



**BUILDING THE BAY AREA'S FUTURE:
A STUDY OF THE ECONOMIC IMPACT
OF THE UNIVERSITY OF CALIFORNIA,
BERKELEY**

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I. INTRODUCTION

BACKGROUND

Sedway Group was retained by the Berkeley Campus of the University of California to conduct a study of the economic impacts of UC Berkeley on the City of Berkeley, the East Bay, and the San Francisco Bay Area. An economic impact study measures the impact of an industry or institution on the economy of an area. A fiscal impact study, by contrast, measures the impact of an industry or institution on public revenues and expenses. As this report is an economic impact study, it does not address fiscal contributions made by UC Berkeley to city, county, or state government or the expenses paid by these agencies to provide public services to the university. The last economic impact study of the Berkeley campus was conducted in May 1989 by KPMG. The purpose of this study is to update the 1989 findings and thereby provide the University with a better understanding of its relationship to the regional economy.

SCOPE OF WORK

In undertaking this assignment, Sedway Group obtained information from the University, conducted independent research, and analyzed the impact of University operations and related University activities. UC Berkeley's academic programs, alumni, faculty, research, employment, spending, students, and visitors were all examined in detail to create an overall picture of the University's economic impact on the region. Financial data were gathered, including the University's payroll, purchasing, and student spending. In addition, non-financial data were analyzed and integrated into the report, including UC Berkeley's contribution to the regional workforce, business creation, research, and community development efforts. Finally, Sedway Group used the IMPLAN model to calculate the multiplier effects of UC Berkeley's spending in the region.

To the extent possible, all data were gathered for three geographic regions: City of Berkeley, Alameda and Contra Costa counties, and the nine-county Bay Area. The most recent fiscal year for which data were generally available was 1998-1999. Therefore, to the extent possible, all data collected and analyzed pertain to this period.

KEY FINDINGS

University Purchasing and Payroll

Based on its spending alone, UC Berkeley is a major force in the Bay Area economy. In 1998-1999, UC Berkeley had revenues of \$1.2 billion, of which approximately 75 percent came from outside the Bay Area. By contrast, 71 percent, or \$842 million of University spending, stayed within the Bay Area. Since only about \$304 million of the University's revenue came from local Bay Area sources, this means UC Berkeley made a net contribution of \$538 million to the Bay Area economy. Put another way, the University spent \$2.77 in the Bay Area for every dollar in revenue it received from the Bay Area. In addition, more than \$180 million was paid to the approximately 9,400 University of California system retirees living in the Bay Area.

The University is an important source of jobs for Bay Area residents. UC Berkeley employed approximately 13,520 non-student and 9,980 student employees in 1998-1999 and paid out almost \$603 million in salaries and wages, 98 percent of which stayed in the Bay Area. Of the \$602 million spent on goods, services, and construction in 1998-1999, about 11.4 percent was spent in the City of Berkeley, 13.1 percent was spent in the rest of the East Bay, and 17.5 percent was spent in the rest of the Bay Area. A total of \$250 million of the University's total purchasing of goods, services, and construction, or 42 percent, was spent in the Bay Area.

Multiplier Effects

The University's direct spending and employment generated millions of dollars of additional spending and thousands of additional jobs. Using multipliers from the IMPLAN model developed by the U.S. Department of Agriculture, Sedway Group calculated that UC Berkeley's direct expenditures of \$842 million in the Bay Area in 1998-1999 generated nearly \$568 million in indirect and induced spending, a total impact of more than \$1.4 billion. UC Berkeley spending also generated 17,500 indirect jobs in addition to 21,500 direct University employees, a total of more than 39,000 jobs in the Bay Area. Finally, University spending translated into more than \$1.1 billion in personal income for Bay Area residents.

Research at UC Berkeley

Research is an important part of UC Berkeley's contribution to the economy of the Bay Area. Research spending at UC Berkeley totaled more than \$432 million in 1998-1999, approximately 68 percent of which came from the federal government. In addition to being an important source of outside income for the region and a significant generator of jobs, the products of University research often have commercial application and lead to the creation of new enterprises. In 1998-1999 UC Berkeley filed 59 first and 44 secondary U.S. patent applications and had a portfolio of 289 active U.S. patents. In addition, the University plays an important role as part of a network of research universities and institutions that serve as a magnet for corporate R & D centers and related enterprises.

UC Berkeley and the Regional Workforce

UC Berkeley supplies many of the most talented workers and entrepreneurs to the economy of the Bay Area. In 1998-1999, UC Berkeley enrolled 30,956 students and awarded 8,416 undergraduate and graduate degrees, making it the largest university in the region in both students and degrees awarded. With 130 academic departments in 14 colleges and schools, it is also the most comprehensive. Furthermore, the University acts as a magnet for the region, attracting talented students, many of whom stay. Of the 24,020 alumni who graduated from UC Berkeley from 1997-1999, 13,655, or about 57 percent, lived in the Bay Area in 2000. By contrast, only about 36 percent of new freshmen over the past three years came to UC Berkeley from the Bay Area.

Bay Area companies listed more than 12,000 jobs and conducted nearly 9,000 interviews on the UC Berkeley campus in 1999-2000. The Haas School of Business, the College of Chemistry, and the College of Engineering are three examples of how the University has been an important source of workers for the Bay Area. In recent years, the Haas School of Business placed more than 150 graduates per year, about 65 percent of each class, in Bay Area jobs. Since 1996, the College of Chemistry has placed 310 workers, or 44 percent of the total, in Bay Area jobs. Graduates of all three programs are leaders in their respective industries, serving as Chief Executive Officers of many successful Bay Area companies. UC Berkeley

alumni and faculty have also founded some of the most respected companies in the region, including Intel Corporation, Chiron Corporation, Inktomi Corporation, and Sun Microsystems, Inc., among others.

UC Berkeley's Impact Compared to Other Universities

Sedway Group utilized recently completed economic impact studies from other universities in the U.S. to compare the impact of UC Berkeley. Each of the universities listed in Table 1 below is a major employer in the city in which it is located as well as a major source of cultural, educational, and community service benefits. UC Berkeley generated more indirect and induced spending than both Harvard and Johns Hopkins, despite starting with a smaller amount of direct spending, which shows that among these universities UC Berkeley's activities are more closely aligned to the local economy. In addition, UC Berkeley generated significantly more total jobs than either Harvard or Columbia, another indication that UC Berkeley is more closely aligned with the local economy than other universities. Harvard, Columbia, and Johns Hopkins all have medical schools that account for a significant portion of their respective economic impacts. Even though UC Berkeley does not have a medical school, its economic impact on the Bay Area compares favorably with the other universities' impacts on their local economies.

TABLE 1: COMPARISON OF UNIVERSITY IMPACTS

Category	University (Impact Area)			
	UC Berkeley (1) (Bay Area)	Harvard (2) (Boston Area)	Columbia (3) (New York City)	Johns Hopkins (1) (Baltimore Area)
Fiscal Year	1999	1998	1997	1999
Spending				
Direct Impact	\$842,479,835	\$1,159,000,000	\$925,800,000	\$1,216,800,000
Multiplier (2)	1.67	1.45	1.82	1.41
Indirect & Induced Impact	\$567,785,416	\$523,000,000	\$766,000,000	\$499,400,000
Total Impact	\$1,410,265,251	\$1,682,000,000	\$1,691,800,000	\$1,716,200,000
Jobs				
Direct Jobs	21,550	15,003	18,400	38,159
Multiplier (2)	1.81	1.52	1.36	1.64
Indirect & Induced Jobs	17,528	7,843	6,640	24,470
Total Jobs	39,078	22,846	25,040	62,629

Notes:

(1) Includes Johns Hopkins University and the Johns Hopkins Health System.

(2) The total impact/jobs is the direct impact/job multiplied by the multiplier. Different input/output models were used to develop the multipliers for each of the university impacts. Therefore, the impacts represent an order of magnitude difference and not a direct institution-to-institution comparison.

Sources: UC Berkeley; Harvard University; Columbia University; Johns Hopkins University and Health System; and Sedway Group.

University Students and Visitors

UC Berkeley students and visitors also make an important contribution to the region's economy. About 71 percent of UC Berkeley students lived in the City of Berkeley in 1998-1999. The remainder lived elsewhere in the East Bay (21 percent) or elsewhere in the Bay Area (8 percent). Based on budget estimates from the University's Financial Aid Office, UC Berkeley students contributed more than \$270

million to the Bay Area economy in 1998-1999. In addition, the University attracts thousands of visitors each year to academic, cultural, and athletic events. Although difficult to track, a conservative estimate of the total number of visitors to UC Berkeley is 200,000 per year. Assuming these visitors spent only a portion of the average amount spent by visitors to Alameda County in 1998, the total UC Berkeley visitor contribution to the City of Berkeley is estimated at more than \$5 million.

Community Service and Volunteerism

The University is intimately connected with the surrounding community. UC Berkeley offers a wide variety of cultural and recreational activities that are open to local residents including Cal Performances, Cal Adventures, and various youth programs. In 1998-1999, approximately 2,250 UC Berkeley students enrolled in service-learning courses that required them to volunteer in the local community. The University sponsors education programs that channel more than \$2.8 million each year to local K-12 schools. Finally, each year more than 2,000 UC Berkeley students participate in volunteer activities sponsored by the University's Cal Corps Public Service Center. UC Berkeley faculty and staff also volunteer in a wide variety of community programs and serve on local non-profit boards.

II. THE REGIONAL FRAMEWORK

UC Berkeley's impact on the economy of the Bay Area is best understood if the University is viewed not in isolation, but as part of a network of academic and research institutions that have helped define the Bay Area. As the following sections of this report will demonstrate, UC Berkeley is by most measures the most significant of these institutions. But what makes institutions like UC Berkeley, Stanford University, and Lawrence Berkeley National Laboratory so important is that their impact on the region over time is greater than the sum of their individual parts.

THE BAY AREA ECONOMY

The UC Berkeley campus is situated at the center of the Bay Area, a region of 6.9 million people that, as defined by the Census Bureau, includes the counties of San Francisco, Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, and San Mateo, as shown in Figure 1.

Figure 1: The Nine-County Bay Area



Source: Association of Bay Area Governments

In economic terms, the Bay Area has few equals. At the end of 1999, non-farm employment totaled 3.4 million, an increase of nearly 19 percent from 1994. The unemployment rate dropped to 2.3 percent, less

than one-half that of California overall and nearly two percentage points below the national average. In 1998, the average wage for the Bay Area was \$38,567, the highest in the nation and 39 percent higher than the national average. Household income was 49 percent higher than the national average.

The current economic performance of the Bay Area is all the more impressive given its recent past. Just a few years ago the Bay Area experienced a recession that began in 1990 and lasted through 1995. During this period, nearly 80,000 Bay Area jobs vanished, in part because defense contracts decreased and military bases began to close. By 1996, however, the region had more than recovered these jobs and, in the four years since, has continued its powerful growth in job creation.

The Bay Area's recovery is to some extent the product of a high employment concentration in industries that have fared well in the 1990s. They include computers and electronics, telecommunications, multimedia, bioscience, banking and finance, environmental technology, and tourism. According to the 1999 report, "The Bay Area: Winning in the New Global Economy" by the Bay Area Economic Forum (BAEF) and the Bay Area Council (BAC), in 1998 the Bay Area ranked among the top five regions in the nation in employment concentration in each of these industries. In telecommunications and bioscience the Bay Area ranked highest in employment concentration and in computers and electronics, multimedia, and environmental technology, the Bay Area ranked second (behind Austin in computers and electronics, Los Angeles in multimedia, and Houston in environmental technology).

Another factor in the region's economic performance is a high level of productivity in these key industries. According to the BAEF/BAC report, in 1998 the Bay Area enjoyed a 51 percent average productivity advantage compared to the U.S. as a whole across the seven industries listed above. In computers and electronics, telecommunications, multimedia, bioscience, and environmental technology, the Bay Area ranked first in the nation in productivity and in banking and finance the Bay Area ranked second. In computers and electronics, for example, the Bay Area produced nearly \$16,000 more per employee than the second-ranked region in 1998. In environmental technology, the lead over the second-ranked region was nearly \$52,000 per employee.

In all of the industries mentioned above, productivity is primarily a function of knowledge. Entrepreneurs and skilled workers bring a capacity for innovation and adaptation that is essential to the knowledge-based industries that have been so important to the Bay Area's economic recovery. In the Bay Area, as elsewhere, the most important source of these entrepreneurs and skilled workers is higher education.

THE ROLE OF HIGHER EDUCATION

The Bay Area's higher education infrastructure is a tremendous competitive advantage. More than fifty Bay Area graduate programs are consistently ranked in the top ten programs in the U.S., more than any other region in the country. These include programs in top institutions such as UC Berkeley, Stanford University, and UC San Francisco. In addition, government research institutions such as the Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and the NASA Ames Research Center augment the top Bay Area graduate programs. These institutions attract many of the world's best thinkers, who in turn start companies or create the technologies demanded by the U.S. and global economies.

Higher education institutions in the Bay Area have been remarkably successful at moving academic and research innovations from the laboratory to the marketplace. UC Berkeley's wireless network research

has greatly improved the ability of hospitals to transmit information to emergency medical teams in the field. Stanford University's gravity-probe research led to the global positioning-satellite landing protocol for commercial airliners. UC San Francisco's research on autoimmune drugs continues to produce new approaches to treating HIV infections.

