

# Semi-Annual Report: Progress on Recommendations from the 10/7/05 Engineering Advisory Council Meeting

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## 1. Introduction

This report summarizes actions taken and plans made over the past half year by the College of Engineering and Applied Science at the University of Colorado at Boulder, in response to recommendations made by the Engineering Advisory Council (EAC) at its previous meeting on 10/7/05. The recommendations and previous reports are available at [http://engineering.colorado.edu/overview/advisory\\_boards.htm](http://engineering.colorado.edu/overview/advisory_boards.htm).

## 2. EAC/RDC Changes

Three EAC subcommittees are now in place:

### *Education and Outreach Committee:*

Chair: Jean Becker, Vice-Chair: Kristy Schloss  
Facilitator: Assoc. Dean John Bennett

### *Research and Corporate/Government Relations Committee:*

Chair: Scott Donnelly, Vice-Chair: Pam Drew  
Facilitator: Assoc. Dean Victor Bright

### *Resource Development Committee (RDC):*

Chair: Gary Anderson, Vice-Chair: tbd  
Facilitators: Dean Rob Davis and Development Director John Mabley

Victor Bright has taken over as Associate Dean for Research, as Stein Sture is now Acting Dean for the Graduate School and Vice Chancellor for Research for the Boulder campus.

## 3. Dean's Report

Key recommendations and comments at the end of the Dean's report are given in *italics*, followed by actions taken or planned:

*We should encourage our own top BS students to enroll as CU graduate students – We are encouraging many of our top undergraduates to consider the combined BS/MS degree, or to enroll in one of our MS programs after the BS, especially in fields such as civil engineering where a master's degree is becoming more important for professional careers. Students interested in the PhD are generally encouraged to seek a broadened experience by going elsewhere, but we do admit our own qualified students when they have interest. To further increase the number of PhD students, two additional actions have been taken: (i) The campus will offer in-state tuition rates for any graduate student on a qualifying appointment (TA, RA) starting Fall 2006, and (ii) Dean's Graduate Fellowships of \$5000 were offered to 40 top PhD applicants.*

*We should start tracking undergraduate involvement in discovery/service/professional (D/S/P) learning vis-à-vis retention, particularly for women and minority students – Starting with AY03-04, we have identified individual students participating in D/S/P learning, and will have enough data to begin tracking retention and graduation rates of these students vs. other students this coming year.*

*Put the presentation on the web site, as it has considerable useful information – Done for both the current and past presentations (see [http://engineering.colorado.edu/overview/advisory\\_boards.htm](http://engineering.colorado.edu/overview/advisory_boards.htm)).*

#### 4. State Budget Referenda

Referendum C (setting aside TABOR spending limits for five years) passed in November 2005, whereas Referendum D (borrowing against future revenues) did not. As a result of the passage of Referendum C, state support of higher education in Colorado is expected to increase for the first time in several years, while tuition increases for AY06-07 will likely be kept modest.

#### 5. University Update

An update on Referenda C and D is given above. The blue-ribbon panel on diversity mentioned by President Hank Brown has had its initial meeting (see <http://www.colorado.edu/cu-diversity/BlueRibbon.html>). Searches for President, Chancellor and Provost are all under way, staggered so that the new President will be on board to appoint the new Chancellor who in turn will appoint the new Chancellor who in turn will appoint the new Provost. On 4/5/06, Hank Brown was recommended as the sole finalist for President. A new CU Foundation President, Wayne Hutchens, has been appointed and started at the beginning of April 2006.

#### 6. ECE Department Update

Key recommendations and comments by EAC members during the ECE Department Overview are given in *italics*, followed by responses from the Department Chair, Bob Erickson.

*Focus curriculum on something like embedded systems, which is where there are jobs in the U.S.* - Embedded systems is a major focus of the ECE curriculum. Two required undergraduate core courses introduce the fundamentals of embedded systems, and each includes a laboratory component. These courses are followed by an optional three-semester sequence that comprises a professional certificate program; this sequence is well respected by local industry and is very popular among our upper-division undergraduates and M.S. students. In the past year, we have further developed this sequence through the introduction of a new course in FPGA technology, *Hybrid Reconfigurable Systems*. The Department has expanded its laboratory facilities in the embedded systems area to meet the student demand, and will continue to develop this area in the next several years.

