

SERVING CALIFORNIA,  
THE BAY AREA, AND THE  
COMMUNITY:

**The Economic Impact  
&  
Social Benefits of the  
University of California, Berkeley**



2005

2006



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# EXECUTIVE SUMMARY

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## INTRODUCTION

The University of California, Berkeley has had a profound influence on California and the San Francisco Bay Area since its founding in 1868. As a premier public research university, the first campus in the most renowned state university system in the country, UC Berkeley provides significant economic benefits and a better quality of life for the residents of Berkeley, the Bay Area, and all Californians.

The San Francisco Bay Area's economy of nearly \$300 billion is 24<sup>th</sup> in the world when compared to national economies. In large part it is a knowledge-based economy that relies heavily on the presence of the area's research universities and laboratories, including University of California, San Francisco, Stanford University; Lawrence Berkeley National Laboratory; Lawrence Livermore National Laboratory; and, notably, University of California, Berkeley.

UC Berkeley last published a study documenting its impact on the San Francisco Bay Area and local economy and quality of life in 2001, based on 1998-1999 data. This study updates the previous findings, based on 2005-2006 fiscal year data and expands the discussion of the impact of the University's research and public service on the economic and social life of the state, region, and city of Berkeley. This provides both the University and the public with a better understanding of the ongoing relationship between the University and its community.

### *Scope of Work*

To measure the University's impact on the economy, a broad range of data about UC Berkeley was collected and analyzed, including financial data, such as employment, payroll, purchasing, construction expenditures, and student and visitor spending. Quantitative and qualitative data on the University's activities as a public teaching and research institution, including academic programs, alumni, faculty, research funding and spending, contribution to the local workforce, business development, and public service, were also collected.

To the extent possible, all data were gathered for three geographic regions: the city of Berkeley, the East Bay (the remainder of Alameda County and Contra Costa County), and the nine-county Bay Area. Unless otherwise noted, all financial and demographic data collected and analyzed pertain to the 2005-2006 fiscal year. Other data, such as public service programs and research in the public interest, are ongoing programs and do not pertain to a specific fiscal year.

This report does not address the University's fiscal impacts on the City of Berkeley, Alameda County, or the State of California. In contrast to an economic impact study, a fiscal impact study measures the impact of an industry or institution on public revenues and expenses. However, Appendix A contains a general discussion of fiscal impacts on the City of Berkeley, prepared by UC Berkeley staff.

### *Methodology*

The 2001 economic impact study of the Berkeley campus was published by the Sedway Group, based on 1998-1999 data. For this study, UC Berkeley retained CB Richard Ellis Consulting

Group (CBRE Consulting, which includes the former Sedway Group) to assist in gathering and analyzing data on the economic impact of the University on the local and regional economies.

CBRE Consulting developed an appropriate methodology to quantify direct University economic impacts and to determine the geographies where those impacts occur. University staff provided data to CBRE Consulting for analysis of the direct, indirect, and induced economic impacts in the city of Berkeley, East Bay, and Bay Area. The indirect and induced impacts were generated using formulas provided by the IMPLAN input-output model, developed by the U.S. Department of Agriculture and commonly used by economists to estimate multiplier effects.

UC Berkeley staff authored this report based on the data gathered by UC staff and analyzed by CBRE Consulting.

## **KEY FINDINGS**

UC Berkeley is a vital force in the Bay Area. In addition to the economic impact of its business operations, as the leading public university in the nation, UC Berkeley's research, academic, and public service programs contribute to job creation, economic development, and a better quality of life for all Californians.

### ***Income and Spending***

- **Revenue.** In 2005-2006, UC Berkeley had revenues of \$1.4 billion, of which approximately 71% came from outside the Bay Area.
- **Expenditures.** In 2005-2006, the University spent over \$401 million on goods and services. Over \$135 million was spent in the Bay Area, including about \$31 million to vendors in the city of Berkeley.
- **Payroll.** UC Berkeley's 2005-2006 payroll was almost \$808 million, 96% of which went to Bay Area residents, including almost \$314 million to employees who live in the city of Berkeley. In addition, almost \$145 million was paid out in 2005-2006 to UC Berkeley retirees, about \$50 million to retirees who live in the city of Berkeley.
- **Net Influx.** About \$413 million of UC Berkeley's 2005-2006 revenue came from the Bay Area. The University spent about \$911 million on payroll and purchase of goods and services in the region. Thus, the University made a net contribution of almost \$500 million to the Bay Area economy.
- **Capital Projects.** UC Berkeley spent about \$144 million on capital projects in 2005-2006, \$117 million, or 81%, on projects located in Berkeley. Almost \$27 million was spent on projects in the nearby cities of Albany and Richmond.
- **Student Spending.** UC Berkeley students, 73% of whom live in the city of Berkeley, spent about \$395 million in the Bay Area, about \$282 million of which was in the city of Berkeley.
- **Visitor Spending.** UC Berkeley attracts about one million visitors each year to the campus to attend academic programs and resources, cultural and athletic events, and conferences, and to visit its many museums. Assuming, conservatively, a one-day visit and \$30 spent off campus, the annual contribution to the local economy is \$30 million.

- **Employment.** UC Berkeley is a stable provider of jobs and a significant employer in the region. In 2005-2006, the University employed about 24,700 people (including about 9,700 students), 21,900 in the Bay Area. The University is one of the largest employers in the region – the largest in the East Bay (Alameda and Contra Costa Counties) and in the city of Berkeley, providing more jobs than the next 10 largest Berkeley employers combined.

### ***The Multiplier Effect***

UC Berkeley's direct spending and payroll 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, CBRE Consulting calculated that:

- UC Berkeley's direct expenditures of over \$1 billion in the Bay Area in 2005-2006 generated over \$464 million in indirect and induced spending, for a total impact of more than \$1.5 billion.
- UC Berkeley's spending generated 9,200 indirect jobs for Bay Area residents, in addition to the 21,900 University jobs in the region, for a total of over 31,000 jobs.
- UC Berkeley's spending of over \$1 billion in the Bay Area in 2005-2006 translated into more than \$1.2 billion in personal income for Bay Area residents.

### ***The Intersection of Research and Economic Development***

UC Berkeley research contributes to the economy of the Bay Area in several important ways.

- Research spending at UC Berkeley totaled more than \$469 million in 2005-2006, 60% of which came from the federal government, making this an important source of outside income and generator of jobs for the University.
- University research provides the scientific and technical foundation for new products, technologies, and entirely new industries. UC Berkeley is a leader in commercial application of its research. In 2005-2006, UC Berkeley researchers reported 128 inventions, bringing the University's total to 1,791. In this one-year period, 68 first and 72 secondary U.S. patent applications were filed and 41 patents were issued.
- Faculty and graduates start new companies based on their research. Other companies license UC Berkeley intellectual property. This creates economic growth, jobs, and tax revenues during long research and development phases – even if no commercial product results.

### ***Building a Knowledge Economy***

UC Berkeley prepares the next generation of skilled and talented workers and entrepreneurs for the Bay Area's knowledge-based economy.

- UC Berkeley is organized into 130 academic departments in 14 colleges and schools and awarded 9,776 undergraduate and graduate degrees in 2005-2006.
- UC Berkeley enjoys an international reputation for academic and research excellence. The institution as a whole, as well as individual departments and programs, consistently rank

among the top institutions of higher education in the world based on many different criteria and methodologies.

- UC Berkeley graduates are in demand among employers. In 2005-2006, companies from all over the United States listed over 26,000 jobs and internships with UC Berkeley's Career Center. Of these, about 2,200 were jobs in the city of Berkeley. Many UC Berkeley graduates are leaders and make significant contributions in their respective fields and industries, often serving as chief executive officers and presidents. Twenty-four UC Berkeley alumni are Nobel Laureates.
- Many UC Berkeley graduates have started innovative and successful companies, including about 250 in the Bay Area (10 in the city of Berkeley). These include Intel Corporation, Sun Microsystems, Gap, and Chez Panisse.
- About 64% of UC Berkeley students come from outside the Bay Area, but many remain here after they graduate, adding to the intellectual talent of the region. Of alumni registered with the California Alumni Association, about 170,000 live in the Bay Area, 17,000 in the city of Berkeley.

### ***Research in the Public Interest***

UC Berkeley engages in research that has practical benefits for the State of California and the general public. UC Berkeley investigators anticipate and respond to some of society's most important concerns and issues in such areas as health and welfare, transportation, environment and conservation, and technology. The impact of this research is not only improved quality of life, but also economic benefits in terms of reduced public costs or greater productivity.

### ***Socially Responsible Licensing***

To maximize the social benefit of technologies based on its research and to bring new medicines and technologies to the developing world, UC Berkeley promotes the widespread availability of its research. It enters into partnerships with industry, social entrepreneurs, and non-profit organizations to bring the fruits of the research to those who lack the means to pay for it.

### ***Informing Public Policy and Providing Technical Expertise***

UC Berkeley faculty provide technical assistance and expertise to policymakers and government agencies at local, state, and federal levels, including expert testimony at legislative hearings, evaluation of educational and social programs, and consulting.

### ***Community Engagement Programs***

UC Berkeley sponsors over 200 community service programs serving K-12 schools, youth and families, seniors, disabled persons, and underserved urban and rural neighborhoods. Annually, UC Berkeley faculty, staff, and students devote more than 300,000 hours to public service, serving about 250,000 people in the community and across California. Students engage in public service through service learning courses, community research projects, K-12 outreach programs, volunteer projects, and public sector internships. The University partners with local government and community organizations to address local issues. Examples include the Berkeley Alliance, the Chancellor's Community Partnership Fund, the Center for Educational Partnerships, and the Center for Cities and Schools in the Institute of Urban and Regional Development.