In addition to providing leaders and innovations, higher education institutions in the Bay Area provide the skilled workers necessary for knowledge-based industries to flourish. There are 68 colleges and universities in the Bay Area. Since 1990, UC Berkeley and Stanford University alone have conferred more than 125,000 undergraduate and graduate degrees. Many of these graduates have stayed in the Bay Area, attracted by a high quality of life and a booming economy. They have been an important part of the Bay Area's economic recovery and will continue to fuel economic growth in the future.

III. UNIVERSITY PURCHASING AND PAYROLL

SOURCES OF UNIVERSITY REVENUE

UC Berkeley is a significant economic force by virtue of its position as a major employer and a major purchaser of goods in the Bay Area. The impact of the University on the local economy can be measured to some degree by the amount of revenue it collects from outside the region, revenue that is then used to finance spending on salaries and goods within the region. The more revenue UC Berkeley collects from outside the Bay Area, the more it benefits the local economy.

As Figure 2 shows, in 1998-1999, University revenues totaled \$1.2 billion, of which approximately 75 percent came from sources outside of the Bay Area. State government accounts for the largest share of UC Berkeley's general revenue. The federal government provides most of the University's research funding. A majority of UC Berkeley students come from outside the Bay Area and a significant number pay out-of-state tuition. The University receives funding from foreign-based companies and organizations and invests a portion of all private gifts in the national and worldwide capital markets. A summary of UC Berkeley's revenues for 1998-1999 is included in Table 2, along with the estimated share of each source of revenue generated from outside the Bay Area.

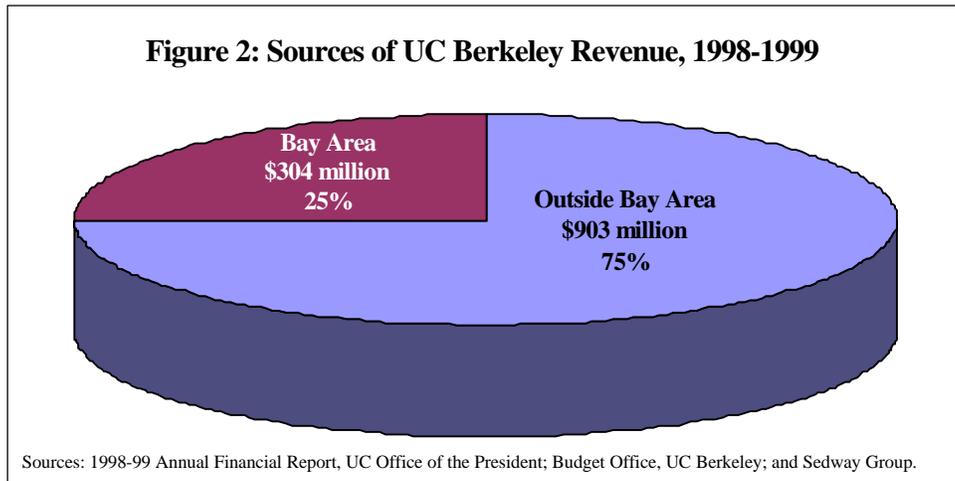


TABLE 2: UC BERKELEY SOURCES OF REVENUE, 1998-1999			
Source	Total Revenue	Revenue from Outside Bay Area	Percent from Outside Bay Area
State Government	\$465,704,000	\$465,704,000	100%
Federal Government (1)	239,251,000	239,251,000	100%
Tuition and Fees	230,234,000	130,500,000 (2)	57%
Private Gifts and Contracts	133,588,000	67,680,000 (3)	51%
Local Sales and Services	138,721,000	0	0%
Total	\$1,207,498,000	\$903,135,000	75%

Notes:

(1) Does not include all federal research funds that are spent at UC Berkeley because some research programs are not accounted for in the annual financial reports published by the UC Office of the President.

(2) Includes \$36.1 million in non-resident tuition and 65.4% (students from outside Bay Area – see Table 15) of regular session fees.

(3) Includes \$28.2 million from foreign-based companies, governments, and organizations and \$39.5 million in investment income.

Sources: 1998-99 Annual Financial Report, UC Office of the President; Budget Office, UC Berkeley; and Sedway Group.

As the remainder of this section will demonstrate, most of the University's spending was concentrated in the Bay Area. In 1998-1999, UC Berkeley spent more than \$1.2 billion on salaries and wages, goods and services, and construction. Approximately \$842 million, or 70 percent, of this total was spent in the Bay Area, as shown in Table 3. Since only about \$304 million of the University's revenue came from local sources, this means that UC Berkeley made a net contribution of \$538 million to the local economy. Put another way, the University spent \$2.77 in the Bay Area for every dollar in revenue received from the Bay Area.

TABLE 3: UC BERKELEY SPENDING, 1998-1999

Source	Total Spending	Spending Within Bay Area	Percent Spent in Bay Area
Salaries and Wages	\$602,627,000	\$589,939,000	98%
Goods, Services, & Construction	602,136,000	252,538,000	42% (1)
Total	\$1,204,763,000	\$842,477,000	70%

Notes:

(1) A majority of UC Berkeley's spending on goods, services, and construction is spent outside of the Bay Area because some of the largest goods and services purchases (i.e., books, biological research materials, banking, and insurance) are only available from vendors that have their headquarters outside of the Bay Area.

Sources: 1998-1999 Annual Financial Report, UC Office of the President; Office of Material Management, UC Berkeley; Payroll Department, UC Berkeley; and Sedway Group.

EMPLOYMENT AND PAYROLL

Total Employment and Payroll

In 1998-1999, UC Berkeley paid out approximately \$603 million in salaries and wages to approximately 13,520 non-student and 9,980 student employees. Student employees of the University included graduate teaching assistants, researchers, and work-study program participants. Based upon only the non-student employees, the Berkeley campus and its direct affiliate the Associated Students of the University of California, Berkeley had more employees than the next eight largest employers in the City of Berkeley combined, as shown in Table 4. UC Berkeley's non-student employees represented approximately 18 percent of the total employment in Berkeley (76,160) in 1999.

TABLE 4: TOP EMPLOYERS IN THE CITY OF BERKELEY, 1999

Rank	Employer	Employees	Product
1	University of California, Berkeley Campus	13,520	Public University
	Associated Students of UC Berkeley	650	Civil & Social Organization
	Total UC Berkeley	14,170	
2	Lawrence Berkeley National Laboratory	3,800	Government Laboratory
3	Alta Bates/Herrick Hospital	2,500	Hospital
4	City of Berkeley	2,000	Municipal Government
5	Berkeley Unified School District	1,800	Public School District
6	Bayer Corporation	950	Pharmaceutical Manufacturing
7	Claremont Hotel Corporation	570	Hotel
8	Kaiser Foundation Hospitals	540	Hospital
9	Pacific Steel Casting	460	Primary Metal Manufacturing
	Total Non-UC Berkeley	12,620	

Sources: City of Berkeley Community Development Office; and Sedway Group

UC Berkeley is one of the most significant direct employers in the region as well. It is the third largest employer in the East Bay and the fifth largest employer in the Bay Area. In the East Bay, only Kaiser Permanente (22,500 employees) and the U.S. Postal Service (20,000 employees) are larger than UC Berkeley. In the Bay Area, and the City and County of San Francisco (27,400 employees), and United Airlines (19,395) are the second and fourth largest employers, respectively (the U.S. Postal Service, with 30,000 Bay Area employees, is first). As one of the largest employers in the Bay Area, it is significant to note that employment at UC Berkeley is somewhat buffered from downturns in the local economy, as most of the jobs are funded from revenue sources outside of the Bay Area that are not market dependent.

Employment and Payroll by Area

Table 5 shows the location of residence of UC Berkeley's regular and student employees in 1999. A total of 9,285, or about 40 percent, lived in the City of Berkeley. Approximately 17 percent of the total employed residents in the City of Berkeley (54,500) in 1999 were UC Berkeley employees. Another 9,384, also about 40 percent, lived elsewhere in the East Bay and 2,881, or about 12 percent, lived elsewhere in the Bay Area. Only 1,956, or about 8 percent, lived outside of the Bay Area. About 53 percent of University faculty lived in the City of Berkeley while about 65 percent of all administrative staff lived elsewhere in the East Bay.

TABLE 5: UC BERKELEY EMPLOYEES AND TOTAL PAYROLL BY AREA, 1999

Employee Type	Berkeley		Other East Bay		Other Bay Area		Outside Bay Area		Total	
	FT (1)	PT (2)	FT	PT	FT	PT	FT	PT	FT	PT
Academic										
Faculty	878	376	501	253	130	157	33	29	1,542	815
Staff	609	338	607	561	178	632	41	123	1,435	1,654
Students (3)	220	2,445	132	1,219	40	407	25	252	417	4,323
Subtotal	1,707	3,159	1,240	2,033	348	1,196	99	404	3,394	6,792
Payroll	\$153,727,342		\$102,458,309		\$27,272,099		\$6,115,116		\$289,572,866	
Administrative										
Sr. Management	108	15	250	15	72	8	6	0	436	38
Staff	1,469	402	4,273	687	555	111	73	36	6,370	1,236
Students (3)	112	2,313	50	836	20	571	60	1,278	242	4,998
Subtotal	1,689	2,730	4,573	1,538	647	690	139	1,314	7,048	6,272
Payroll	\$74,645,282		\$202,947,087		\$28,888,782		\$6,572,983		\$313,054,134	
TOTAL (4)	9,285 (4,835)		9,384 (6,399)		2,881 (1,289)		1,956 (653)		23,506 (13,176)	
Total Payroll	\$228,372,624		\$305,405,396		\$56,160,881		\$12,688,099		\$602,627,000	

Notes:

(1) FT is full-time employees (51 percent time or more) who receive benefits.

(2) PT is part-time employees (less than 51 percent time) who do not receive benefits.

(3) Some undergraduates with local addresses have checks mailed to their permanent addresses, thus many are listed as Outside Bay Area.

(4) The number of full-time equivalents is listed in parentheses (the total of the percent of full-time for all employees).

Sources: Payroll Department, UC Berkeley; and Sedway Group

Approximately 98 percent of the salaries and wages paid by UC Berkeley in 1999 went to Bay Area residents. More than \$228 million, or about 38 percent, went to employees living in the City of Berkeley. About \$305 million, or 51 percent, went to employees living elsewhere in the East Bay and about \$56 million, or 9 percent, went to employees living elsewhere in the Bay Area. About \$13 million, or just over 2 percent, was paid to employees living outside of the Bay Area.

Blue-Collar and White-Collar Employment and Payroll

UC Berkeley's staff covers a diverse range of job types and includes a large number of blue-collar workers with full benefits. According to the Sponsored Projects Office, 1999 benefits for UC Berkeley employees were valued at 23 percent of salaries, or about \$8,440 for the average blue-collar employee.

In 1999, UC Berkeley employed 1,258 full-time blue-collar employees, with an average salary of \$36,700. These employees included custodians, security guards, parking attendants, food service workers, carpenters, masons, machinists, electricians, painters, and plumbers. Only about 12 percent of these employees lived in Berkeley. Most, approximately 79 percent, lived in the other parts of the East Bay. According to County Business Patterns data from the U.S. Census Bureau, the average salary in Alameda County was \$37,900 in 1999 (1997 average adjusted upwards by 3 percent annually).

The staff at UC Berkeley also included a large number of white-collar support workers (not management, faculty, or students). In 1999, UC Berkeley had 6,547 full-time white-collar support workers with an average salary of \$39,700. These employees included everyone from word processors and office managers to planners and architects. About 28 percent of these employees lived in Berkeley and 62 percent lived in elsewhere in the East Bay.

UNIVERSITY OF CALIFORNIA RETIREES IN THE BAY AREA

According to data from the UC Office of the President, in 1998-1999 there were approximately 9,400 University of California retirees living in the Bay Area. Of these, about 1,300, or 14 percent, lived in the City of Berkeley and 4,700, or about 50 percent, lived elsewhere in the East Bay. Total annual payments to retirees in the Bay Area during the year were more than \$180 million, with about \$25 million going to retirees in the City of Berkeley and \$90 million going to retirees elsewhere in the East Bay.

PURCHASING

Goods and Services

In 1998-1999, UC Berkeley purchased more than \$533 million worth of goods and services. These items included everything from cleaning supplies to management consulting services. Table 6 lists some examples of national, Bay Area, and Berkeley suppliers to the University. The examples were chosen at random from the vendors that were listed in the database provided to Sedway Group by UC Berkeley.

TABLE 6: EXAMPLES OF MAJOR UC BERKELEY SUPPLIERS

National	Bay Area	Berkeley
Blackwell's Book Services	East Bay Municipal Utilities	Consolidated Printers
Prudential Life Insurance	Spicers Paper Incorporated	Santa Fe Bar & Grill
McKesson Drug Company	Grace Street Catering	Apollo Printing
American Express	Oakland Children's Hospital	Berkeley Fuller Paints

Sources: Office of Materiel Management, UC Berkeley; and Sedway Group.

One of the goals of the Berkeley campus is to ensure that the small business community has equal access to contracts and business opportunities with the University. In 2000-2001, 40.7 percent of the vendors from whom UC Berkeley purchased goods and services were classified as small business enterprises. As shown in Table 7, most of the vendors that UC Berkeley did business with in 1998-1999 received less than \$50,000 over the course of the year. Approximately 43 percent of the vendors from whom UC Berkeley purchased goods and services received less than \$20,000 in 1998-1999. Another 32 percent received between \$20,000 and \$49,999. Only about 3 percent received more than \$500,000 and less than 2 percent received more than \$1,000,000.

