an average of two faculty growth lines per year during FY04-FY08.

Result: Progress toward this goal is on track, using a combination of new funding from the campus and reallocation of funds within the College. One faculty growth line was added starting in FY04 (in AES). For FY05, three growth positions were added (one in ChBE, one in CS @ 50%, and one in Herbst). For FY06, two growth lines have been added in the Mechanical Engineering Department.

Goal: \$1.5M in new continuing annual institutional funds by FY08 for faculty startup support.

Result: As shown in the table below, the requirement for startup support per new faculty member for equipment, research student support, etc. is rising, though the number of new faculty hired for FY04 is low due to state budget cuts. Campus funding for startups has been essentially flat for the past three years, and so the additional burden has fallen on the College and departments. To help meet the need, the College has more than doubled the amount it provides per new faculty member, and \$125K in new continuing institutional funds were allocated by the College in FY05 for startup support (\$75K from the engineering differential tuition, and \$50K from internal reallocation of operating funds).

Year	# New Faculty	New Startup Required	Amount from Campus	Amount from College	Amount Req'd by Departments
FY03	14	\$2,240,518	\$502,378	\$207,622	\$1,530,518
FY04	3	\$663,000	\$400,000	\$204,405	\$58,595
FY05	11	\$2,390,000	\$406,008	\$878,694	\$1,105,298
FY06					
FY07					
FY08					

Goal: \$1.0M in new continuing annual funds (post inflation) by FY08, to provide for competitive faculty salaries, requiring annual raise pools of inflation plus 1.5%.

Result: As seen in the table below, the annual raise pools of 2.8% and 3.3% in FY04 and FY05 (for faculty raises effective at the start of the following fiscal year), respectively, exceed inflation by more than the 1.5% goal. Despite tight budgets, the campus leadership and the College are making a long-term investment in faculty quality.

Year	FY03	FY04	FY05	FY06	FY07	FY08
Base \$	\$15.1M	\$15.1M	\$15.9M			
Raise %	2.6%	2.8%	3.3%			
Inflation %	1.9%	1.1%	0.1%			
Gross Increase	\$390K	\$420K	\$520K			
Net Increase	\$110K	\$260K	\$510K			

Goal: \$300K in new continuing annual institutional funds by FY08, to provide a doubling of matching funds for research equipment and proposals.

Result: No new continuing funds have been obtained for this purpose. Nevertheless, the college changed in FY04 its policy on providing equipment matching funds to ¼ college, ¼ department, ½ graduate school (from 1/6 college, 1/3 department, ½ graduate school). The amount of institutional matching funds provided from just the college portion is given below.

FY03: \$290,464 matching funds

FY04: \$286,075 matching funds (includes \$75,000 for nanotech lab)

FY05: \$408,450 matching funds (includes \$116,667 for nanotech lab)

Goal: \$800K in new continuing annual institutional funds for FY08 for curriculum-based program enhancements, including support for instructional faculty and teaching assistants (\$400K), laboratory equipment and materials (\$300K), Engineering Honors Program (\$25K), and Engineering Advising Program (\$75K).

Result: In FY04, \$225K in new continuing annual funds were provided toward this goal for teaching assistants (\$75K stipend, \$150K tuition). In FY05, \$296K in new continuing annual funds were provided for teaching assistants (\$183K), lab equipment and materials (\$70K), and instructors (\$43K). The Engineering Honors Program and an enhanced Engineering Advising Program are in their planning stages.

Goal: \$700K in new, continuing annual institutional funds by FY08 for extracurricular student programs, including Discovery Learning (\$325K), Service Learning (\$175K), Professional Learning (\$50K) and Outreach (\$150K).

Result: No new funds were allocated for these programs in FY04, but \$120K was reallocated within the College to hire directors to lead these programs. In FY05, new continuing annual funds were provided from differential tuition for discovery learning (\$9K) and service learning (\$39K).

Goal: \$300K in new continuing annual institutional capital funds to combine with existing funds to invest a total of \$2M by FY08 for renovations of teaching and research space.

Result: While no new continuing funds were received for this purpose in FY04, \$1.5M in existing and temporary funds were allocated for college space renovations in FY04, and another \$1.4M were allocated in FY05. Also, in FY05, \$36K of new continuing annual funds from differential tuition were budgeted for renovations of teaching space, and another \$100K

in new continuing annual funds from differential tuition were budgeted for future major building projects.