### *Cultural and Recreational Programs*

UC Berkeley offers a wide range of cultural and recreational programs that are open to local residents and visitors, enhancing the quality of life for the community. Some examples are:

- **Museums.** Major museums on the Berkeley campus include the Berkeley Art Museum and Pacific Film Archive; the Lawrence Hall of Science; and the Berkeley Natural History Museums, which include the Phoebe Hearst Museum of Anthropology, UC Botanical Garden, Essig Museum of Entomology, University and Jepson Herbaria, Museum of Paleontology, and Museum of Vertebrate Zoology.
- **Performing Arts.** For over 100 years, Cal Performances has brought world-class artists to the Berkeley campus. Cal Performances' community programs serve over 30,000 Bay Area residents annually in over 100 arts education and humanities programs offered on the UC Berkeley campus, in local schools, and throughout the community. The Department of Music offers noon-hour, evening, and weekend concerts. The Department of Theater, Dance, and Performance Studies offers public performances and workshops. The Lunch Poems series is a free, monthly poetry reading open to the public.
- **University Library.** With a collection of over 10 million volumes, the UC Berkeley Library is ranked second among public university libraries and fifth overall among all university libraries in the United States. Many campus libraries have open stacks and visitors can use most collections on site.
- **Conferences, Public Lectures and Educational Events.** Hundreds of conferences, workshops, lectures, and symposia held on the UC Berkeley campus and sponsored by various academic departments are open to the public, many at no cost.
- **UC Berkeley Online.** Increasingly, the University is making its academic and research materials accessible to people worldwide through webcasts and online digitized content.
- **Recreational Resources.** Cal Recreational Sports offers youth programs during the summer and throughout the academic year. Partial and full scholarships are available to low-income families. Cal STAR programs provide physical recreational activities for the disabled community, including free volunteer assistants. The UC Berkeley campus and University property in the Berkeley hills provide open space for a variety of recreational uses that are available to the community at no cost.

### *Environmental Policies and Practices*

The University of California system and the UC Berkeley campus are committed to upholding sustainable environmental policies. The green building policy and clean energy standards for construction projects include such measures as reducing non-renewable energy use by purchasing green power from the electrical grid, promoting energy efficiency, and creating local renewable power sources. The Chancellor's Advisory Committee on Sustainability (CACS), whose members include students, staff, and faculty, leads the campus-wide sustainability effort. UC Berkeley has been recognized for its sustainability efforts. Every year since 2002, UC Berkeley has been named one of the "Best Workplaces for Commuters" for offering cost-effective commuter benefits to employees. In 2006 the Berkeley campus received a Flex Your Power Award — California's top energy efficiency award.



# INTRODUCTION

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The University of California, Berkeley has had a profound influence on its surroundings since its founding in 1868 in an unincorporated area in northern Alameda County. The city of Berkeley was founded in 1878 and grew up around the new university, the first campus of the most renowned state university system in the country. UC Berkeley has benefited from the vitality of the city of Berkeley, and the city has enjoyed the benefits of an academic community that attracts scholars, businesses, artists, and thinkers to its stimulating environment.

The scholarship at UC Berkeley has always been exceptional. Some of the most important scientific discoveries of the 20th century were made on the Berkeley campus. In the last 25 years, this tradition has continued as UC Berkeley faculty and graduates helped create and build companies in the two most important new industries of the region: computer technology and life sciences.

In addition to the economic impact of its business operations, as the leading public university in the nation, UC Berkeley's research, academic, and public service programs contribute to job creation, economic development, and a better quality of life for all Californians.

It is appropriate, from time to time, for the University to document its economic and social contributions to the local community, the Bay Area region, and the State of California. UC Berkeley's last economic impact report was published in 2001, based on 1998-1999 data. This study updates the previous findings for the 2005-2006 fiscal year, and contains an expanded discussion of the role of University research and public service in the economic and social life of the community. This provides both the University and the community with a better understanding of the ongoing relationship between the campus and the local and regional economies and the University's role in the community.

## SCOPE OF WORK

As an economic impact study, this report measures the impact of UC Berkeley on the San Francisco Bay Area and local economy. To do so, a broad range of data about UC Berkeley was collected and analyzed to provide an overall picture of the University's economic impact. This includes financial data, such as employment, payroll, purchasing, construction expenditures, and student and visitor spending. Quantitative and qualitative data on the University's activities as a public teaching and research institution, including academic programs, alumni, faculty, research funding and spending, contribution to the local workforce, business development, and public service illustrate the scope of UC Berkeley's social benefits for the local community and the region.

To the extent possible, all data were gathered for three geographic regions: the city of Berkeley, East Bay (the remainder of Alameda County and Contra Costa County), and the nine-county Bay Area. Unless otherwise noted, all financial and demographic data collected and analyzed pertain to the 2005-2006 fiscal year. Other data, such as public service programs and research in the public interest, are ongoing and do not pertain to a specific fiscal year.

In contrast to an economic impact study, a fiscal impact study measures the impact of an industry or institution on public revenues and expenses. This report does not address in detail the University's fiscal impacts on the City, county or state. However, there is a general discussion of fiscal impacts on the City of Berkeley that was prepared by UC Berkeley staff.

## **METHODOLOGY**

In 2001, an economic impact study of the Berkeley campus was prepared by the Sedway Group, based on 1998-1999 data. In 2005, UC Berkeley again retained Sedway (now known as CB Richard Ellis Consulting Group (CBRE Consulting)) to assist in data gathering and analysis of the economic impact of the University on the local and regional economies.

CBRE Consulting developed an appropriate methodology to quantify direct University economic impacts and to determine the geographies where those impacts occur. University staff provided data to CBRE Consulting for analysis of the direct, indirect, and induced economic impacts in the city of Berkeley, East Bay, and Bay Area. The indirect and induced impacts were generated using formulas provided by the IMPLAN input-output model, developed by the U.S. Department of Agriculture and commonly used by economists to estimate multiplier effects.

UC Berkeley staff authored this report based on the data gathered by UC staff and analyzed by CBRE Consulting.

## THE REGIONAL FRAMEWORK

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The UC Berkeley campus is located in the center of the San Francisco Bay Area, which includes San Francisco, Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara and San Mateo counties. With close to seven million residents in 101 cities, the region is California's second largest and the nation's sixth largest metropolitan area.

### THE BAY AREA ECONOMY<sup>1</sup>

The San Francisco Bay Area economy of nearly \$300 billion is 24th in the world when compared to national economies.

Over 64% of job positions in the Bay Area are “knowledge workers” compared to 59% in the nation overall. The Bay Area has a high concentration of technology workers, even in industries not generally considered high-tech. The proportion of math, computer, and engineering jobs is twice the national average. Over 35% of Bay Area adult residents have at least a bachelor's degree, compared to 24% nationwide, and one in six has a graduate or professional degree. Many large companies in non-technology industries, e.g., auto manufacturers, locate their “technology-oriented” activities and knowledge workers in the Bay Area.

Although perhaps best known for its high-tech industries such as computer hardware and software, telecommunications and electronics, and the life sciences, the Bay Area economy is fairly diversified, with a significant presence of companies in the financial services, business services, and retail industries. One reason is that high tech companies are heavy users of business services such as law and financial services.

The Bay Area economy is a mix of large and small companies. The region retains a stable share of Fortune 500 firms – 26 in 2004 – including Apple, Chevron, Clorox, HP, Intel, Levi Strauss, Sun Microsystems, Charles Schwab, Cisco Systems, the Gap, and Wells Fargo. Only New York, with 51 Fortune 500 companies, has more.

The Bay Area's impressive economic productivity—\$63,400 output per capita—is almost twice the national average and higher than New York, Boston, and Los Angeles, among other cities. Some of the factors that account for this are the concentration of high value-added activities, the educated and high quality workforce, and the spirit of innovation.

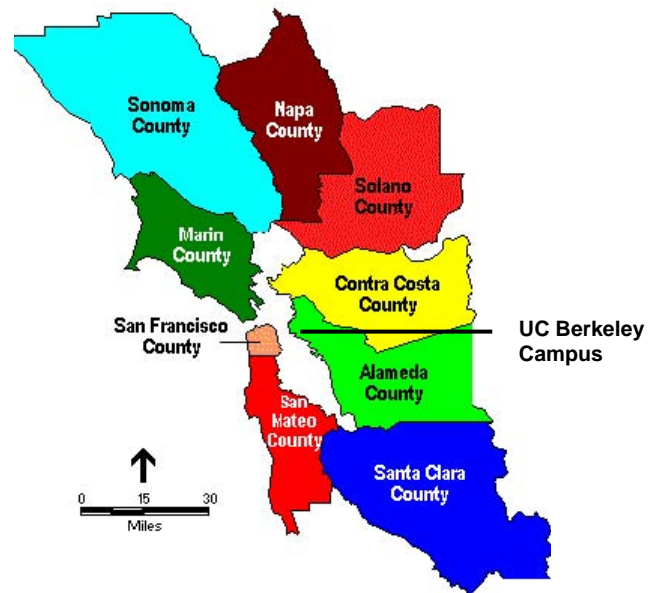


Figure 1: The San Francisco Bay Area

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<sup>1</sup> The description of the Bay Area economy and associated data are derived from two Bay Area Economic Profiles issued by the Bay Area Economic Forum: “Downturn and Recovery: Restoring Prosperity,” January 2004 and “The Innovation Economy: Protecting the Talent Advantage,” February 2006.

As it plays a leading role in delivering innovation to U.S. economy, the Bay Area attracts 35% of the nation's overall venture capital investments. Bay Area companies serve the global market, and as such do not have to be located here in order to be close to their markets; rather, companies choose to locate to the Bay Area.

Despite its diversity, the Bay Area economy is not immune to economic fluctuations or challenges from other U.S. regional economies. When the 2001 UC Berkeley Economic Impact report was published, the Bay Area economy was in the throes of the "dot.com" bubble burst. During that downturn unemployment doubled and hundreds of companies closed their doors. However, as the Bay Area Forum reports state: The Bay Area economy has a highly productive, knowledge-based economy supported by an outstanding talent base and a spirit of creativity and innovation. It has repeatedly reinvented itself, and has emerged from the 2001 downturn with a broad-based, productive economy that remains one of the most innovative on earth." Its advantages include "its highly skilled work force, global presence, and multifaceted economy, not to mention its vibrant art and culture, temperate climate, and natural beauty."

