

## **FLAGSHIP 2030 ENROLLMENT TASK FORCE: REPORT OF ACTIVITIES AND RECOMMENDATIONS, SEPTEMBER 2008**

### **Introduction**

The Enrollment Task Force has responsibility for two Core Initiatives and four Flagship Initiatives: Enhance Graduate Education, Ensure Access, Residential Colleges, Experiential Learning, University Villages, and Year-Round Learning.

The task force has approached this work by dividing into three subcommittees.

- One on undergraduate enrollment focused on creating a modest rate of growth that reduces CU-Boulder's share of Colorado high school graduates to historical levels. Lou McClelland (chair), John Ackerman, Sylvie Denise Burnet-Jones, Kambiz Khalili, Kevin MacLennan, Gwen Pomper, Jeffrey Zax (members)
- One on year-round learning focused on making the summer session equivalent to the fall and spring semesters. Deb Coffin (chair), Chuck Gamber, Noel Lenski, Armando Pares, Garrison Roots, Ken Strzepek (members)
- One on graduate enrollment focused on obstacles to overcome and strategies to develop in expanding graduate students from 15 to 20 percent of all students and restructuring the graduate program to establish more professional master's degrees, including many with an interdisciplinary emphasis. Fred Pampel (chair), David Boonin, Bill Emery, Bernadette Park, Tina Tan (members)

The subcommittees and task force met in the spring, discussed implementation of the initiatives, obtained information from informal conversations with faculty and department chairs, and examined various projections. In the summer, a survey of departments provided new data on graduate enrollment needs and capacities. These activities plus interaction with other task forces, reactions from the Dean's Council, and a meeting Ric Porreca guide our report.

### **Part One**

#### **Undergraduate Enrollment**

##### *Enrollment goals*

- Return, then maintain, our resident freshman share of Colorado high school graduates to historic levels. In recent years around 7% of graduates have enrolled at CU-Boulder as new fall freshmen; return this to the 5% level last seen in the late 1980's.
- Maintain out of state enrollment at one-third of total (including graduate and undergraduate), the maximum allowable under statute.
- An important determinant of the proportion out of state is the percentage of new fall freshmen who are out of state. Maintain this at about 44% to ensure staying within the statutory 45% maximum for fall freshmen while keeping the proportion of total enrollment as close to one-third as possible.
- Aim for smooth trends in numbers of both new freshmen and new transfers, with a 20% growth in transfers over the planning period.

*Qualifiers on the goals:* The goals for out of state enrollments are based on fiscal necessities. If per-student funding for in-state students, from tuition and state support combined, increases significantly relative to that for out-of-state, maintaining out of state enrollments at one-third the total is not important – the proportion out of state can fall below one-third. Conversely, if per-

student funding for in-state students declines significantly relative to current levels and/or peer levels, the proportion out of state may have to increase to over one-third, with freshmen over 45% out of state.

*Resulting enrollment patterns (see Appendix E for details)*

- *Colorado freshmen:* With an over-30% increase in Colorado high school graduates projected between 2007 and 2030, returning the CU-Boulder share of graduates to 5% would keep the number of new freshmen from Colorado between 3,000 and 3,500 through 2030. This is the same number seen (on average) fall 2005-2008.
- *Total freshmen:* With 3,000-3,500 Colorado freshmen each fall and an average of 44% of freshmen from out of state, total fall freshmen will average about 5,800, with around 2,500 from out of state. This is very similar to projected fall 2008 numbers.
- *Total undergraduate enrollment:* Total undergraduate enrollment will increase under 10% to 2030, from 24-25,000 to over 26,000.
- Given graduate enrollment growth from 4,500 to around 7,000, the proportion graduate will increase from 15% to 20%, with total enrollment increasing to over 33,000, an increase of 15% from fall 2007.

*Reasons for returning the CU-Boulder share of Colorado high school graduates to 5%. This action will*

- Continue to meet our obligation to the State of Colorado for access to Colorado high school graduates;
- Acknowledge projected increases in Colorado high school graduates, and acknowledge also the changing demographics and college-going patterns of those graduates;
- Acknowledge the increasing importance of transfer students
- Improve academic preparation levels of all entering freshmen by enrolling a lower proportion of the total;
- Allow numbers of faculty and numbers of graduate and professional students to increase relative to numbers of undergraduates;
- Allow total enrollment to increase very gradually.

*Actions: Housing*

- Add 1,350 residence hall beds in 10-12 years to house freshmen and a greater proportion of non-freshmen undergraduates. In fall 2008 this proportion is almost zero. Construction of beds and associated facilities will cost in excess of \$150 million. Begin planning work immediately.

*Actions: Financial aid*

- Increase annual total gift or grant aid to undergraduates by \$25 million by fiscal year 2015, roughly doubling such aid from fiscal year 2009 levels. In increasing gift aid, emphasize aid for resident undergraduates, both need-based and merit. Develop and draw upon both institutional and private sources to fund the increase.
- In our need-based financial aid policy, aim to provide access to low-income students considering not only tuition, fees, books and supplies, but a student's *total* cost of attendance, which also includes housing, transportation, medical, and personal expenses.
- Consider federal and state financial aid eligibility rules in development and expansion of innovative programs for undergraduates. Year-round enrollment, study abroad, and concurrent bachelor's-master's programs all pose eligibility issues currently. Develop alternative funding sources for aid to support students in such programs.

