UC Santa Cruz, in the words of the February 2004 WASC Visiting Team (p. 2), “has had an interesting history. Originally conceived as a campus that would place particular emphasis on undergraduate education, UC Santa Cruz has developed into an accomplished research university with highly regarded graduate programs.” The evolution of UC Santa Cruz as a research university has been integrally tied to the growth of its graduate programs.

The present essay focuses on graduate growth. The essay falls into five parts. In the first, we present a series of snapshots of graduate education on the UC Santa Cruz campus. The second part of the essay sets forth campus goals and the justifications for the goals. The next three parts of the essay consider three linked strategies for reaching our goals. In parts three, four and five of the essay, we are ever mindful of the difficulties – financial and otherwise – of augmenting graduate and professional programs, especially in the present California budget climate. Yet we remain hopeful that careful and coordinated planning can enhance our chances for success.

**Development of graduate programs at UC Santa Cruz**

UC Santa Cruz was founded in 1965 with an entering class of 650 undergraduate students and no graduate students, though graduate education was part of the campus academic plan from the beginning. The following year, three Ph.D. programs opened with an entering cohort of 26 students. After five years, the campus had opened 10 Ph.D. programs: three in Humanities, six in Natural Sciences, and one in Social Sciences. In the 15 years following the initial period, two additional Ph.D. programs were developed and several Master’s and Certificate programs were added.

The current state of graduate programs at UC Santa Cruz results from the effects of this development, steady progress in expanding graduated education interrupted periodically by downturns in the state budget. An overview of this development is presented in Exhibit O and supports the following observations about graduate education at UC Santa Cruz:

- The development of new graduate programs is linked to state budget cycles, and has therefore not been continuous. The initial burst of graduate program development was followed by a long period in which few Ph.D. programs were developed and graduate degree production reached a plateau. New program approvals have come in three small clusters: one around 1980-82; another around 1988-90; and a more steady development beginning in 1998-99 and projected to continue into the future.

- Graduate programs have developed to take advantage of clusters of faculty expertise and as a result have been distributed unevenly across the academic departments and divisions. From the earliest period, the faculty in the former division of Natural Sciences (now corresponding to either Physical and Biological Sciences or part of the School of Engineering) were well-connected with graduate education. The distribution within the Humanities and Arts was more uneven. In Social Sciences, after the early foundation of a Ph.D. program in Psychology graduate education spread slowly through the division.
• From the beginning, faculty in graduate programs collaborated across traditional disciplinary lines. The founding program in Humanities was a graduate-only program in History of Consciousness. Within the natural sciences, graduate programs developed as a natural result of building critical mass in new areas.

• Of the nine Ph.D. programs created since the last WASC review, three include faculty who worked in previously existing graduate programs (Environmental Toxicology, Ocean Sciences, and Education); three others have developed in departments whose faculty had little previous connection with graduate education (Environmental Studies, Philosophy, Politics); two were created with all-new faculty.

• Total graduate enrollment for the campus has grown in proportion to the increase in the number of graduate programs. That is, most graduate programs have taken a few years to reach a steady state size in enrollment and then have remained at that level.

At present, UC Santa Cruz has the lowest percentage of graduate enrollment of any UC campus. The chart below presents the situation in dramatic visual form based on Fall 2001 enrollment figures and including a representation of our goal for 2010. The increases in graduate admissions since that time have been substantial, allowing graduate enrollment to keep pace with the growth in undergraduate enrollment. The impression of an under-developed graduate student presence is further confirmed by the comparative data presented in Exhibit P, which shows the percentages of graduate students at UC Santa Cruz and other research doctorate universities. The relative underdevelopment of graduate studies at UC Santa Cruz was noted by the WASC team that visited the campus in February 2004.

During the period of rapid growth in undergraduate enrollment, the proportion of students who are graduate students declined slightly despite steady increases in the number of graduate students. As Exhibit A shows, at the time of the last WASC review (1992-93), the graduate student enrollment on campus was 968 students (11 percent of a total population of 8989). Over the next decade, graduate enrollment grew by 26 percent. But during the same period the undergraduate enrollment grew by 46 percent. As a result, percentage of graduate students in the total campus enrollment declined from 11 percent to 9 percent. In 2003-04, UC Santa Cruz had 1,286 graduate students enrolled in 31 graduate programs (Ph.D., Masters, and Certificates). Recent growth has been faster and allowed the campus to achieve – but not advance beyond – the earlier proportions.

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1 The data in this chart have not been adjusted to indicate the difference among the campuses in their specialized schools.
Nor is UC Santa Cruz overcrowded by postdoctoral scholars. In 2003-04, UC Santa Cruz had 165 postdoctoral fellows in residence. Policies have only recently been put in place to standardize their pay, benefits, and working conditions across academic divisions.