## **THE CITY OF BERKELEY**

The City of Berkeley was founded in 1878, ten years after the founding of the University of California. Its current population of about 105,000, in an area of 18 square miles, represents a diversity of cultures, races, economic levels, and lifestyles. Fourteen percent of the population is under the age of 18; 76% is between the ages of 18–64; and 10% is 65 and older. Berkeley is a well-educated city. Of residents aged 25 years and older, 92% have a high school education or higher, 64% have a bachelor's degree or higher, and 34% have a graduate or professional degree.

Berkeley is known as a receptive environment for innovation. It is home to biotechnology and service firms, green products and services, manufacturing companies (including food processing and printing/publishing), and popular retailers. There are over 9,700 businesses and institutions in the city, which provide about 75,000 jobs and generate over \$3 billion in gross business receipts and about \$1 billion in taxable sales.

Berkeley is a city of neighborhoods, with several vibrant neighborhood retail shopping districts in addition to the downtown. Berkeley's retail mix contributes to its stability with a variety of restaurants, bookstores, specialty shops and boutiques, and deliberate exclusion of strip malls and auto rows. Downtown Berkeley's Arts District features the nationally acclaimed Berkeley Repertory Theatre, as well as other performance and cultural venues that also play an important role in the City's economic development strategy.

The local economy continues to experience slow, steady growth, consistent with regional and state trends. According to the City of Berkeley website, "the composition of Berkeley's economic base, with the University of California as the largest single employer, has historically contributed to a relatively stable local economy."

Berkeley is a built-out city, where land use has remained largely unchanged for 100 years. Approximately one half of the land area is devoted to residential uses. Much of the city's owner-

occupied housing units were built before 1960, and many current development projects are mixed-use, in-fill development.

## **THE ROLE OF HIGHER EDUCATION**

The Bay Area is home to three of the country's great research and teaching universities: UC Berkeley, UC San Francisco, and Stanford University. In addition, government research institutions such as Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, and the NASA Ames Research Center augment these top academic institutions.

The Bay Area Economic Forum report "Downturn and Recovery: Restoring Prosperity, January 2004 Bay Area Economic Profile" noted the following among the key factors that contribute to the area's regional, global, and national competitiveness:

- The nation's largest concentration of national laboratories, corporate and independent research laboratories, and leading research universities.
- The largest number of top-ten ranked graduate programs in business, law, medicine, and engineering in the nation.
- The most highly educated workforce in the nation, with the highest percentage of residents with graduate and professional degrees.

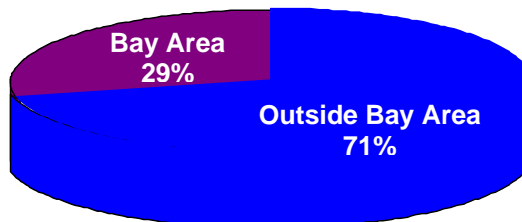
The Bay Area's higher education infrastructure is a tremendous competitive advantage for the region's economic development: It provides the skilled workers the regional economy requires; its graduates and faculty found new companies; and its research results in innovative and marketable products.

## UC BERKELEY AS AN ECONOMIC ENGINE

UC Berkeley is a vital force in the Bay Area economy. It is a major employer and purchaser of goods and services in the region. Most of its revenues come from outside the Bay Area and most of its spending stays in the region, producing net economic benefits for the local economy.

### REVENUE

As Figure 2 and Table 1 summarize, in 2005-2006, UC Berkeley revenues totaled \$1.4 billion, \$1 billion of which, or approximately 71%, came from sources outside of the Bay Area. The principal sources of revenue from outside the Bay Area are the State of California (provider of the largest single share of UC Berkeley's general revenue), the federal government (which provided most of the University's research funding), and students. A majority of UC Berkeley students come from outside the Bay Area; an additional number are from outside the state and pay higher out-of-state tuition rates.



**Figure 2: UC Berkeley Sources of Revenue, 2005-2006**

**Table 1: UC Berkeley Sources of Revenue, 2005-2006**

	Total Revenue	Revenue from Outside Bay Area	Percent from Outside Bay Area
State Government	\$ 446,128,000	\$ 446,128,000	100%
Federal Government (1)	\$ 259,419,000	\$ 259,419,000	100%
Tuition and Fees (2)	\$ 283,160,000	\$ 191,315,333	68%
Private Gifts and Contracts (3)	\$ 271,948,000	\$ 135,974,000	50%
Local Sales and Services (4)	\$ 113,586,000	\$ -	0%
Reserves and Other Sources	\$ 71,794,000	\$ -	0%
<b>Total</b>	<b>\$ 1,446,035,000</b>	<b>\$ 1,032,836,333</b>	<b>71%</b>

(1) Includes only federal research funds paid out on the Berkeley campus.  
 (2) Includes \$62.9 million in non-resident tuition and \$128.4 million of in-state tuition and fees.  
 (3) Includes all investment income, endowment income, and any private gifts and contracts from companies, governments, or organizations outside the Bay Area. Assumed at 50% of total.  
 (4) Includes educational activities and auxiliary enterprises, such as parking fees.

### SPENDING

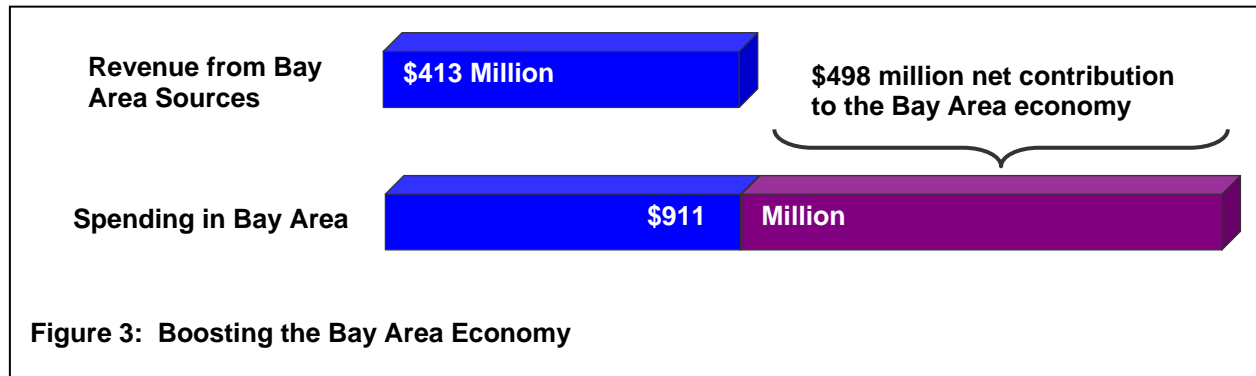
Most of the University's spending is concentrated in the Bay Area. In 2005-2006, UC Berkeley spent more than \$1.3 billion on salaries and wages, goods and services, and construction. As

shown in Table 2, approximately \$1.1 billion, or 78%, was spent in the Bay Area or on projects in the Bay Area.

<b>Table 2: UC Berkeley Spending, 2005-2006</b>			
<b>Source</b>	<b>Total Spending</b>	<b>Spending In the Bay Area</b>	<b>Percent Spent in the Bay Area</b>
Salaries and Wages	\$ 807,888,000	\$ 775,154,441	96%
Goods & Services	\$ 401,559,239	\$ 135,643,830	34%
Construction	\$ 144,395,997	\$ 144,365,468	100%
<b>Total</b>	<b>\$ 1,353,843,236</b>	<b>\$ 1,055,163,738</b>	<b>78%</b>

Note: Most of UC Berkeley's spending on goods and services is outside the Bay Area because some of the largest goods and services purchases (e.g., books and biological research materials) are only available from vendors headquartered outside of the Bay Area.

In 2005-2006, \$413 million of the University's revenue came from Bay Area sources and the University spent \$911 million in the region on payroll and purchase of goods and services. Thus, as Figure 3 illustrates, UC Berkeley made a net contribution of \$498 million to the Bay Area economy. Put another way, for every dollar in revenue received from the Bay Area, the University spent \$2.20 in the Bay Area.



### **EMPLOYMENT AND PAYROLL**

UC Berkeley is a stable provider of jobs and one of the most significant employers in the region. In 2005-2006, the University employed approximately 24,700 people, including 9,700 student employees.

As shown in Table 3, the University is the largest employer in the city of Berkeley and in the East Bay. Even when considering only the 15,000 non-student employees, the Berkeley campus employed more people than the next nine largest employers in the city of Berkeley combined.

<b>Table 3: Top 10 Employers in the City of Berkeley, 2005-2006</b>		
<b>Employer</b>	<b>Employees</b>	<b>Industry/Sector</b>
University of California, Berkeley	24,702	Higher Education
Lawrence Berkeley National Laboratory	3,832	Research
Alta Bates Medical Center	2,065	Hospital
City of Berkeley	1,569	Local Municipal Government
Berkeley Unified School District	1,200	K-12 Education
Bayer Corporation	1,200	Life Sciences Research & Manufacturing
Kaiser Permanente Medical Group	700	Health Services
California Department of Health Services	500	Government/Public Health
Pacific Steel Casting Company	380	Primary Metal Manufacturing
Andronico's	325	Grocery Stores
Source: Berkeley Chamber of Commerce		

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. This provides a stable source of jobs — from entry level, semi-skilled positions to professional and technical jobs — for the city and region.

#### ***Employment and Payroll by Area***

In 2005-2006, UC Berkeley paid almost \$808 million in salaries and wages. Table 4 shows the payroll amounts and residential location of UC Berkeley's regular and student employees in 2005-2006.