TABLE 7: UC BERKELEY PAYMENTS TO VENDORS BY AMOUNT, 1998-1999

Amount Received	Number of Companies	Percent of Total
\$10,000 – \$19,999	1,019	43%
\$20,000 – \$49,999	769	32%
\$50,000 – \$99,999	274	11%
\$100,000 – \$499,999	256	11%
\$500,000 – \$999,999	35	1%
\$1,000,000 – \$4,999,999	33	1%
\$5,000,000 +	5	<1%
Total	2,391	100%

Sources: Office of Materiel Management, UC Berkeley; and Sedway Group.

Construction

UC Berkeley spent nearly \$69 million on construction in 1998-1999. Included in this figure are 82 Physical Resource Requisition and deferred maintenance projects, valued at \$7.8 million, and 36 capital projects, with total project budgets valued at \$61.1 million. Table 8 lists the major capital projects completed at UC Berkeley in 1998-1999.

TABLE 8: UC BERKELEY CAPITAL PROJECTS COMPLETED, 1998-1999

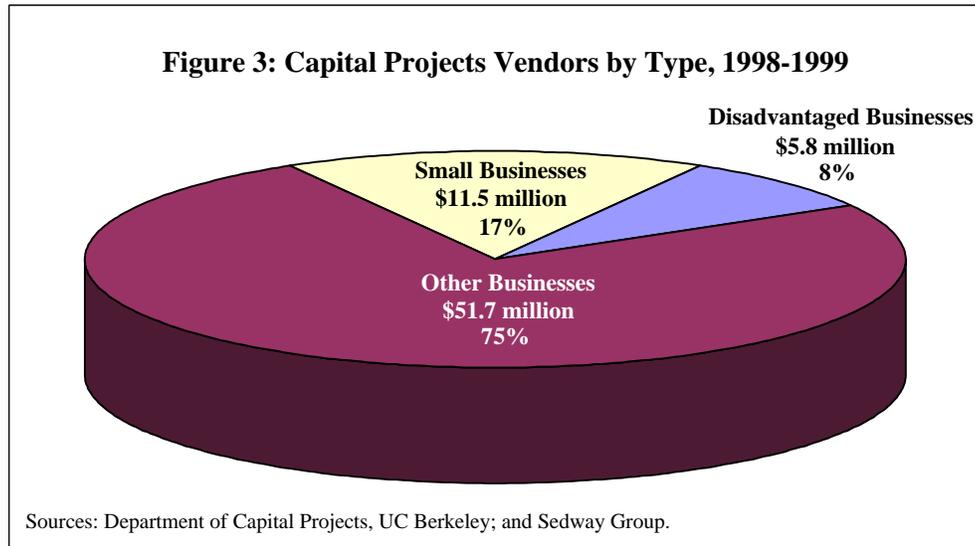
Project	Budget
Dwinelle Hall Expansion	\$14,464,000
Silver Space Sciences Laboratory Expansion	13,850,000
Environment, Health, and Safety Facility	9,941,000
Doe Library Seismic Corrections, Step 2	6,254,000
Goldman School of Public Policy Renovation and Seismic Corrections	3,779,000
Heart Memorial Mining Building Surge	2,042,148
University House Restoration, Step 3	1,887,000
Dance Facility Seismic Corrections	1,645,000
All Others	7,276,789
Total	\$61,138,937

Sources: Department of Capital Projects, UC Berkeley; and Sedway Group.

Projects Under Construction or in Planning

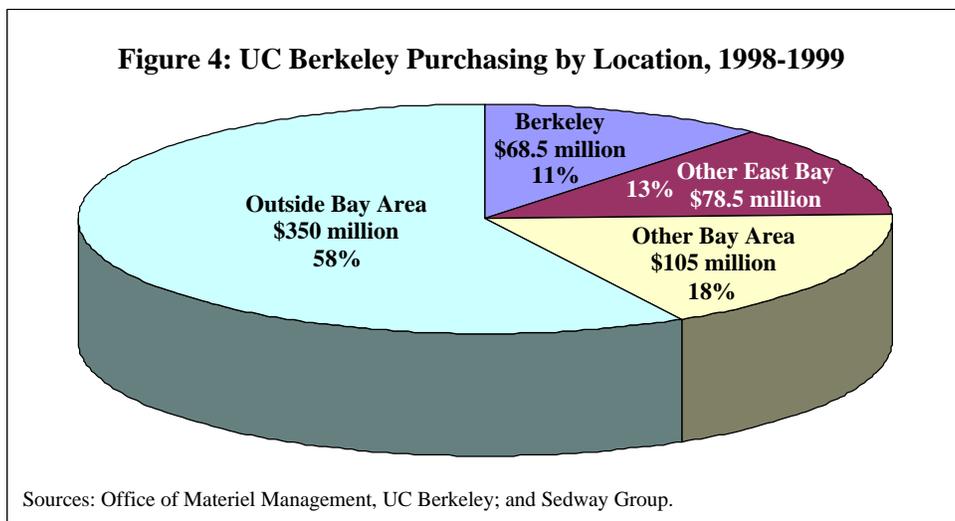
In addition to the \$61 million in capital projects completed, the University had 62 active capital projects with a total value of nearly \$473 million in 1999 and many other projects in the planning stages. The total value of all projects under construction or in planning in 1999 was \$1.26 billion.

Out of the nearly \$69 million in construction contracts awarded by the University in 1998-1999, more than \$11.5 million, or about 16.7 percent, went to vendors classified as small business enterprises. Another \$5.8 million, or 8.4 percent, went to businesses owned by women and other disadvantaged groups, about three-quarters of which were also small businesses. Thus, as Figure 3 shows, \$17.3 million, or 25 percent of capital expenditures by UC Berkeley in 1998-1999, went to small businesses and businesses owned by women and other disadvantaged groups.



Location of Purchasing

UC Berkeley spent a total of approximately \$602 million in 1998-1999 on goods, services and construction. About \$68.5 million of this amount, or 11.4 percent, was paid to vendors located in the City of Berkeley. Another \$78.5 million, or about 13.1 percent, was paid to vendors in the East Bay, excluding Berkeley. More than \$105 million, or 17.5 percent was paid to vendors in the Bay Area, excluding Alameda and Contra Costa counties. As Figure 4 shows, nearly 42 percent, or more than \$250 million, of UC Berkeley's total purchasing of goods, services and construction, was spent in the Bay Area in 1998-1999.



IV. MULTIPLIER EFFECTS

THE MULTIPLIER CONCEPT

The impact of UC Berkeley on the region's economy is greater than the total of the University's direct spending on salaries and wages, goods and services, and construction. This is because money spent by the University is spent again by the employees and local businesses that receive it. Employees use their salaries and wages to purchase from local businesses. Local businesses make their own purchases and hire employees, who also spend their salaries and wages in the local economy. The multiplier represents the number of times each dollar spent by the University cycles through the economy, generating additional income and jobs before it effectively leaves the system through savings, taxes, and expenditures made outside the region.

METHODOLOGY

There are several input-output models commonly used by economists to estimate these "multiplier" effects. Because of the difficulty of measuring multiplier effects, all of the models have limitations. Still, economists generally agree that the models can provide an approximate measure of the indirect and induced spending, total jobs, and personal income generated by a given amount of direct spending in a particular geographic area. To calculate the multiplier effects of UC Berkeley's spending, Sedway Group used an input-output model developed by the U.S. Department of Agriculture known as IMPLAN (Impact Analysis for PLANning). The IMPLAN model organizes the economy into 528 separate industries and has comprehensive data on every area of the United States. Sedway Group organized all University purchasing and payroll into the IMPLAN industry classifications and used the 1997 IMPLAN tables of multipliers for Berkeley, the rest of Alameda and Contra Costa counties, and the rest of the Bay Area to calculate the total effect of UC Berkeley's spending for 1998-1999. The results are summarized in Tables 12-14. [See Appendix D for IMPLAN Model Limitations.]

MULTIPLIERS FOR UNIVERSITY SPENDING

Indirect and Induced Spending

Based on the multipliers in the IMPLAN model, UC Berkeley's direct expenditures of \$842 million in the Bay Area in 1998-1999 generated nearly \$568 million in indirect and induced spending (additional spending by University employees and local businesses from which the University purchases goods and services), as shown in Table 9. More than \$170 million, or about 30 percent, of this indirect and induced spending, took place in the City of Berkeley. Another \$278 million, or about 49 percent, was spent in the rest of the East Bay, and \$119 million, or about 21 percent, was spent in the rest of the Bay Area. The overall output multiplier for UC Berkeley spending was 1.67, meaning that every dollar of direct expenditures by the University generated an additional \$0.67 in indirect and induced spending in the Bay Area.

TABLE 9: INDIRECT AND INDUCED EFFECTS OF UCB SPENDING, FY 1998-1999

Area and Type of Spending	Direct Spending	Multiplier (1)	Indirect & Induced Spending	Total Direct, Indirect, & Induced Spending
Berkeley				
Purchasing	\$68,503,232	1.56	\$38,030,411	\$106,533,643
Payroll	228,372,624	1.58	132,785,937	361,158,561
Subtotal	296,875,856	1.58	170,816,348	467,692,204
Other East Bay				
Purchasing	78,590,975	1.79	62,094,342	140,685,317
Payroll	305,405,396	1.71	216,237,217	521,642,613
Subtotal	383,996,371	1.72	278,331,559	662,327,930
Other Bay Area				
Purchasing	105,446,727	1.77	80,898,045	186,344,772
Payroll	56,160,881	1.67	37,739,463	93,900,344
Subtotal	161,607,608	1.73	118,637,508	280,245,116
TOTAL	\$842,479,835	1.67	\$567,785,416	\$1,410,265,251

Notes:

(1) Purchasing multipliers are a composite of individual industry Type II Output Multipliers weighted according to UC Berkeley spending in those industries. Payroll multipliers are Type II Output Multipliers for Salaries, Wages, and Benefits. Each multiplier represents the amount of indirect and induced spending for every dollar of direct expenditures.

Sources: Office of Materiel Management, UC Berkeley; Payroll Department, UC Berkeley; IMPLAN; and Sedway Group.

Jobs

UC Berkeley spending helped create a total of more than 39,000 jobs in the Bay Area, including 21,550 direct jobs (employees of the University) and more than 17,500 indirect jobs (employees of other businesses), as shown in Table 10. In the City of Berkeley alone, UC Berkeley spending produced nearly 16,000 jobs, or about 41 percent of the total jobs generated by the University's spending in the Bay Area. Another 17,100 jobs were produced in the rest of the East Bay, or about 44 percent of the total, and 6,100 jobs were generated in the rest of the Bay Area, or about 15 percent of the total. In all, the University helped create more than 20 jobs for every \$1 million in direct expenditures, or about 1.8 indirect jobs for every direct University job in the Bay Area.

TABLE 10: TOTAL JOBS PRODUCED BY UCB SPENDING, FY 1998-1999

Area and Type of Spending	Direct Spending	Direct Jobs	Multiplier (1)	Indirect Jobs	Total Direct & Indirect Jobs
Berkeley					
Purchasing	\$68,503,232		21.05	1,442	1,442
Payroll	228,372,624	9,285	22.55	5,149	14,434
Subtotal	296,875,856	9,285	22.20	6,591	15,876
Other East Bay					
Purchasing	78,590,975		22.36	1,757	1,757
Payroll	305,405,396	9,384	19.50	5,954	15,338
Subtotal	383,996,371	9,384	20.08	7,711	17,095
Other Bay Area					
Purchasing	105,446,727		20.73	2,186	2,186
Payroll	56,160,881	2,881	18.52	1,040	3,921
Subtotal	161,607,608	2,881	19.96	3,226	6,107
TOTAL	\$842,479,835	21,550	20.81	17,528 (2)	39,078

Notes:

(1) Purchasing multipliers are a composite of individual industry Total Employment Multipliers weighted according to UC Berkeley spending in those industries. Payroll multipliers are Total Employment Multipliers for Salaries, Wages, and Benefits. Each multiplier represents the number of indirect jobs generated per \$1 million of expenditures.

(2) A total of 1.81 indirect jobs for every direct University job.

Sources: Office of Materiel Management, UC Berkeley; Payroll Department, UC Berkeley; IMPLAN; and Sedway Group.

Personal Income

The \$1.4 billion in total direct, indirect, and induced spending generated by UC Berkeley in the Bay Area during 1998-1999 translated into nearly \$1.1 billion in personal income for Bay Area residents, as shown in Table 11. In the City of Berkeley, approximately \$374 million in personal income was generated, or about 34 percent of the total personal income generated in the Bay Area by the University's spending. In the rest of the East Bay, UC Berkeley's spending generated more than \$530 million in personal income, or about 49 percent of the total, and in the rest of the Bay Area, approximately \$187 million in personal income was generated, or about 17 percent of the total. The overall personal income multiplier for UC Berkeley spending was 1.3, meaning that every dollar in direct spending by the University in the Bay Area generated a total of \$1.30 in personal income in the Bay Area.