GOALS AND THEIR JUSTIFICATION

For a number of years, the Academic Senate has been pushing for increased graduate enrollment. In March 2002 the Senate passed a resolution endorsing the goal of increasing graduate and professional student enrollments until they comprised 15 percent of the total student body. As our Preparatory Report makes clear, UC Santa Cruz’s administration has joined the faculty in embracing the twin goals of (1) increasing the proportion of graduate and professional students on campus, and (2) enhancing the quality of graduate education. Several documents, including the Senate Committee on Planning and Budget’s 2002-03 Annual Report, its 2003-04 Annual Report, and its 2004 Report on the Strategic Futures Committee/Long Range Development Plan Process and the Future of Enrollment Growth at UCSC, show why we are convinced that the future character and quality of our institution are linked to the further development of our graduate students and postdoctoral researchers.

There are several reasons why the campus is dedicated to increasing the quantity and quality of graduate education at UC Santa Cruz.

First, we wish to do our part to serve the needs of the state of California. As the 2001 report from the UC Commission on the Growth and Support of Graduate Education notes (p. 8), “California’s future strength depends on investing now in graduate education. California’s economy depends upon it.”

Second, the presence of good graduate students is crucial to attracting and retaining excellent faculty. All areas of our faculty deserve the benefits of engagement in graduate education. Graduate students and postdocs are also essential to building capacity to carry out faculty research projects. In a few instances, the capacity of our faculty to develop extramural support for their research has exceeded their ability to locate graduate students and postdocs to carry out the projects.

Third, graduate students enhance the intellectual excitement of the university in ways that are important for both researchers and other students, including undergraduates. Especially in the sciences and engineering, the presence of graduate students enlarges the number of laboratory research opportunities that are open to undergraduate students. Generally, able undergraduate students are attracted to institutions that are intellectually vibrant; and everywhere graduate students contribute to the liveliness of scholarship.

Finally, graduate students are essential to providing quality undergraduate education in many areas by serving as teaching assistants, teaching fellows, and mentors in research projects.

Realism about how to reach the goals

While we have achieved consensus on our goals, we are still reviewing the strategies by which we can achieve them. We have decided to use this review as a stimulus to a prolonged and deep community engagement with questions about how to intelligently grow graduate programs on our campus over the next five to ten years. One factor that makes the discussions especially complicated is the near certainty that we will continue to face economic challenges during the next few years. Indeed, we fear that we may be facing such challenges for more than a few years. Another factor that adds a challenging dimension to the discussions is our commitment to UC Santa Cruz’s historically distinctive character. We prefer to increase the quantity and quality of our graduate programs in ways that do not detract from, and ideally further enhance, our excellence as an undergraduate institution.

Campuswide discussions that have occurred subsequent to the dissemination of the visiting team’s report and of the Commission’s June 2004 action letter have already resulted in agreement about three basic observations concerning the strategies by which we hope to achieve our goals. First, the faculty and administration are in agreement that our goal of increasing the quantity of graduate students must go hand in hand with our goal of increasing quality, both in measurements of the preparedness of enrolled graduate students for
pursuing graduate study, and in our effectiveness in bringing those students to appropriate outcomes in their programs. It does not seem sensible to attempt to increase the absolute number and percentage of graduate students and postdoctoral scholars at UC Santa Cruz without also improving the quality of their experiences here.

Second, the faculty and the administration agree that diversity and excellence can be mutually enhancing goals. Indeed, one of the hallmarks of UC Santa Cruz is its dedication to innovation and diversity. We would ill meet the mandate of a great public university if we were to forsake our traditional commitment to increasing the representation of populations in academia that have in the past been underrepresented. We currently have several programs in place to provide financial and mentoring support to underrepresented minorities in our graduate programs. We have awarded 20 dissertation-year fellowships and 123 Cota-Robles Fellowships (each of two years duration) as ten AGEP (Alliance for Graduate Education of the Professoriate) to our graduate students.

Finally, the faculty and administration at UC Santa Cruz concur that there are three general strategies that we must employ to meet the twin goals of quantity and quality. First, we must begin the improvement process by immediately improving our measures of accountability. We must, in other words, eschew a laissez faire attitude toward graduate studies, and systematically use our data about current programs to guide our future planning and resource allocations in accord with campus priorities for graduate growth. Second, we must, as our own Preparatory Review portfolio hints, make better use of the resources that we already possess. The third and final strategy is one noted in the visiting team’s report – we must increase the resources that support graduate education at UC Santa Cruz.

**First Strategy: Accountability**

What specifically do we envision as ways to increase accountability? Working closely together, the Graduate Council of the Academic Senate, the office of the Vice Chancellor for Research/Dean of Graduate Studies, and the Office of Institutional Research have identified several steps that will provide a sound view of the current situation and allow us to identify the barriers to increased capacity and actual growth in graduate education. Through careful attention to data, we hope to learn how to move effectively toward achieving our objectives.