About 10,200 employees, or 41%, lived in the city of Berkeley; about 8,700 employees, or 35%, lived elsewhere in the East Bay; and about 3,000, or about 12%, lived in other parts of the Bay Area. Only about 2,800 UC Berkeley employees, or about 11%, lived outside of the Bay Area.

About \$775 million, or 96%, of the salaries and wages paid by UC Berkeley in 2005-2006 went to Bay Area residents. Approximately \$314 million, or about 39%, went to employees living in the city of Berkeley. About \$383 million, or 47%, went to employees living elsewhere in the East Bay and about \$78 million, or 10%, went to employees living elsewhere in the Bay Area.

**Table 4: UC Berkeley Employees and Total Payroll by Area, 2005-2006**

	Berkeley		Other East Bay		Other Bay Area		Outside Bay Area		Total	
	FT (1)	PT (2)	FT (1)	PT (2)	FT (1)	PT (2)	FT (1)	PT (2)	FT (1)	PT (2)
<b>Academic</b>										
Faculty	897	574	533	346	157	202	53	123	1,640	1,245
Staff	980	345	626	545	206	519	85	238	1,897	1,647
Students (3)	142	2,892	59	877	21	386	13	318	235	4,473
<b>Subtotal</b>	<b>2,019</b>	<b>3,811</b>	<b>1,218</b>	<b>1,768</b>	<b>384</b>	<b>1,107</b>	<b>151</b>	<b>679</b>	<b>3,772</b>	<b>7,365</b>
<b>Total Academic Employees</b>	<b>5,830</b>		<b>2,986</b>		<b>1,491</b>		<b>830</b>		<b>11,137</b>	
<b>Total Academic Payroll</b>	<b>\$210,132,179</b>		<b>\$130,968,600</b>		<b>\$33,575,683</b>		<b>\$14,930,793</b>		<b>\$389,607,256</b>	
<b>Administrative</b>										
Senior Management	149	6	300	9	63	5	22	1	534	21
Staff	1,642	370	4,185	568	767	106	276	90	6,870	1,134
Students (3)	216	1,982	87	568	42	547	117	1,447	462	4,544
<b>Subtotal</b>	<b>2,007</b>	<b>2,358</b>	<b>4,572</b>	<b>1,145</b>	<b>872</b>	<b>658</b>	<b>415</b>	<b>1,538</b>	<b>7,866</b>	<b>5,699</b>
<b>Total Administrative Employees</b>	<b>4,365</b>		<b>5,717</b>		<b>1,530</b>		<b>1,953</b>		<b>13,565</b>	
<b>Total Administrative Payroll</b>	<b>\$103,785,371</b>		<b>\$252,151,891</b>		<b>\$44,540,716</b>		<b>\$17,802,766</b>		<b>\$418,280,744</b>	
<b>Total Employees</b>	<b>10,195</b>		<b>8,703</b>		<b>3,021</b>		<b>2,783</b>		<b>24,702</b>	
<b>Total Full Time Equivalents (4)</b>	<b>6,246</b>		<b>6,952</b>		<b>1,711</b>		<b>1,244</b>		<b>16,153</b>	
<b>Total Payroll</b>	<b>\$313,917,551</b>		<b>\$383,120,491</b>		<b>\$78,116,399</b>		<b>\$32,733,559</b>		<b>\$807,888,000</b>	

(1) FT = full-time employees (51% time or more) who receive benefits.

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

(3) Some undergraduate student employees have their paychecks mailed to their permanent addresses outside the Bay Area and are therefore listed as Outside Bay Area. Student employees of the University include graduate teaching assistants, researchers, and work-study program participants.

(4) Calculated as the total of the "% of full-time" for all employees.

### ***Payments to UC Berkeley Retirees***

In 2005-2006 approximately 4,800 UC Berkeley retirees lived in the Bay Area. About 1,100, or 24%, lived in the city of Berkeley, over 2,400, or about 50%, lived elsewhere in the East Bay, and 540, or 11%, lived in other parts of the Bay Area.

Total annual payments to UC Berkeley retirees in the Bay Area during the year were about \$145 million, with about \$50 million going to retirees in the city of Berkeley, over \$66 million going to retirees elsewhere in the East Bay, and over \$13 million going to retirees living in other parts of the region.

## PURCHASING

### *Goods and Services*

In 2005-2006, UC Berkeley purchased more than \$401 million in goods and services – from cleaning supplies to laboratory equipment to consulting services. Over \$31 million was paid to vendors in the city of Berkeley, over \$40 million was paid to vendors in the remainder of the East Bay, and over \$60 million was paid to vendors in the remainder of the Bay Area. Thus, over \$132 million, or one-third, of the University’s purchases for goods and services were in the Bay Area. It should be noted that in determining where purchasing took place, billing address is used. A number of local vendors of the University have billing addresses outside of the immediate area and thus are not, for the purpose of this analysis, considered as Berkeley or Bay Area vendors.

Berkeley is a city of predominantly small businesses. UC Berkeley purchases from many of them, at least 150 if not more, in amounts ranging from a few thousand dollars to a few hundred thousand dollars. Many are located in the immediate campus area. Sectors represented, among others, include entertainment/hospitality (restaurants, catering, and hotels), printing design and production, and consulting.

Table 5 lists examples of national, Bay Area, and Berkeley vendors of the University.

<b>Table 5: Examples of UC Berkeley Suppliers, 2005-2006</b>		
<b>Outside the Bay Area</b>	<b>Bay Area</b>	<b>Berkeley</b>
Boise Cascade Office Products	Alko Office Supply	Arrow Glass
Bruker Daltonics	Berkeley Farms	Ashby Plumbing & Heat Supply
CH2M HILL	Brite Food Service Distributors	Cheese 'N Stuff
Fisher Scientific	Fifth and Potter Associates	Greenlining Institute
IKEA	Give Something Back	Hotel Durant
Institute for Genomic Research	Hewlett Packard	Hunza Graphics
Piranha Produce	Pedro Zarate Concrete Construction	King Pin Donuts
Rainin Instruments	Peet's Coffee & Tea	Pursel Quality Paints
Swales Aerospace	Sun Microsystems	University Press Books
Yankee Book Peddler	United Natural Foods	Yali's Oxford Street Café

### ***Construction Spending***

UC Berkeley spent over \$144 million on capital projects in 2005-2006. Of this, over \$116 million, or 81%, was spent on projects in Berkeley and over \$27 million, or 19%, was spent on projects in the nearby cities of Albany and Richmond.

Table 6 lists the largest projects for 2005-2006.

<b>Table 6: UC Berkeley Capital Expenditures by Project, 2005-2006</b>	
<b>Project</b>	<b>Capital Expenditure</b>
Stanley Hall	\$38,251,080
University Village Albany	26,791,318
Davis North Hall (CITRIS)	6,370,369
Le Conte Hall	10,228,894
MSRI Auditorium Addition	6,598,546
East Asian Library Building	11,914,107
Underhill Parking Facility & Field Replacement	9,757,582
Doe Library Seismic Improvement	2,686,368
Recreational Sports Facility Exterior	2,766,952
All Others	29,030,780
<b>Total</b>	<b>\$144,395,997</b>

The focus of capital construction continues to be the replacement of older academic facilities with state-of-the art and seismically improved buildings and increasing campus housing for students. Upon its completion in 2007, the new Stanley Hall will become the hub of interdisciplinary research as part of the Health Sciences Initiative. At University Village, in the city of Albany, World War II-era housing is being replaced by modern family units.

UC Berkeley capital projects provide jobs for hundreds of local workers in the construction trades and infuse millions of dollars into the local and Bay Area economy.

# MULTIPLIER EFFECTS

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## THE MULTIPLIER CONCEPT

UC Berkeley's economic impact on the Bay Area is greater than its direct spending on salaries, goods, services, and construction. This is because money the University spends locally is spent again by those who receive it. UC Berkeley purchases goods and services from local businesses and its employees shop in local businesses. These businesses make 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. The additional local spending by businesses is called the "indirect" effect, and the spending by UC Berkeley employees and employees of the University's local vendors is called the "induced effect."

## METHODOLOGY

Several input-output models have been developed to estimate the multiplier effect. Although they have limitations, 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, CBRE Consulting used the respected and widely used 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 industries and has comprehensive data on every area of the United States. CBRE Consulting organized all appropriate UC Berkeley purchasing and payroll data into the IMPLAN industry classifications and used the 2004 IMPLAN multipliers for Berkeley, Alameda and Contra Costa counties, and the Bay Area to calculate the total effect of UC Berkeley's spending for 2005-2006. The results are summarized in Tables 7-9 and Figures 4-6.

## THE MULTIPLIER EFFECT

### *Indirect and Induced Spending*

Table 7 shows that, based on the multipliers in the IMPLAN model, UC Berkeley's direct expenditures of over \$1 billion in the Bay Area in 2005-2006 generated over \$464 million in indirect and induced spending for a total impact of \$1.5 billion. Almost \$133 million, about 29%, of this indirect and induced spending, took place in the city of Berkeley. Another \$232 million, or about 50%, was spent in the rest of the East Bay, and over \$99 million, or about 21%, was spent in the rest of the Bay Area. The overall output multiplier for UC Berkeley spending was 1.44, meaning that every dollar the University spent generated an additional \$0.44 in indirect and induced spending in the Bay Area.