TABLE 11: TOTAL PERSONAL INCOME FROM UCB SPENDING, FY 1998-1999

Area and Type of Spending	Direct Spending	Multiplier (1)	Total Personal Income Generated
Berkeley			
Purchasing	\$68,503,232	0.93	\$63,590,267
Payroll	228,372,624	1.36	310,032,751
Subtotal	296,875,856	1.26	373,623,018
Other East Bay			
Purchasing	78,590,975	0.99	78,134,794
Payroll	305,405,396	1.48	452,030,810
Subtotal	383,996,371	1.38	530,165,603
Other Bay Area			
Purchasing	105,446,727	1.00	105,259,180
Payroll	56,160,881	1.46	82,226,771
Subtotal	161,607,608	1.16	187,485,951
TOTAL	\$842,479,835	1.30	\$1,091,274,572

Notes:

(1) Purchasing multipliers are a composite of individual industry Total Income Multipliers weighted according to UC Berkeley spending in those industries. Payroll multipliers are Total Income Multipliers for Salaries, Wages, and Benefits. Each multiplier represents the amount of personal income generated for every dollar of direct spending.

Sources: Office of Materiel Management, UC Berkeley; Payroll Department, UC Berkeley; IMPLAN; and Sedway Group.

V. RESEARCH AT UC BERKELEY

THE SIGNIFICANCE OF UNIVERSITY RESEARCH

UC Berkeley's research contributes to the economy of the Bay Area in several important ways. First, because most research spending is sponsored by the federal government with a lesser amount from foundations and major corporations, university research is a significant generator of jobs and income. It is, in effect, a major export industry. Second, the products of university research may have potential commercial application and may provide the basis for creation of new enterprises or the expansion of existing ones. Finally, the presence of a large academic research complex in the region serves as a magnet for corporate R & D centers and related enterprises.

UNIVERSITY RESEARCH AS AN EXPORT INDUSTRY

Research spending at UC Berkeley during fiscal year 1999 totaled more than \$432 million. As Table 12 shows, the federal government provided approximately 68 percent of the University's research funding, with the National Institutes of Health, the National Science Foundation, NASA, the Department of Defense, the Department of Energy, and the Department of Education combining to provide almost two-thirds of the total.

TABLE 12: SPONSORED RESEARCH FUNDING BY SOURCE, FY 1999		
Source	Amount	Percent of Total
Federal Government		
Health and Human Services	\$129,510,000	30%
National Science Foundation	65,370,000	15%
NASA	32,250,000	7%
Department of Defense	25,010,000	6%
Department of Energy	14,380,000	3%
Department of Education	12,100,000	3%
All Other Federal Agencies	17,280,000	4%
Subtotal	295,900,000	68%
Non-Federal Government		
State, Local, and Foreign Governments	36,600,000	8%
Foundations and Other Non-Profits	56,140,000	13%
Industry	35,020,000	8%
University of California	8,910,000	2%
Subtotal	136,670,000	32%
TOTAL	\$432,570,000	100%

Sources: 1998-1999 Annual Financial Report, UC Office of the President; Sponsored Projects Office, UC Berkeley; and Sedway Group.

Between fiscal year 1995 and fiscal year 1999, sponsored research funding at UC Berkeley grew by an average of 9 percent per year. Federal funding grew by an average of 10 percent per year during this period, while funding from foundations and non-profits grew by an average of 12 percent per year.

During the same period, funding from private industry increased by an average of 7 percent per year and funding from state, local, and foreign governments increased by an average of 1 percent per year.

Based on the sources of funds, it is not surprising that science and health-related departments lead the University in sponsored research spending. Together, the Division of Biological Sciences, the College of Engineering, the College of Natural Resources, the School of Public Health, the Space Sciences Laboratory, and the College of Chemistry accounted for more than two-thirds of all sponsored research spending in fiscal year 1999, as shown in Table 13.

TABLE 13: SPONSORED RESEARCH SPENDING BY DEPARTMENT, FY 1999		
Department	Amount	Percent of Total
Division of Biological Sciences	\$84,310,000	19%
College of Engineering	73,720,000	17%
College of Natural Resources	49,360,000	11%
School of Public Health	42,590,000	10%
Space Sciences Laboratory	30,040,000	7%
College of Chemistry	29,550,000	7%
All Other Divisions	123,000,000	28%
Total	\$432,570,000	100%

Sources: Sponsored Projects Office, UC Berkeley; and Sedway Group.

FROM THE LABORATORY TO THE MARKETPLACE

UC Berkeley policy encourages the practical application of research for public benefit. To this end, the University's Office of Technology Licensing works with campus inventors to facilitate the transfer of technology created at UC Berkeley to the commercial sector. In 1998-1999, UC Berkeley researchers reported 96 inventions, bringing the University's total number of inventions to 567. A total of 59 first and 44 secondary U.S. patent applications were filed and 41 patents were issued. As of June 1999, the University had a total of 289 active U.S. patents as well as 225 active foreign patents. The University also had a total of 142 active license agreements as of June 1999. These totals do not include technologies developed at Department of Energy laboratories under UC management.

Center for Information Technology Research in the Interest of Society (CITRIS)

Centered at UC Berkeley, CITRIS has teamed more than 20 supporting companies with more than 100 faculty members in engineering, science, social science, and other disciplines at four UC campuses. The partnership will sponsor research on problems that have a major impact on the economy, quality of life, and future success of California. The Center's research will focus on: conserving energy; education; saving lives, property, and productivity in the wake of disasters; boosting transportation efficiency; advancing diagnosis and treatment of disease; and expanding business growth through much richer personalized information services. Solutions to many of these problems have a common information technology feature: at their core they depend on highly-distributed, reliable, and secure information systems that can evolve and adapt to radical changes in their environment. This feature is at the heart of research at CITRIS. Corporate and private donors have pledged more than \$170 million to CITRIS in addition to \$100 million in matching state funds.

THE IMPACT OF UNIVERSITY RESEARCH ON THE BAY AREA

UC Berkeley research has had a direct impact on the economy of the Bay Area, the nation, and the world through technology transfers. A few examples of the University's research achievements and their applications follow.

Engineering and Transportation

- UC Berkeley faculty and alumni have been leaders in the design, retrofit, and selection processes for new Bay Area bridges. University research has led to improved structural designs that allow highways and buildings to better withstand earthquakes. Buildings and roadways designed to UC Berkeley-tested specifications withstood the Loma Prieta Earthquake. The Pacific Earthquake Engineering Research Center, funded by the National Science Foundation, is headquartered at UC Berkeley.
- The Institute of Transportation Studies at UC Berkeley heads California Partners for Advanced Transit and Highways (PATH). Supported by \$25 million in research funding, PATH is developing "smart" traffic control systems and prototypes of automated vehicles that could help relieve traffic congestion on Bay Area freeways.
- The Plasma Theory and Simulation Group in UC Berkeley's Department of Electrical Engineering and Computer Sciences has recently worked on Navy radar, making improvements to a widely used microwave tube manufactured in Palo Alto. The group has also worked on improving the efficiency of fluorescent lamps, an innovation that could potentially save billions of kilowatt-hours of energy per year.

Health Sciences

- Cetus Corporation, one of the first health sciences companies, was formed in 1971 by UC Berkeley professor and Nobel Laureate Donald Glaser. In 1991, Cetus merged with Chiron, a health sciences firm started by UC Berkeley professor Edward Penhoet along with two UC San Francisco professors. Today Chiron is one of the world's largest health sciences companies.
- UC Berkeley scientists have made great advances in cancer research. Biochemistry professor Bruce Ames pioneered the Ames Test, the most widely used test for identifying carcinogenic substances. The Ames Test has detected many potentially dangerous products before they could reach the market. Another UC Berkeley professor, Kathleen Collins, recently made a breakthrough in cancer research by purifying telomerase, an enzyme that allows cancer cells to reproduce wildly.
- The division of Public Health Biology and Epidemiology at UC Berkeley's School of Public Health has been a leader in efforts to identify new or reemerging infectious agents such as viruses, bacteria, and parasites. A four-state program funded and directed by the school and the California Department of Health Services, with additional funding from the Centers for Disease Control, has already beefed up surveillance of known bacteria that cause meningitis and pneumonia.

Computer Science

- UC Berkeley's Computer Mechanics Laboratory (CML), founded in 1989, has worked in collaboration with 17 private companies including IBM, Hewlett-Packard, Seagate, and Fujitsu. The lab has produced leading edge instrumentation developments, numerical computer design codes, and other research results widely deemed to be important to future developments in the computer industry. CML has adopted a policy of placing results of research in the public domain.
- In the late 1970s, UC Berkeley computer scientists, led by Sun Microsystems co-founder Bill Joy, developed Berkeley UNIX, an operating system that included the first open software platform implementation of the Internet. The system quickly became the most commonly used among researchers, largely because it was widely distributed in source form so that others could learn from it and improve it. It provided the foundation for many of the advances in computer networking that we enjoy today.
- As the manufacture of microcomputer chips evolved and designs became more complex, UC Berkeley researchers pioneered the development of computer aided design (CAD) tools for the semiconductor industry. In the 1980's, UC Berkeley's CAD program received one of the first major grants from the Semiconductor Research Corporation, a joint venture of the federal government and leading computer corporations. Berkeley faculty and alumni/students were the key contributors to the research that led to the design of the CAD software products of the two largest vendors worldwide: Cadence Design Systems (\$1.2 billion in 1999 revenue) and Synopsis (\$1 billion in 1999 revenue).

THE BAY AREA AS A MAGNET FOR RESEARCH AND DEVELOPMENT

The Bay Area is home to an impressive array of research and development institutions that may be unmatched in the world. The key components of the region's research infrastructure are listed in Table 14. They include research universities, institutions, corporate R&D facilities and the largest concentration of biotech research firms in the world. According to a 1999 report by the Bay Area Science Infrastructure Consortium (BASIC), "The Bay Area's Research Institutions," the concentration of R&D activity is no chance occurrence. Instead, it is the result of calculated strategic decisions and investment. At the heart of the Bay Area's R&D infrastructure are the region's three great research universities: UC Berkeley, Stanford, and UC San Francisco.

TABLE 14: RESEARCH INSTITUTIONS AND COMPANIES IN THE BAY AREA	
Research Universities	Research Institutions
UC Berkeley	Lawrence Berkeley National Laboratory
Stanford University	Lawrence Livermore National Laboratory
UC San Francisco	NASA Ames Research Center
UC Davis	Stanford Linear Accelerator Center
R&D Companies	Biotech Firms
Xerox Palo Alto Research Center	Genentech, Inc.
Hewlett-Packard Company	Chiron Corporation
IBM Almaden Research Center	Bayer Corporation
Sun Microsystems, Inc.	Roche Bioscience

Sources: Bay Area Science Infrastructure Consortium; and Sedway Group.

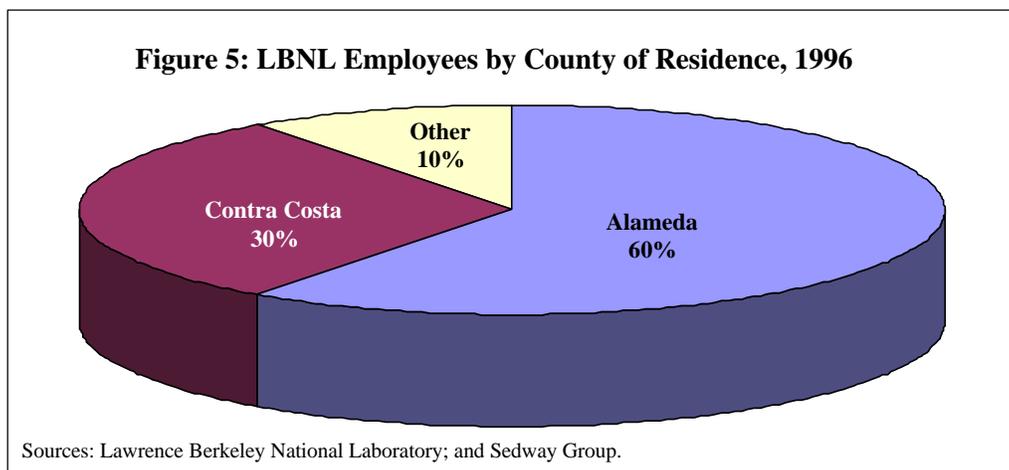
Most of the other research institutions in the region trace their beginnings to these universities and continue to retain strong connections to their academic parents. Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory grew out of E.O. Lawrence's accelerator laboratory on the UC Berkeley campus. Access to the region's universities was a major factor in the location decision for the NASA Ames Research Center. The biotech industry and its strong R&D presence in the Bay Area is a direct consequence of research carried out at UC Berkeley, Stanford, and UC San Francisco.

The research universities study and create new technologies and concepts, expanding the region's base of knowledge. This new knowledge is shared with graduates who in turn migrate to research and administrative positions in government and industry laboratories or start new companies of their own. Government laboratories apply their collective talents to problems of national interest, especially in areas of national defense, energy, the environment, and space exploration. Industry laboratories apply scientific and technical knowledge to the development of new commercial products, stimulating economic growth and creating the products that impact and improve everyday lives. All of these research institutions help to fuel the Bay Area's economy by attracting capital from outside the region and creating jobs.

LAWRENCE BERKELEY NATIONAL LABORATORY

Lawrence Berkeley National Laboratory (LBNL) illustrates the importance of research institutions to the Bay Area economy. E.O. Lawrence, a UC Berkeley professor and winner of the Nobel Prize in Physics, founded LBNL in 1931. Today the lab is a nationally recognized research institution with over 60 years of groundbreaking work in the sciences. Located on 130 acres in the hills overlooking the UC Berkeley campus, the lab is managed by the University of California.