**Agenda for Improved Assessment**

In order to plan for growth, we want to know more than we do at present about our current graduate students. To assess our progress towards the objectives of expanding the graduate student population while enhancing quality, furthermore, UC Santa Cruz will have to develop appropriate measures and implement systematic data collection. These measures should address three aspects of the graduate experience: the Outreach, Recruitment and Admission Process; the Quality of Graduate Experience; and Career Paths.

1. **Outreach, Recruitment and Admission Process**

   We need to systematize our data on the demographics of applicants, admits, and enrolled students by graduate program. For each of these populations, we will track scores on the general GRE or other program-relevant measure. Analysis should reveal the strength of the applicant pools and relative success of programs in yielding enrollments from the higher end of those pools.

   We will conduct a survey of admits. This survey will parallel a similar survey that is conducted annually by Institutional Research to determine the decision factors for undergraduate students who attend UC Santa Cruz, as well as those who elected to attend elsewhere. During the summer of 2004, Student Affairs Research and the Office of Planning and Budget developed a prototype of the survey using an on-line survey tool and pilot-tested the instrument with graduate applicants for fall 2004. The response rate has been gratifying. We will develop program specific definitions of quality applicants. What criteria do programs employ in selecting graduate admits? Are those criteria clearly enunciated to potential applicants and effectively incorporated into admissions processes? Have programs given consideration to the question of who
will thrive in UC Santa Cruz’s distinctive academic culture?

Where feasible, we will develop standard reports of application overlap and yield. To identify the institutions with whom we compete, we should track the overlap between applicants to UC Santa Cruz and other institutions, and compare the yield rates for those overlapping applicants at both institutions. The graduate admissions directors in each program can provide an assessment of the institutions with which they compete for admissions yield. The College Board might also be useful in reporting other institutions to which applicants send their GRE scores.

2. Graduate Student Life

A comprehensive assessment of graduate student life – both by program and for the institution as a whole – is important to understanding the pattern of admissions yield and retention. It is also fundamental to clarifying measures of educational effectiveness in graduate education. The revised external review protocols require departments under review to survey their graduate students. The first surveys have been conducted for the Departments of Math, Environmental Studies, and Physics. Review of these first steps will help guide future revisions. Already it is clear that every department and program that serves graduate students needs to include in its self-study a listing of the professional accomplishments of its graduate students and post doctoral scholars, citing publications, papers delivered at professional meetings, and so on, as a measure of research productivity. It is clear that much relevant information already exists; however effort is needed to insure that it is systematically accessible to both the administration, graduate division, and the programs involved.

The Graduate Student Association has identified a list of concerns crucial to our effectiveness in recruiting and retaining graduate students. We believe that we must analyze and disseminate existing and new data on a number of topics to the relevant programs:

- **Financial Support Packages at Competing Institutions.** To assess UC Santa Cruz’s competitive advantage or disadvantage, we will review our existing data on financial assistance available at competing institutions as a basis for comparison to support at UC Santa Cruz. A good deal of analysis of data about the sources of graduate support at UC Santa Cruz has been completed. We need to improve annual support from year to year.

- **Student Budgets.** To understand student finances, we should prepare several prototype budgets, by division or program, enumerating their likely sources of income (RAs, TAs, stipends, grants, loans, family resources, personal resources) compared to typical expenses (such as tuition and fees, books, room, food, insurance). How do out-of-pocket expenses at UC Santa Cruz compare to those at competing institutions?

- **Survey of graduate student life.** Though we have a complete set of surveys assessing many aspects of the undergraduate experience, we do not routinely survey graduate students. Many academic departments have a good sense of the well-being of their own students, but we do not have a systematic tool for assessing the overall graduate experience, or for comparing the experience across departments or with comparable programs at other universities. We might pattern a graduate survey after UCUES (the UC system undergraduate survey), adapting it to the goals and activities of graduate students. Such a survey should provide data on a range of aspects that influence graduate student success – parking, transportation, cost of living, disposable income, health care, counseling, housing, child care, etc. It should also monitor working conditions of TAs and RAs, satisfaction with instruction and mentoring, ease of establishing thesis committees, functionality of dissertation process, and preparation for career (practice teaching, resume writing).

- **Exit surveys or interviews.** Exiting students can reveal a lot about the strengths and weaknesses of programs. We need to learn more about when students elect to leave, what impediments they may have encountered here, and their levels of
satisfaction or dissatisfaction when they make their decisions to leave.

- **Retention and Graduation Statistics.** We need to complete the production of a standard report for graduate students, tracing their progress towards degrees and completion rates. Like the undergraduate reports, it will allow us to monitor subpopulations of various types, both institutionally and by program. Institutional Research is nearing completion of this report.