<b>Table 7: Indirect and Induced Spending, 2005-2006</b>				
<b>Area and Type of Spending</b>	<b>Direct Spending</b>	<b>Multiplier</b>	<b>Indirect &amp; Induced Spending</b>	<b>Total Direct, Indirect, and Induced Spending</b>
<b>Berkeley</b>				
University Purchasing	\$31,293,111	1.44	\$13,752,211	\$45,045,322
University Payroll	313,917,551	1.24	64,129,243	378,046,794
Capital Expenditures	116,527,648	1.47	54,857,500	171,385,148
<b>Subtotal</b>	<b>\$461,738,309</b>	<b>1.29</b>	<b>\$132,738,954</b>	<b>\$594,477,263</b>
<b>Other East Bay</b>				
University Purchasing	40,694,811	1.59	28,827,233	69,522,045
University Payroll	383,120,491	1.38	164,971,119	548,091,610
Capital Expenditures	27,216,165	1.65	38,388,071	65,604,237
<b>Subtotal</b>	<b>\$451,031,468</b>	<b>1.51</b>	<b>\$232,186,424</b>	<b>\$683,217,891</b>
<b>Other Bay Area</b>				
University Purchasing	60,391,341	1.63	41,359,039	101,750,380
University Payroll	78,116,399	1.43	56,036,478	134,152,877
Capital Expenditures	621,655	1.66	2,287,571	2,909,225
<b>Subtotal</b>	<b>\$139,129,394</b>	<b>1.72</b>	<b>\$99,683,088</b>	<b>\$238,812,483</b>
<b>Total</b>	<b>\$1,051,899,171</b>	<b>1.44</b>	<b>\$464,608,466</b>	<b>\$1,516,507,637</b>

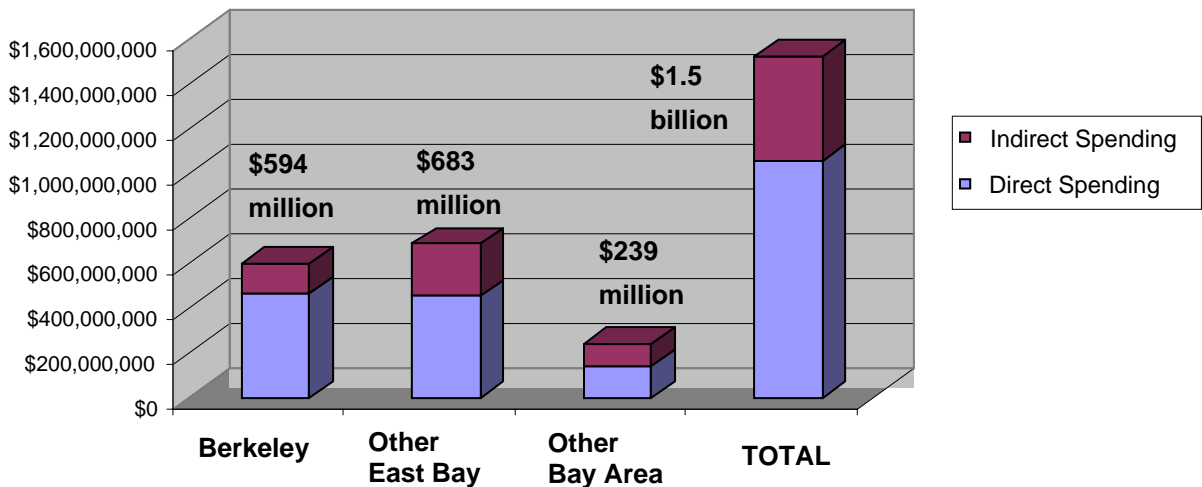


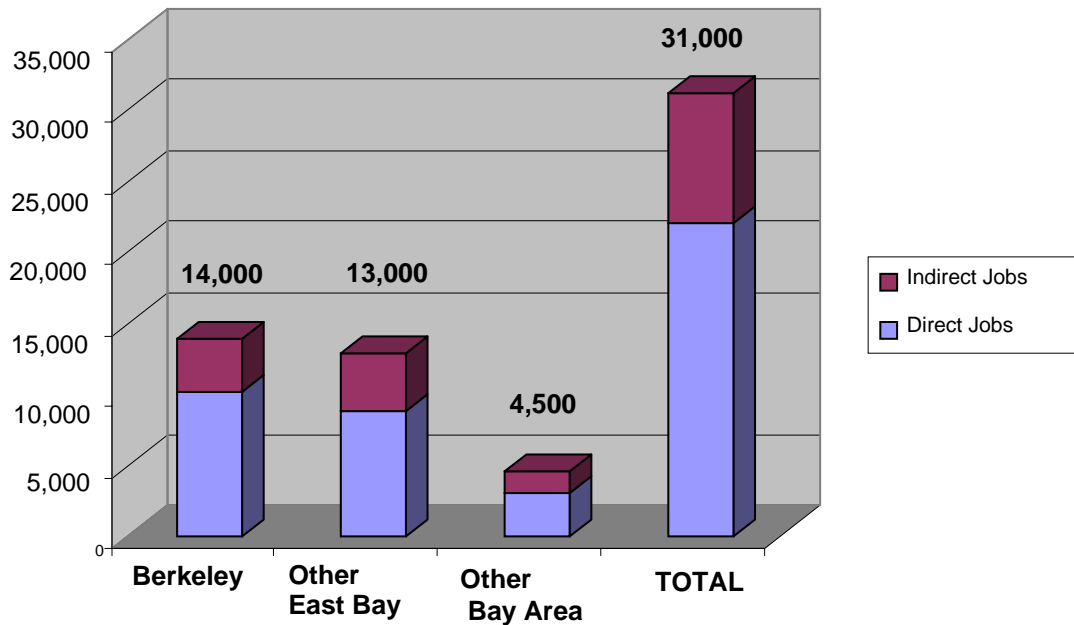
Figure 4: Direct and Induced Spending, 2005-2006

## Jobs

UC Berkeley's payroll and direct spending helped create more than 31,000 jobs in the Bay Area, including 21,900 direct (University) jobs in the region and about 9,200 indirect jobs (employees of other businesses), as shown in Table 8. In the city of Berkeley alone, UC Berkeley generated over 10,000 direct jobs and 3,700 indirect jobs – about 45% of the total jobs generated by the University in the Bay Area.

About 12,700 direct and indirect jobs were produced in the rest of the East Bay, about 41% of the total, and about 4,500 jobs were generated in the rest of the Bay Area, or about 14% of the total. In all, the University helped create almost nine jobs for every \$1 million in direct expenditures, or about 0.4 indirect jobs for every direct University job in the Bay Area.

<b>Table 8: Total Jobs Produced by UC Berkeley Spending, 2005-2006</b>					
<b>Area and Type of Spending</b>	<b>Direct Spending</b>	<b>Direct Jobs</b>	<b>Multiplier</b>	<b>Indirect Jobs</b>	<b>Total Direct &amp; Indirect Jobs</b>
<b>Berkeley</b>					
University Purchasing	\$31,293,111		12.85	402	402
University Payroll	313,917,551	10,195	7.27	1,962	12,157
Capital Expenditures	116,527,648		11.49	1,338	1,338
<b>Subtotal</b>	<b>\$461,738,309</b>	<b>10,195</b>	<b>8.02</b>	<b>3,703</b>	<b>13,898</b>
<b>Other East Bay</b>					
University Purchasing	40,694,811		13.60	577	577
University Payroll	383,120,491	8,703	8.24	2,980	11,683
Capital Expenditures	27,216,165		12.79	500	500
<b>Subtotal</b>	<b>\$451,031,468</b>	<b>8,703</b>	<b>9.00</b>	<b>4,058</b>	<b>12,761</b>
<b>Other Bay Area</b>					
University Purchasing	60,391,341		12.66	728	728
University Payroll	78,116,399	3,021	8.49	720	3,741
Capital Expenditures	621,655		12.98	35	35
<b>Subtotal</b>	<b>\$139,129,394</b>	<b>3,021</b>	<b>10.66</b>	<b>1,482</b>	<b>4,503</b>
<b>Total</b>	<b>\$1,051,899,171</b>	<b>21,919</b>	<b>8.79</b>	<b>9,243</b>	<b>31,162</b>
Note: Job multipliers are calculated per \$1 million of output.					



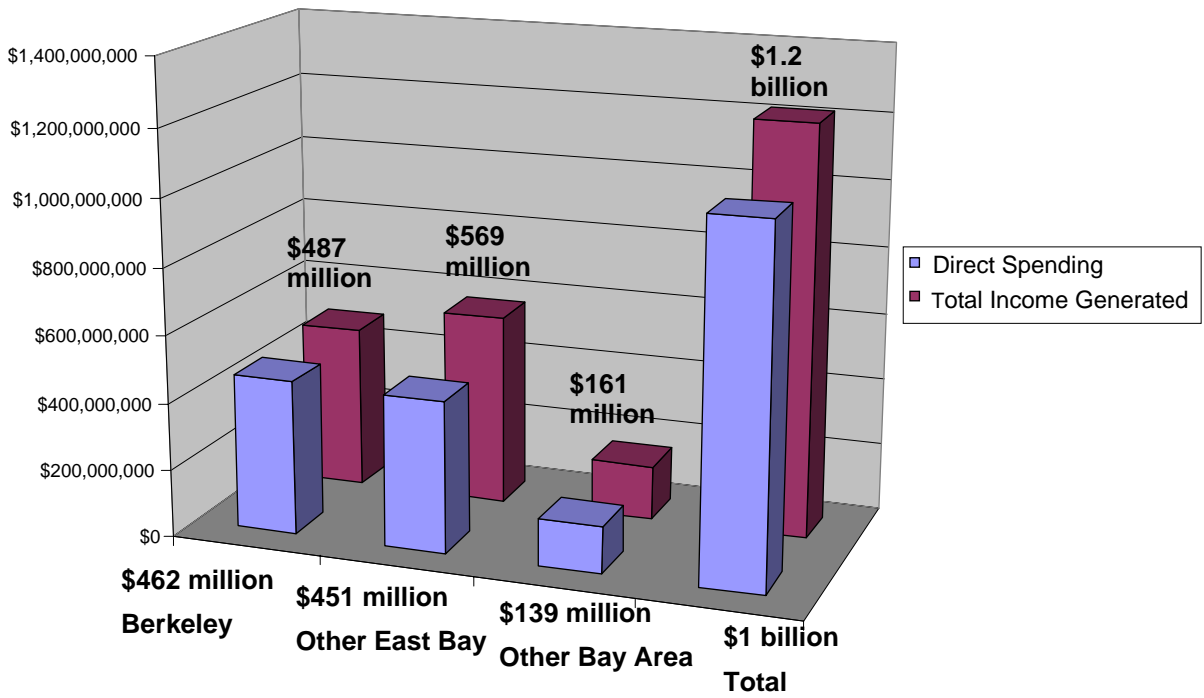
**Figure 5: Total Direct and Indirect Jobs Produced, 2005-2006**

***Personal Income***

UC Berkeley’s spending of over \$1 billion in the Bay Area during 2005-2006 translated into \$1.2 billion in personal income for Bay Area residents, as shown in Table 9. In the city of Berkeley, approximately \$487 million in personal income was generated, about 40% of the total. In the rest of the East Bay, UC Berkeley’s spending generated \$569 million in personal income, or about 47% of the total, and in the rest of the Bay Area, approximately \$161 million in personal income was generated, or about 13% of the total. The overall personal income multiplier for UC Berkeley spending was 1.16, meaning that every dollar in direct spending by the University in the Bay Area generated a total of \$1.16 in personal income in the Bay Area.

