

ACADEMIC DIVISION LONG RANGE SUMMARIES

Academic Planning Committee

DRAFT FOR APC REVIEW

June 12, 2001

Introduction

The Academic Planning Committee¹ (APC) was asked by Campus Provost Simpson in his letter of March 26, 2001 to provide written comments on the plans and proposals included in the divisional summaries. The committee was asked for comments on (1) the overall quality of the plans relative to the articulated campus goals; (2) the extent to which individual plans address the specific goals formulated for the academic plans;² and (3) the synergies and opportunities for collaboration among divisions.

Methodology

In one four-hour meeting held on April 10, 2001, the divisional deans each presented a synopsis of their respective divisional summaries. Owing to schedule constraints, there was insufficient time to critically examine the proposals. In a one hour special meeting held on May 15, the APC discussed in some detail the goals presented in appendix A; and on May 22, in a four-hour joint meeting between the Provost's Advisory Council, the Academic Planning Committee, and the Academic Support Planning Committee, the divisional summaries were discussed in further detail.

General Issues: Campus Goals

In its May 15 meeting, the APC discussed issues relevant to all of the divisional summaries. There was a general consensus on the following *Campus Goals*:

1. *Managing enrollment growth necessary to accommodate 5,200 new student FTE between now and 2010.* There are three general comments that can be made about enrollment growth management:

1. The campus is enrolling about seven hundred new students each year. At this rate the campus will have reached its fall-winter-spring on-campus target of 13,000 undergraduate students with the entering class of 2003-2004. By 2004-2005, the campus will have reached its LRDP limit of 15,000 on-campus students.
2. At a faculty-student ratio of approximately 18:1, this growth rate will require the recruitment of about 40 new faculty per year, plus an approximately equal number of faculty replacements arising from separations and retirements. This is probably well beyond the institution's capacity to hire, let alone provide the necessary housing, start-up funding, and office and laboratory/studio space. As a consequence,

¹ The APC comprises the five academic deans; the Vice Provost for Academic Affairs; the Dean of Graduate Studies; the Dean of Undergraduate Education; the Vice Chancellor for Research; and representatives from the following academic senate committees: the Committee on Planning and Budget, the Committee on Educational Policy; the Committee on Research; and the Graduate Council.

² Campus and specific goals are presented in Appendix A.

managing enrollment growth will undoubtedly require substantially greater temporary academic staffing than has been historically the case.

3. The most rapid enrollment growth is taking place in the Engineering, Social Sciences, and Arts Divisions. Enrollments in the Natural Sciences and in the Humanities Divisions are relatively static. This imbalance must be addressed in, among other places, our admissions and outreach strategies.

2. Strengthening UCSC's position as a major research university. This campus goal will be achieved by attracting the most distinguished senior faculty, and the most promising junior faculty, to UCSC. Strategies for accomplishing this goal will obviously be discipline dependent. In all cases, however, excellence in hiring will be contingent upon the committed leadership of the hiring departments and divisions.

3. Doubling UCSC's Graduate enrollments: The campus goal of doubling graduate enrollments needs further critical examination and elaboration. In a thoughtful note,³ former Acting Graduate Dean Gill argued that an appropriate Ph. D. program should comprise 10% of the total student body, a number consistent with other UC campuses at the time. Additional graduate enrollments would arise in professional master's degree programs, established for entirely different academic purposes. APC members seriously questioned whether a campus of 15,000 on-site students could support major professional degree programs of a magnitude that would bring the overall graduate program up to 20% (3,000 students). Based on long-range graduate enrollment growth plans derived from division proposals, a projected 750 new graduate students will be derived from five areas:

Engineering (MS/Ph.D.)
Education MA/MAS/Ph.D.
Environmental Studies MES
Community Studies MA
Digital Arts (est.) MFA/PHD

This growth added to the current 1,100 graduate students will bring enrollment to 1,850, 12% of the proposed 15,000 on-site total campus enrollments and does not include enrollment projections from the 25 other preliminary graduate proposals.

This matter deserves further thoughtful discussion. In this regard, reference to Appendix E, UC Comparative Graduate Student FTE, should be helpful.

4. Increasing contract and grant support two-fold: The priority placed upon this goal will markedly affect campus resource allocation. Two points are relevant here. Historically, and across the UC campuses, the bulk of overhead-generating contracts and grants are awarded to the sciences and engineering. Within these units, a substantial increase in contract and grant funding will necessarily arise from the formation of new institutes as exemplified by the Center for Adaptive Optics and the Cal-ISI institutes. Such institutes will require substantial initial investments in space and faculty startup funds.

5. Enhancing quality at the undergraduate and graduate levels, promoting innovation, and enhancing access for the diverse population that comprises today's California: The first of these campus goals, quality at the undergraduate and graduate levels, is most

³ James Gill, Appendix B, 2005 Report. This article is also reproduced as Appendix D of this report.

relevant to academic planning. Here the APC agreed that the campus culture and tradition must shift. UC Santa Cruz has always been known, and should continue to be known, for its commitment to undergraduate education, despite increasing student-faculty ratios and diminishing state support. The campus culture has been more one of ‘protecting’ the undergraduate program from the depredations arising from new graduate programs. The new paradigm must be one of harnessing the talent arising from new graduate programs, so that new (and existing) graduate programs actually *enhance* the quality of the undergraduate program. Here, UCSC can provide some major innovations, such as creating prestigious teaching fellows among the cohort of most talented graduate students who have advanced to candidacy. Many similar innovations are possible, as the campus matures.