- **Comparable programs.** While standardization of measures for our graduate programs is a useful tool in bringing academic planning and resource management together, in graduate education it should not be assumed that “one size fits all”. Internally derived institutional benchmarks are likely to be less helpful in interpreting the data across programs than well-constructed benchmarks based on discipline and program type. For each of UC’s graduate programs, we need to develop an inventory of comparable programs at other UC campuses, as well as a group of ‘aspirational peers’ outside the UC system.

3. **Career Paths**

To understand the career paths of our graduate students, we need to develop more complete profiles of the careers of students who have graduated. Each department will be encouraged to keep in touch with its graduate alumni so as to be able to ask how well and in what ways their UC Santa Cruz experience prepared them for success in academia, industry, or other careers. Departments will be expected to regularly share the data that they have with their divisions and with the Graduate Council.

We believe that it is a realistic goal to complete the agenda of improved assessment and institutional research over the next three years. Exhibit Q gives a detailed timeline of the aspirations of the Associate Dean of Graduate Studies, and shows why we think our plans for improving assessment are realistic. As we proceed, campus administration will need to assess the priorities for research, to make sure that data are routinely shared with the program faculty, and that the external review process is attentive to how departments make use of the data they are given. The academic planning process and resource management must also engage in focused consideration of how the priorities articulated in departmental plans are related to realistic strategies for achieving the goals of graduate growth and improved effectiveness.

As we make increased use of various assessments over the next decade, we must remember that the data do not in and of themselves dictate policy. Although system-wide policies and practices will certainly affect the development of UC Santa Cruz’s graduate programs, we will need to be especially mindful that a strategy of replicating the pattern of graduate education at older institutions may not be the best path toward effective graduate education at UC Santa Cruz. There are many respects in which anticipation of a period of substantial growth in graduate education provides novel opportunities for success in spite of the practical challenges, a point made by the visiting team for the Preparatory Review.

**SECOND STRATEGY:**
**ENHANCED USE OF EXISTING RESOURCES**

If improving our culture of evidence is a strategy for increasing graduate enrollments and enhancing the quality of our graduate students’ experience, then the culture of evidence must also be put in service of a second strategy: To make optimal use of existing campus resources. This strategy is similarly amenable to systematic research that will enable us to determine how best to deploy available resources in ways that will benefit graduate education and serve institutional priorities.

We consider, in turn, assessing support services for graduate students, the administrative structures that provide them, and faculty resources.

**Support services**

Which services and experiences are most essential to attracting and retaining quality graduate students, and which are less essential? Which do the most to enhance graduate students’ education, prepare them for productive careers, and help them actually enter
those careers? What evidence do we now have that will help us assess effectiveness and prioritize our investments in various services and experiences?

The Graduate Council conducted a survey of graduate student opinion, reported in the 1999 Report of the Task Force for a Graduate College and Graduate Life. This survey that was useful in identifying support services (e.g., medical services, career counseling, housing) that students found critical to both their well being and progress toward a degree. However, the survey did not generate data on actual student use of these services, on their degree of satisfaction with those services, or on the efficiency of the delivery of those services. The survey’s emphasis was on students’ desire for more service rather than for more efficient service. It did not investigate the priorities or the trade-offs students would be willing to make in order to gain more from some services – e.g., affordable housing – if such gains meant cut-backs in other services. And it did not attempt systematically to identify other services and experiences, particularly expanded orientation or additional skill enhancement services similar to those currently offered by the Center for Teaching Excellence, that students might find important enough in terms of their education and career planning to warrant the reduction of some services.

Developing an analogue of the UCUES undergraduate survey for our graduate students would provide a way of assessing utilization of, and satisfaction with, various services. Because of the considerable consultation required with graduate students, graduate programs, the Graduate Division, the Academic Senate, Student Affairs, various campus administrators, and the campus’s institutional research unit in the Office of Planning and Budget, in order to develop a genuinely useful assessment instrument, we anticipate that it will take the campus a year to develop and inaugurate this review process. Simultaneously we need to develop an analysis of costs that would be involved in the improvement of current services or the addition of others that would enable the campus to prioritize its deployment of support resources. We must also be mindful that carrying out such a research program will itself absorb resources and attention and prioritize such projects accordingly.

A published study of mentoring experiences among UC Santa Cruz graduate students has already revealed divisional differences, and we might expect further differences to be revealed.

We will be particularly interested in expanding some of the existing campus services. Some divisions, like the School of Engineering, and some organizations like the Center for Teaching Excellence, have well-developed orientation sessions for incoming graduate students. These orientation sessions could be expanded and elaborated or extended to unserved populations. For example, there might be special orientations for international students, and review of departmental orientations. A review may well show that the current situation provides effective efforts in this area; but we should be confident that this is true.