Action Planned and Assessed: Request an engineering differential tuition and course-specific lab fees, in addition to promoting Quality for Colorado and other campus initiatives for additional institutional resources. A differential-tuition proposal, originally submitted for FY03, was resubmitted in FY04. The first installment of Quality for Colorado was approved for FY04, representing a campus-wide tuition increase of \$140 (per year) for each resident student and \$300 for each nonresident student. Quality for Colorado was not approved for FY05, but the first installment of \$300 per student per year for differential tuition in the College of Engineering and Applied Science was approved for FY05. The University of Colorado was also granted enterprise status, starting in FY05, so that its tuition increases are no longer subject to the state spending limits. A suite of course-fee proposals for laboratory and design courses was submitted in FY05 and approved for implementation starting Fall 2005.

IV.4 Private Giving

Goal: Increase private gift support to \$12M per year (not including in-kind donations), a 50% increase from the prior campaign.

Result: This goal has proven to be too ambitious, during the current period of economic uncertainty and between campaigns. The total amount of gift support received in FY05 (\$4.7M) is up 30% from FY04 (\$3.7M), though well short of the \$12M goal.

Year	Support from Prior Pledges	New Support	Total Received	New Pledges	Total New Commitment
FY03	\$1,045,396	\$2,856,032	\$3,901,428	\$215,000	\$3,071,032
FY04	\$83,260	\$3,576,168	\$3,659,428	\$1,907,159	\$5,051,838
FY05	\$1,331,822	\$3,412,450	\$4,744,272	\$761,511	\$4,173,761
FY06					
FY07					
FY08					

Note: these numbers do not include in-kind donations of ~ \$5M/yr

Goal: \$20M in additional faculty endowment gift funds by FY08, including two full chairs @ \$4M, four partial chairs @ \$1.5M, eight professorships @ \$500K, and eight faculty fellowships @ \$250K, with at least half of these funds received by FY08 versus pending as bequests or pledges.

Result: In FY04, \$151K was received toward endowed chairs or professorships. The amount was increased to \$1644K in FY05. Though still short of the goal, these funds plus current funds given by donors who have endowed bequests have allowed the college to award five new chairs and professorships starting in FY06.

Goal: \$10M in new endowed student gift support by FY08, for undergraduate scholarships (\$6M), graduate fellowships (\$2M), and earn-learn assistantships (\$2M).

Result: The total gifts of \$1013K received in FY04 for new or existing student endowment accounts represent about half of the annual amount required to meet the goal, with most of the support focused on undergraduate scholarships. Not included in this total are approximately \$100K raised by the Resource Development Committee in current funds to establish the Earn-Learn Program and \$150K in current funds received from Agilent for graduate fellowships. In FY05, \$824K in new endowed gifts were received for student support (primarily undergraduate scholarships), or less than half of the annual goal, in addition to \$271K in current funds raised for the Earn-Learn Program.

Year	FY04	FY05	FY06	FY07	FY08
Scholarships	\$933,475	\$778,748			
Fellowships	\$29,234	\$15,600			
Earn-Learn	\$50,000	\$30,000			
Total	\$1,012,709	\$824,348			

Goal: Doubling of the annual giving support for the Dean’s Fund for Excellence, to \$500K in FY08.

Result: Annual giving to the College for the Dean’s Fund increased by 28% in FY04, primarily due to hiring a firm to coordinate mail and phone solicitations, and then held steady in FY05, though it remains well short of the \$500K annual goal:

FY03 Annual Giving: \$232,155

FY04 Annual Giving: \$296,769

FY05 Annual Giving: \$297,189

Goal: \$10M in current and endowment gifts over the next five years for educational and research support.

Result: Not including the Dean’s Fund for Excellence and the endowed faculty and student support noted above, \$1,549,721 in current gifts and \$526,518 in endowment gifts were received in FY04 for educational and research support of departments and programs, exceeding the annual goal of \$2M. Slightly lower totals of \$1,482,496 in current gifts and \$464,443 in endowment gifts were received in FY05.

Goal: 10% increase per year in number of alumni or friends donating time or funds to the college.

Result: The number of donors increased by 10% from FY03 to FY04, at least in part due to expanded efforts in the annual fund campaign, and then contracted a small amount in FY05. The number of volunteers increased by 5% from FY04 to FY05.