General Issues: Academic Goals

In addition to the *Campus Goals*, the APC discussed the eight *academic goals* upon which the academic plans will be reviewed. The APC comments on goals 1, 2, and 4 were given in the preceding section.

1. *Strengthening research and scholarly accomplishment and distinction.* See *Campus Goal #2*, above.

2. *Markedly increasing graduate programs and enrollments.* See *Campus Goal #3*, above.

3. *Developing interdisciplinary programs at all levels.* Interdisciplinary programs have been a hallmark of the UCSC campus since its founding. Such programs were a natural consequence of the early college system, in which all faculty held appointments jointly with their discipline (Board of Studies) and their college. This administrative structure proved unworkable, and was dissolved in the 1979 reorganization.⁴

It is the considered opinion of the APC that a high priority attaches to the removal of administrative barriers to interdisciplinary research, graduate programs, and undergraduate programs. This being said, interdisciplinarity should not be taken as a goal in itself, since it suggests that lesser importance attaches to excellence within disciplines.

4. *Markedly increasing external support, from grant/contract as well as private fundraising.* See *Campus Goal #4*, above.

5. *Creativity in combining present resources with new resources.* Owing to time constraints, this goal was not discussed.

6. *Innovative programming in non-traditional areas, including the Silicon Valley Center, state-funded summer session, and other off-campus enterprises (e.g. distance learning, EAP, UC-DC, others).* The APC is well aware that all campuses of the University of California are being asked to enroll significant numbers of students through non-traditional means that do not count against the Long Range Development Plan ceilings.

⁴ See, e.g. Robert Sinsheimer, **Strands of a Life: The Science of DNA and the Art of Education.** University of California Press, 1994.

Each of the possible modes of instruction has its own set of challenges, which are the subject of intense analysis and debate. Members of the APC agreed that the most cost-effective and substantial program would be state-funded summer instruction, for obvious reasons. Instruction at the Silicon Valley Center and at UC-DC will be significantly more costly than on-campus traditional instruction, and detailed financial analysis should inform these programs well in advance of their serious proposal.

7. Enhancing faculty, staff, and student diversity. The APC concurs that academic units should set overall goals for diversity, and should be held accountable for those goals as growth funding is awarded.

8. Proposing accountability measures. The APC concurs that academic units should set accountability measures early in the proposal development process, and that the APC should be given an early opportunity to comment on those goals.

General Issues: Undergraduate Education

Many members of the APC felt that the health and the excellence of the undergraduate program was conspicuously lacking in the eight academic plan goals. In a written communication,⁵ the Academic Senate Committee on Educational Policy expressed its specific concerns about the pursuit of the eight academic goals absent a careful consideration of the undergraduate program.

General Issues: Next Steps

Divisions are asking for clear criticisms of the executive summaries to facilitate revisions and inform faculty. Department faculty and deans are embedded in their planning details and will benefit from external feedback. Identifying questions, omissions, and other comments is beneficial, and thoughtful dialogue will build better campus understanding of planning goals. Interdivisional collaboration is strong and must continue to guarantee successful programmatic outcomes. Administrative feedback on program priorities and resource realities will help faculty prioritize the wealth of new programs.

Expanding the academic senate role in the planning process to include comprehensive dialogue and feedback to faculty is recommended. The committees on Educational Policy, Planning and Budget, Graduate Council, and Research are the most expert faculty bodies to offer sophisticated, detailed, programmatic advice. The Academic Planning Committee recommends that substantial discussions between the deans and the Committee on Educational Policy, the Committee on Planning and Budget, the Graduate Council, and the Committee on Research will advance the plans to the next level. The format of discussions must avoid any perception of final decisions, and promote informal candor. The meetings should be modeled after department external review closure meetings, with discussion targeted to the highest priority issues. Productive dialogue will provide faculty with issues they can be responsive to in completing comprehensive plans. APC recommends that a subset of these senate committees meet with deans and key administrators over the summer.

Specific Issues: All Academic Divisions

⁵ CEP Chair Freeman to VPAA Brown, May 17, 2001.

Many of the program proposals are interdisciplinary in nature and offer a number of opportunities for collaboration. The comprehensive plans will benefit from a discussion of the overlap and how they contribute to each other. Articulate the range of differences among potentially overlapping fields and specific areas proposed for faculty recruitment. Overlapping themes in (but not limited to) environment, health, technology and policy should be clarified. What are the divisions' strategies for pursuing interdisciplinary collaborations? How can Human Health be organized with Health Sciences? How can Natural Sciences and Social Sciences environment themes complement without duplication? Are Public Humanities and Social Policy and Public Advocacy related? What are the interdisciplinary connections in Engineering Management?

What is the phasing planned for new graduate programs? In what ways will they enhance the undergraduate interests and faculty scholarly agendas? How does graduate program growth affect the division's space needs? Which programs are critical to the disciplines, and which are interesting but not absolutely critical? What are the implications to the disciplines if one or more new graduate programs are not pursued?

Arts and Humanities organization at other UC campuses is very fluid. At UCSC, the Arts and Humanities division was once combined. Larger campuses include the Social Sciences in a school of Arts and Letters. Is the current division administrative structure the best to accommodate the disciplines and facilitate new programs? How does this structure avoid program duplication, and support interdisciplinary collaborations?

Do the Division of Natural Sciences and School of Engineering plan ties with the new California Institutes for Science and Innovation? Resource leveraging, potential for enhancing professional connections, and other advantages are likely if connections are pursued. What collaborations are considered between the division and school to best position UCSC in these fields? Are there opportunities for Arts, Humanities and Social Sciences?

