SUMMARY AND RECOMMENDATIONS FROM THE 4/24/2015 MEETING OF THE CU-BOULDER ENGINEERING ADVISORY COUNCIL

This report provides a summary of the 4/24/2015 meeting of CU-Boulder Engineering Advisory Council (EAC), with key recommendations collected in italics near the end of the report. This summary, presentations, prior reports and other EAC information are posted on the EAC website at http://www.colorado.edu/engineering/about/engineering-advisory-council

1. **College Update** – Dean Robert Davis provided several updates on the college:

   **EAC Member and Organization Updates:** Dean Davis recognized several EAC members whose terms were expiring or who had achieved a particular award or milestone. He reviewed the organization of the college’s advancement team. The college is currently recruiting a new Assistant Dean for Advancement, and alumni relations are now part of the advancement team.

   **Enrollment:** The college received almost 7400 applications for prospective freshmen, up 6% from 2014, the college admitted 3623 students, an increase of just 1% over the prior year, and the college has received 976 confirmations from students for fall 2015, essentially the same as fall 2014. The incoming class has 31% women, up from 27% in 2014, and has 18% underrepresented minorities, up from 14%. The quality of the incoming class continues to improve, with an average ACT score of 30.2/36 and an average SAT score of 1308/1600, both all-time highs.

   **Faculty Hiring:** Faculty searches are underway in all departments in the college. A new approach was taken this year where candidates are reviewed and evaluated on a ‘best available player’ approach rather than for a specific faculty role. Offers are extended as soon as the department determines that the candidate is worthy of an offer rather than waiting until all candidates had been interviewed. Outcomes will be known in June.

   **New Budget Model:** Campus has instituted a new budget model that will distribute funds on the basis of undergraduate enrollment increases. Dean Davis has requested that the campus consider graduate student enrollment as well, as the college has a relatively high proportion of graduate students in its student body.

   **Building Projects:** The Sustainable Energy and Environment Complex (SEEC) will be completed in early 2016, and the Environmental Engineering faculty and labs will move there along with other ‘wet’ labs in the Department of Civil, Environmental and Architectural Engineering. A portion of the Engineering Center will be renovated in 2016 after the environmental labs are moved to SEEC. The 5th wing of the Biotechnology Building...
is scheduled for construction beginning late 2015, and will add classrooms and labs to the current building. A new Aerospace Building has been planned on east campus, and design is likely to get underway next fiscal year. The college will be expected to raise $35 million of the $75+ million in building costs, but a new campus funding model will allow us to raise these funds in endowments to support the people and programs using the building, rather than for construction.

*Idea Forge and Catalyze CU:* The Idea Forge has been the site of many events and celebrations. Chevron made a major gift to name the mechanical engineering project space, and several other gifts have also been received. Catalyze CU-Boulder’s second class of student companies will be housed in the Idea Forge this summer.

*Space Grand Challenge:* Dean Davis mentioned the Grand Challenge and that an update will be given later in the meeting. The college will have a significant role in its undertaking, but the Grand Challenge will reach across campus to include all colleges and departments.

2. *Education Update* – Associate Dean for Education Diane Sieber provided updates of several college educational programs:

*New Majors:* ATLAS now has a BS degree approved in Technology Arts and Media (TAM), and the certificate and minor have over 900 students. The new major will launch this fall and focus on technology, computing, creativity and design; examples are: game design, sound design, animation, and interactive design. The General Engineering Plus (GE+) degree is finishing its first full year; there are about 40 students enrolled, with an additional 37 new students confirmed for fall 2015. It provides curricular choice and flexibility: there over 16 GE+ concentrations, from economics to premed.

*New Minors:* Energy Engineering started fall 2014 with 23 students. They’re mostly chemical, chem-bio and mechanical majors, with some students from architectural, civil, environmental and computer science. The plan is to grow to around 70 students. The new interdisciplinary senior projects class will emphasize technology, economics and policy and launches in fall 2015. A Biomedical Engineering minor officially starts in spring 2016. It already has over 100 pre-enrolled incoming first-year students. The total anticipated enrollment is 200. Our intent is to attract high-quality students with this minor who otherwise might not have attended CU-Boulder.