*Actions: Undergraduate enrollment management*

- Action: In 2008-09, systematically assess how to increase the analytic resources for and communication and coordination among the undergraduate enrollment management actors and activities listed below. At the same time, assess the same for graduate enrollment management, and reasonable fit between the two. In this assessment, determine if a new position or office is advisable and if so where it should be located administratively.
- Enrollment management encompasses institutional activities designed to
  - Understand and influence student flow from early interest, recruiting, and admission to graduation and beyond, including retention and graduation rates.
  - Understand and influence constraints on and goals for student flow, including internal priorities and budget, campus physical and administrative capacities, State priorities and rules, national and State demographics, and public perceptions
  - Set and manage toward goals for student flow.
- Enrollment management activities are carried out by
  - The chancellor and chancellor's cabinet
  - Deans' offices and college advising units; e.g., recruiting, enrollment goals, setting admission and program requirements, advising, probation and suspension, managing course offerings, setting department budgets; residential academic programs
  - The senior vice chancellor and chief financial officer, particularly for financial goals and constraints
  - Academic Affairs; e.g., coordination of college and cabinet enrollment goals, coordination of policies, implementation of externally-set policies; often involves the provost and the associate vice chancellor for undergraduate affairs. Also Study Abroad.
  - The division of Diversity, Equity and Community Engagement
  - The offices of admissions, financial aid, registrar, and bursar: Recruiting, admissions, administration of financial aid and bills, registration, administration of degrees, majors, and other offerings; administration of advising tools and degree audit
  - Other student affairs offices; e.g., counseling, career services, health services
  - Planning, budget and analysis's institutional analysis staff, with collation and analysis of national and internal data, and of rules and constraints, plus within-cycle and long-term enrollment projections.
- Enrollment management activities necessarily span many CU-Boulder divisions and units. This presents a challenge in communicating and coordinating among them. Currently communication and coordination takes place in five main ways:
  - Bi-weekly meetings of the enrollment prediction committee, with representatives of admissions, financial aid, registrar, bursar, budget, housing, and institutional analysis. This committee and its precursors have met since 1984, with an initial focus on new freshmen, now expanded to total enrollment. It has been chaired since 1984 by the director of institutional analysis.
  - Meetings and communications of enrollment-prediction members (and their staffs) with their supervisors and with the schools and colleges and other offices.
  - Quarterly meetings of the enrollment-prediction principals (directors of institutional analysis, admissions, and financial aid) with (jointly) the vice chancellors for academic affairs, finance, and student affairs.
  - Deans council, council of associate deans (CADS), and cabinet meetings.
  - Other – communications and coordination not known or communicated to the enrollment prediction committee.
- *Action: Money sources.* Reducing growth in undergraduates and increasing the proportion graduate enrollment will make it more difficult to generate significant increases in tuition revenue with undergraduate growth, a traditional source of revenue growth.

## **Year-Round Learning**

**Big Ideas:** The Flagship 2030 goals note that expanding the summer session to become the near-equivalent of the fall and summer sessions would have benefits of increasing enrollment without increasing/expanding UCB infrastructure and shortening the time to degree completion for participating students. However, the year-round learning subcommittee see major challenges to implementing this recommendation. An on-campus, full-enrollment, summer session

- Would overstrain an already deteriorating infrastructure and, when classrooms are used continuously, make it more difficult to complete renovation and maintenance projects. It would also increase cooling needs.
- Would require a new model for distributing faculty teaching, department duties, and office space. For example, if faculty can select which two of the three semesters they teach and participate in service activities, it means a good part of the department will be non-participants each semester. Or, if many faculty prefer summers free from teaching when children are home, distributing duties evenly across semesters may be difficult.
- Would affect revenue from meetings/housing/events for symposiums, institutes and youth camps that go on in the summer.
- Would require changes in the employment and course offerings for graduate students, who often do not have summer assistantships to cover tuition and can choose from only limited seminar offerings.

A stronger case needs to be made for the benefits of an on-campus, full-enrollment, summer session relative to the costs. The task force recommends that efforts be made under the current structure of summer session to increase enrollment and special opportunities for experiential learning, distance learning, and travel abroad.

**Implementation.** If an on-campus, full-enrollment, summer session is viewed as worth pursuing, in the next 12-18 months, complete a comprehensive study of 1) available classroom inventory for summer, 2) the estimated growth in summer enrollment needed to offset loss of revenue from summer orientation, institutes/symposiums, and camps, 3) successful summer programs elsewhere, 4) undergrads who attend summer session before graduating, 5) faculty interest in summer teaching, and 6) new tuition strategies for summer enrollment. With this information, a year-round enrollment growth and operations model can more precisely specify facility, faculty, and financial needs.

In the next 3-5 years, make more specific plans to meet infrastructure needs to expand summer on-campus enrollment, attach academic course expansion to current initiatives, increase graduate course offerings in the summer and graduate compensation for summer session instruction, and examine the possibility of shortening the spring and fall semesters to 13 or 14 weeks to allow for more operational and infrastructure development in interstitial periods between terms.