*The BS curriculum should focus on fundamental core, as one with lots of labs may be viewed as vocational training* - The ECE core curriculum is a rigorous and fundamental sequence of instruction that is certainly not merely a vocational program. The effectiveness of hands-on

learning in labs has been well documented. In addition, our program is well respected by those who have hired our graduates. For example, a quote is given below from the manager of the Boulder office of Qualcomm, who hires our graduates having communications and embedded systems backgrounds:

“Currently I am in charge of new graduate engineering recruiting for the Boulder office. I have been able to tour many colleges across the US and view their engineering programs. When comparing CU-Boulder to the local universities I can say that we have been very successful with recruiting at CU. On the other hand, we have given up recruiting from any of the other local universities. The main difference is that CU prepares the new graduates with real world experience, via labs, that more closely match what we need... Your main competition from our perspective is University of Illinois at Urbana-Champaign (UIUC), Purdue, University of Texas-Austin, and Michigan.”

As a result of our recent accreditation review, the ECE visitor listed the following strength of our program: “The program has approximately twice as many laboratory courses as peer institutions. Students in the program and the [ECE] industrial advisory board expressed strong support for the extensive laboratory experiences. The strengths of the extensive laboratory experiences give the graduates an edge when they are recruited by industry.”

*EE departments elsewhere are overflowing* - Undergraduate enrollments in ECE programs nationally have dropped significantly in the last several years. For example, the *ASEE Profiles of Engineering and Engineering Technology Colleges, 2004 Edition*, states that nationwide enrollments in ECE undergraduate programs dropped from 75,337 students in 2002 to 63,218 students in 2004 (data for 2005 will be published in the 2006 edition, available later this year), down 16%. Over the same period, our enrollment dropped from 457 to 388, down 15%, showing a similar decline as the national averages. To improve our enrollment figures, we have embarked on a campaign to more actively recruit incoming freshmen. This spring, the department faculty has personally telephoned every applicant, with personal follow-up letters and new promotional materials sent by the department chair. We have already seen a response to these efforts, through a substantial increase in participation in the Explore CU Engineering Day (3/18/06) by potential ECE students.

## 7. Subcommittee Progress Reports

The three EAC subcommittees have been active on various fronts, and progress made on their prior recommendations is given in the following subsections.

### **7.1 Education and Outreach Committee (EOC)**

There were four major recommendations identified at the Fall 2005 EAC meeting. Most centered on the establishment of the Honors Program.

*Pilot honors program in Fall 2006* - The Honors program was approved by the Administrative Council of the College on 14 November 2005. Since then, an initial cohort of Honors Faculty has been identified, and Scot Douglass, an award-winning faculty member who teaches in the College’s Herbst program has been named as the Faculty Director of the Honors Program. Professor Douglass has established an Executive Committee of Honors

Faculty who have been performing detailed program planning for the Fall 2006 pilot rollout of the program. Several departments have identified honors courses that will be created offered in Fall 2006 and Spring 2007. Professor Douglass is working with department chairs to ensure that a broad assortment of courses is available by the Fall 2007 formal program introduction. This spring, a prototype Honors Seminar was offered to a group of eight students (chosen from the Engineering Fellows) by Professor Douglass.

*Pilot honors industry night in February 2006* - We intend to establish a “Job Fair” for students in the Honors Program, to be held in the fall every year. At the Fall 2005 EAC meeting, a suggestion was made to conduct a pilot of this event this spring, using the Engineering Fellows and outstanding graduates as the “guinea pigs” for this event. The lack of a critical mass of interest among the Fellows and graduates (many already had firm post-graduate plans), and timing mismatch (which had initially informed a decision to conduct this event in the fall) resulted in a decision to forego the pilot event. We will host this event with the first cohort of Honors students in October 2006.

*Seek to endow the honors program* – A primary financial need of the Honors Program is student aid in the form of scholarships and earn-learn and discovery-learning apprenticeships, to help attract and support the very best students. Raising endowment funds to meet this need is among the top educational fundraising priorities of the College. Ongoing support for operations of the Honors Program, primarily associated with the cost of developing and teaching the extra honors courses, is included in the college budget increase based on differential tuition; if this support is insufficient, an endowment to further support the Honors Program will be sought.

*Ask EAC members to call prospective students in Spring 2006* - All EAC Members were invited to request prospective student call lists created to their demographic specifications. 13 EAC members requested such lists. If all students so identified are called, a total of 118 prospective students will be called by EAC members. On 18 March 2005, the College hosted its second annual ‘Explore CU Engineering’ event for admitted students. Approximately 224 students and nearly twice that number of family members and friends attended this event. It is too early to know how this event impacted prospective student confirmation, but this information will be reported to the EAC when available.