*Residential Academic Programs:* Andrews Hall/Engineering Honors Program (EHP) has been in existence for eight years, and currently has 252 students. 223 live in Andrews Hall, which has 57% returning students. Andrews has increased its entering class size this fall to 84
students. The program is almost 50% female, and all majors are represented. Sustainable by Design has been in existence for five years, with the goal of 125 students this fall and a plan to recruit returners. A focus of the program is on pre-engineers with environmental engineering interests. Global engineering is in its second year. It is full at 111 students with a waitlist of over 200 students who speak Spanish, French, and/or Russian. Many of the students study abroad or engage in Engineers Without Borders. It is over 50% female and 30% Hispanic; over 80% of the first cohort returned, and next year over half of the residence hall will be returning sophomores, juniors and seniors. All majors are represented. A recent campus-wide study identified the top three residential academic programs on campus for GPA and student persistence. In order, they are: EHP, Arts and Sciences Honors, and Global Engineering. EHP and global are the only RAPS on campus with 50% returners, as opposed to the campus average of 5%.

Pre-engineering: The program started in 2013 with 529 students; in 2014 it had 621 new students, and we project 600 students for fall 2015. Admissions criteria for the program have been increased. Of the first cohort, 16% voluntarily left the program, 23% were admitted to the college within their first two years, and the remaining students were not admitted.

Engineering Leadership Program: ELP has 111 students, 34% female, and all majors are represented. This semester, there were 15 certificate recipients. There will be a new Maymester course offered, and there is currently a very highly rated introductory course and multiple noncredit leadership gatherings and community events.

Math Roundtable Assessment: A group of faculty representing most engineering departments and the math departments on campus has been studying the undergraduate math experience and looking at the math sequence as critical to student retention and success. This group has examined what other campuses are doing to support student success in math, has run comprehensive surveys and held focus groups in order to make recommendations for the improvement of student success in math.

3. Departmental Gap Analyses: Based on the presentation that each of the department chairs made to the EAC at its fall 2014 meeting, each chair presented a brief summary of the strategic gap that exists between where the department is currently and the strategic plan for 2020. After the presentations, the EAC divided into groups by department and spent the next hour discussing means by which the department could close the gap. One of the EAC members assigned to each group presented a summary of the findings:

Aerospace Engineering – Get rolling on new building. Campus leadership should engage top industry leaders to gain industry support of research related to their perceived needs;
identify ROI of current research; identify key professors to engage with industry; and build on the strengths of the 3\textsuperscript{rd} ranked department in the nation in graduate research.

*Electrical, Computer & Energy Engineering* – The department has been too ‘siliced’ in its approach and needs to work across intradepartmental boundaries; the department needs to create a new brand that makes an emotional connection with its alumni and supporters and builds on the strengths of the department such as sensors, optics and embedded systems; faculty need to improve leadership in strengthening reputation by being involved in publications and societies; create an appetite in high school students by engaging in K-12 STEM activities; invest in some senior faculty who bring reputation with them.

*Civil, Environmental & Architectural Engineering* – The department will be challenged with a split location between east and main campus, and needs to identify the positive attributes from the new space; identify long-term plan on east campus and build toward that; recommend that architectural engineering be re-branded as ‘building systems’ engineering; recommended that undergraduate minors be approved in environmental and building systems engineering.

*Mechanical Engineering* – Update department bylaws to provide for consistent leadership; focus on improving rankings by engaging other department chairs and peers; provide enhanced visibility into the departments sub-units through an improved website; develop a structured marketing pitch for all faculty who travel to conferences so that they are prepared to share the department’s strengths; be creative with faculty recruitment and spousal recruitment to include industry partners and EAC members; continue to invest in and improve laboratory facilities. Add space when Aerospace Building is done.

*Chemical and Biological Engineering* – Improve department rankings by hiring a few ‘top guns’ who would attract other strong faculty; document key skills for departmental leadership and groom potential successors; manage critical laboratory space so that new research is supported with space. Recruit international graduate students.

*Computer Science* – Managing explosive growth while maintaining quality will be a big challenge with faculty and space; nurture faculty who are at risk of being recruited by other universities; create a more flexible credit hour policy to provide support to the department for teaching students from A&S; evaluate a federated faculty model across campus; add significant space (Old power lab? Add floors to current wing?).