## **Graduate Enrollment**

### *Debate over Expanding Graduate Enrollment*

Given projections for undergraduate enrollment, increasing graduate students from 15 to 20 percent of all students translates into a 58 percent increase. It requires the substantial change of adding 2600 graduate students to the 2007 number of 4500 to reach 7100.

Faculty across campus disagree (sometimes heatedly) on the value of the goal. Those in favor of increasing graduate enrollment believe that, in the next several decades, the master's degree will replace the bachelor's degree as a requirement for many entry-level jobs and the demand will grow for the advanced research skills and specialized training that PhDs have. Meeting this demand for better-trained students will increase the intellectual vitality and prestige of the university. Also, more master's students would allow faculty to offer additional graduate seminars, cover more specialized topics, and have a large enough number of seminar participants to optimize discussion. More doctoral students would demand additional time from faculty supervisors but also help generate fresh ideas, advance faculty research, and move their disciplines forward.

Those opposed to expansion believe that the demand for master's degrees among employers, undergraduate students, and parents who pay for the education of their children is not yet apparent. Even if it were, including more master's students would dilute the quality of many graduate programs that focus on PhD training. Besides, with low state support and a division of labor with CU Denver and the Health Sciences Center, CU Boulder needs a more specialized focus and smaller graduate enrollment than many AAU peers. Departments already are over-stretched in recruiting, supporting, and training the current number of graduate students. CU Boulder should focus on improving the quality rather than increasing size.

To some extent, the two views have different time frames. The Flagship 2030 goals reflect a long-term vision. The Enrollment Task Force applauds this vision and believes that CU Boulder will need in future decades to help meet growing demand for higher-level degrees. Opponents to expansion focus more on immediate problems. The Enrollment Task Force likewise agrees that current resources limit the ability to realize an ambitious vision. Before anything else, it's important to concentrate on overcoming current problems in graduate support and creating a solid base for future expansion.

### *Big Ideas: A Strategy for Change*

Our initial recommendations for change thus focus in the next five years on increasing resources for graduate education. More assistantships and fellowships with higher stipends will, on their own, produce some modest increases in numbers. More importantly, they will help to improve the yield rate for graduate applicants and contribute to program quality. This strategy fits the Flagship 2030 goals, which propose "strengthening our recruiting efforts and enhancing graduate student incentives." It also helps address concerns of opponents by putting off further enrollment increases until the capacities of departments to attract and handle more students improve.

Our longer-term recommendations for the following decade or two focus on more substantial expansion of existing graduate programs and establishment of new programs, departments, and schools. Much of the increase would come at the doctoral level, but expanding and establishing new master's program would also contribute.

These recommendations necessarily generalize across the diverse capacities and graduate program goals of departments in the arts, humanities, social sciences, natural sciences, engineering sciences, and professional schools. Departments differ so markedly that a single set of recommendations for expansion cannot apply equally to all. Some can grow more than others, some are more suited for master's programs than others, and some will adopt new programs more readily than others. The recommendations speak of averages.

### *Steps toward Expansion*

First, CU Boulder should aim to add about 300 graduate students in the next several years by providing more assistantships and fellowships, increasing the rate of pay, and making more multi-year offers. A survey of departments shows that a majority desire more students, can find advisors for them, and see a strong market for graduates. Yet they cannot attract all the students they want because of low stipends, too few university assistantships and fellowships, high out-of-state tuition for those with external fellowships, and inability to promise multi-year support. Addressing these problems as a first step would increase enrollment while maintaining or increasing quality. Departments that cannot grow without more faculty or space would maintain current enrollments. (More details on the survey appear in Appendix A).

Second, in the longer term, the addition of 300 new tenure-track faculty lines in the next ten years, as recommended by the Flagship 2030 goals, should lead to an additional 1340 graduate students without greatly changing the faculty workload (see Appendix B). This increase in faculty lines and graduate students would require proportional increases in space, staff support, and operating expenses – all Flagship 2030 goals. It also would require new resources and strategies for recruiting top students (including more foreign students). Given these additional needs, it would make sense, as recommended by the Faculty Task Force, for the increase in graduate enrollment to follow the increase in faculty lines by 4-6 semesters.

With roughly 4500 graduate students in 2007-08, the 300 new graduate students added in the short run and the 1340 added in the long run would reach a total of 6140. This number represents a 36 percent increase and would take graduate enrollment from the current 15 percent to just under 18 percent of total enrollment by 2030. This may be the most the university and its departments can reasonably handle. The next steps to reach the Flagship 2030 goals require more extensive changes in the university and still more resources. We treat these next steps more as prospects for exploration and evaluation than firm recommendations.

Third, increasing the size and number of programs for concurrent bachelor's/master's degrees, terminal master's degrees, and professional master's degrees would increase graduate enrollment further. Most engineering departments support this goal, but many A&S departments prefer to devote resources to doctoral education and many professional schools already enroll large numbers of master's students. If part of the incoming tuition from master's students were returned to departments, it might help overcome resistance. It would also give departments some choice in the strategies of graduate training they adopt. Ideally, the new programs would involve less in new resources than shifting resources as graduate enrollment rises relative to undergraduate enrollment. Such changes might increase graduate enrollment by several hundred more.