How are the proposed programs attractive to diverse student populations? What are the divisional strategies for collaborating with Student Affairs regarding increasing student diversity?

Divisions are asked to describe the interplay between enrollment management and plans to maintain and strengthen program quality. What is each division's capacity for a targeted number of majors based on intellectual quality? What are the divisions' positions on their most appropriate share of campus enrollments? How can historical disciplines be best balanced with current student demand?

Can distance learning or web based instruction contribute to meeting student demand and help implement programs at the Silicon Valley Center? What impact might that have on campus instructional technology infrastructure? What instructional technology enhancements are needed to support on campus enrollment growth and new programs?

Divisions are asked to provide comprehensive analysis of potential summer quarter plans and how summer curriculum can be useful for students. Will the summer plans shift enrollment from the conventional academic year or introduce separate components?

What is each division's leadership role in outreach to K-12 and community colleges? How do the divisions support public school instructors as they develop curriculum preparing future UC students? What does the Arts division plan to support public school instructors as they develop arts curriculum to meet the new G requirement? Do these issues affect all division plans for hiring new faculty?

What are the space impacts of division plans? How does space capacity influence program priorities and timing? All divisions should provide student, faculty, and staff numbers for the entire ten year planning period and provide a business model describing how program growth will drive enrollment growth and at what student levels.

Specific Issues: Division of the Arts

The Executive Summary of the Arts Division Academic plan expressed an excellent description of the discipline's intellectual vision and its development of instructional and research programs. Summer instruction and participation at the Silicon Valley Center are well thought out. The preliminary planning enhances program quality while responding to campus goals.

Can faculty FTE appointments analogous to clinical appointments be considered? Examples include faculty who can contribute to specialized instruction and qualified practicing professionals. Arts might broaden its fields by increasing affiliations with professionals while retaining resource flexibility.

The division should present research on what mix of university funding for Arts graduate students is most appropriate.

Has an architecture or design program been considered?

The Film and Digital Media Department might be an appropriate area for potential professional school development. Has the division considered this? If Film and Digital Media were developed into a professional school, what student-faculty ratio would the division need to support the remaining curriculum? If a school were to emerge, would it make sense to align the remaining arts areas more closely with humanities? What is the division plan to develop departments with slower enrollment growth, and how is this related to the constituencies they serve?

The campus attracts non-major arts students who have difficulty accessing studio courses. Concurrently, the University of California has added a high school "G" arts admissions requirement. How can the division accommodate this student interest? Is there consideration of developing a minor? To what extent can non-majors be accommodated in summer quarter? At the Silicon Valley?

Specific Issues: School of Engineering

Engineering's instructional goals include the education of engineering professionals in strong demand from private industry. School participation at the Silicon Valley Center might be expected to be strong, particularly as a base for internships and research

enhancement. When does the school plan to begin SVC instructional programs? How will SVC programs be phased?

How does the Engineering upper range of 140 faculty FTE affect the discipline's critical needs? How does this size compare with nationwide Engineering Schools relative to the specific disciplines UCSC plans to focus on? Can the division produce quality research programs at the intermediate FTE level? Can faculty hiring, and its associated high start-up costs, be staggered to spread the resource impact? How can the School leverage high external research productivity with undergraduate enrollment demands?

Specific Issues: Division of Humanities

The Division of Humanities proposes new programs to increase enrollments and consolidate division strengths. Identification of the role of humanities in corporate and public organizations is the basis for new master's level and doctoral programs.

What are the department strategies for increasing workload ratios and graduate student support? How do they integrate with promising intellectual developments? Humanities is asked to provide a fuller discussion of the interrelationship between the division's overarching vision and the departments goals.

Are the more applied programs (Public Humanities, Human Health, Science, Medicine and Technology) appropriate for a professional school structure? Could they be combined with policy initiatives from the Social Sciences?

Humanities is asked to provide student demand analysis for the proposed programs.

Specific Issues: Division of Natural Sciences

The Natural Sciences Division planning focuses on managing campus enrollment growth and increasing external funding through contracts and grants. The division's mature complement of doctoral programs and research enterprises positions it well to launch the proposed new undergraduate majors.

Natural Sciences enrollments have leveled off since the mid 1990's. The division is asked to provide enrollment trend analysis and proposed enrollment targets. How do Natural Sciences enrollment trends at other UC's inform the division's planning?

Faculty start-up costs, effective overhead rates, and graduate program competitiveness should be discussed in terms of the Division's faculty recruitment and research goals.

Can the Health Sciences proposal link with UC San Francisco's medical school or other professional public health schools? A multiple institution consortium is likely to have a powerful attraction for external funding.

How do previously funded initiatives fit within Natural Science proposed new programs? How does the forward funded Institute for Geophysics and Planetary Physics (IGPP) initiative overlap with current divisional themes?

Specific Issues: Division of Social Sciences

The Division of Social Sciences plans are focused on enrollment pressures integrated with interdisciplinary intellectual themes. Heavy undergraduate student demand is projected to continue throughout the campus-planning period.

Are professional schools, particularly in Education, under consideration? New programs in policy and engineering management appear feasible for the Silicon Valley Center. The Division is asked to describe their potential. Would a small management program be a useful component to many programs outside Social Sciences?

Attest:

George Brown, Vice Provost
Chair, Academic Planning Committee

Appendix A

Planning Goals and Review Criteria

Campus Goals

- Managing enrollment growth necessary to accommodate 5,200 new student FTE between now and 2010.
- Strengthening UCSC's position as a major research university.
- Doubling UCSC's graduate enrollments.
- Increasing contract and grant support two-fold.
- Enhancing quality at the undergraduate and graduate levels, promoting innovation, and enhancing access for the diverse population that comprises today's California.