LBNL employs over 3,800 people, making it the second-largest employer in the City of Berkeley, after UC Berkeley, and the twelfth-largest employer in Alameda County. According to an economic impact study conducted by the lab in 1996, most LBNL employees reside in the East Bay, with nearly 60 percent in Alameda County and about 30 percent in Contra Costa County, as shown in Figure 5. The study also found that about 30 percent of lab employees lived in the City of Berkeley and approximately 14 percent lived in Oakland. As of 1996, over 240 lab researchers also held faculty appointments at University of California campuses, many at UC Berkeley.



VI. UC BERKELEY AND THE REGIONAL WORKFORCE

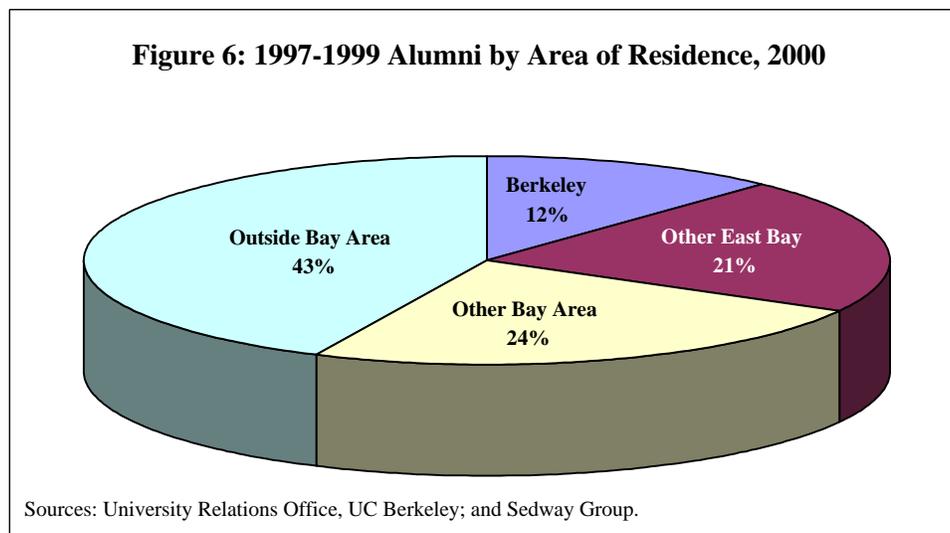
A LEADER IN HIGHER EDUCATION

UC Berkeley is the largest university in the region and one of the most respected institutions of higher learning in the world. The combined size, quality, and scope of UC Berkeley's teaching and research activities make it the leading provider of higher education services in the Bay Area. The intellectual infrastructure that supports these activities is also remarkable. It includes one of the largest university-based library systems, several museums, and a host of specialized resources.

UC Berkeley's 130 academic departments and programs organized into 14 colleges and schools offer an indication of the scope of the institution; and the 8,400 undergraduate and graduate degrees awarded in 1998-1999 provide an indication of its scale. The highly skilled personnel these colleges and schools supply are perhaps UC Berkeley's most significant contribution to the Bay Area economy. Nearly all of UC Berkeley's colleges and schools are consistently near the top of national rankings for their fields. Many programs, including the Colleges of Chemistry and Engineering, and the Departments of Mathematics, English, and History, are frequently ranked first or second in the nation.

UC BERKELEY GRADUATES IN THE BAY AREA

Of the 24,020 alumni (defined for the purpose of this study as all persons who have received graduate or undergraduate degrees) who graduated from UC Berkeley between from 1997-1999, 13,655, or about 57 percent, lived in the Bay Area in 2000, as shown in Figure 6. Of these alumni, 2,879, or about 12 percent, lived in Berkeley, 5,061, or 21 percent, lived elsewhere in the East Bay, and 5,715, or 24 percent lived elsewhere in the Bay Area.



Most of UC Berkeley's new students, however, come from outside the region. As the data in Table 15 indicate, from 1997 to 1999 between 62.8 and 65.4 percent of new freshmen came to UC Berkeley from outside the Bay Area. These figures support the view that the University acts as a magnet that draws talented people to the region.

TABLE 15: PERCENT OF NEW FRESHMEN REGISTRANTS BY HOME LOCATION

County	1997	1998	1999
Alameda	7.2	8.4	8.1
Contra Costa	5.1	6.0	5.3
Marin	1.0	1.4	1.1
Napa	0.4	0.3	0.3
San Francisco	5.1	4.1	4.0
San Mateo	3.1	3.7	3.3
Santa Clara	10.2	9.7	8.4
Solano	0.7	0.9	1.1
Sonoma	1.0	0.7	1.0
Total from Bay Area	35.8	37.2	34.6
Total from Outside Bay Area	64.2	62.8	65.4

Sources: Office of Student Research, UC Berkeley; and Sedway Group.

ON-CAMPUS RECRUITING AT UC BERKELEY

In 1999-2000, Bay Area companies listed 12,209 jobs (including full-time jobs and internships) with UC Berkeley's Career Center. Of these, 1,078, or about 9 percent, were jobs in the City of Berkeley, 3,149, or about 26 percent, were jobs in other parts of the East Bay, and 7,982, or about 65 percent, were jobs in other parts of the Bay Area. In addition, Bay Area companies conducted approximately 8,798 on-campus interviews during the same period. While no data exist on the number of students who were hired by these companies, the very fact that more than 12,000 jobs were listed and almost 9,000 interviews were conducted reveals the high demand for UC Berkeley students in the Bay Area. Fast-growing companies, such as those in the computer and health sciences industries, have an especially high need for university graduates. A 1997 survey by Coopers & Lybrand of 425 of America's fastest-growing companies found that 70 percent hired student interns and 40 percent recruited on campus. Some of the companies that conducted on-campus interviews at UC Berkeley for jobs in the Bay Area are listed in Table 16.

TABLE 16: EXAMPLES OF COMPANIES INTERVIEWING ON-CAMPUS, 1999-2000

Company	Job Location	Number of Interviews
Hewlett-Packard Company	Sunnyvale	256
Cisco Systems	San Jose	129
Altera Corporation	San Jose	128
Wells Fargo Bank	San Francisco	82
Gap Incorporated	San Francisco	70
Apple Computer	Cupertino	68
LSI Logic Corporation	Milpitas	53
Barra Incorporated	Berkeley	52
Genentech	South San Francisco	29
Dicon Fiberoptics Incorporated	Berkeley	13
Portera Systems	Berkeley	11

Sources: Career Center, UC Berkeley; and Sedway Group.

UC BERKELEY AS A PROVIDER OF SKILLED WORKERS

UC Berkeley graduates are leaders in virtually every sector of the Bay Area economy, including both public and private organizations. For example, many of the large law firms in San Francisco have a high percentage of attorneys with degrees from the Boalt Hall School of Law, and ten active members of the California legislature are alumni of UC Berkeley. While it is beyond the scope of this study to document all of these activities in detail, below are some examples of how UC Berkeley's schools and colleges have contributed leaders to a variety of activities.

The Haas School of Business

Like other UC Berkeley graduate programs, the Haas School of Business has consistently ranked among the top ten graduate business schools in the nation for as long as such surveys have been conducted. It is particularly noteworthy as a source of skilled personnel for companies located in the Bay Area. From 1996 to 1999, an average of 65 percent of each Haas graduating class, or more than 150 graduates per year, have taken jobs in Northern California. The second most popular destination for Haas graduates, Asia, attracted an average of 10 percent of each class.

Recent career trends among Haas graduates have mirrored the changes in the economy. In 1999, 38.7 percent of students went into technology jobs, an increase of 8.3 percent over the previous year. This increase is largely a result of the record number of Haas graduates who started their own firms or who went to work for Internet-based companies. In 1999, 14.1 percent of students took jobs with Internet companies, an increase of 10.6 percent over 1998. Another 12.9 percent of graduates either started their own companies or are working for early stage start-ups.

The Haas School of Business continues to be an important source of skilled employees for large companies headquartered in the Bay Area. Over the past few years, Cisco Systems, Intel, Gap, and Hewlett-Packard have typically hired Haas graduates from each class. The same is true of large financial and consulting companies with a strong presence in the Bay Area including Charles Schwab, Goldman Sachs, Anderson Consulting, and McKinsey & Company. Of the more than 300 companies that participated in on-campus recruiting at the Haas School of Business in 1999, nearly all were headquartered or had large offices in the Bay Area.

College of Chemistry

The College of Chemistry at UC Berkeley consists of the Department of Chemistry and the Department of Chemical Engineering. Both have been at or near the top of national rankings of similar programs for decades. Although the College of Chemistry is not large compared to the other colleges and schools at UC Berkeley, it is one of the largest of its kind in the nation, with an enrollment of 450 graduate students, 770 undergraduates, and between 150 and 200 postdoctoral fellows. The College is home to four of UC Berkeley's 17 active Nobel laureates.

Graduates of the College of Chemistry are an important part of the Bay Area's workforce. Of the 705 graduates of the College of Chemistry since 1996, 310, or 44 percent, live and work in the Bay Area. Furthermore, its graduates and faculty are Chief Executive Officers of several of the most important chemical and pharmaceutical companies in the Bay Area, including Bio-Rad Laboratories, Cubist Pharmaceuticals, Inc., Gryphon Sciences, InSite Vision, InterMune Pharmaceuticals, MitoKor, Xenogen Corporation, Collabra Pharmaceuticals, Oculex Pharmaceuticals, and Varian Medical Systems, Inc.

College of Engineering

UC Berkeley's College of Engineering includes 11 departments, all of which are nationally ranked at or near the top of their respective disciplines. The College has one of the highest representations of faculty in the National Academy of Engineering and has more recipients of prestigious National Science Foundation awards for young faculty than almost any other University in the country. Each year, the College awards approximately 570 undergraduate and 510 graduate degrees. Graduates of the College of Engineering are Chief Executive Officers of some of the most successful engineering firms in the Bay Area, including Actel Corporation, Castlewood Systems, Epro Corporation, Integrated Automation, Liftech Consultants, Inc., Monterey Mechanical Company, Network Appliances, Sybex, Inc., and Wadell Engineering Corporation, among others.

KEY LOCAL BUSINESSES FOUNDED BY ALUMNI AND FACULTY

In addition to providing skilled workers to the region, UC Berkeley alumni and faculty have started many of the most successful and fastest growing companies in the Bay Area, including Intel, Chiron, Inktomi, and Sun Microsystems. Sedway Group surveyed data provided by the Office of the Chancellor and found 247 UC Berkeley alumni that have founded companies in the Bay Area. Many of these are high-tech companies, including software, telecommunications, and biotech firms. The list also includes many other types of companies, such as financial, consulting, architectural, and manufacturing firms. Table 17 provides a sample of the many Bay Area companies founded by UC Berkeley alumni.

TABLE 17: SELECTED BAY AREA COMPANIES FOUNDED BY UC BERKELEY ALUMNI		
Company	Location	Industry
Powerbar, Inc.	Berkeley	Food Products
Virolab, Inc.	Berkeley	Biotechnology
Holtsmark Architects	Berkeley	Architecture
EcoTimber	Berkeley	Wood Products
Adax, Inc.	Berkeley	Telecommunications
Chez Panisse	Berkeley	Restaurant
Versata, Inc.	Oakland	Software
Amot Controls	Richmond	Electronic Parts
Genesys Telecom Labs	San Francisco	Telecommunications
Media Arts Group, Inc.	San Jose	Home Decorations
Corio, Inc.	San Jose	Software

Sources: Office of the Chancellor, UC Berkeley; and Sedway Group.

Out of the 247 UC Berkeley alumni founders, 128 received undergraduate degrees from the University, 94 received graduate degrees, and 25 received both an undergraduate and a graduate degree. Although their age and majors were not available, 88 alumni founders, or about 36 percent, received their degrees between 1990 and 1999, and 86 received their degrees between 1980 and 1989. Based on these figures, UC Berkeley alumni are an important entrepreneurial force in the Bay Area.

Profiles of Selected Companies Founded by UC Berkeley Alumni and Faculty

Intel Corporation – A national leader in the semiconductor industry, Intel supplies the computing and communications industries with chips, boards, systems, and software. Intel chips so dominate the market that they have come to be seen as standard equipment on a wide range of computer systems. In 1999, Intel had revenues in excess of \$29.4 billion, an increase of 12 percent from 1998, and 70,200 employees worldwide. Intel is headquartered in Santa Clara, CA.

UC Berkeley Affiliate – Andrew S. Grove

Chemical Engineering, Ph.D. (1963)

Founder; President (1979-87), CEO (1987-97), Chairman and CEO (1997-98)

Chiron Corporation – Chiron is one of the world's largest biotechnology companies with a product portfolio focused on vaccines, blood testing, and biopharmaceutical development. Its founding and most valuable technology was the discovery and cloning of hepatitis B antigens, used to develop the first genetically engineered vaccine. In 1999, the company's revenues were \$683 million, an increase of 3 percent from 1998, and it employed 3,110 people. Chiron is headquartered in Emeryville, CA.

UC Berkeley Affiliate – Edward E. Penhoet

Biochemistry, Professor (1971-83); School of Public Health, Dean (1998-Present)

Founder; President and CEO (1981-98)

Inktomi Corporation – Inktomi develops and markets software designed for use by global enterprises, media companies, and service providers in the Internet access, broadband, hosting, and content markets. The company's applications have become one of the core components of the Internet infrastructure, enabling users to easily find information and access it more quickly. In 1999, Inktomi had revenues of more than \$25 million, an increase of 233 percent over 1998, and 688 employees, 473 in the Bay Area. The company is headquartered in Foster City, CA.