Fourth, to increase graduate enrollment to the 20 percent goal, one more step would be needed: Establish new interdisciplinary programs, departments, and schools (with new faculty, space, and support). Doing more than adding numbers, new programs should have the potential to build on current strengths, increase university prestige, and improve the quality of the university. For

example, the energy initiative might be a candidate for a full-fledged program – particularly in collaboration with the new Conoco research lab in Louisville and the National Renewable Energy Lab in Golden. In the area of life sciences, bioengineering and medical physics may represent other promising candidates. Still further, CU Boulder lacks graduate programs in public policy, social work, library science, and no doubt other fields of study. We do not offer more specifics, but consideration of possible new programs should begin soon. In addition, finding space for the additional graduate students will be difficult and costly.

These changes will be expensive. Based on some crude estimates in Appendix C, the first step will cost on the order of \$6-7 million a year and the second step, to be reached by 2030, will cost nearly \$30 million per year in current dollars. Raising the stipend of all other assistantships will cost roughly another \$1.7 million.

### *Action Plan*

Increasing graduate student enrollment requires new funding for assistantships and fellowships, expansion of faculty lines and space, and perhaps new budget models to return more tuition dollars to the departments that generate them. Developing new departments and schools requires collaboration across colleges and campuses. These are substantial changes. However, translating the goals into more modest steps can begin soon. The recommendations focus on actions in the next two years, but also suggest some longer-term changes.

1. Allocate a major part of budget increases over the next several years to graduate student support. Raise average stipends for all current and new assistantships, add funding for more assistantship positions, and create a new pool of funds for fellowships.
2. As part of graduate enrollment management, delegate responsibility for keeping ongoing track of graduate applications, admittances, and yield rates. While decisions are made in the colleges and departments, timely statistics for the university as a whole can help guide decisions at the college and department level. Also examine changes in the qualifications of accepted students, time to completion, and placement of graduates that follow increases in stipends and fellowships. Data analysis can help evaluate claims that better funding improves quality.
3. Further enlarge national and international recruitment efforts. The university has increased allocations to departments for recruitment but more may be needed. In particular, recruiting more international students requires new strategies (and work with the Office of International Education). Examples might include more travel of faculty and administrators to foreign countries and universities, joint offices with other universities in foreign countries, and help for individual faculty attending international conferences or collaborating with colleagues at universities outside the United States.
4. Strengthen ties to national labs, Colorado companies, and nearby universities that employ PhDs with the expertise to help support and supervise graduate students. Although not a replacement for regular faculty, highly qualified, non-traditional faculty can help with special needs for teaching graduate students and supporting their research.
5. Make the case for the benefits of additional graduate students. A committee can collate survey information on the jobs taken by graduates with master's and doctoral degrees and the contributions they make to the national and Colorado economies.

6. Offer tuition waivers for international or out-of-state students with a fellowship but no assistantship.
7. Allocate new faculty lines and space to schools, colleges, and departments in part on the basis of the potential to expand graduate education.
8. Increase support services for graduate students, departments, and campus-wide organizations (e.g., Graduate Teaching Program) to deal with increased numbers.
9. Offer test or pilot programs that give additional funding to departments that increase enrollment in tuition-generating concurrent, terminal, or professional master's programs. Departments may use the additional funding to support doctoral programs or other needs. Results from these test cases could help plan for ways to implement such programs campus wide.
10. Appoint a committee involving Continuing Education to develop ways to increase distance learning and professional certificates for potential graduate students who need something other than normal on-campus degree programs.
11. Lay the groundwork to consider establishing new departments and schools. Such programs will involve multiple departments, schools, colleges, and perhaps other campuses, and they will require multidisciplinary hires.

## **Part Two**

1) Describe how your recommendations help advance UCB's mission as a comprehensive graduate research institution with selective admission standards.

Increasing enrollment at all levels but at a faster pace for graduate than undergraduate students and providing more funding for graduate assistantships will

- Expand the number of students getting an education at UCB.
- Increase the academic preparation of undergraduates attending UCB. As a percentage of all UCB students, undergraduate enrollment will decline and the academic qualifications of those admitted will improve.
- Increase the selectivity of graduate students attending UCB by offering more attractive financial packages that compete better with top universities.
- Enhance comprehensiveness by adding new master's and doctoral programs.
- Meet demand for more advanced training of students in a globally competitive environment.

2) Discuss how your recommendations affect the allocation of campus resources (personnel, financial, facilities, etc.) in order to allow us to fulfill our mission, improve the quality of education, and respond to future challenges and opportunities.

Increasing graduate enrollment relative to undergraduate enrollment will shift resources from undergraduate to graduate education and to departments with strong demand for graduates with advanced degrees. It perhaps will also foster an allocation model based on responsibility centered management, with graduate enrollment a key in determining school, college, or department funding. Increasing undergraduate financial aid will improve access to Colorado residents.

3) Describe how your recommendations improve student learning and effective teaching.

With increased faculty size, the student-faculty ratio will decline. The change will provide more opportunity for students to work individually with faculty and learn from involvement in cutting-edge research. And stronger academic preparation of entering students will aid effective classroom teaching.