## **7.2 Research and Corporate/Government Relations Committee (RCRC)**

Key recommendations from the 10/7/05 Research and Corporate/Government Relations Committee (RCRC) meeting are given in *italics* below, followed by actions taken or planned.

*Prepare a white paper on recommendations for technology transfer efforts and intellectual property rights* – It was perceived by the members of the RCRC that the CU’s policies on technology transfer and intellectual property are too restrictive and differ from peer institutions. The RCRC members decided to put forth a set of recommendation by means of a white paper for the College and CU Technology Transfer office to consider. The white paper development is led by Scott Donnelly (Chair of the RCRC) in collaboration with the other members. Scott is working on the paper and plans to have a draft ready to present at the upcoming Spring ’06 EAC meeting.

*Explore with campus leadership the possibility of a full-time advocate acting on the College's behalf with federal agencies* – Deans Davis and Bright met on 12/6/05 with Associate Vice Chancellor for Research, Stein Sture, to discuss the possibility of hiring an individual who would work with the faculty, federal agencies, and corporations to advance major research funding opportunities. It was agreed that this opportunity should be seriously considered, and was brought to the attention of the Provost Susan Avery by Rob Davis on 12/14/05, who is discussing it with the campus Federal Relations Advisory Committee to better define the scope of this proposed position. Provost Avery has agreed to update the EAC on the status of this position during the Spring'06 meeting. The current view, which is also strongly supported by the leadership of the RCRC, is that this individual should be a full-time CU professional employee who will report at the campus level. It is expected that this individual should be effective not just at the federal funding agencies level but also at the policy and budget level within the federal and state governments.

*Industry members should plug the value of higher education and of the College of Engineering and Applied Science* – Several EAC members have played key roles with the media and legislature, as indicated by the following examples:

1. From the Aerospace Daily & Defense Report, May 25, 2005:

“Testifying before the House Science Committee’s research subcommittee last week, Donnelly emphasized the “critical role” of the National Science Foundation’s education efforts in producing the next generation of researchers and technically trained workers for GE’s labs and business units.”

2. From the Business Wire, Nov. 3, 2005:

Headline: Society of Women Engineers Honors G. Thomas Marsh with the Rodney D. Chipp Memorial Award; G. Thomas Marsh Recognized for His Significant Contributions to the Acceptance and Advancement of Women in Engineering.

“Marsh has developed six programs at Lockheed to better foster cultural change. Two programs Girls Exploring Science, Engineering and Technology and Young Minds at Work reach out to young girls to educate them on the benefits of selecting math and science courses in high school. Another program, University Relations, reaches out to women engineering students in universities to encourage the students to consider Lockheed Martin Space Systems Co. as a career, and to support the students’ efforts to feed the pipeline of women engineers. Three other programs, Women’s Vision Foundation, Unique Woman of Colorado/Unique Lives Lecture Series and Women’s Success Forum, all serve as development and retention tools for women employees at Space Systems Co.”

3. Gary Anderson, Gary Jacobs, and Raymond Kolibaba lobbied for Referenda C&D in 2005. From the Denver Post, Aug. 24, 2005:

“State colleges and universities “have survived so far,” said Kolibaba, who serves on the external advisory board of the University of Colorado’s School of Engineering. “But they are reaching the critical point of being able to maintain and improve versus actually going downhill. That’s my main concern.”

“So Kolibaba, who runs Raytheon’s 2,600-worker Space Systems business in Aurora, will tell anyone willing to listen why they should vote for Referendums C and D in this fall’s election.”

Other EAC members who are willing to speak with the media or legislature should let Dean Davis know, who will then inform CU’s Office of Government Relations.

### **7.3 Resource Development**

The 10/7/05 Resource Development Committee (RDC) meeting included discussion of three initiatives (the biotechnology building, Engineering for Developing Communities, and the next campaign). Updates are given, along with responses to *italicized* key recommendations.

*Biotechnology Building* - Significant progress has been made on the planning for the new Systems Biotechnology Building. The Boulder Campus Planning Committee (BCPC) and the Chancellor’s Executive Committee (CEC) approved the Feasibility Study in October and November 2005, respectively. (See <http://fm.colorado.edu/planning/projects/biotechnology/biotechnology.html> for a full copy of the Feasibility Study.)