UC Berkeley Affiliates

Eric Brewer

Electrical Engineering and Computer Science (1994-present)

Founder; Chief Scientist (1996-present)

Paul Gauthier

Electrical Engineering and Computer Science, Graduate Student (1995-96)

Founder; Chief Technology Officer (1981-98)

Sun Microsystems, Inc. – Sun Microsystems is a worldwide provider of products, services and support solutions for building and maintaining network computing environments. The company's products are used for many demanding commercial and technical applications in various industries including telecommunications, manufacturing, financial services, education, retail, government, energy, and healthcare. In 1999, Sun had revenues of over \$13 billion, an increase of 24 percent over 1998, and 29,700 employees. The company is headquartered in Palo Alto, CA.

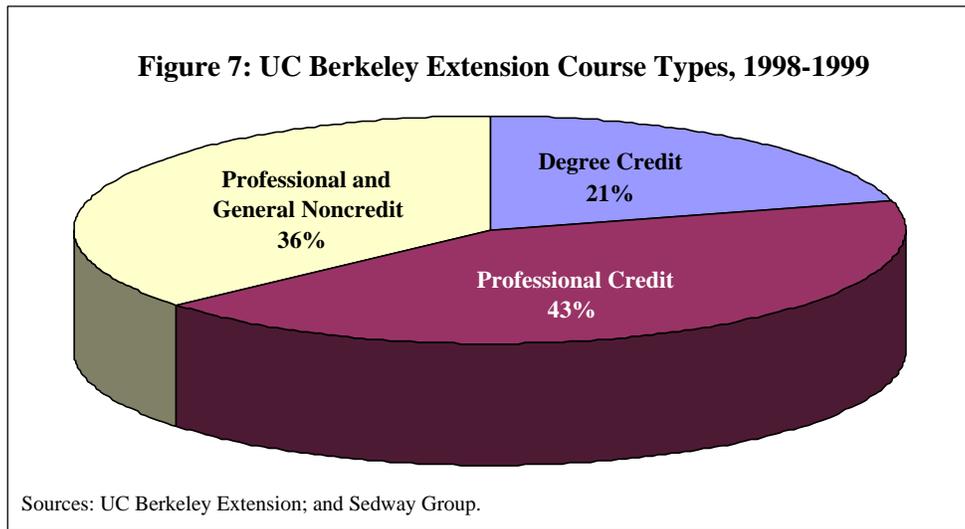
UC Berkeley Affiliate – Bill Joy

Electrical Engineering and Computer Science, M.S. (1982)

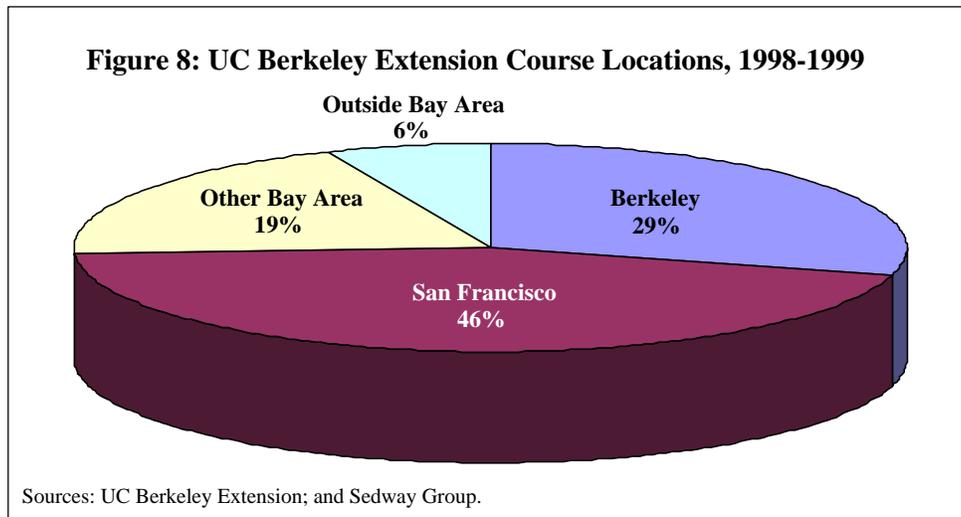
Founder; Chief Scientist and CEO (1998 - present)

UC BERKELEY EXTENSION

While UC Berkeley's undergraduate, graduate, and professional programs have demonstrated their ability to draw talented individuals to the Bay Area, the UC Berkeley Extension program is notable for its contribution to the development of existing Bay Area residents. Extension classes meet during the evening and on weekends, to accommodate working students. The popularity of offerings in fields such as computer science, business, and engineering reflect the fact that many students use UC Berkeley Extension courses to acquire knowledge and skills relevant to employment in some of the region's leading industries. But many students also enroll in extension courses for personal enrichment – which accounts for the continuing popularity of courses in History, Literature, and Religion.



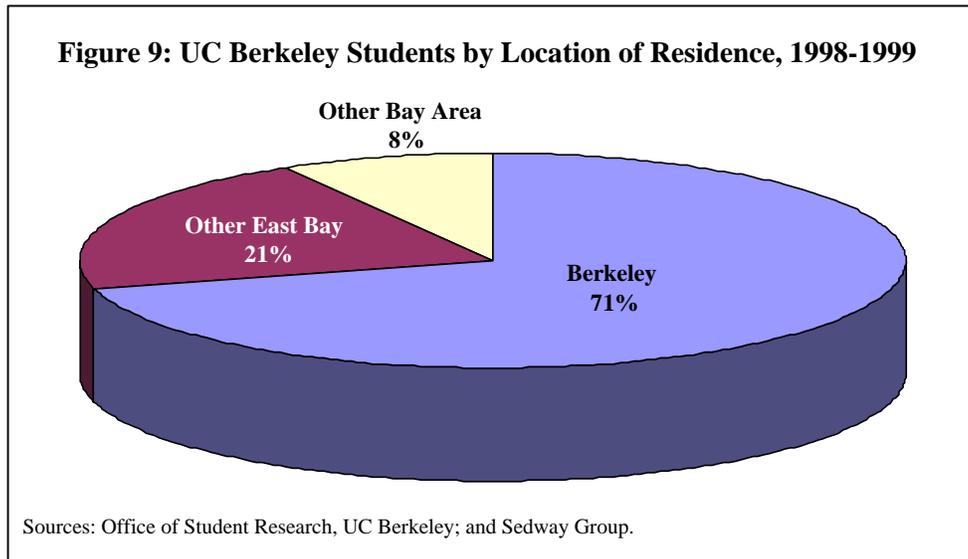
In 1998-99, a total of 61,279 students enrolled in UC Berkeley Extension courses. A total of 2,857 courses were offered. As shown in Figure 7, 596 of these were degree credit courses, 1,222 were professional credit courses, and 1,039 were professional and general noncredit courses. As shown in Figure 8, 834, or 29 percent, of UC Berkeley Extension courses were offered in the City of Berkeley, 1,283, or 46 percent, were offered in San Francisco, and 557, or 19 percent, were offered elsewhere in the Bay Area.



VII. UNIVERSITY STUDENTS AND VISITORS

STUDENT EXPENDITURES

In addition to the University's purchasing and payroll expenditures, UC Berkeley students fuel the local economy through their spending. Based on residential data from the Registrar's Office and spending estimates from the Financial Aid Office, the approximate location and amount of spending by UC Berkeley students can be determined. As shown in Figure 9, a total of 71 percent of the University's students lived in the City of Berkeley in 1998-1999. Among undergraduates, the figure is slightly higher, about 80 percent, while among graduate students, the figure is lower, about 49 percent. About 14 percent of undergraduates and 38 percent of graduate students, or 21 percent of all students, live elsewhere in the East Bay. About 7 percent of undergraduates and 13 percent of graduate students, or 8 percent of all students, live in other parts of the Bay Area.



Student budget estimates from the Financial Aid Office tend to represent a fairly economical spending pattern. As such, the estimates of student expenditures that follow represent a conservative approximation of student spending. According to spending estimates from the University's Financial Aid Office, UC Berkeley students contributed more than \$270 million to the Bay Area economy in 1998-1999. Table 18 lists the total spending of undergraduate and graduate students according to where they live. The average spending for each student includes food, transportation, and personal expenses. On-campus housing and meal plans, university registration and fees, books and supplies, and non-resident tuition are not included. The Financial Aid Office 1998-99 budgets for graduate students are higher than for undergraduates because they are older and are more likely to have families. Based on these figures, UC Berkeley undergraduate and graduate students spent more than \$170 million in the City of Berkeley and a total of more than \$240 million in the East Bay in 1998-1999.

TABLE 18: STUDENT SPENDING AT UC BERKELEY, 1998-1999

Student Type and Location of Residence	Total Students	Average Spending (1)	Total Spending
Undergraduate			
Berkeley On-Campus	5,507	\$1,812	\$9,977,960
Berkeley Off-Campus	12,301	8,850	108,861,432
Other East Bay	3,098	8,850	27,416,547
Other Bay Area	1,481	8,850	13,104,707
Subtotal	22,386	7,119	159,360,645
Graduate			
Berkeley On-Campus	721	6,392 (2)	4,607,946
Berkeley Off-Campus	3,501	13,522 (2)	47,337,350
Other East Bay	3,276	13,522 (2)	44,292,577
Other Bay Area	1,128	13,522 (2)	15,251,174
Subtotal	8,625	12,926	111,489,047
TOTAL	31,011	\$8,734	\$270,849,692

Notes:

(1) Based on estimates from the UC Berkeley Financial Aid Office. Spending does not include on-campus housing and meal plans, registration and fees, books and supplies, and non-resident tuition

(2) 1998-1999 graduate student budgets are 2000-2001 graduate student budgets reduced by 5 percent.

Sources: Office of Student Research, UC Berkeley; Financial Aid Office, UC Berkeley; and Sedway Group.

INTERNATIONAL STUDENTS AT UC BERKELEY

UC Berkeley draws students from around the nation and around the world. Even more than domestic students from outside the Bay Area, international students dramatically reveal the role of higher education as an export industry. According to the Institute of International Education (IIE), about three-quarters of the expenses of international undergraduate students at U.S. schools (including tuition, fees, and living expenses) are funded by sources in their home countries.

In 1998-1999, the IIE estimates that a total of 18,945 international students attended colleges and universities in the Bay Area, as shown in Table 19. UC Berkeley ranked second in both the number of international students and the value of their total contribution to the economy. Based on these figures, international students attending UC Berkeley contributed more than \$91 million to the Bay Area economy, about 75 percent of which, or more than \$68 million, came from sources outside the United States. Nationally, California ranked first in the total contribution of international students to its economy, estimated by IIE at \$1.7 billion for 1998-1999. New York was second with \$1.5 billion and Massachusetts was third with \$1.1 billion.

TABLE 19: INTERNATIONAL STUDENT CONTRIBUTIONS TO THE BAY AREA, 1998-1999

Institution	International Students	Tuition and Fees	Living Expenses	Total Contribution
Stanford University	2,459	\$54,368,490	\$63,679,903	\$118,048,393
UC Berkeley	2,297	31,586,047	59,630,120	91,216,167
San Francisco State University	1,730	16,061,320	36,791,333	52,852,653
De Anza College, Cupertino	1,582	7,264,544	33,430,550	40,695,094
Academy of Art College, San Francisco	1,465	19,967,950	29,300,000	49,267,950
San Jose State University	1,228	11,443,732	25,575,147	37,018,879
City College of San Francisco	1,225	6,039,250	25,886,488	31,925,738
Golden Gate University, San Francisco	945	8,006,040	19,969,576	27,975,616
Foothill College, Los Altos Hills	800	3,384,000	16,905,461	20,289,461
University of San Francisco	756	12,647,880	19,177,200	31,825,080
Santa Clara University	621	10,943,262	15,158,610	26,101,872
Mission College, Santa Clara	504	2,091,600	10,650,441	12,742,041
CSU Hayward	502	4,582,758	8,523,960	13,106,718
Peralta Community College, Oakland	471	4,937,493	9,953,090	14,890,583
All Others	2,360	18,265,545	49,252,262	67,527,807
Total	18,945	\$211,589,911	\$423,884,141	\$635,484,052

Sources: 1998-1999 Open Doors Report, Institute for International Education; and Sedway Group.

CAMPUS VISITORS

Each year, UC Berkeley attracts thousands of visitors to its academic programs, libraries, museums, performances, and athletic events. While no comprehensive source of data exists that measures the total number of visitors to the campus, the University does keep records of certain visitor activities that give an indication of the number of people who come to the campus. According to the 1998 Campus Parking Study, the average daytime attendance of visitors on weekdays is estimated at 290 people, or about 75,000 visitors per year. On evenings and weekends, the campus draws thousands more visitors. On days of major events, such as football games, as many as 40,000 visitors can come to the campus in a single day. The Office of Visitor Services also tracks visitor attendance. They estimate the number of people who took campus tours, went to the top of Sather Tower, or contacted the Office of Visitor Services each year from 1995 to 2000 has averaged about 125,000 per year. While it is difficult to approximate the total number of visitors to the campus each year, based on these sources, and taking into account home football games, basketball games, and graduation, a conservative estimate would put the total at well over 200,000.