4) Describe how your recommendations help foster the acquisition, discovery and application of knowledge and promote a life of learning for faculty, staff and students.

The increase in the proportion of students at the graduate level means more people working on acquisition, discovery, and application of knowledge. This benefits faculty research as well as student learning and encourages collaboration between faculty and students. More generally, the intellectual vibrancy of the campus will increase with a greater presence of advanced students.

5) Discuss how your recommendations impact the university's internal and external constituencies and serve their needs and expectations.

The Flagship 2030 recommendation to increase graduate enrollment is a response to the belief that, in the next several decades, the master's degree will replace the bachelor's degree as a requirement for many entry-level jobs and demand will grow for the advanced research skills and specialized training that PhDs have. Meeting this demand for master's and doctoral graduates will serve the needs of students and employers. Increasing graduate enrollment should also

increase the intellectual vibrancy of the campus – a benefit to students and faculty alike – and may improve the national and international prestige of the university. Returning to and maintaining CU-Boulder’s historical share of Colorado high school graduates and increasing undergraduate financial aid also help fulfill our obligations to the State of Colorado.

**PBA reference:**

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**Appendices follow**

## Appendix A. Results of Summer 2008 Survey about Graduate Enrollments

Response Rate:

- 43 of 45 departments with graduate programs (96 percent). Seven of those departments have master's programs only, nine have PhD programs only, and 27 have both.

What are the most important changes needed to increase graduate enrollment?

- In order from most often mentioned: more assistantships, more university fellowships, higher graduate stipends, more faculty, more space, and more recruitment and applicants

How much could the program grow with higher stipends and more assistantships but no additional faculty, space, or operating funds?

- About 16 or 48 percent of reporting departments with master's programs say they could grow at the master's level and about 22 or 63 percent of reporting departments with doctoral programs say they could grow at the doctoral level. These departments estimate that, in total, they can add about 300 more graduate students (about one-third master's and two-thirds doctoral students). Averaged across all departments, total CU Boulder graduate enrollment could grow by about 7 percent.

Would the department have trouble finding positions for additional graduate-degree students?

- About 85 percent at the master's level and 86 percent at the doctoral level say they'd have no trouble. However, several say that the quality of students would need to be maintained or increased.

Any interest in new terminal or professional master's program?

- Of those with such a program (26), about 23 percent say they can expand; of those without such a program (14), 21 percent express interest in developing one.

Would students benefit from a joint bachelor's/master's program?

- Of those with such a program (16), about 81 percent say it works well; of those without such a program (23), about 43 percent say they have some interest in developing one.

Would like more international students?

- About 86 percent say yes.

What is rated as very important in expanding graduate enrollment?

- In order from most often mentioned: more stipends and fellowships, higher stipends, more space, more faculty, more staff, more applicants, more tuition waivers, better facilities, and more jobs for graduates.

The findings span a variety of disciplines but some modest differences in emphasis exist across fields of study. By field, the needs listed in order of most often mentioned as very important are as follows.

- Arts and Humanities: more stipends and fellowships, higher stipends, more staff, more space, more applicants, lower tuition, more faculty
- Social Sciences: more faculty, higher stipends, more stipends and fellowships, more space, more staff
- Natural Sciences: more space, more stipends and fellowships, more faculty, higher stipends, better facilities, more staff
- Engineering: more stipends and fellowships, more space, more applicants, lower tuition, more faculty, higher stipends, more international students
- Professional Schools: more stipends and fellowships, more faculty, higher stipends, more space, more jobs for grads

## **Appendix B. More Numbers on Graduate Enrollment Growth**

Some calculations can illustrate in more detail how expansion of graduate enrollment might work. To review, we divide the change into four steps. The first two steps, based on expanding existing programs and departments, would lead to an estimated 36 percent increase and a total of 17.8 percent graduate students rather than 20 percent. The next two steps involving new programs and new units needed to move closer to the proposed 58 percent increase and 20 percent graduate students.

First, CU Boulder could likely add about 300 graduate students by providing more assistantships and fellowships, increasing the rate of pay, and allowing for more multi-year offers. The estimated increase of 300 (about one-third master's and two-thirds doctoral students) comes directly from a summer 2008 survey of graduate departments (Appendix A). The number sums the response of each department to a question on the number of master's and doctoral students that it could add with more assistantships and fellowships but no additional faculty lines, space, and operating funds. From a base of 4500, the increase would produce a count of 4800 graduate students over the next five years or so. (Also see Appendix D for a note on the difficulty in replacing professional research assistants with graduate students.)

Second, the addition of 300 new tenure-track faculty lines could increase graduate enrollment by about 1340. Based on figures of 4500 graduate students and 1075 tenured and tenure-track faculty, the graduate student-to-faculty ratio equals 4.19. This might increase to 4.47 if graduate enrollment could grow to 4800 (without more faculty lines as calculated above). Multiplying 300 new faculty lines by 4.47 equals 1340 more graduate students. Added to 4800, total graduate enrollment would reach 6140, which represents a 36 percent increase and by 2030 would make up 17.8 percent of all students (based on projections for undergraduate enrollment).