The Provost has provided funding to develop the Program Plan for the building. The Program Plan is a required document and must follow a format established by the Colorado Commission on Higher Education (CCHE). The document provides a next level of detail about the building size, footprint, location, and client requirements for labs, offices, seminar rooms, classrooms, etc. Three architectural firms were selected in December 2006 to work with the three units, Biochemistry, Chemical and Biological Engineering, and the Colorado Initiative for Systems Biotechnology, to develop the plan, which is expected to be available on the link above by 4/10/06. The BCPC will review the Program Plan at their 13 April 2006 meeting, followed by CEC review at their May meeting. If approved, the Program Plan will be included on the 29 June 2006 Regent meeting for approval. After Regent approval, the program will then be included in the state funding bill and will undergo CCHE review. Assuming approval by each group, detailed design would begin May 2007.

The campus has launched an update to the Campus Master Plan in parallel with this Program Plan. This Master Plan will specifically address the “repurposing” the Research Park as a Science Campus for the University. The Systems Biotechnology Building would be the first new building on this campus.

The Program Plan was developed using an iterative, intense, fact-finding and data analysis process with the three units. This process included analyzing each unit’s current space and projecting future needs. This level of analysis, which was deeper than what was done during the feasibility study, uncovered needs for additional space in all areas: labs, offices, and educational space. Particular attention was paid to ensuring the plan was conducive to student needs, such as adequate space for working and studying and pedestrian and mass transit access. The total programmed size of the building in the Program Plan is 150,340 assignable square feet, with a total gross square footage of 262,662. It will occupy Pod I of the Research Park, which is the southwest corner of the Research Park land on Colorado between 30<sup>th</sup> St. and Foothills Parkway. The total project cost is expected to be about \$113 million, with

building occupancy targeted for late 2009. The University will be requesting of state funding for about 20% of the building cost, with the rest financed by research funds, campus/college support, and private fundraising. A request has been made for a dedicated fundraiser for this major project.

*Send out the biotechnology building plan for feedback* – As soon as the Program Plan is completed and posted on the web, feedback will be requested from RDC members.

*Engineering for Developing Communities* – Since the Fall 2005 meeting, Engineering for Developing Communities (EDC) has been approved as an option within the civil engineering BS and MS degrees. This formalization of EDC in the civil engineering curriculum will contribute to EDC's attractiveness as a giving option for interested donors.

Following the fall EAC meeting, RDC chair Gary Anderson hosted a brunch on campus coincident with Homecoming '05 that featured a presentation by Professor Bernard Amadei, the faculty member who principally developed the EDC concept. Guests responded to Professor Amadei with gifts totaling over \$35,000 to support EDC.

Gift response to the Homecoming '05 brunch suggests that further events of this type may be welcome in other communities having concentrations of CU Engineering alumni. Possibilities will be explored, although the logistics for out-of-town meetings will continue to challenge the development staff team until full staffing level is achieved.

Two vacant major gift officer positions on the development team for most of the winter months has blunted outreach for EDC as well as other specialized purposes, but one vacancy was filled in March 2006 and an active search is underway to fill the second. Once development staffing returns to full complement, potential will be available to promote the case for support to EDC more aggressively.

Pat Sullivan, the College's Director of Corporate and Foundation Relations, regularly scans charitable foundations with possible funding interest in EDC. It appears, however, on the basis of study thus far that the foundation sector has greater interest in students working on-site with community projects than in support to curricular development. Regular searching for foundation support opportunities will continue within Corporate and Foundation Relations. Additionally, individual Major Gift Officers with the College development team are briefed on EDC, have worked with donors to secure gift support for EDC in the past, and will continue to do so.

*RDC focus for EDC should be on identifying a major donor (or several major donors) to create a \$1M-\$1.5M endowment for EDC* – Members of the CU Engineering Development team continue to explore major donor interest in EDC, both from individuals and foundations.

*EDC staff can go after small gifts/support* – An advisory board for EDC has been formed to help with this task, and the Dean committed \$20K in matching funds. Support such as earn-learn for students to participate in EDC projects appears to be an attractive fundraising focus.

*Preparing for the Next Campaign* - The prospect of a university-wide campaign remains in the wings. No firm details concerning scheduling, etc. have been provided from the Foundation's senior management since the EAC's fall meeting. In the meantime, the College has accepted in principle to seek \$15M from private sources for the new biotech building.

*Provide updates to RDC members via phone, email and visits on fundraising initiatives throughout the year* – Phone calls and visits to individual members have been made by the Director of Development, John Mabley, and by Dean Rob Davis. John Mabley will send an email update to all RDC members prior to the Spring 2006 meeting.

## 8. Wrap-up and Future Planning

The 2<sup>nd</sup> National Solar Decathlon, which began on the date of the prior EAC meeting, 7 October 2005, was again won by the CU team and will be highlighted at the upcoming EAC meeting. Future EAC meetings are planned for:

21 April 2006  
29 September 2006  
20 April 2007