**Table 9: Total Personal Income From UC Berkeley Spending, 2005-2006**

Area and Type of Spending	Direct Spending	Multiplier	Total Personal Income Generated
<b>Berkeley</b>			
University Purchasing	\$31,293,111	0.52	\$16,312,072
University Payroll	313,917,551	1.29	392,700,003
Capital Expenditures	116,527,648	0.67	77,838,754
<b>Subtotal</b>	<b>\$461,738,309</b>	<b>1.05</b>	<b>\$486,850,830</b>
<b>Other East Bay</b>			
University Purchasing	40,694,811	0.57	24,721,579
University Payroll	383,120,491	1.35	515,492,734
Capital Expenditures	27,216,165	0.74	29,071,203
<b>Subtotal</b>	<b>\$451,031,468</b>	<b>1.26</b>	<b>\$569,285,516</b>
<b>Other Bay Area</b>			
University Purchasing	60,391,341	0.59	37,462,711
University Payroll	78,116,399	1.43	123,085,201
Capital Expenditures	621,655	0.75	813,039
<b>Subtotal</b>	<b>\$139,129,394</b>	<b>1.16</b>	<b>\$161,360,951</b>
<b>Total</b>	<b>\$1,051,899,171</b>	<b>1.16</b>	<b>\$1,217,497,296</b>



**Figure 6: Total Personal Income Generated, 2005-2006**

## OTHER SPENDING

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### STUDENT EXPENDITURES

UC Berkeley student spending also contributes to the local economy. Using 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 estimated.

In 2005-2006, the UC Berkeley student population was about 33,600. Eighty percent of undergraduate students and 58% of graduate students lived in the city of Berkeley. As shown in Figure 7, overall, 24,650 students, or 73% lived in the city of Berkeley; 5,300, or 16%, lived in Other East Bay, and 3,600, or 11%, lived in other parts of the Bay Area.

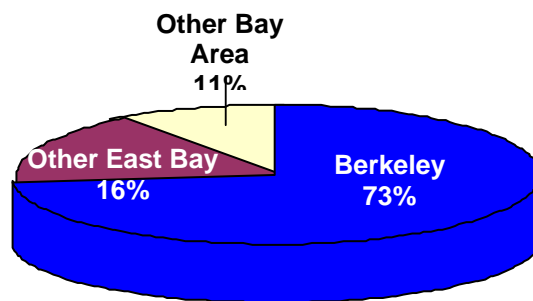


Figure 7: Residential Location of UC Berkeley Students

According to spending estimates, UC Berkeley students contributed more than \$395 million to the Bay Area economy in 2005-2006 – about \$282 million in the city of Berkeley and an additional \$113 million in other parts of the East Bay. Table 10 lists undergraduate and graduate student spending for different residence types and locations. Students who live outside of Berkeley spend a considerable amount of time on and around the campus and thus spend significant amounts in the city of Berkeley even if they do not live there.

Average spending categories include 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. Spending estimates for graduate students are higher than for undergraduates because they are older and are more likely to have families.

Student budget estimates tend to reflect a fairly economical spending pattern, therefore the estimates of student expenditures represent a conservative approximation of student spending.

**Table 10: Student Spending at UC Berkeley 2005-2006**

<b>Residence Type and Location</b>	<b>Total Students</b>	<b>Average Spending</b>	<b>Total Spending</b>
<b>Undergraduate Spending</b>			
Berkeley University Housing	6,250	\$2,973	\$18,581,250
Berkeley Private Housing	12,519	11,888	148,825,872
Other East Bay University Housing	143	5,238	749,034
Other East Bay Private Housing	2,751	11,888	32,703,888
Other Bay Area	1,842	11,888	21,897,696
<b>Subtotal</b>	<b>23,505</b>	<b>\$9,477</b>	<b>\$222,757,740</b>
<b>Graduate Spending</b>			
Berkeley University Housing	286	8,850	2,531,100
Berkeley Private Housing	5,595	17,846	99,848,370
Other East Bay University Housing	485	8,850	4,292,250
Other East Bay Private Housing	1,955	17,846	34,888,930
Other Bay Area	1,756	17,846	31,337,576
<b>Subtotal</b>	<b>10,077</b>	<b>\$17,158</b>	<b>\$172,898,226</b>
<b>Total</b>	<b>33,582</b>	<b>\$11,782</b>	<b>\$395,655,966</b>
Note: Spending does not include campus housing and meal plans, registration and fees, books and supplies.			

## VISITOR SPENDING

Each year, UC Berkeley attracts about one million visitors from the region and around the world to its academic programs and conferences, libraries, museums, lectures, cultural performances, and community and athletic events. While no single source of data exists that can measure the total number of visitors to the campus, certain visitor measures, as illustrated in Table 11, give an indication of the numbers of people who come to the campus annually.

**Table 11: Sampling of Average Annual Visitors to UC Berkeley**

Entity/Type of Event	Number of Visitors
Campus Tours	43,300
Campanile (Sather Tower)	64,200
Football	407,500
Men's basketball	136,200
Women's basketball	18,500
Rugby	30,900
Soccer	14,400
All other sports	34,400
Berkeley Art Museum/Pacific Film Archive	66,000
Lawrence Hall of Science	130,000
Cal Day	40,000
Summer conferences	11,200
<b>Total</b>	<b>996,600</b>

Certain athletic events such as football and basketball home games draw out-of-town visitors, including the athletes, staff, and fans of the visiting team (approximately 17,500 in the 2006 football season alone), many of whom stay in local hotels. Although no comprehensive data exists on UC Berkeley-related hotel guests, some local hotels report full capacity at such times as football games and commencement season, and one Berkeley hotel alone estimates an annual average of 10,000 room nights (15,000 hotel guests) that can be attributed to visitors to the Berkeley campus.

During the summer of 2005, over 11,000 people attended 150 workshops and conferences held on the Berkeley campus. Some participants are accommodated in campus housing, others in local hotels.

The UC Berkeley 2020 Long Range Development Plan estimated that about 1,200 people visit the campus daily during regular working hours.

While it is difficult to determine the total number of visitors to the campus each year, based on these sources, a conservative estimate would put the annual total number of visitors at about one million.

Depending on the nature of the campus visit, visitors will spend varying amounts of money on and off campus. Many shop, eat, and stay at hotels in the city of Berkeley or elsewhere in the East Bay.

According to the 2005 California Domestic Travel Report, the average visitor to Alameda County in 2005 stayed 2.2 nights and spent \$79 per day. Assuming one million campus visitors in 2005-2006, an average spending of \$30 per day 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), and a one-day visit, the total annual visitor contribution to the economy of the city of Berkeley is approximately \$30 million.

# THE INTERSECTION OF RESEARCH AND ECONOMIC DEVELOPMENT

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*“There is a significant connection between a university’s research and economic impact and social benefits including the creation of new ‘basic’ knowledge, the development of technological innovation, capital investment (construction and equity of private business), and co-production of a knowledge-based infrastructure...”<sup>2</sup>*

## THE SIGNIFICANCE OF UC BERKELEY RESEARCH

UC Berkeley’s research contributes to the Bay Area economy in several important ways:

- UC Berkeley research brings hundreds of millions of dollars to the region, generating a significant number of jobs and income. Most research spending is sponsored by entities outside of the Bay Area, particularly the federal government, with lesser amounts from state government, foundations and major corporations.
- Through technology transfer agreements, companies license UC Berkeley intellectual property to develop commercial products. Innovative products are developed for the benefit of society.
- Faculty and graduates start new companies based on their research. Start-up companies play a vital role in the innovation ecosystem of the region and contribute to local economic development in many ways, including job creation. Berkeley professors have helped found such prominent life science companies as Chiron (now Novartis), Exelixis, Tularik, and Renovis.
- UC Berkeley faculty and students create and study new technologies and concepts, expanding the region’s knowledge base. The research conducted at the University is long term, providing the scientific and technical foundations for new products, technologies, and even entirely new industries.
- UC Berkeley prepares the next generation of scientists, engineers, and entrepreneurs. Many graduates go on to research and administrative positions in government and industry laboratories.

The potential for commercial application of University research has spawned the creation of new businesses and expansion of existing ones. Commercialization creates economic growth, high-wage jobs, new industries, and tax revenues. There can be a substantial economic impact during long research and development phases, even if no commercial product results. Service providers, such as law and accounting firms, are attracted to the Bay Area to serve these start-up companies.

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<sup>2</sup> Luger and Goldstein, “What is the Role of Public Universities in Regional Economic Development?” Dilemmas of Urban Economic Development. p. 104, Thousand Oaks, CA: Sage Publications (1997).

The Bay Area also attracts companies, corporate research and development centers, and a variety of enterprises to the region because UC Berkeley and other research institutions produce the educated workers they need. The industry laboratories apply scientific and technical knowledge to the development of new commercial products, stimulating economic growth, creating new jobs, and developing the products that impact and improve everyday lives.