Academic Plans will be reviewed based on goals of:

1. Strengthening research and scholarly accomplishment and distinction;
2. Markedly increasing graduate programs and enrollments;
3. Developing interdisciplinary programs at all academic levels;
4. Markedly increasing external support, from grant/contract as well as private fundraising;
5. Creativity in combining present resources with new resources;
6. Innovative programming in non-traditional areas, including the Silicon Valley Center, state-funded summer session, and other off-campus enterprises (e.g., distance learning, EAP, UCDC, others);
7. Enhancing faculty, staff and student diversity; and
8. Proposing accountability measures

Academic Support plans will be reviewed based on goals of:

1. Enhancing overall institutional excellence;
2. Providing the administrative and physical infrastructure needed to achieve the academic goals;
3. Accommodating campus growth, for expanded academic as well as academic support enterprises;
4. Increasing efficiency and effectiveness in campus activities;
5. Creativity in combining present resources with new resources;
6. Innovative academic support programming in non-traditional areas, including the Silicon Valley Center, state-funded summer session, and other off-campus enterprises (e.g., distance learning, EAP, UCDC, others);
7. Enhancing campus diversity; and
8. Proposing accountability measures

Appendix B

Summer Session Proposals

<http://planning.ucsc.edu/pac/Topics/Plans2001/Plans2001Excerpts-summer-010315.pdf>

Appendix C

Silicon Valley Center Proposals

<http://planning.ucsc.edu/pac/Topics/Plans2001/Plans2001Excerpts-SVCenter-010315.pdf>

Appendix D

Academic Planning to 2005

(attached)

26 December 1990

To: COMMITTEE ON 2005
From: Jim Gill, Acting Dean, Graduate Studies and Research

Academic Planning to 2005: Graduate Division

Being a UC campus with <8% graduate students is anomalous and was unintended. The original campus plans expected that within ten years the student body would be 16% in graduate and 20% in professional programs. Even those figures are low for public research universities, and 25 years later there is no evidence that UCSC can prosper yet be atypical in these regards. The net result of this "vision statement" would be a more conventionally-constituted university. In my view, UCSC needs to be more conventional in structure in order to be more innovative in instruction; for historical and fiscal reasons, we have become the opposite.

Our currently-stated goal of having a 20% graduate student body is necessary if we are to rank among the top 100 research institutions in the nation, a goal of the 1985 20 Year Plan. Also it is necessary if we are to attract a representative range of Californian students, and to be full participants in UC's effort to meet California's need for future university professors and for a technically sophisticated work force. Although the 20% figure is somewhat arbitrary, it is based on the post-war experience of American public research universities and is an attainable goal. The attractiveness of our physical site, our reputation for high quality research, and our tradition of attention to undergraduate teaching all are sound bases on which to build.

1) What are the major challenges in our development of graduate studies and research? a) To develop world-class PhD programs while retaining unusually strong undergraduate degree programs; b) to move beyond our present Arts and Sciences emphasis to develop professional programs that identify, clarify, and help to solve urgent environmental, economic and social problems on State, national, and international scales; c) to develop programs which attract and retain faculty of excellence in research as well as teaching in an increasingly sellers market; d) to attract graduate students to a small town with little local employment in a State with weak secondary education.

2a). What are our major strengths? At the graduate and research level, "strength" is externally recognized distinctiveness, excellence, and potential. I see little that is distinctive about our graduate education. For example, Syracuse, not UCSC, is the national model for TA training. We could carve out a niche in which we paid special attention to the preparation of university teachers, e.g., by expanding TA training, experience, and supervision for PhD candidates, and by conducting research about national and international tertiary

education. Although that is part of my "vision," UCSC faculty do not seem to be keen to do more in this regard now.

As regards excellence, my judgment is no better informed than yours. No UCSC program has been ranked in the top 10% nationally, although we are top-ranked nationally in citation frequency in the physical sciences and 9th-ranked in the life sciences. Although there are small groups of internationally acclaimed scholars in many fields, in terms of research productivity, professional awards, contracts and grants, and citation frequency, our highest concentrations of excellence in graduate studies and research seem to me to be in Astronomy and Astrophysics, Biology, Biophysics, Developmental Psychology, Earth Science, History of Consciousness, Marine Science, and Particle Physics. Too many other academic programs have potential to list them.

More broadly, UCSC's geographic location relative to other UC campuses gives us natural advantage in several areas: biotechnical, computer, electrical, and other fields of engineering related to Santa Clara Valley; environmental and marine studies; town (vs. urban) planning; natural resource management (e.g., marine, forestry, agroecology, water); etc.

2b). Major weaknesses. As a consequence of our institutional history, a smaller fraction of faculty are oriented and motivated toward entrepreneurial development of research programs than is typical in UC. Our number of graduate students and amount of external support per faculty are below UC averages except in a few fields. This is a natural consequence of hiring people also seriously interested in undergrad teaching, and of our investment in student services which make the undergraduate experience more pleasant. Although newer faculty often differ, I think this history is sufficiently entrenched and beneficial that it will always limit our research infrastructure relative to UC norms. Good teachers often are not good entrepreneurs, and vice versa.

Costs and competition. Lacking as many entrepreneurs per capita, there will be less extramural support and fewer cost-effective ideas bubbling up.

Geographic location. Only Davis is as non-urban. This deprives us of local industry support and employment for grad students and spouses. Few public universities with 3000 graduate students are in such small towns.