Many visitors spend their entire stay on the campus and therefore do not spend anything in the City of Berkeley or elsewhere in the East Bay. However, it is also clear that many shop and eat outside of the campus, and some stay in local hotels. All four of the major hotels in Berkeley offer discounts to guests who are attending an official event at the University, not including parents attending graduation or other informal visitors. Based on the estimates of hotel managers interviewed by Sedway Group, in 1999-2000, official University guests accounted for more than 26,000 room-nights in these four hotels alone. According to the California Trade and Commerce Agency, the average visitor to Alameda County in 1998 stayed 1.7 nights and spent \$62 per day. If 200,000 people are assumed to have visited UC Berkeley

in 1998-1999 and each spent an average of just \$25 outside of the campus (a conservative estimate based on the fact that most visitors to UC Berkeley spend a significant amount of their time and money on campus), the total visitor contribution to the economy of the City of Berkeley would be approximately \$5 million.

VIII. COMMUNITY SERVICE AND VOLUNTEERISM

CULTURAL AND RECREATIONAL PROGRAMS

UC Berkeley provides a wide range of cultural and recreational programs that are open to local residents. A few examples are described below.

Cal Performances

Cal Performances is a nationally respected performing arts institution and host to prestigious dancers, singers, and musicians from around the world. In 1998-1999 its two main venues, Zellerbach Hall and Hertz Hall, featured such world class performers as the Mark Morris Dance Group, Pina Bausch Tanztheater Wuppertal, the Grand Kabuki Theatre of Japan, the New York City Ballet, Yo-Yo Ma, Cecilia Bartoli, Mikail Baryshnikov, and the Shenyang Peking Opera Company. Subscribers are offered a variety of packages, including the Family Fare series, which has special matinee performances and is half price for children under sixteen.

Cal Performances also sponsors more than 75 education and community events each season. These include master classes for the community and students, open rehearsals, and symposia and workshops with international scholars and artists. Cal Performances also offers a SchoolTime program that brings 18,000 2nd through 12th grade student to the UC Berkeley campus each year. The live performances are complemented with educational materials sent to teachers in advance.

Museums

Many of UC Berkeley's museums are open to the public at no charge, or for a nominal fee with discounts for children and seniors and free admission on specified days. Others offer public access to their collections online through virtual exhibits, develop classroom resources and curriculum support, host annual open houses, and provide other outreach services.

- Lawrence Hall of Science – The Lawrence Hall of Science (LHS) provides hundreds of hands-on science exhibits on a wide range of scientific topics for visitors of all ages. LHS also develops science and math curricula, used in elementary and secondary schools throughout the country, and trains science and math teachers. LHS offers summer science and math camps for children and holds special events and family workshops. Onsite attendance at LHS is approximately 220,000 per year. Of this number, about 85,000 are elementary and secondary school students. Offsite school outreach serves 225,000 children in the Bay Area.
- Berkeley Art Museum/Pacific Film Archive – The Berkeley Art Museum hosted 132,772 visitors in 1999-2000, including approximately 2,500 children under age six. The Pacific Film Archive had 49,390 visitors in 1999-2000, including the approximately 5,000 children who participated in the Children's Film Program.

- Botanical Garden – The garden’s 34 acres contain 21,000 plants and 13,000 species from all over the world arranged by region. It is open daily for a nominal fee with free admission on Thursdays. The Garden hosts school groups, providing volunteer docents. Its facilities are available for rental for meetings, conferences, and social occasions.
- Phoebe Hearst Museum of Anthropology – The museum collection numbers 3.8 million objects, with rotating exhibits. Admission to the museum is for a nominal fee, with free admission on Thursdays. In 1998-1999, there were 19,740 visitors to the museum, including 942 students participating in school visits. There were 1,017 participants in outreach programs and 32 volunteers and interns providing 3,919 hours of service. The museum provided teaching kits to 56 schools in 19 school districts around the country, including many in the Bay Area.
- University and Jepson Herbaria – The herbaria offers public workshops on botanical and ecological subjects.
- Museum of Paleontology – The museum sponsors an online exhibit, with information and resources for individual and classroom use, and participates in outreach partnerships with local schools.
- Essig Museum of Entomology and Museum of Vertebrate Zoology – Provide extensive online exhibits.

Arts and Lectures

The Graduate Council Lectures present eminent scholars, Nobel laureates, and prominent political figures to the University and San Francisco Bay Area community throughout the year. All lectures are free and open to the public. The campus sponsors a Lunch Poems series during the academic year, free to the public, featuring noted faculty and visiting scholars reading favorite poems. The Department of Music offers free noon concerts at Hertz Hall every Wednesday during the academic year. Evening and weekend concerts are held at Hertz Hall at nominal cost, with reduced fees for seniors, students, and groups.

Cal Adventures

UC Berkeley’s outdoor education program, Cal Adventures, offers a wide variety of classes and outings in activities such as backpacking, rock climbing, whitewater and sea kayaking, whitewater rafting, sailing, rowing, and cross-country skiing. All programs are open to community members and a complete line of rental equipment is available including everything from sleeping bags and tents to kayaks and sailboats. Boating and other water activities are taught at the UC Aquatic Center at the Berkeley Marina.

Intercollegiate Athletics

UC Berkeley hosts 27 competitive sports teams, providing one of the largest programs for male and female student athletes in the country. Attendance at home football games (approximately 6 per year) is about 185,000, excluding UC students. Approximately 4,200 complimentary football tickets are provided to community groups and local youth, in addition to 1,500 half-price tickets. Men’s basketball draws approximately 175,000 non-UC student fans to home games and offers half-price tickets for some pre-season games. Women’s basketball hosts approximately 14,000 fans and offers discounts and free tickets

to local youth. Other sports, including soccer, rugby, track and field, gymnastics, volleyball, and swimming are open to the public for a nominal cost, with free admission for children.

Recreational Facilities and Youth Sports

Community members can join the Cal Rec Club, for a fee, and have access to one of the most complete and diverse sports and fitness centers in the Bay Area, offering fields, swimming pools, tennis courts, gymnasiums, weight rooms, racquetball courts, handball courts, squash courts, tracks, and specialized programs. Facilities include the Golden Bear Recreation Center, Strawberry Canyon Recreation Area, the Recreational Sports Facility, Hearst and Spieker pools, Kleeberger Field, Hearst Gymnasium, Edwards Track and Hellman Tennis Courts.

For more than 30 years, UC Berkeley has sponsored recreation and sports camps for youth that include activities like archery, swimming, hiking, arts and crafts, as well as specialized sports camps in basketball, baseball, softball, volleyball, swimming, and soccer. Each year, more than 4,000 children participate in UC Berkeley recreation and sports programs.

Open space, picnic areas, and hiking trails on and around the central campus and hill areas are open for community use.

ACADEMIC SERVICE-LEARNING

While University institutions and facilities bring people from the community to the campus, many UC Berkeley academic courses send students out into the community to perform a variety of services. In 1998-1999, according to the University's Service-Learning Center, 141 service-learning courses in 35 departments were offered at UC Berkeley. Approximately 2,250 students enrolled in at least one service-learning course over the year. Some examples are described below.

City and Regional Planning

In the College of Environmental Design's Department of City and Regional Planning, students have a variety of opportunities to serve Berkeley and the East Bay while gaining valuable hands-on experience. Students work with neighborhood organizations to define a problem, create a research or design proposal, and analyze and present recommendations. Recently, students have volunteered at sites that provide services to South Berkeley and on the redevelopment of Clinton Park in the Fruitvale neighborhood of Oakland. Other courses have partnered UC Berkeley students with students from Oakland Technical High School to work on neighborhood planning, documenting neighborhood resources, and developing citywide youth policy in Oakland.

Education

The Graduate School of Education places approximately 75 student teachers in East Bay public schools each year. As prospective teachers from one of the nation's top graduate education programs, these students are a welcome addition to schools in Richmond, Oakland, Berkeley, and other communities. By working closely with a cooperating teacher and UC Berkeley faculty, these student teachers explore new techniques and make a valuable contribution to area schools. Other courses in the Graduate School of Education put students to work in community organizations serving youth and families or tutoring in

after-school programs. Education 97/197 provides hundreds of UC students as tutors and mentors in local classrooms.

Law

The Boalt Hall School of Law has a variety of courses and programs that put students to work in the community. In the Berkeley Community Law Center Clinic, students provide free legal services to Oakland and Berkeley residents, focusing especially on housing, income maintenance, and AIDS law. The Domestic Violence Clinic matches law student interns with domestic violence legal agencies, including the Family Violence Law Center, Battered Women's Alternatives, Marin Legal Aid, and the San Francisco District Attorney's Office. In addition to these and other clinics, each year law students teach a Street Law course to 3,700 young people in 50 Bay Area high schools.

Public Policy

Master's degree students in the Richard and Rhoda Goldman School of Public Policy are required to take a year-long Advanced Policy Analysis course in which they produce a policy analysis of an issue for a real client, usually an individual in a public sector organization confronting some policy problem. Although students can choose clients from around the world, about 85 percent of these projects are with clients in the Bay Area and about half of these are with clients in the East Bay. Recent Advanced Policy Analysis projects include: "Strategies for Attracting Retail Development to Downtown Oakland," "Housing California's Homeless: An Analysis of Retaining Low-End Housing," "Juvenile Justice Reform in San Francisco: An Examination of the Community Assessment and Referral Center," and "Housing San Francisco's Workforce: Strategies for Increasing the Supply and Affordability of Housing." The students work closely with UC Berkeley faculty to provide their clients with the best possible recommendations. Most clients are eager to have a student working full-time on a policy issue that concerns them and, in some cases, students have actually gone to work for the agencies that were the subject of their analyses.

SUPPORT FOR K-12 EDUCATION

UC Berkeley supports Bay Area public schools through School-University Partnerships (also known as the Berkeley Pledge) and the Early Academic Outreach Program (EAOP). School-University Partnerships was initiated by UC Berkeley in 1996 and administers a variety of programs for public schools including Math, Science, and Engineering Achievement (MESA), the Bay Area Writing Project, and Cal Reads. EAOP is a statewide program with offices at each UC campus that provides academic support, college counseling, and skill-building workshops to junior and senior high schools. In total, the University contributes more than \$2.8 million each year to programs that seek to improve K-12 education in the Bay Area.

Through School-University Partnerships, UC Berkeley, working closely with four Bay Area school districts – Berkeley, Oakland, West Contra Costa County, and San Francisco – has adopted "pipeline" schools. At these schools, the University offers programs for students, professional development for teachers, and help in strengthening the K-12 curriculum. A wide variety of programs are offered to the schools, most of which existed before 1996. Rather than create new programs, School-University Partnerships sought to coordinate existing UC Berkeley programs that had previously operated independently of one another. The University tracks the results of the programs at pipeline schools

annually and the results have been encouraging. Most schools have seen dramatic increases in test scores and enrollment in advanced courses by historically low-performing students.

EAOP serves more than 3,000 students in 65 Bay Area schools each year. The program offers regular school site visits, academic planning and career advising, study skills improvement, college admissions workshops, PSAT/SAT preparation, and UC Berkeley campus tours. Some EAOP participants are also invited to enroll in a Pre-College Academy, a rigorous six-week summer program at UC Berkeley, where they are treated to challenging coursework and social activities.

TABLE 20: SELECTED UC BERKELEY OUTREACH AND PARTNERSHIP PROGRAMS	
Cal Performances	Berkeley Alliance
Lawrence Hall of Science	Telegraph Area Association
Berkeley Art Museum/Pacific Film Archive	Southside Community Safety Partnership
Graduate Council Lectures	Institute of Urban and Regional Development
Cal Adventures	Suitcase Clinic
Cal Rec Club/Summer Youth Camps	Cal Corps Public Service Center
Academic Service-Learning	Cal AIDS Ride
School-University Partnerships (Berkeley Pledge)	Early Academic Outreach Program

Sources: UC Berkeley; and Sedway Group.

COMMUNITY PARTNERSHIPS

Berkeley Alliance

Founded in 1997, the Berkeley Alliance is a partnership of the University of California, Berkeley, the Berkeley Unified School District, the City of Berkeley, and the Berkeley community, dedicated to improving the quality of life for Berkeley residents through sharing resources and collaborative initiatives. The Berkeley Alliance is funded through matching contributions from the City of Berkeley and the University. It directs the academic resources of the campus to address community needs, such as youth and education issues, adolescent health programs, and disaster prevention measures, among others.

Southside Revitalization

The Southside commercial and residential area is home to over 10,000 Cal students, university offices and research institutes, student residential complexes, and major campus institutions, such as the Berkeley Art Museum.

The University works closely with the area's residents and businesses and with the City of Berkeley to improve the quality of life on the Southside. From 1993 to 1996, the campus contributed \$300,000 to the Southside Revitalization Project. Between 1995 and 1999, the campus funded a lighting study, new street trees, pedestrian lighting, other physical improvements, and UCPD/BPD training for a total expenditure of \$630,000. With the City of Berkeley, it has jointly funded the development of the Southside Plan (to be incorporated into the City's General Plan) and a Transportation Demand Management study. The University Police Department and Berkeley Police Department provide joint bicycle patrols in the area.

The Telegraph Area Association, which the campus helped found, is a broad coalition of residents, merchants, students, property owners, churches, nonprofit organizations, the City, and the University,

working to achieve a safe, attractive, and economically vital neighborhood. The University provides free office space to TAA in a Victorian house across the street from People's Park and contributes \$60,000 annually to its operations. UC staff, faculty, and students serve on TAA's Board of Directors and committees. The University also contributes \$45,000 per year to the Telegraph Business Improvement District.