## SOURCES OF RESEARCH FUNDING

Research spending at UC Berkeley during 2005-2006 totaled more than \$469 million. As Table 12 shows, the federal government provided 60% of the University's research funding, with major funding coming from the Department of Health and Human Services, the National Science Foundation, NASA, the Department of Defense, the Department of Energy, and the Department of Education. Between fiscal years 2002-2006, sponsored research funding at UC Berkeley grew by an average of 3% per year.

<b>Table 12: Sponsored Research Funding by Source, 2005-2006</b>		
<b>Source</b>	<b>Amount</b>	<b>% of Total</b>
Federal Government		
Health and Human Services	\$108,660,000	23%
National Science Foundation	76,670,000	16%
NASA	23,920,000	5%
Department of Defense	18,780,000	4%
Department of Energy	9,110,000	2%
Department of Education	14,110,000	3%
All Other Federal Agencies	28,830,000	6%
<b>Subtotal</b>	<b>\$280,080,000</b>	<b>60%</b>
Non-Federal Government		
State, Local, and Foreign Governments	\$89,380,000	19%
Foundations and Other Non-Profits	62,350,000	13%
Industry	15,670,000	3%
University of California System	21,640,000	5%
<b>Subtotal</b>	<b>\$189,040,000</b>	<b>40%</b>
<b>Total</b>	<b>\$469,120,000</b>	<b>100%</b>

## RESEARCH SPENDING

Science and health-related disciplines led in sponsored research spending in 2005-2006. Together, biological sciences, physical sciences, engineering and computer science, natural resources, and health sciences accounted for 71% of all sponsored research funding, as shown in Table 13.

<b>Table 13: Sponsored Research Spending by Discipline, 2005-2006</b>		
<b>Discipline</b>	<b>Amount</b>	<b>Percent of Total</b>
Biological Sciences	69,300,000	15
Business/Law/Professional	14,600,000	3
Education	43,000,000	9
Engineering/Computer Science	96,500,000	21
Health Sciences	52,200,000	11
Libraries/Museums	8,000,000	2
Natural Resources	29,000,000	6
Physical Sciences	87,200,000	19
Social Sciences/Humanities	61,800,000	13
All Other Divisions	7,500,000	2
<b>Total</b>	<b>\$469,100,000</b>	<b>100%</b>

### **TAKING RESEARCH FROM THE LABORATORY TO THE MARKETPLACE**

UC Berkeley policy encourages the practical application of research – locally, nationally, and internationally – in several ways.

Through technology transfer, UC Berkeley licenses University intellectual property to private enterprise for further research and development to produce commercial products for the public benefit.

The University’s Office of Intellectual Property and Industry Research Alliances (IPIRA), which includes the Office of Technology Licensing (OTL) and Industry Alliances Office (IAO), facilitates interaction between the campus and industry research partners through sponsored research collaborations and commercialization of intellectual property. IPIRA staff help UC Berkeley researchers and companies navigate federal and state laws and policies regarding research, conflict of interest, intellectual property, contracts, and employment in a university research environment.

#### **UC Berkeley, Yahoo Team up to Research New Internet Technologies**

In August 2005, UC Berkeley teamed up with Yahoo Research Labs to launch a new laboratory to explore innovations in areas such as Internet search technology, social media, and mobile media.

The Yahoo Research Labs-Berkeley is a first-of-its-kind partnership between a top public university and a leading Internet company to conduct research and explore new technologies that will support and reinforce key areas of Internet growth.

"When you bring together the world's leading Internet company and one of the world's top academic institutions, the possibilities are endless," said Usama Fayyad, Yahoo's senior vice president and chief data officer.

AnnaLee Saxenian, dean of the School of Information, called Yahoo Research Labs-Berkeley "an exciting and open framework for collaboration" that provides research possibilities not possible at UC Berkeley alone, largely because of the huge investments required in terms of equipment and technology.

Most intellectual property developed at the lab will be shared jointly between UC Berkeley and Yahoo.

In 2005-2006, the IAO negotiated and signed 400 research-related agreements. Through IPIRA, the University is enhancing its key role in the ongoing cycles of technology innovation, commercial development, and reinvestment in the research enterprise.

In 2005-2006, UC Berkeley reported 128 inventions, bringing its total number of inventions to 1,791. During this period, a total of 68 first and 72 secondary U.S. patent applications were filed and 41 patents were issued. As of June 2006, the University had a total of 521 active U.S. patents and 354 active foreign patents.

Berkeley inventions have been licensed to over 60 start-up companies, many of which are located in the San Francisco Bay Area.

Over 100 products based on UC Berkeley research have been commercialized and many more are under development, evaluation, option, or license agreements. Five of the top 25 revenue-generating inventions in the UC system come from UC Berkeley patent and copyright licenses.

Many UC Berkeley faculty consult for companies where they gain vital insight into the commercialization process, and contribute their expertise to strategic planning and product development.

Some examples of applications of UC Berkeley research are listed in Table 14.

### Five Universities You Can Do Business With

In the February 2006 issue of Inc. Magazine, Carl Schramm wrote:

*“Many of the great breakthroughs of the past 30 years — in fields such as computing, telecom, the Internet, and fiber optics — were first conceived in a university lab.*

*“Only a handful of universities produce a steady stream of inventions with commercial potential”...Just five schools...constitute the elite of the technology transfer world. They are Berkeley, Caltech, Stanford, MIT, and Wisconsin. [E]ach of these five schools consistently garners around 100 patents per year.*

*“...The five schools above,...in addition to producing new ideas,... consistently rank at the top of the list of universities in terms of how many businesses are built around technologies created in their labs. Along with teaching and doing research, they seem to be in the business of inventing companies.”*

**Table 14: Selected Products and Processes Based on UC Berkeley Intellectual Property**

Products	Processes
Antitumor Therapy MDX-010 (in clinical trials for treatment of melanoma)	Breast cancer diagnostic
Colitag™ - an E. coli Detection Method	Energy transfer primers and terminators for DNA sequencing
NanoBlock™ integrated circuits in plastic substrates	MEMS-based optical switching engines for telecommunications
ELVES™ protein crystallization software	Bio-kinetic assays for drug development and diagnosis
Rosetta Resolver™ Gene expression data analysis system	Optical high data storage CD
SiliconThin film filter	Gene chip arrays
Soilchem™, Geomapper™, Madonna™, Worldfood™ software	Radio-frequency ID tags
Inktomi™ Internet search engine	Software for gene analysis, molecular modeling and protein crystallograph

### ***Companies Founded by UC Berkeley Faculty and Alumni Based on University Research***

UC Berkeley continues to be a start-up company leader in the UC system. UC Berkeley patent and copyright licenses have been the basis of over 105 start-up companies, the vast majority of which are located in the San Francisco Bay area. The Berkeley campus encourages faculty and student entrepreneurship. Students participate in business plan competitions and student entrepreneurship clubs such as the Berkeley Nanotechnologies Club and the Engineering Entrepreneurship Club. The Management of Technologies program offers courses in biotech product development, and opportunity recognition. Faculty interested in starting a company can get industrial leave and advice on financing, professional services, and real estate

Many UC Berkeley alumni and faculty have started innovative companies in the Bay Area in such fields as computer technology, telecommunications, and bioscience, based on research originally conducted on the Berkeley campus. Table 15 lists some of the Bay Area startup companies founded by UC Berkeley alumni and faculty.

<b>Table 15: Selected Bay Area Companies Founded by Alumni and Faculty Based on UC Berkeley Research</b>		
<b>Company</b>	<b>Location</b>	<b>Industry</b>
Calimetrics, Inc	Alameda	Laser Technology
Adax, Inc.	Berkeley	Telecommunications
Virolab, Inc.	Berkeley	Bioscience
Genesys Telecom Labs	Daly City	Telecommunications
Amyris Biotechnologies	Emeryville	Bioscience
KineMed	Emeryville	Bioscience
Alien Technologies	Morgan Hill	Semiconductor
Versata, Inc.	Oakland	Software
Acacia Biosciences	Richmond	Bioscience
Berkeley ExoWorks	San Francisco	Exoskeletons
Discera	San Jose	Semiconductor
Atheros Communications	Santa Clara	Semiconductor
Exelixis	South San Francisco	Bioscience
Tularik	South San Francisco	Bioscience

### ***Profiles of Selected Start-Up Companies Based on University Research***

#### ***Discera Inc., San Jose, CA***

Discera designs, develops, and markets the smallest, most integrated, multi-frequency components for advanced RF, Clock, and Timing applications. Discera recently introduced its award winning proprietary PureSilicon Resonator™ technology to provide an effective replacement solution to Quartz crystal, Ceramic, and other SAW-based frequency control and timing products. Discera's silicon-based micro-oscillator was selected by Microwaves & RF Magazine as one of the top products of 2003.

#### **UC Berkeley Affiliate**

Clark Nguyen, B.S., M.S., Ph.D., Electrical Engineering and Computer Sciences

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### ***Amyris Biotechnologies, Emeryville, CA***

Amyris Biotechnologies, launched in 2003, focuses on the creation of pharmaceuticals for the developing world, such as the anti-malarial drug artemisinin. The proprietary synthetic microbes developed at Amyris can produce compounds that currently are available only in small quantities through the extraction of natural resources. Amyris can rescue promising drugs that have been abandoned due to the supply limitations related to harvesting and extraction. The benefits include faster delivery of new drugs, decreased production costs, and less impact on the environment.

#### **UC Berkeley Affiliates**

Jay Keasling, Professor of Chemical Engineering and Bioengineering, Director of the Berkeley Center for Synthetic Biology  
Neil Renninger, Ph.D., Chemical Engineering  
Jack D. Newman, Ph.D., Molecular and Cell Biology

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### ***KineMed, Emeryville, CA***

KineMed was founded in 2001 to provide kinetic solutions to fundamental problems in disease management and drug development. KineMed's tests, termed KineMarkers™, measure molecular kinetics in living systems, including humans. This technology is the only commercially available technology that measures molecular kinetics in living organisms. It provides the tools necessary to measure the ability of a drug to intervene in a targeted disease process, and follow the natural course of metabolic events in the pathways of disease and health.