Arts and Sciences-only tradition. It is uncommon for much more than 10% of the student body to be in academic PhD programs in public universities; UCB is the only UC campus for which this is true. Within Letters and Sciences, only 11.9% of UC enrollment was graduate in 1985-86. In 1988-89, Systemwide graduate enrollment was 50% academic PhD, 12% academic master's, 24% professional master's, and 14% health science doctorates. Arguably, our existing programs are 2/3

of the way or closer to their carrying capacity now.

3. Where should we go? Table 1 presents the current plan for graduate student enrollment at UCSC to 2005. It was only intended as a preliminary plan, but it is quite instructive because I think it is unrealistic for three reasons:

a) We cannot support that many students in academic PhD and programs. Table 2 illustrates this point. Currently, with about 7.7% graduate students, the mean support per grad student is about \$12,800. If grad students were 20% of the student body, TA support would drop from its current \$7268 to \$2540 per grad student. To support 3000 students at the same level as now would require the campus to provide about \$19 million more in annual Fellowship support than it does now. In contrast, were the graduate student body 50% in master's programs in which they receive only \$2000 to \$5000 support per year, then we would need to increase our Fellowship support base by only about \$3 million provided that at least 1/3 of the faculty produced the same level of GSR support as does the average NSE faculty now.

Obviously the other principal leverage is GSRs. Average GSR support per faculty member at UCLA during 1988-89 was \$27,000 in engineering, \$21,700 in the physical sciences, \$10,700 in the life (not health) sciences, \$5700 in the social sciences, \$2400 in the humanities, and \$1500 in the arts. (Figures are unavailable to me from other campuses, and UCLA may be anomalously high due to GSRs in old ORUs.) For example, were our faculty in 2005 15% in engineering, 23% physical sciences, 10% life sciences, 25% social sciences, 15% humanities, and 10% arts, and the average UCLA figures were applied, then per capita GSR support for 3000 graduate students would be \$3200, which is close to our status quo and twice what is used in Table 2. This would, in turn, support a higher ratio of academic to professional students.

Systemwide levels of average GSR support per faculty probably are unrealistically high for a campus which gives special attention to undergraduate education. Even so, 25% of graduate students Systemwide are in professional programs and receive on average only \$1300 in merit-based financial support. That is why the weighted student workload formulae benefit graduate campuses; students pay to attend so that only the costs of instruction, not of full student support, are borne by the institution. Some graduate schools can trade on their reputation for awhile and attract students with below-market support. I see no reason to believe this will be true of many programs at UCSC by 2005.

The fundamental choice, therefore, is between two poles: growing to 10% graduate students, mostly in academic PhD programs; or growing to 20% graduate students, half of whom are in master's programs which are market-oriented enough that students will attend primarily at their own expense. Reality lies in between.

Excellence could lie at either pole. Our current strength is built on PhD programs and could continue to be so, albeit with a permanent fiscal disadvantage within the UC formulae that weight student workload as at present. Professional programs don't lead to Nobel prizes or high citation frequencies, and industry-oriented students take a lot of faculty time without contributing much to the research effort. However, professional schools create linkages with local industry and with government (improving the job market for all our graduates, breaking down out-dated images of UCSC, and establishing a better base for private-sector fund-raising), serve the public more directly than do most academic research programs, are important in affirmative action recruiting, and can generate significant external funds which trickle down to academic programs (at least through overhead).

b) The distribution between Divisions is out of synch with Systemwide growth plans and with most research universities. Table 1 anticipates that 50% of UCSC graduate students will be in natural sciences and engineering (NSE) at 2005, 25% in social sciences, 18% in humanities, and 7% in the arts (SSHA). This reflects neither current State practice, State priorities, nor existing campus strengths. In 1988-89, 22% of UC graduate students were in the health sciences and another 17% were in other professional studies. We cannot afford to write off such students. Excluding them, 59% of the rest were in NSE, 20% in social sciences, 14% in humanities, and 8% in the arts. Finally, Systemwide growth plans (Table 3) call for 65% of the growth in graduate student FTE to be in NSE but only 12% in SSHA, whereas Table 1 calls for 54% of our growth to be in SSHA.

Our pattern of existing strength in NSE is typical of research universities. We should return to 60% NSE graduate students in order to meet State needs, to best utilize present strengths as bases for centers of excellence, and to pay for graduate education (and other bills). Both present practice and future plans reflect the job market and those social needs which society will pay to address. We should consciously plan to differ from typicality only when (a) we have a clear academic rationale and (b) we know how to pay for it differently from other universities.

c) I think the plan overestimates the ability of existing programs to add and enlarge graduate programs, but this should emerge from the Divisional Deans' visions. Here is my view.

Table 1 assumes that all Boards now at UCSC will have a graduate program. About 49% of the growth is expected to occur in new versus existing graduate programs. Subtracting the growth projected for the engineering school, 94% of the balance (1100 graduate students) is expected to come from new graduate programs in SSHA. Many of these programs are struggling to be born, and I find the idea of relying on them for so much of our growth frightening.

Arts. Table 1 calls for 217 graduate students. Even assuming "U1" is

Visual Culture, I'll be surprised if there are more than 150 non-certificate Arts graduate students. Top-ranked Art History and Theater Art departments have 3 grad students per faculty, but student support and faculty interest in grad programs are limits here.

Humanities. Table 1 calls for 546 graduate students. Top-ranked Humanities departments have 2-3 grad students per faculty and currently UCSC has 1.8 per permanent faculty. Even were programs added in Creative Writing, Philosophy, and Feminist Studies (none of them straightforward), I'll be surprised if there will be financial and intellectual support for more than about 325 Humanities graduate students.