Other potential expansions in support services include:

- Development of mini-courses focused on enhancing students’ research and teaching skills that would be available to students in all programs. These could include workshops on uses of the web, course development, lecturing and discussion-leading skills, grant writing and fellowship seeking, efficient time management, and job-searching strategies. Such workshops are already available to undergraduate students through the Coalition for Student Academic Success. UC Santa Barbara offers graduate students in any program the opportunity to gain a certificate in teaching, and we might consider providing the same opportunity.

- Introductions for graduate students to the institutional aspects of higher education: governance structures; the funding and deployment of university budgets; the development of academic policy and protocol; internal and external political dynamics; and the “cultures” of higher education.

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- A program of panels and lectures by prominent Ph.D.s who have found productive non-academic careers.
- Support for writing at the graduate level. Dissertation writing support structures both within and across departments are needed. But support should not be deferred to the time of the dissertation. All programs should attend to developing their students’ fluency in the idiom of their discipline. Graduate students may be unfamiliar with the writing conventions of their field. International students in particular may benefit from attention in this area, as they currently do in special preparation workshops for their service as teaching assistants.
- Systematization of oversight of the training of TAs. At UC Santa Cruz, TA and Teaching Fellow training is generally considered to be the responsibility of the individual department. We think that it may useful to expand the ability of the Center for Teaching Excellence so that it could monitor the departments and coordinate support for the training of TAs. This would require increasing the staff and budgeting for the CTE.

We anticipate that discussions within the Graduate Council and among graduate program representatives and graduate students during 2004-05 will identify other possible services and experiences that can be further assessed in the comprehensive review discussed above.

As a part of the review, we should also assess the effectiveness and efficiency of the campus’s present delivery structures for support services to graduate students. Are the present structures efficiently organized to provide these services? Are the service assignments distributed appropriately among them? If new services are added, where should they be administered? How should they be funded? Are other structures needed? Beyond the Graduate Division, the academic departments and their respective divisions/schools, and the Division of Student Affairs, we should examine the current and potential role of the Center for Teaching Excellence, the University Library, and University Extension.

The assessment will also include a further examination of the potential of a “graduate college” discussed in our Preparatory Report to both coordinate existing services to graduate students and provide additional services at minimal cost. To date the campus has not discussed the notion of a graduate college in enough detail to decide whether or not the ‘college’ would exist in some physical space or would be merely an administrative structure for unifying and delivering services to graduate students. Present budgetary constraints may realistically delay serious discussion of the concept of a graduate college. However many of the initiatives suggested above could be organized so that they would reinforce a desired sense of campus-wide community among graduate students.

Administration

The office of Vice Chancellor of Research (Robert Miller) and the Associate Dean of Graduate Studies (Lisa Sloan), working with the Academic Senate’s Graduate Council and the graduate directors of each program, are responsible for managing graduate education and the role of postdoctoral scholars. They have already begun an enhanced data collection process through the newly redesigned program reviews instituted by the Vice Provost for Academic Affairs (George Brown) and described in the introductory section of this report. As shown in Exhibit G, the reviews of the Departments of Economics and of Environmental Studies have been conducted under the revised program review process, including augmented information about graduate studies in those programs. The essay on program review includes description of new data requirements, especially graduate student surveys on their satisfaction with their major program as well as historical data on graduate admissions selectivity and enrollment yield. Improved reporting capabilities will allow routine production of yield data for programs.

UC Santa Cruz has recently invested in improving the technical support for the graduate admissions process. In 2002 we adopted an on-line application package and improved web based presentations for our graduate programs. In 2004 we implemented a supplemental system for Graduate Application Review (GARP), an on-line application system that
not only processes graduate applications but also provides secure electronic access to student application information and admissions decisions. With GARP we are accelerating and streamlining the application process, as well as reducing admission workload per application. As the campus implements its new academic information system (AIS), we are working to integrate these systems both to support graduate outreach and admissions and to improve our ability to communicate with the graduate student population. Through GARP, we will be able to automatically collect systematic data about our graduate applicant pool. For each department, starting in 2005, we will know: (a) how many applicants there are; (b) the percentage of applicants admitted; (c) the yield of admitted applicants; and (d) the GRE scores of applicants, of admitted applicants, and of those admitted applicants who enroll. Using simple additions to the GARP programming, we will also know (e) percentage of applicants, admits, and acceptances who did their undergraduate work at the University of California, at a California State University, at a land-grant university other than the University of California (e.g., the University of Michigan or University of Texas) or at a private institution. We anticipate that within two years, GARP can be modified to support our agenda of improved research on graduate admissions. This time line is related to the ongoing development of GARP and its incorporation into AIS.