Year	FY03	FY04	FY05	FY06	FY07	FY08
# donors	2664	2935 (+10%)	2,889 (-2%)			
# volunteers	n/a	591	622 (+5%)			

Action Planned and Assessed: Intensify private fundraising efforts by adding three development staff, making 1500 face-to-face contacts, 40 dean/leadership visits to donors, and 12,000 mail/email/phone contacts with alumni each year, targeting efforts toward foundation and corporations, and assigning a development officer and setting fundraising goals for each department and program. One new development staff person was added in FY04, and two more in early FY05, but a Development Officer and the Director of Development left. A new Director of Development, John Mabley, was hired in May 2005, giving an Engineering Development team of five fundraisers and one administrative assistant. 201 face-to-face visits were made by engineering development staff in FY04, substantially below the goal, and the Dean made 71 visits to donors and potential donors in FY04. These numbers were increased to 294 visits by development staff and 131 visits by the Dean in FY05. With the aid of an outside firm, hired by the CU Foundation, the engineering alumni mailing list was increased to 23,979 individuals. Each of these individuals was mailed a fundraising and the *CU Engineering* magazine in Spring 2005, and 12,209 of these alumni were contacted by students via phone for the FY05 annual fund drive (including 3823 in July 2005). In addition, the engineering development staff recorded 212 individual donor substantial contacts by mail/email/phone in FY05. The new Director of Development is working with each member of the development staff to enhance the effectiveness of the team's fundraising efforts for FY06.

Action Planned and Assessed: Cultivate alumni involvement through advisory boards, development visits, alumni events, project and seminar courses, and professional-learning opportunities. In FY05, the College had 22 advisory boards, with a total of 294 volunteer members, and another 328 volunteers participated in other activities. These volunteers participated in a total of 980 volunteer activities with the college. Alumni events in FY05 included

- AES Retirement Party (7/21/04, Boulder, 15 alumni, 150 total)
- Scholarship Dinner (9/24/04, Boulder, 28 alumni, 205 total)
- ChBE – AIChE Reception (11/8/04, Austin, TX, 20 alumni, 125 total)
- Holiday Celebration (12/3/04, Boulder, 22 alumni, 166 total)
- MEP Awards Banquet (4/2/05, Boulder, 12 alumni, 259 total)
- ChBE Centennial Celebration (4/15-16/05, Boulder, 34 alumni, 133 total)
- Engineering Awards Banquet (4/22/05, Boulder, 71 alumni, 199 total)
- Alumni Reception (5/1/05, Portola Valley, CA, 11 alumni, 17 total)
- Golden Reunion Lunch (5/5/05, Boulder, 25 alumni, 37 total)

IV.5 Discussion of Resource Progress and Outlook

Faculty hiring was successful in FY04 and FY05, with both high quality and diversity, though some positions remain unfilled. A culture of excellence is being promoted through a New Faculty Program established in FY04. A Faculty Excellence Program (aimed at helping

faculty at all levels with teaching, research, and leadership) was piloted in FY05. New resources were provided for faculty startup funds, equipment matching, seed grants, travel to funding agencies, and performance awards. Nevertheless, research infrastructural support for faculty startup, graduate fellowships, equipment, and specialized facilities remains low, and new investment by the campus will be needed for the College to be competitive with top research schools. Significantly, five new endowed chairs and professorships were established in FY05, which have helped in the retention of outstanding faculty. Other faculty highlights of the past two years include two college faculty members elected to the National Academy of Engineering and college faculty members receiving the prestigious NAE Gordon Prize and NSF Waterman Award. On the other hand, several outstanding faculty members have left during the past two years for other academic institutions.

Good progress was made on improved use of the current building, by undertaking 40 remodeling projects, initiating shared research facilities in computing and nanotechnology, and moving three programs to space outside of the main Engineering Center. On the other hand, new building projects have not moved forward, primarily due to the current lack of state funding for capital projects.

Progress during the past two years on increasing the financial resources of the College was mixed. Approval of the first year of the campus-wide Quality for Colorado tuition increase for FY04, of enterprise status and the first year of an engineering differential tuition increase for FY05, and of engineering course fees starting in FY06, represents the important first steps in increased institutional funding to enhance quality of our educational and research programs. However, state funding has been flat during this time, after experiencing a major cut in FY03. Together with a decline in nonresident enrollments for the campus, a large increase in the base resident tuition (28%) was needed to meet the campus budget in FY06, and so a second step in engineering differential tuition has been postponed.

Private fundraising has been less than the goal for the past two years, but an increase in funds received in FY05 and the recent hiring of a new Director of Development are encouraging. In FY06, options and fundraising will continue to be investigated for one or two major expansion projects, and for a new biotechnology building shared by faculty from our college and faculty from the biosciences. Also, considerable effort will be made in laying the groundwork for a much-needed capital campaign.