Natural Sciences and Engineering. Table 1 calls for 1,489 graduate students, or growth of about 1,000. The engineering school expects to have 522 graduate students (growth of about 425). (The sum of App. Math, U1 to U3, and the three engineering departments in Table 1 is about the size of the new programs proposed for the engineering school; the chief difference between Table 1 and the engineering proposal is that Table 1 envisions 300 in CE+CIS, whereas the proposal envisions 200.) I find these NSE targets too low, disproportionately in engineering, and too little in life sciences. As noted above, overall UC graduate schools in science are about 40% physical, 40% engineering, 20% life. Individual universities commonly have 2:1 science:engineering graduate enrollments. Consequently, I think the problem with NSE is that too few new non-Engineering programs have been planned, especially in the life sciences and in professional master's degrees.

Social Sciences. Table 1 calls for 748 graduate students. Top-ranked social science departments have 3-4 graduate students per faculty whereas currently UCSC has 1.5 per permanent faculty. Significantly increased GSR support is possible in several Boards. Nonetheless, I think the estimates in Anthropology, Politics, and Social Documentation are too high, and U1+U2 seem fictional. I would guess that 600 is more realistic unless large professional master's programs emerge. In summary, my guess is about 1075 graduate students could be accommodated in SSHA were there enough GSR support. The balance will need to be in NSE and other professional programs.

4. My Vision (with the disclaimers and humility appropriate to an Acting stand-in Dean; "For every vision there is an equal and opposite revision"):

a. Build-out most existing graduate degree programs until they reach a typical number of graduate students and ratio of graduate students to faculty characteristic of smaller top-ranked public university departments in those fields. This means roughly 3-4 graduate students per faculty.

b. Add graduate programs to some existing Boards which lack one.

These might include professional master's degree programs in some of Theater Art, Studio Art, Creative Writing, Social Documentation, or Applied Law; and PhD +/- master's degree programs in some of Philosophy, Feminist Studies, Visual Culture, Politics, or Environmental Studies.

c. Adopt the goal of training college and university professors for the 21st century as an explicit "State need" that UCSC will help to meet. To do so: (i) we need to be a comprehensive university in which all faculty have the opportunity to train graduate students. (It does not mean that all departments will have graduate programs.) (ii) We should emphasize TA experience, TA training by faculty, and TA supervision. (iii) We might build on our undergraduate teaching tradition to create another Center for the Study of Higher Education within an Education School, that focuses on analysis of college and university teaching and administration.

d. Develop graduate programs around each of the five themes mentioned at your 12.12.90 meeting: cultural, ethnic, and linguistic diversity; environmental studies; K-12 education, especially emphasizing multilingual, math, science, and environmental education; technology; and global systems.

In addition, break out the Pacific Rim as an explicit target area within which to focus on languages, economics, technology transfer, regional marine, biological, and earth science, and cultural anthropology. (That is, keep "global systems" global, and separately emphasize that California is not Eurocentric.) Envision a small East-West Center emphasizing our strengths vs Hawaii's or UCSD's. Use College Nine to advantage.

Stress the inter-relatedness of our response to the themes. Each theme has important cross-Divisional components built on existing multi-divisional interest if not yet strength. Each has both undergraduate and graduate, both academic and professional, components. Do this in such a way that about 1500 students are in master's programs which are sufficiently market-oriented that little financial support is necessary to attract students.

e. Leave room, indeed create momentum, for professional programs that aren't high priorities of your committee. I think academic programs are well-represented and can fight effectively for themselves, but there is no constituency besides you for other fields that might help us reach our goals. Further, it will be hard to meet our objectives or to enroll 1150 students in non-engineering professional master's programs using only those you've already identified. Examples of additional programs include the health training fields (perhaps in association with UCSF), library and information science (a mix between engineering and education schools), technical journalism (a mix between the science writing program and engineering), and architecture (which could have strong ties to environmental studies). These may

need to have PhD components in order to distinguish them from CSU programs; I know little about inter-segmental issues.

f. Re-open your consideration of a satellite campus in the San Jose area. The Santa Cruz Mountains are one of the biggest barriers to the growth of our graduate school; i.e., to students who need to be largely self-supporting. If we had instructional and office space in the San Jose area we could attract more commuter and night graduate students, and permit some faculty who live there both to reduce their commute and to have easier access to non-university colleagues. More expensive research facilities and undergraduate programs would remain here, graduate lecture classes could meet at either site via electronic media, and it would be environmentally foresightful. True, it would be better for UCSC to have all activity centralized, but I think the truer choice is between having or not having >10% graduate students.

g. Obviously there are many matrices through which to combine these various goals, and distinctions are somewhat arbitrary between academic and professional master's programs, or between Divisions when multi-disciplinary programs are envisioned. Nonetheless, and for illustration only, **Table 4 is one example of how these elements could be combined.** In it the distribution is 50:50 between professional:academic students, and the distribution between Divisions is: Arts, 5%; Humanities 11%; Social Sciences 20%; Natural Sciences 27%; Engineering 17%; Other Professional 21%, mostly in the social and natural sciences.