**Faculty Resources**

Many of the interesting developments arising from the current academic enterprise are emerging from the points of contact between traditionally distinct fields. An institution that can move itself beyond the sometimes narrow perspectives held by entrenched disciplines is at a relative advantage in conceiving of and implementing new programs that attract high quality graduate students. UC Santa Cruz has a successful track record of developing graduate programs that bridge divides between traditional departments and, increasingly, between the separate academic divisions. The program in the History of Consciousness, one of the founding graduate programs of the campus, is a highly regarded program that explores the development and nature of expression and social action over the full range of human intellectual endeavor. The Ph.D. programs in Environmental Studies, Ocean Sciences, and Environmental Toxicology have effectively drawn on faculty from several disciplines across departmental lines. More recently, two more inter-divisional graduate programs have been approved by the systemwide Academic Senate and are now engaging students. Digital Arts and the New Media brings together faculty and students from the School of Engineering and from the Division of the Arts, and Bioinformatics draws on the expertise of faculty from the School of Engineering and from the Division of Physical and Biological Sciences. The administrative structure for the implementation of an inter-divisional program depends on a charter that clearly delineates the nature and degree of responsibility for resources and participation, and establishes one academic division as both the fiscal and academic lead. While individual faculty are evaluated within their home departments, the responsibility for the oversight of the status and progress of the program rests with the dean of the lead unit. This “single chain of command” structure establishes a clear organizational structure for the program, and avoids the ambiguity of separate and sometimes conflicting expectations from the participating divisions.

With a successful and well-formulated model already in place, UC Santa Cruz is in an excellent position to exploit new interdisciplinary and inter-divisional opportunities as they arise, either through administrative initiative or through the inspiration of its dynamic faculty. Real and imagined obstacles present themselves whenever scarce resources are to be allocated among different disciplines, but the administration will continue to facilitate interdisciplinary research opportunities. In particular, the growing School of Engineering and the nascent Silicon Valley Center present great potential for the inter-divisional growth of graduate programs at UC Santa Cruz. It is even possible that careful and strategic thinking might develop a way to include University Extension, UC Santa Cruz’s current most visible face in Silicon Valley, in plans for inter-divisional programs.

Interdisciplinary graduate programs contribute to our goals of increasing the quality and quantity of graduate education at UC Santa Cruz. As examples of distinctive approaches to new research, they can attract highly qualified graduate students. They also
represent an effective way of building capacity in graduate education with relatively small marginal increases in faculty resources. By locating existing clusters of faculty expertise that cut across administrative units, interdisciplinary programs can find advocates and intellectual leadership locally, and can connect faculty who would not otherwise be involved in graduate education to both new colleagues and to the opportunity to guide graduate student research. For instance, within the Humanities Division, the proposed Ph.D. programs in Comparative U.S. Studies and Feminist Studies would involve the collaboration of faculty in American Studies and Women’s Studies (departments currently without graduate programs), with faculty in other departments with well established graduate programs (e.g. Anthropology, Sociology, Literature, History, etc.) to support new graduate curricula.

**Prioritization of Resource Use**

Growth in graduate education at UC Santa Cruz will require resources of several kinds. Graduate student support, and its relation to the practical aspects of graduate student life, is clearly connected both to the number of graduate students who can be supported and to the quality of the students yielded from the graduate admissions processes in existing programs. Faculty resources are also required, both for their scholarly expertise and for their ability to mount curricula appropriate for graduate students. Extramural support for research is an important parameter of capacity in graduate education, one with variable potential across disciplinary areas.

In order to make the most effective use of existing resources, we need to analyze critically the potential of existing programs and initiatives to locate opportunities for improvement. Critical analyses require that the campus as a whole work to develop a consensus on priorities. We will need to engage in some difficult questions within our academic planning and resource management, questions that will entail some ‘zero sum’ trade-offs.

One place to begin could be to examine growth patterns of current graduate programs. Which programs currently show growth trends, and which have reached a stable state of enrollment? To what extent does current size of a graduate program represent a “right sizing”, given the available faculty and realistic placement rates for graduates? Where have faculty resources already been invested with expectations of future growth? To what extent does the current size of a program represent limitations imposed by resources for graduate student support, separate from the investment in faculty and curricula? To what extent does it reflect the limitations of the program’s success in developing appropriate application pools or yield rates of suitable students?

In some cases, it may be that additional graduate student support for existing programs that have underutilized capacity would be a more efficient way of achieving the campus goal of growth than the development of new programs. In other situations, concentrating existing graduate support to improve the competitiveness of offers could improve the quality of the student yielded by the admissions processes, at a cost of yielding fewer students.

It is also possible that developing new interdisciplinary programs could be more effective than attempting to improve the size or the quality of the yield for existing departmental programs. New programs give the university access to new pools of potential graduate students. New initiatives, however, generally require elaboration of graduate curricula, which can put strains on existing graduate programs and on the undergraduate curricula. Finally, in other cases, the effectiveness of existing undergraduate programs could be improved by integration with related graduate programs.