Is growth by 36 percent warranted? The survey shows that 85 percent of departments say that additional master's and doctoral graduates would have little trouble finding a job. Moreover, the growth need not occur proportionately across departments – it can respond to market incentives

and capacities. The provost and deans can direct growth in faculty lines and graduate students to expanding fields and decide whether to concentrate on building up smaller programs, developing new programs, or adding to strong programs. With such flexibility, growth by 36 percent would meet the needs of students and the CU Boulder.

Third, increasing the number of programs for concurrent bachelor's/master's degrees, terminal master's degrees, and professional master's degrees could increase graduate enrollment further. About 20 percent of departments say they could develop new master's programs. Also about 40 percent of departments without a joint bachelor's/master's program express interest in developing one. It is hard to translate these responses into specific numbers, but it seems likely that, with some return of tuition dollars as an incentive for departments, several hundred new graduate students could be added to terminal and professional master's programs. More concurrent bachelor/master's degree students would not increase the total number of students, but it would give more emphasis to advanced training.

Fourth, to further increase graduate enrollment by 600-700 to reach the 20 percent and 7100 goal, one more step would be needed: Establish new interdisciplinary programs, departments, and schools (plus new faculty, space, and support) with special emphasis on graduate education. Without being more specific, suffice it to say that new degree programs emerge regularly from the interdisciplinary interests of the faculty and deans (sometimes in collaboration with other colleges and campuses). Support for multidisciplinary graduate programs can spur innovation and faculty interest.

### **Appendix C. Some Crude Costs Estimates of Graduate Enrollment Growth**

The first proposed step in graduate enrollment growth involves adding 300 students who would be attracted to CU Boulder with more assistantships, more fellowships, and higher stipends. Since we cannot count on a major increase in externally funded research assistantships and fellowships, we assume the students will work as TAs. Multiplying 300 times the 2007-08 average cash salary for a TA of \$15,257 (from Perry Sailor, PBA) equals \$4.58 million. If, as recommended, the stipend level is increased along with the number of stipends, it will cost more. At current levels, CU-Boulder is a few hundred dollars higher than the median of 23 mostly public AAU universities (once subtracting out unwaived fees to get net compensation). However, many departments compete for graduate students with the top rated universities that pay well above the median. A 10 percent increase on top of the usual cost of living adjustment would move us up to roughly the fifth highest among the 23 universities and make stipends competitive with top schools. Assuming a 10 percent increase in the average stipend, then, the cost for the 300 new assistantships would equal \$5.03 million. The cost of covering fringe benefits (3.2 percent) raises the costs to \$5.20 million. Reducing fees, particularly for health insurance, would add further to the total, but we assume that the proposed 10 percent increase in stipends would go in part to paying fees.

Added fellowships of two kinds would do still more to attract top students. One type for exceptional students would provide a full stipend without formal teaching or research duties, while another would add to the typical assistantship stipend. Offering the former (again at \$15,257 times the 10 percent raise and fringe benefits) to the top 1 percent of the current number of 4500 graduate students (or 45 students) would cost around \$779,000. Offering the latter to the next top 3 percent of students (or 135 students) at, say, \$3000 each would cost about \$405,000. Although near the median on average stipend, CU Boulder ranks low in the maximum stipend; an added \$3000 fellowship for a few top students would improve our position.

To sum things up, the yearly added cost of proposed changes in graduate support would at minimum equal \$6.4 million.

With the report calling for adding 1340 more graduate students by 2030, the long-term costs in current prices can be estimated in much the same way. If 300 more graduate students cost \$6.4 million, then 1340 more would cost an additional \$28.6 million ( $6.4 * 1340/300$ ). Also by 2030, the proposed expansion calls for several hundred new concurrent, terminal, or professional master's students. However, since most of these students will pay tuition, we assume the costs to the university will roughly equal the new revenues. Last, the proposal for new departments and schools remains much too vague to present cost estimates. Such figures cannot come until plans are made more specific. However, we do know the costs – both start-up and annual – would be substantial.

One other cost needs to be considered. Giving all assistants, not just the new ones, a 10 percent raise would conservatively require another \$1.7 million per year. The cost comes first from estimating the total expenditures for the assistantships and multiplying that number by 10 percent. Total expenditures come from multiplying the number of half-time equivalent (1062) teaching and graduate assistants by the average salary of TAs plus fringe benefits (\$15,257+488). Increases in stipends for research assistants would come from external funding.

#### **Appendix D. Note on Post-Docs and Graduate Research Assistants**

Shifting grant funds from post-docs and professional research assistants to graduate student research assistantships could help increase graduate enrollment. While CU Boulder has fewer graduate students than most of our public AAU peers, it may have more entry-level research professionals known on the campus as PRAs (though comparable data are not available to be certain). With graduate program expansion, PIs might hire more graduate assistants enrolled in school and fewer professional research assistants.

However, after informal discussions with members of departments and institutes with many PRAs, it appears that such a shift would cause problems for externally funded projects. Because PRAs and graduate assistants perform different functions, they are not easily substitutable. PRAs do more to keep long-term programs running; graduate assistants eventually contribute original research but spend much time learning. Both are needed, but grant projects would work less well with fewer PRAs. Graduate student expansion likely could not come from replacement of PRAs.