In summary, I doubt that UCSC will be able to financially support much more than 1,500 graduate students in PhD-intensive Arts, Sciences, and Engineering programs such as we have now. Even then, in order to generate GSR support and overhead-generated Opportunity Funds, and to meet identified State needs in graduate education, they should be closer to the 60% NSE percentage that has characterized UCSC historically than to the 50% figure that characterizes Table 1. In order to meet our goal of being in the top 100 research institutions, and to meet the thematic goals of your 2005 plan, it is desirable to have up to an additional 1,500 additional graduate students in professional master's programs. To reach those objectives by 2005, some radical rethinking of graduate programs is needed, perhaps including a satellite campus.

Appendix E

UC Comparative Graduate Student FTE

(attached)

**SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE**

	1998-99										
	1998-99 Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz	<i>Max</i>	<i>Min</i>	<i>Ave</i>
Arts Division											
UCSC Programs											
Art (Studio)	9	15	16	49		40	15		49	9	24
Art History	38	8	11	66	25				66	8	30
Film & Digital Media/F	11		11	269					269	11	97
Music	36	10	16	91	16	55	65	12	91	10	38
Theater Arts/Dance/D	9	28	78	70	37	63	21	7	78	7	39
Subtotal UCSC Program	103	61	132	545	78	158	101	19	545	19	150
Other											
Architecture	90			147			53		147	53	96
Design				10					10	10	10
Environmental Design	3								3	3	3
Landscape Arch.	40								40	40	40
Media Arts & Tech.							4		4	4	4
Musicology/Ethnomusicology				66					66	66	66
Textile Arts & Costume Design		7							7	7	7
World Arts and Culture				47					47	47	47
Other Subtotal	134	7	0	270	0	0	57	0	270	0	58
Campus Total	237	68	132	814	78	158	158	19	814	19	208

**SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE**

	Berkeley	Davis	Irvine	Los Angeles	Riverside	San Diego	Santa Barbara	Santa Cruz	Max	Min	Ave
School of Engineering											
UCSC Programs											
Applied Math & Statistics	61	53		18	33		28		61	18	38
Computer Eng/Electrical Eng	340		107	340	15	217	192	83	340	15	185
Information & Computer Sci	46	70	168	211	33	133	92	64	211	33	102
Subtotal UCSC Programs	446	123	275	569	81	350	312	147	569	81	288
Other											
Applied Sci & Technology	7								7	7	7
Bio Eng	6					55			55	6	30
Biomedical Eng		48		38					48	38	43
Chemical & Biochem Eng	66		34	51	16		64		66	16	46
Chemistry & Material Scienc	80			50			92		92	50	74
Civil & Environmental Eng	199		59	98			54		199	54	102
Engineering	17	512							512	17	264
Industrial Eng	38								38	38	38
Interdisc. Eng.	7								7	7	7
Mechanical & Aerospace En	205		73	167	3	123			205	3	114
Nuclear Eng	30								30	30	30
Ocean Eng	1								1	1	1
Other Subtotal	655	560	166	403	19	178	210	0	655	0	274
Campus Total	1102	683	441	972	99	528	522	147	1102	99	562

SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE
1998-99

	Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz	Max	Min	Ave
Humanities Division											
UCSC Programs											
American Studies									0	0	#DIV/0!
Classics	30		13	24			14		30	13	20
So & East Asian Lang	29		11	66			8		66	8	28
Comparative Lit	43	21		55					55	21	40
French	15	15	12	22			7		22	7	14
German	25	6	8	17			5		25	5	12
History	162	58	59	204	77	70	96	30	204	30	94
History of Consciousness								53	53	53	53
Italian	9			15					15	9	12
Languages					9				9	9	9
Linguistics	25	14	13	44		24	28	24	44	13	25
Literature						102		58	102	58	80
Logic & Philosophy	26	22	27	35	65	34	22		65	22	33
Religious Studies					20		64		64	20	42
Spanish & Portuguese	34	34	40	58	13		26		58	13	34
Women's Studies	4		4						4	4	4
Writing/Eng. Composi	1								1	1	1
Subtotal UCSC Progran	401	170	187	539	184	230	270	165	539	165	268

SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE
1998-99

	Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz	<i>Max</i>	<i>Min</i>	<i>Ave</i>
Other											
African-Am/Black Stud	14			39					39	14	26
American Indian Studies				15					15	15	15
Ancient History & Med	1								1	1	1
Asian Studies	1								1	1	1
As-Amer Studies				21					21	21	21
Applied Linguistics & TESL				68					68	68	68
English	133	87	145	103	100		65		145	65	105
Ethnic Studies	44								44	44	44
Folklore & Mythology				13					13	13	13
Grad School of Journæ	77								77	77	77
Humanities/Other	3								3	3	3
Indo European Studies				8					8	8	8
International Area Stu	10								10	10	10
Islamic Studies				16					16	16	16
Medieval Studies	21								21	21	21
Near Eastern Studies	24			27					27	24	25
Rhetoric	29								29	29	29
Romance Philology	0			9					9	0	5
Scandinavian/Slavic L	25			27					27	25	26
Other Subtotal	382	87	145	345	100	0	65	0	382	0	141
Campus Total	783	257	332	884	284	230	335	165	884	165	409

SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE

	1998-99										
	Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz	Max	Min	Ave
Natural Sciences											
UCSC Programs											
Biology					101	238		87	238	87	142
Developmental & Cell	9	22	10	35			40		40	9	23
Ecology & Evolutionary		147	32	69			81		147	32	82
Genetics & Dev.	5								5	5	5
Integrative Biology	88								88	88	88
Microbiology		55		29					55	29	42
Molecular Bio & Biochem	380	52	13	62			15		380	13	104
subtotal	482	276	55	195	101	238	136	87	482	55	196
Astronomy & Astrophysics	27		48	25				29	48	25	32
Chemistry & Biochemistry	279	131	151	274	114	159	96	73	279	73	160
Earth Sciences/Geology	58	31	13	50	20		33	58	58	13	38
Environmental Toxicology							1st year		0	0	#DIV/0!
Mathematics	130	34	42	108	25	82	55	44	130	25	65
Ocean/Marine Sciences							21	23	23	21	22
Physics	169	73	in Astr.	102	31	101	115	41	169	31	90
Science Communication								20	20	20	20
subtotal	664	269	254	559	191	342	320	288	664	191	361
Subtotal UCSC Programs	1146	545	309	754	291	580	456	375	1146	291	557
Other											
Agri Chem/Agri & Env Che	6	40							40	6	23
Agronomy & Range Science		8							8	8	8
Animal Behavior/Science		53							53	53	53
Atmospheric Sciences		19		34					34	19	27
Avian Science		8							8	8	8
Biomedical					18				18	18	18
Biophysics		8							8	8	8
Comparative Pathology		56							56	56	56
Endocrinology		3							3	3	3

**SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE**

	1998-99								<i>Max</i>	<i>Min</i>	<i>Ave</i>
	Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz			
Entomology		25			151				151	25	88
Epidemiology		29							29	29	29
Food Science & Technology		71							71	71	71
Genetics (Biol Sci)		72							72	72	72
Hydrolic Science		37							37	37	37
Horticulture		32							32	32	32
Immunology	6	17							17	6	11
International Agricul. Devel.		30							30	30	30
Medical Informatics		1							1	1	1
Nematology					25				25	25	25
Neurobiology & Behavior/N	8		26						26	8	17
Neuroscience		27			5				27	5	16
Nutrition	20	81							81	20	51
Pharmacy & Toxicology		46							46	46	46
Physical Sci Other	7								7	7	7
Physiological Sciences		46		75					75	46	60
Plant Biology	35	74			92				92	35	67
Plant Pathology		31			41				41	31	36
Plant Protect. & Pest Mgt.		9							9	9	9
Population Biology		33							33	33	33
Science & Math Education	7								7	7	7
Scripps Inst. Of Oceanography							182		182	182	182
Soil & Water Science		30							30	30	30
Transportation Science			4						4	4	4
Vegetable Crops		4							4	4	4
Zoology		1							1	1	1
Other Subtotal	88	891	30	109	332	182	0	0	891	0	204
Campus Total	1234	1436	339	863	624	762	456	375	1436	339	761

Notes:

College of Medicines not included

SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE
1998-99

	Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz	Max	Min	Ave
Social Sciences											
UCSC Programs											
Anthropology	95	39	24	93	43	38	58	36	95	24	53
Community Studies									0	0	#DIV/0!
Economics	130	41	43	112	28	66	49	50	130	28	65
Education	256	50	35	458	217	6	298	84	458	6	175
Environmental Studies/Scie	101				47		100	35	101	35	71
Latin American & Latino St	6			34					34	6	20
Political Science	107	36		145	58	57	60	1st yr.	145	36	77
Psychology	101	35		142	47	49	45	57	142	35	68
Social Ecology, Psychology & Social Behavior			37						37	37	37
Sociology	90	43	45	98	111	34	59	37	111	34	65
Subtotal UCSC Programs	885	244	184	1081	549	250	669	299	1081	184	520
Other											
Agri & Resource Economic	36	47							47	36	41
Archaeology				16					16	16	16
Child Development		17							17	17	17
Cognitive Sciences	2		23			39			39	2	21
Communication						38	27		38	27	33
Community & Regional Dev.		22							22	22	22
Demography	8								8	8	8
Educational Leadership		9							9	9	9
Energy & Resource Group	26								26	26	26
Ethnic Studies						12			12	12	12
Geography	35	21		51			79		79	21	47
Human/Community Development		27							27	27	27
International Relations & Pacific Studies						188			188	188	188
Policy Studies				64					64	64	64
Politics & Society			42						42	42	42

SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE
1998-99

	Berkeley	Davis	Irvine	Los Angeles	1998-99 Riverside	San Diego	Santa Barbara	Santa Cruz	Max	Min	Ave
Public Policy	86								86	86	86
S Ecology, Criminology, Law & Design			25						25	25	25
S Ecology, Environmental Analysis & Design			42						42	42	42
S Ecology, Urban & Regional Planning			33						33	33	33
Urban/Regional Planning	108			148					148	108	128
Other Subtotal	301	143	165	280	0	277	106	0	301	0	159
Campus Total	1185	387	349	1360	549	527	775	299	1360	299	679

**SAMPLE - UC COMPARISON SIZE OF PROGRAMS
1999-2000 TOTAL UNWEIGHTED GRADUATE STUDENT FTE**

	Berkeley	Davis	Irvine	Los Angeles	Riverside	San Diego	Santa Barbara	Santa Cruz	Max	Min	Ave
OTHER PROFESSIONAL SCHOOLS/GRADUATE PROGRAMS											
Arts/Humanities							21		21	21	21
Business Administration	669	260							669	260	465
Individual		3					1		3	1	2
Interdisciplinary Studies		23	4	51					51	4	26
Law	846	511		950					950	511	769
Library Science				137					137	137	137
Management		116	864	682	78				864	78	435
Optometry	109								109	109	109
Physical Ed.					1				1	1	1
Public Health	359								359	359	359
Social Welfare	167			196					196	167	181
Textiles/Clothing		6							6	6	6
Veterinary		530							530	530	530
Subtotal	2,150	1,449	868	2,015	80	-	22	-	2,150	-	823

Schools of Medicine not included