During the discussions triggered by this review, we have seen the value of attending to the distinction between Ph.D. program enrollments as a proportion of the graduate enrollments. Current enrollment measures track Ph.D. and Masters/Certificate programs separately, though reports of degrees granted do not routinely separate terminal Masters degrees from those granted during progress toward the Ph.D.

The development of inter-divisional graduate programs is one indication that campus academic planning, which depends heavily on the development of separate plans from the various schools and divisions, has not been an insurmountable barrier to strategic planning.
However it seems clear that the administration and the Academic Senate have more work to do to develop a consensus on the priorities and strategies for the campus level academic planning and resource allocation needed to achieve our general goals. One outcome of this review has been the realization that consensus on a goal of graduate growth – whether in absolute terms or expressed as a percentage of enrollment – does not resolve these questions. Clarification of these alternatives and assessing their priorities to the institution is a prerequisite for effective action in deploying new resources, whether they come from reassignment of existing resources or the allocation of newly developed resources.

**THIRD STRATEGY: INCREASING RESOURCES**

Enhancing graduate education at UC Santa Cruz by increasing the resources that support graduate education presupposes that there are resources that might, in fact, be increased. What, then, are some resources that could be augmented? Where and how can UC Santa Cruz obtain new funds to augment the quantity and quality of graduate studies?

Five main sources can be identified. First, there are the general funds that originate with the state of California and come to the campus each year via the Office of the President of the University of California (UCOP). Second, there are state funds that are available through UCOP that are earmarked for special purposes. Third are funds that come from student fees and tuition. Fourth are funds that come from contracts and grants from the federal or state government, from private foundations and individuals, and from industry. Grants and contracts generate direct payments (stipends) and also generate revenue through indirect costs. (Indirect costs are distributed to UCOP, the central administration at UC Santa Cruz, and the specific division in which the grants are housed according to a strict but intricate formula.) Finally, gifts and endowments from many sources can provide support for both faculty and students.

General funds from the state are sometimes categorized as belonging to the base budget or to the growth budget. Under the state’s Master Plan for Higher Education, the University of California provides spaces in undergraduate education for the top 12.5 percent of students graduating from high schools in the state. As a result, undergraduate enrollments at UC are driven by the demographics of the state. As the population of high school graduates increases, the University must create new capacity in undergraduate education, and UC Santa Cruz will be expected to absorb a fair share of this growth.

Enrollment growth funds are therefore one potential source of money to support graduate education, although the actual costs of educating a graduate student are generally assumed to exceed the costs of educating an undergraduate student. Consequently, relying on growth funds to support increases in the proportion of graduate students on campus will require us to develop ways of absorbing increased undergraduate enrollment without using all of the resulting growth funds only for undergraduate education – thereby enabling us to ensure that where possible all growth funds contribute to both undergraduate and graduate education.

It is also possible to imagine that UC Santa Cruz might obtain special one-time funding from UCOP for some aspects of the growth in graduate studies. Under the leadership of former Chancellor M.R.C. Greenwood, and continuing under the strong leadership of Acting Chancellor Chemers, UC Santa Cruz explored the possibility of developing a presence in Silicon Valley through targeted funding. It is possible that some programs in Silicon Valley could include a disproportionate number of graduate students or could house new graduate programs. UC Santa Cruz might explore with UCOP ways in which such initiatives could benefit from special funding, either in connection with specific initiatives or as a permanent adjustment to our base budget. Former Chancellor Greenwood also hoped that UC Santa Cruz might work closely with UCOP to bring to reality the dream of a graduate college, housed in one or more new buildings on the UC Santa Cruz campus. However, the realities of the state’s current budget mean that such dreams might best be put on hold for a few years, at least until we have solid data about how effective a strategy this might be.

Because graduate support packages generally include payment of fees and tuition, funds generated through student fees are not really a viable source of
revenue for enhancement of current graduate studies at UC Santa Cruz. Truly self-supporting graduate professional programs would be a means of increasing graduate enrollment through student fees. However the campus must be clear about how such programs are related to its institutional priorities.

Funds that come from sources external to UC and external to students include primarily grants and contracts. Currently, we generate about $91m annually from grants and contracts. As noted in the visiting committee’s report, one might expect the highly productive and well recognized faculty of UC Santa Cruz to able to continue to increase external funding for themselves and their students. Similarly, some graduate programs might be linked more closely than they are at present to industry, in ways that leverage campus investments to provide well trained professionals into targeted workforces.