The same point holds for post-docs. They have experience and skills that graduate students lack and likely cannot be replaced by graduate students.

#### **Appendix E: Enrollment assumptions** – see next page.

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CU-Boulder Enrollment Scenarios

Degree-seeking w state-reportable hrs only

2008-2030--version G-- UG and I

2007 = Actuals

Fall of:	1988	1989	2002	2003	2004	2005	2006	2007	2008	2009	2010
x Continuing undergrads											
x Fr/soph/jr contin rate	Res	80.6%	81.0%	81.9%	81.4%	82.4%	82.4%	82.4%	82.4%	82.4%	82.4%
x to fall listed	NR	74.8%	74.2%	73.7%	73.8%	76.8%	76.8%	76.8%	76.8%	76.8%	76.8%
Res	9,826	10,008	11,483	12,078	12,575	12,566	12,481	12,335	12,426	12,374	12,385
NR	4,699	4,710	5,142	5,414	5,555	5,346	5,142	5,284	5,412	5,679	5,777
Total	14,525	14,718	16,625	17,492	18,130	17,912	17,623	17,619	17,838	18,053	18,162
New freshmen											
Pct resident	57%	57%	55.7%	56.3%	58.1%	62.1%	58.3%	59.9%	56.1%	57.5%	57.5%
Res	2,001	1,933	3,002	3,137	2,983	3,110	3,277	3,327	3,140	3,230	3,241
NR	1,481	1,434	2,389	2,434	2,155	1,897	2,340	2,228	2,460	2,388	2,395
Total	3,482	3,367	5,391	5,571	5,138	5,007	5,617	5,555	5,600	5,618	5,636
Transfers -- pct resident	61%	63%	70%	70%	71%	72.7%	71%	72%	72%	72%	72%
Res	807	935	1,010	1,033	1,029	948	884	929	960	965	973
NR	513	547	428	444	413	356	360	370	380	385	387
Total	1,320	1,482	1,438	1,477	1,442	1,304	1,244	1,299	1,340	1,350	1,360
Total grad level								69%	69%	69%	69%
Res total	3,219	3,222	3,030	3,199	3,297	3,213	3,214	3,119	3,181	3,244	3,309
NR total	1,231	1,280	1,470	1,412	1,251	1,188	1,244	1,396	1,424	1,452	1,481
Total	4,450	4,502	4,500	4,611	4,548	4,401	4,458	4,515	4,605	4,696	4,790
TOTALS											
Res undergrads	12,634	12,876	15,495	16,248	16,587	16,624	16,642	16,591	16,526	16,570	16,598
NR undergrads	6,693	6,691	7,959	8,292	8,123	7,599	7,842	7,882	8,252	8,451	8,559
All undergrads	19,327	19,567	23,454	24,540	24,710	24,223	24,484	24,473	24,778	25,021	25,158
<b>Total UG + Grad</b>	<b>23,777</b>	<b>24,069</b>	<b>27,954</b>	<b>29,151</b>	<b>29,258</b>	<b>28,624</b>	<b>28,942</b>	<b>28,988</b>	<b>29,383</b>	<b>29,718</b>	<b>29,948</b>
Total res	15,853	16,098	18,525	19,447	19,884	19,837	19,856	19,710	19,707	19,814	19,907
Pct resident (fall dg-seek	66.7%	66.9%	66.3%	66.7%	68.0%	69.3%	68.6%	68.0%	67.1%	66.7%	66.5%
Pct grad level	18.7%	18.7%	16.1%	15.8%	15.5%	15.4%	15.4%	15.6%	15.7%	15.8%	16.0%
CO HS grads (1000's)	37.6	37.1	43.2	44.8	47.3	47.0	46.8	46.9	48.5	47.1	48.4
Ests updated 4/08											
Share of CO HS grads	5.3%	5.2%	7.0%	7.0%	6.3%	6.6%	7.0%	7.1%	6.5%	6.9%	6.7%

HS grads/share revised 4-15-08. See intro tab for assumptions.