4. **Student Presentations** – Jessica Lynch, a junior in Computer Science, presented her journey toward being a computer science engineer after graduating with a degree in opera performance. She related the importance of ‘hands-on’ learning and internships in her studies. Alex Dohm, a graduating senior in Mechanical Engineering and French, shared her
story that included competing as a varsity athlete (soccer) and having a dual major that allowed her the flexibility to travel abroad her 5th year.

5. Grand Challenge – Associate Dean Scott Palo provided the EAC with an update on the Grand Challenge, which seeks to advance connections between space and our lives. He reviewed the timeline for the grand challenge, and then summarized the five proposal areas: Unmanned Aerial Systems, Sustainable Space, Earth Lab, Global Water, and Space Exploration. There will be a public launch for the Grand Challenge in September 2015.

6. Capital Projects – Vice Chancellor and CFO Kelly Fox gave the EAC an update on the capital projects on campus that will impact the College of Engineering and Applied Science. She reported that the 5th wing of the Biotechnology Building will be completed with state and campus funds in the next calendar year, and that the campus has made available $24 million for improvements to the current Engineering Center. She reported that the Sustainable Energy and Environment Complex (SEEC) will be completed in February 2016. She said that the new Aerospace Building on east campus has a chance of receiving design funds from the state in FY17, with construction in FY18. If the state does not fund the building, the campus is will consider alternative funding to build the building.

7. Election of New Officers – Mike Wirth was elected as incoming Chair of the Engineering Advisory Council, and Lisa Glatch was elected Vice-Chair for the upcoming 2-year term. Pam Drew was thanked for her service as Chair over the past 2 years.

8. Recognition of Graduating Members – Dereje Agonafer, Steve Dunn and Mike Fry were recognized and received gifts in thanks for their service. Patty Quinones, Don Wallette and Chantel Veevaete were recognized in absentia, and their gifts will be sent to them.

9. Idea Forge Update – Rebecca Komarek, Assistant Director of the Idea Forge, presented an update on the activities at the Idea Forge. The space was finished and occupied in fall 2014, and has hosted many classes and events. The Chevron ME senior design studio with 31 teams and 188 students was dedicated in February 2015. Special events were hosted for Catalyze CU-Boulder when 15 university accelerators attended Catalyze ‘U’ and shared best practices; the BOLD Bash celebrated the past year; Hackathon CU had 130 students work in the Idea Forge for 36 straight hours to perfect their innovations; and welding workshops were attended by 75 people. Summer 2015 will include Catalyze CU-Boulder, Design Thinking Certificate, Science Discovery, and Boulder Maker Faire.
10. **RDC/Advancement Update** – Assistant Dean Doug Smith reported out from the RDC meeting that giving to the Dean’s Fund for Excellence has continued to grow and that the Dean’s Club is running at about the same level as last year. The GOLD Board (graduates of the last decade) has been very active engaging young alumni, and would like to be better connected with the EAC. The Gold Board is a critical link to younger alumni who make up almost 1/3 of the college’s total alumni. Overall giving to the college is down 33% from the previous year, with total gifts of $5 million. Melinda Seevers provided an update of corporate and foundation giving, and reported gifts in excess of $3 million for the Idea Forge, SEEC, senior projects, AES building and other projects. This total does not include a $1 million grant from the Keck Foundation that will be received by the campus.

11. **BOLD Update** – Assistant Dean Sarah Miller provided an update from the previous weeks’ meeting of the BOLD Advisory Council. Enrollment of diverse students is substantially increased for fall 2015, and more interest from community colleges and K-12 schools has been identified. Twenty graduate students and 20 undergraduate students participated in research during spring break sponsored by BOLD.

12. **Executive Session, Wrap-up, and Recommendations** – The executive session with the dean and the wrap-up included the following recommendations:

- **Ask department chairs for updates in one year, and provide incentives and leadership training for chairs**
- **Create an office manager position in each department, and review (and replace, if needed) department and program bylaws**
- **Improve advancement efforts through long-term relationships, reduced turnover, and engagement of the Chancellor and President**
- **Increase communications on college programs’ quality, and consider a distinguished lecture series at college level**
- **For the next meeting, include an overview of campus advancement and its structure by the Chancellor and the Associate Vice Chancellor for Advancement, and update on the aerospace building, and an update on the Space Grand Challenge – the latter should solve major problems (grand challenges) and not just develop tools**

**Upcoming Meetings** – Upcoming EAC meetings are scheduled for 16 October 2015 and 22 April 2016, on Fridays and in Boulder.