Clarity about the sources of revenue can help campus discussions move beyond platitudes about enhanced graduate education to the point of laying the material foundation for substantial increases in the proportion of UC Santa Cruz enrollments in graduate programs. But clarity about the sources of revenue, while necessary for productive colloquy, is not sufficient. We must engage in the difficult work of identifying the most efficient ways to utilize resources, and relate the value of those initiatives to the priorities of the campus for graduate enhancement.

Once the campus has reached agreement about funding sources and efficient ways of utilizing resources, we can and must squarely face a number of interlocking questions about the direction of our university. Preliminary conversations within the Academic Senate, and between the Senate and the administration, have already surfaced a number of queries, phrased at various levels of generality. We have, for example, wondered whether to expand existing programs uniformly (the “blow up the balloon” option) or to be more selective in the programs that we encourage. The attraction to the creation of one or more additional professional schools and our desire to spawn more interdisciplinary programs has decreased the popularity of the “balloon” option. But, as yet, there is no clear campus understanding about which programs and departments should be targeted to receive any new resources. Nor have we fully confronted the issue of how to re-deploy or re-distribute existing resources if and when growth funds cease to be available.

Another closely related question involves the issue of uniformity. Do we expect different divisions to all follow the same models? External funding is less available for the Arts and for Humanities than for the School of Engineering, the Division of Physical and Biological Sciences, and the Division of Social Sciences. If some programs prioritize increasing the quality of their graduate students (e.g., a goal of increasing the GRE scores of the students yielded), should all other departments be expected to have the same goal? How can we best assist graduate programs and departments to obtain increased external funding for their students in ways that are tailored to their own disciplines?

A recurrent theme in recent discussions about graduate growth is the relative balance between Ph.D. programs and (terminal) Masters and Certificate programs. A variant of this theme examines the possible growth of future professional schools at UC Santa Cruz. Ph.D. students are not the only ‘graduate’ students, but they have a distinct profile in resource utilization, placement possibilities, and effect on external assessments of the quality of graduate education at UC Santa Cruz (such as the NRC rankings of programs). One advantage to increasing the proportion of graduate students who are seeking professional master’s degrees is that those students are expected to primarily fund their education, allowing the campus to concentrate its resources on support for Ph.D. students. Terminal Masters programs can also be effective in developing ways for faculty not currently engaged in graduate education to work with graduate students.

Similar questions arise about the proportion of graduate growth allocated to the creation of professional schools, which would have different fee and support structures. As the campus resolves these issues, the office of the Vice Chancellor for Research will be seeking to expand non-state funds for graduate study. One mechanism that is not presently used, and that may yield opportunities for students to engage in research while providing overhead dollars to the campus, is to encourage the
submission of grants through UC Santa Cruz by principal investigators (PIs) who are not ladder-faculty. The Vice Chancellor for Research is empowered to award exceptions to the PI policy to departments and Organized Research Units that wish to obtain permission for qualified scholars to generate grant funding through the university. In a related development, the Office of Research is implementing new strategies for the creation of Affiliates Programs, which provide corporate consortium opportunities (including graduate support) to particular university programs.

Another related mechanism, already used in a preliminary way, is to encourage the institution (as distinct from specific individuals) to bid on grants and contracts. Two examples of this approach show how additional funds can come along with additional opportunities for graduate students.

The first example is the University Affiliated Research Center (UARC), a collaborative effort between UC and NASA Ames, which is overseen by UC Santa Cruz’s Vice Chancellor of Research (VCR). This project has the potential to create four sources of funding that could be used to support graduate students at UC Santa Cruz. The first source is that of “task orders,” mission-oriented projects that, under contract, include graduate student participation. (The graduate student stipends are directly charged to the UARC.) The second source of possible funds arises from indirect costs. Task orders managed by UC Santa Cruz generate indirect cost funds that are at standard rates (depending on whether the work is done on campus or off). A significant fraction of the indirect costs come to the UC Santa Cruz Vice Chancellor for Research as the responsible officer and PI on the UARC. These funds have significant flexibility with respect to graduate student support. The third source provides Chancellor’s Award funds that can be used for graduate student support, and the fourth possible source of funds is the aligned research fund. This can be used to support research projects at UC Santa Cruz which are aligned with the Research Mission of NASA Ames.

The second example is a recently established NSF Science and Technology Center, the Center for Adaptive Optics (CfAO). The CfAO has generated indirect costs for the university to support construction of its facilities, has supported world-class graduate research, and has increased the visibility of the university. It has also led to the subsequent award of another large grant associated with this work from the Moore Foundation.

In keeping with our desire to use the WASC review process to assist the campus in grappling with issues of importance to UC Santa Cruz, in the final integrative section of this report we continue the theme of how to enhance the quality of graduate education while increasing the proportion of UC Santa Cruz students who are graduate students. The challenge for us centers on the effective integration of our thrust toward graduate education with our historical commitment to undergraduate education.