In 1999, the University and TAA established the Southside Community Safety Partnership, whose objective is to promote public health and safety in the area through community projects and advocacy. The steering committee, comprising residents, students, and merchants, as well as University, TAA, and City staff, is currently working on projects in the areas of community policing, building safety, and crime prevention through environmental design (CPTED). Co-managed by the University and TAA, the campus jointly funds the Partnership's activities.

Institute of Urban and Regional Development (IURD)

The Institute of Urban and Regional Development is a multidisciplinary research unit which links the academic resources of the campus with the communities of Oakland and Berkeley on projects involving a wide range of urban issues, including housing, urban design, economic development, education, transportation, disaster preparedness, health care, and community parks. In 1998-1999, through a HUD Community Outreach Partnership Center grant, IURD completed a three-year partnership with local communities, focusing on needs and programs for the homeless in the East Bay, providing data, policy recommendations, and support to local agencies, community-based organizations and elected officials.

People's Park

In 1998-1999, under a contract with the City of Berkeley, the campus provided \$197,000 to operate People's Park as public open space and a recreational resource. In addition, the campus provided groundskeeping, maintenance, landscaping, planning, and community outreach staff to support the park. Community members may reserve the facilities for special events at no cost.

Miscellaneous Local Contributions

The campus contributes funding or in-kind donations for a number of community projects, including refurbishing of the Berkeley Main Library, land for a homeless shelter in northwest Berkeley, use of campus land for youth sports fields, and a homeless breakfast program in the south campus area, among others.

STUDENT, STAFF, AND FACULTY VOLUNTEER PROGRAMS

The Cal Corps Public Service Center was founded in 1967 to engage UC Berkeley students in volunteer activities throughout the Bay Area. Each year, more than 2,000 University students participate in Cal Corps sponsored activities in the surrounding community. The center maintains a database of over 180 Bay Area non-profit agencies and student service organizations. The activities range from one-time and short-term projects to on-going volunteer positions throughout the academic year and summer. In addition, there are more than 450 student organizations on campus, including fraternities, sororities, and student honor societies, many of which participate in philanthropic activities in the community.

UC Berkeley staff and faculty also volunteer in a wide range of community programs, some on an individual basis and others through programs organized by the campus. UC Berkeley recruits and organizes volunteers each year for the San Francisco AIDS Walk. The campus is a sponsor of Christmas in April (now renamed Rebuilding Together), contributing financial support and hundreds of volunteers each year who rebuild homes and community centers for low-income and disabled residents in South and West Berkeley, Albany, and Emeryville. A Cal AIDS Ride Team of 35-50 riders raises in excess of \$100,000 each year for AIDS programs. Staff and faculty volunteers serve on local nonprofit boards, mentor local youth and host campus visits, volunteer in local schools, clinics, and community centers, and raise funds for community needs. The campus recognizes and encourages community involvement through annual service awards to faculty, staff, and students who volunteer locally.

ASSUMPTIONS AND GENERAL LIMITING CONDITIONS

Sedway Group has made extensive efforts to confirm the accuracy and timeliness of the information contained in this study. Such information was compiled from a variety of sources, including interviews with government officials, review of City and County documents, and other third parties deemed to be reliable. Although Sedway Group believes all information in this study is correct, it does not warrant the accuracy of such information and assumes no responsibility for inaccuracies in the information by third parties. We have no responsibility to update this report for events and circumstances occurring after the date of this report. Further, no guarantee is made as to the possible effect on development of present or future federal, state or local legislation, including any regarding environmental or ecological matters.

The accompanying projections and analyses are based on estimates and assumptions developed in connection with the study. In turn, these assumptions, and their relation to the projections, were developed using currently available economic data and other relevant information. It is the nature of forecasting, however, that some assumptions may not materialize, and unanticipated events and circumstances may occur. Therefore, actual results achieved during the projection period will likely vary from the projections, and some of the variations may be material to the conclusions of the analysis.

Contractual obligations do not include access to or ownership transfer of any electronic data processing files, programs or models completed directly for or as by-products of this research effort, unless explicitly so agreed as part of the contract.

This report may not be used for any purpose other than that for which it is prepared. Neither all nor any part of the contents of this study shall be disseminated to the public through publication advertising media, public relations, news media, sales media, or any other public means of communication without prior written consent and approval of Sedway Group.

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APPENDICES

APPENDIX A: UNIVERSITY STAFF RESOURCES

Several individuals from the University contributed input and assistance to Sedway Group throughout the course of this study, including:

Name	Title	Department
Jacki Bernier	Principal Planner	Physical and Environmental Planning
Janet Brewster	Planning Analyst	Physical and Environmental Planning
Laura Capps	Director	Governmental Relations
Ron Coley	Associate Vice Chancellor	Business and Administrative Services
Frederick Collignon	Professor	City and Regional Planning
John Cummins	Chief of Staff	Chancellor's Immediate Office
Edward Denton	Vice Chancellor	Capital Projects
Tom Devlin	Director	On-Campus Recruiting
David Dowall	Professor	City and Regional Planning
Michelle Edrada	Associate Planner	Physical and Environmental Planning
Marie Felde	Director	Media Relations
Russell Giambelluca	Assistant Vice Chancellor	Budget and Finance
Elizabeth Gillis	Analyst	Chancellor's Immediate Office
George Goldman	Economist	Agricultural and Resource Economics
Martha Grenhart	Programmer Analyst	University Relations
Irene Hegarty	Director	Community Relations
William Hoskins	Director	Office of Technology Licensing
Kevin Hufferd	Senior Planner	Physical and Environmental Planning
Sean Ireland	Administrative Analyst	Chancellor's Immediate Office
Darrell Kelly	Payroll Manager	Financial and Business Services
Dave Kolsom	Manager	Materiel Management
Thomas Koster	Assistant Vice Chancellor	Space Management and Capital Programs
Cynthia Kroll	Regional Economist	Fisher Center for Real Estate and Urban Economics
Helen Levay	Manager	Real Estate Services
Thomas Lollini	Director	Physical and Environmental Planning
Steven Lustig	Executive Director	Environmental Health and Safety

Name	Title	Department
Matthew Lyon	Assistant Vice Chancellor	Public Affairs
Horace Mitchell	Vice Chancellor	Business and Administrative Services
Teresa Moore	Director	Engineering, Public Affairs
Amy Resner	Speech Writer	Chancellor's Immediate Office
John Landis	Professor	City and Regional Planning
Glenda Rubin	Manager	Community Relations
Christine Schaff	Communications Manager	Capital Projects
Lani Shepp	Director	Visitor Services

APPENDIX B: DATA SOURCES AND USES

In completing this study, Sedway Group relied heavily on the University's own documents. This section describes how these documents and other data sources were used in the report.

Payroll and Purchasing

The Sources of University Revenue section is the result of a review of financial documents from the University of California Office of the President (UCOP) and other data from UC Berkeley. UCOP publishes campus financial schedules for each of the UC campuses. These documents provided the sources of revenue and categories of expenditures for UC Berkeley. UC Berkeley data on the location of residence for 1999 students were used to calculate the amount of tuition revenue that came from outside of the Bay Area.

The University Payroll is based on data gathered from the UC Berkeley Payroll Department with assistance from Janet Brewster in the Department of Capital Projects. Data for thousands of employees were analyzed by Sedway Group and sorted by Personal Program, Title Code, Appointment Type, Student Status, Percent of Full Time, and other categories. The payroll database was incomplete, however, because it contained only the prior year's salaries for 1999 employees of the University. Sedway Group was able to adjust these figures by comparing the total payroll in the UC Berkeley data to the actual number of employees and amount of payroll contained in the UCOP financial schedules for UC Berkeley.

Data on UC Berkeley spending on goods and services were obtained from the University's Office of Materiel Management in spreadsheet form. Sedway Group organized the entries according to the amount each vendor received and where the payments were sent. This analysis made it possible to determine how much UC Berkeley spending occurred in Berkeley, the East Bay, and the rest of the Bay Area. Data on UC Berkeley spending on construction was obtained from the Department of Capital Projects and organized according to vendor type. The location of construction vendors was not available, but construction spending was included in the larger list of vendors obtained from the Materiel Management Department, which Sedway Group had organized by location.

Multiplier Effects

The multiplier effects were calculated based on multipliers contained in the IMPLAN input-output model developed by the U.S. Department of Commerce. More detail is provided in Section IV and Appendix D.

Research at UC Berkeley

Data on research at UC Berkeley were obtained from the UCOP financial schedules, the Office of Technology Licensing, the Office of the Vice Chancellor for Research, and the Sponsored Projects Office. The sources and areas of University research were compiled from all of these sources. Valuable information on the contributions of University research was obtained from the Institute for Transportation Studies at UC Berkeley, the UC Berkeley School of Public Health, and the Computer Mechanics Laboratory at UC Berkeley. Data on the Bay Area's research infrastructure were obtained from the Bay Area Science Infrastructure Consortium (BASIC) and Lawrence Berkeley National Laboratory (LBNL).

UC Berkeley and the Regional Workforce

Data on UC Berkeley alumni were obtained from the UC Berkeley Office of University Relations and the Office of the President. The location of residence of incoming students was obtained from the Office of Student Research. On-campus recruiting information was gathered by the UC Berkeley Career Center and analyzed and sorted by Sedway Group. Data on UC Berkeley alumni who founded Bay Area companies or serve as CEO's of Bay Area companies was provided by the UC Berkeley Office of the President, the College of Chemistry, and the College of Engineering. Sedway Group further analyzed data from the Office of the President. Profiles of private companies and UC Berkeley colleges and schools were compiled from data that were provided by the respective organizations.

University Students and Visitors

Data on the location of students were obtained from the UC Berkeley Office of Student Research with assistance from Janet Brewster of the Department of Capital Projects. Student spending was estimated based on data gathered from the University's Financial Aid Office. Data on international students were obtained from the Institute of International Education (IIE).

The number of visitors was estimated based on data from the UC Berkeley Office of Community Relations, the Department of Visitor Services, and the 1998 Campus Parking Study. Visitor spending was estimated based on figures from the California Trade and Commerce Agency. Hotel occupancy by visitors to UC Berkeley was obtained through interviews with the four largest hotels near the campus.

Community Service and Volunteerism

The Office of Community Relations compiled a large amount of data on community service and volunteerism. Other data were obtained from Cal Performances, Cal Adventures, School-University Partnerships, the Early Academic Outreach Program, and the Cal Corps Public Service Center. Data on academic service-learning were obtained from the College of Environmental Design, the Graduate School of Education, the School of Law, and the School of Public Policy.

APPENDIX C: DOCUMENTS CITED

Bay Area Economic Forum and Bay Area Council. *The Bay Area: Winning in the New Global Economy*; 1999.

Bay Area Science Infrastructure Consortium (BASIC). *The Bay Area's Research Institutions*; 1999.

Institute for International Education. *1998-1999 Open Doors Report*; 1999.

Physical and Environmental Planning, UC Berkeley. *Campus Parking Study*; October 1998.

San Francisco Business Times. *Book of Lists: 2000*; 2000.

University of California, Office of the President. *A Century of Discovery: University of California. 1998-99 Annual Financial Report*; 1999.

APPENDIX D: IMPLAN MODEL LIMITATIONS

Sedway Group conducted a literature search regarding limitations of IMPLAN. Largely, the identified limitations are reflective of input-output models in general, and not specifically IMPLAN. The most commonly cited limitations are as follows:

- Input-output models, especially the most frequently used ones, deal with readily quantifiable impacts, such as dollars or employment, and do not consider environmental, health, or social costs or benefits of economic activities.¹
- IMPLAN is a static model that does not take into consideration changes over time in a dynamic economy. In this manner, it assumes relationships between economic sectors are fixed as of the date of the model's underlying database, and does not account for adjustments that take place over time.²
- Input-output analysis also assumes that the relationships between changes in demand for products and services and the resulting changes in income and employment are linear. Thus it does not take into account how productivity at specific businesses may increase over time, or with changing local circumstances.³
- In like manner, input-output analysis assumes that the response to any incremental change in demand for goods or services is at the average rather than the marginal rate.⁴
- Finally, a general weakness of input-output models is that they do not account for additional capital expenditures required to support indirect and induced effects on the local economy. For example, the model would include the employment required to provide health services to a community with an increased employment base, but not the capital expenditures required to provide the health services facilities.⁵

Despite these limitations, input-output models in general, and IMPLAN in particular, are powerful tools that estimate how specific economic activities affect the economy in which the activity takes place. They are the best tool available for estimating the economic effects of one or more specific economic activities on a local, regional, or other geographically defined economy. The most challenging task for the analyst is in determining the appropriate expenditures to include in the analysis, as the quality of an economic impact analysis is only as good as the data used.

¹ See "Economic Development" by Iowa State University at http://www.public-health.uiowa.edu/icash/swine-book/economic_dev.htm and "Economic Impact of Fuel Ethanol Facilities in the Northeast States" by Resource Systems Group, 29 December 2000.

² See Georgia Economic Developers Association Gazette, November 2000, "Economic Models, Economic Models for Decision Making" and "Economic Assessment of the Atlantic Coast Horseshoe Crab Fishery," by Industrial Economics, Incorporated, April 7, 2000.

³ See "The Economic Impact of Open Space in New Hampshire" by Resource Systems Group Inc., January 1999.

⁴ Ibid.

⁵ See "Economic Development" by Iowa State University at http://www.public-health.uiowa.edu/icash/swine-book/economic_dev.htm.