Fall of:	2011	2012	2013	2014	2030		
Continuing undergrads						fixes to R, NR contin rts fro	
Fr/soph/jr contin rate	82.4%	82.4%	82.4%	82.4%	82.4%	1.9%	Change from fall
to fall listed	76.8%	76.8%	76.8%	76.8%	76.8%	2.6%	07 to 2030
Res	12,400	12,445	12,492	12,535	13,196	861	7%
NR	5,835	5,858	5,873	5,891	6,198	914	17%
Total	18,236	18,303	18,365	18,427	19,395	1,776	10%
New freshmen							
Pct resident	57.5%	57.5%	57.5%	57.5%	57.5%	(0)	-4%
Res	3,251	3,261	3,272	3,282	3,448	121	4%
NR	2,403	2,411	2,418	2,426	2,548	320	14%
Total	5,654	5,672	5,690	5,708	5,996	441	8%
Transfers -- pct resident	72%	72%	72%	72%	72%	0	0%
Res	980	987	994	1,001	1,116	187	20%
NR	390	393	396	399	444	74	20%
Total	1,370	1,380	1,390	1,400	1,560	261	20%
Total grad level	69%	69%	69%	69%	69%	0	0%
Res total	3,374	3,442	3,510	3,580	4,905	1,786	57%
NR total	1,510	1,540	1,571	1,602	2,195	799	57%
Total	4,885	4,982	5,081	5,182	7,100	2,585	57%
TOTALS							
Res undergrads	16,631	16,694	16,758	16,819	17,760	1,169	7%
NR undergrads	8,628	8,661	8,687	8,716	9,191	1,309	17%
All undergrads	25,260	25,355	25,445	25,535	26,951	2,478	10%
<b>Total UG + Grad</b>	<b>30,145</b>	<b>30,337</b>	<b>30,526</b>	<b>30,716</b>	<b>34,051</b>	5,063	17%
Total res	20,006	20,135	20,268	20,398	22,664	2,954	15%
Pct resident (fall dg-seek	66.4%	66.4%	66.4%	66.4%	66.6%	Plot	0%
Pct grad level	16.2%	16.4%	16.6%	16.9%	20.9%	Plot	5%
CO HS grads (1000's)	48.0	47.3	47.3	47.7	64.8	Plot	18
Ests updated 4/08							
Share of CO HS grads	6.8%	6.9%	6.9%	6.9%	5.3%	Plot	(0) -25%

### Enrollment scenario for Flagship 2030 strategic planning

See revision history below.

Lou McClelland, CU-Boulder Planning, Budget, and Analysis. This and other versions are posted at <http://www.colorado.edu/pba/records/flagship2030.htm>

In the PROJ tab, click on the + signs at the top to open columns/years not visible

Flagship 2030:

<http://www.colorado.edu/flagship2030/>

Modified assumptions 4-18-08 -- version G. OK'd by Ric and Phil.

**INITIAL assumptions on enrollment in Plan 2030 and in the scenario:**

1	Increase total degree-seeking enrollment by roughly 6,500, from 29,000 to 35,500, from fall 2006 to 2030. This is about the same increase in headcount seen over the prior 25 years.	A: Maintain resident freshman share of Colorado HS graduates at historic levels -- between 5% and 7%. This is an OBLIGATION.
2	Increase graduate level enrollment (graduate school, law, and MBA) from about 15% to about 20% of the degree-seeking total. Couple with the increase in total enrollment, this would mean increasing graduate-level enrollment to over 7,000, an increase of over 50% from fall 2007.	B: Increase graduate level enrollment (graduate school, law, and MBA) in number and relative to undergraduates. This is a GOAL.
3	Maintain out of state enrollment at one-third of total, the maximum allowable under statute, if the per-student funding from tuition and state support remains markedly lower for in-state than out-of-state students	C: Maintain out of state enrollment at one-third of total, the maximum allowable under statute, IF the per-student funding from tuition and state support remains markedly lower for in-state than out-of-state students.
4	Achieve the enrollment goals by about 2020, with stable enrollment thereafter. <i>This assumption is not stated in Plan 2030, but was used in developing financial scenarios for it.</i> <b>ASSUMPTION CHANGED in version F-- to reach goals by 2030, not by 2020.</b>	D: Smooth increases in freshmen and in transfers. Don't set freshmen as a fixed pct of Colo HS graduates, which varies year to year.  And, for this model, set 2008 undergraduates to match projections used in budget and admissions.

**Tabs in this workbook**

Intro	This tab
Proj	Enrollment by year, 1988-2030, for graduate-level and freshmen, transfers, and total undergraduates, by residency. Figures through fall 2007 are actuals.  Also includes associated measures, such as Colorado HS graduates and CU-Boulder freshmen as a percentage of Colorado HS graduates
Plots	Plots of some of the major series
NewTTT	For illustration only, of methods used around 2006 to calculate number and cost of new tenured-tenure track positions to return the student-faculty ratio to historic levels.

PBA reference: L:\mgt\Road\StratPlan2007\TXX\_B.xls  
Version Bsmooth

**Revision history**

- A Created 06-07 for Plan 2030 deliberations
- B Revised fall 07 with fall 07 actuals
- C Posted Feb 08
- D Revised 3-6-08 to correct error in transfer numbers, revise freshmen to compensate, add change columns, add intro
- E Revised 3-14-08 by Fred Pampel consistent with change in assumption #4. TXX\_Bsmooth.xls
- F Revised 3-19-08 LMCC to fill in years 2022 to 2029.
- G Revised 4-15-08 LMCC:
  - 1. Revise Colorado HS grad projections consistent with WICHE transition ratios. Now include private-school for all years.  
Projections are less than WICHE's because first year projected by WICHE (2006) is already known and is 2000 below WICHE proj.  
See PBA L:/ir/emgt/HS/proj/WICHE2008Colorado.xls, tab PBA, for derivations
  - 2. Modify freshmen residents per assumption A
  - 3. Modify freshmen pct resident, and transfers, to maintain 2/3 resident over all enrollment.
  - 4. Did NOTHING to graduate level
- G Revised 4-18-08 to clarify assumptions only.

L:\mgt\Road\StratPlan2007\TXX\_BSmoothVersG.xls, Intro