#### **UC Berkeley Affiliates**

Marc K. Hellerstein, Professor of Nutritional Sciences  
Elizabeth Murphy, Postdoctoral Fellowship in the Department of Nutritional Sciences  
James E. Burden, B.S. School of Business Administration

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### ***Calimetrics, Inc., Alameda, CA***

Founded in 1994, after the development of a laser measurement innovation, Calimetrics brings low-cost, high capacity and high-speed enhancements to desktop, set-top box, portable and enterprise storage applications. In development for over eight years, Calimetrics' first ML (MultiLevel) chip delivers up to a three-fold increase in disc storage capacity and data transfer rates. Calimetrics has over 70 issued patents and patents pending, and has partnerships with many of the leading companies in the data storage, semiconductor, disc media, and consumer electronics industries.

#### **UC Berkeley Affiliates**

Michael O'Neill, Ph.D., Biophysics  
Terrence Wong, Ph.D., Biophysics  
Allen Bearden, Professor, Biophysics

# BUILDING A KNOWLEDGE ECONOMY

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## **THE ECONOMIC AND SOCIAL BENEFITS OF AN EDUCATED WORKFORCE**

UC Berkeley graduates are poised to enter the economy with the skills and abilities to provide economic and social benefits for themselves and society. In the 21st century knowledge-based economy, human capital is more important than ever.

California has been recognized as one of America's richest and most highly educated states. According to a UC Berkeley study ("Return on Investment: Educational Choices and Demographic Change in California's Future," Professors Henry Brady and Michael Hout and researcher Jon Stiles, November 2005), every \$1 California invests in education is expected to return \$3 in net benefits to the state. Over the lifetime of one cohort of 18-year-olds, this translates into \$3 billion to the state in additional net tax revenue. Cumulated year after year for each cohort of high school seniors, these gains are large enough to substantially improve the economic viability of the state. The return on investment begins to occur in 10 years, as college-educated adults increase their earning power and further contribute to the state's tax rolls.

On average, California residents with a bachelor's degree will earn \$1.9 million over their lifetime compared to \$934,000 for those with only a high school diploma. This concurs with a 2003 study by the Organisation for Economic Co-operation and Development, which found that earnings of U.S. university graduates in the 30-44 years age group are about 90% higher than the earnings of those who only completed high school.

## **UC BERKELEY: A LEADER IN HIGHER EDUCATION**

UC Berkeley is the largest university in the San Francisco Bay Area 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 institution of higher education in the region. The intellectual infrastructure that supports these activities is formidable. UC Berkeley counts 20 Nobel Laureates among its current and former faculty members. Nobel prizes have been awarded to 24 UC Berkeley alumni. For 2004-2005 (most recent published results), the Association of Research Libraries ranked UC Berkeley second among public university libraries, and fifth among major research universities in the United States. The University is also home to several museums and a host of specialized resources.

UC Berkeley's 14 colleges and schools with 130 academic departments that offer 343 degree programs suggest the scope of the institution, and the 9,776 undergraduate and graduate degrees awarded in 2005-2006 provide an indication of its scale. The highly skilled personnel these colleges and schools educate are among the most significant contributions of the University to the Bay Area economy.

UC Berkeley graduates are in demand among employers – in no small part because of UC Berkeley's stature in comparison to other universities around the world. Many publications rank universities, and although they use different data and methodologies, UC Berkeley – the

institution as a whole and individual departments and programs – consistently ranks high among all of them. Some examples:

- *US News & World Report* consistently ranks UC Berkeley as the best public university in the nation. In its 2006 list, UC Berkeley also retained its rank as third best business program, its engineering program tied for second, and its law program ranked eighth in the nation.
- The National Research Council's peer-based rankings of doctoral programs (conducted every 10 years) is the most respected ranking in academia. In its most recent (1995) assessment, UC Berkeley ranked in the top 10 in 35 of the 36 programs reviewed.
- The *Washington Monthly's* ranking approach assesses the degree to which college and university educational programs benefit the nation. Using social mobility, research, and public service as yardsticks, UC Berkeley was ranked third in the nation in 2005 and moved to second place in 2006.
- Shanghai JiaoTong University has published its Academic Ranking of World Universities since 2003. In 2005, UC Berkeley ranked fourth.
- The Times Higher Education Supplement in London ranked UC Berkeley in sixth place on its 2005 list of the world's top 200 universities.
- The Wall Street Journal/Harris Interactive Business School Survey relies on the opinions of over 2000 corporate recruiters to select the top 50 MBA programs in the country. Berkeley's Haas School of Business ranked seventh in the 2005 survey.

### **UC BERKELEY: A PROVIDER OF KNOWLEDGE WORKERS**

UC Berkeley graduates are leaders in virtually every sector of the Bay Area economy, including public and private organizations. Eighty-five percent of California's biotech companies report employing UC alumni with a graduate degree. Many serve as senior scientists, chief scientific officers, president, or CEO.

In 2005-2006, companies from throughout the U.S. listed over 26,000 jobs (including full-time jobs and internships) with UC Berkeley's Career Center. Of these, about 2,200 were jobs in the city of Berkeley; 2,700 were in other parts of the East Bay, and 1,200 were in other parts of the Bay Area. In addition, Bay Area companies conduct on-campus interviews. While no data exist on the number of students who were hired by these companies, the extent of position listings and interviews conducted reveals the high demand for UC Berkeley students. Fast-growing companies, such as those in the computer and health sciences industries, have an especially great need for university graduates. 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 at UC Berkeley, 2005-2006**

Company	Job Location	Number of Interviews
Wells Fargo	San Francisco	199
Chevron Corporation	San Ramon	180
Cisco Systems, Inc.	San Jose	113
Apple Computer	Cupertino	108
Pacific Gas & Electric Company	San Francisco	86
Mervyn's	Hayward	78
E & J Gallo	Modesto	62
Fisher Investments	Woodside	61
Genentech	South San Francisco	54
Google	Mountain View	52

The UC Berkeley Career Center conducts an annual survey of recent undergraduate alumni. About 36% of the 2006 graduating class responded about their initial post-UC activities. The majority of students chose employment after graduation: 51% were employed full-time and 13% were seeking employment. Eighty-six percent of business majors reported being employed full-time, as did 40% of chemistry majors, 55% of engineering majors, and 51% of environmental design students. About 74% of the graduates were hired by firms in the business and industry sectors with the remaining 25% working in non-profit organizations, education, and government. Eighty-six percent of the respondents reported working in California: 63% in the Bay Area, 8% in Northern California, 9% in the Los Angeles area, and 6% in Southern California.

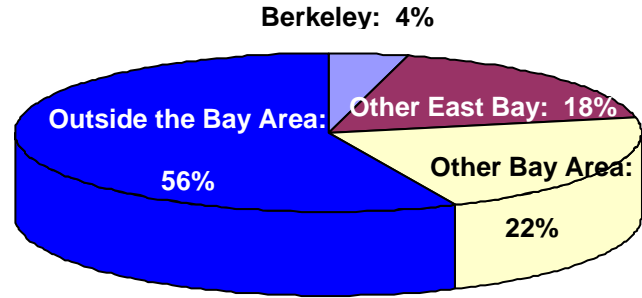
### UC BERKELEY ALUMNI IN THE BAY AREA

UC Berkeley attracts talented students to the Bay Area, many of whom remain after graduation. Most of UC Berkeley's students come from outside the Bay Area. As the data in Table 17 illustrate, of the 33,558 students enrolled in 2005-2006, 64% came from outside the Bay Area.

**Table 17: Students' Home Location: 2005-2006**

County	Number	Percent
Alameda	3,525	11
Contra Costa	1,749	5
Marin	462	1
Napa	115	0
San Francisco	1,900	6
San Mateo	1,091	3
Santa Clara	2,719	8
Solano	287	1
Sonoma	365	1
<b>Total from Bay Area</b>	<b>12,213</b>	<b>36</b>
<b>Total from Outside Bay Area</b>	<b>21,345</b>	<b>64</b>
<b>Total from All Areas</b>	<b>33,558</b>	<b>100</b>

As illustrated in Figure 8, of the approximately 400,000 UC Berkeley alumni for whom there is data, about 170,000 live in the Bay Area: 17,000 in the city of Berkeley, 69,000 in other areas of the East Bay, and close to 85,000 in other parts of the Bay Area.



**Figure 8: Residential Location of UC Berkeley Alumni**

Together, Table 17 and Figure 8 illustrate that UC Berkeley contributes to the population growth of the region as many graduates who came from beyond the nine Bay Area counties remain in the region.

**ALUMNI CONTRIBUTIONS**

Many UC Berkeley alumni have made significant contributions in their fields – from athletics to politics, the arts, civic service, and philanthropy.

UC Berkeley’s notable alumni include 24 Nobel Laureates and many government officials, including eight current members of the U.S. House of Representatives, 13 current members of the California state legislature, and several Bay Area mayors, city council members and county supervisors. Other notable alumni include 40 Olympic athletes, 14 presidents of universities, and hundreds of leaders in business, culture, the arts, and professional sports.

**Key Local Businesses Founded by UC Berkeley Alumni**

UC Berkeley alumni have founded about 250 companies in the Bay Area – 10 in the city of Berkeley. Many are high-tech and life science companies, but others are innovative in other ways, such as the culinary revolution started by Chez Panisse founder Alice Waters or the health snack company, PowerBar, founded by Brian Maxwell. Other types of companies include financial, consulting, architectural, and manufacturing firms. Table 18 provides a sample of Bay Area companies founded by UC Berkeley alumni.

<b>Table 18: Selected Bay Area Companies Founded by UC Berkeley Alumni</b>		
<b>Company</b>	<b>Location</b>	<b>Industry</b>
Holtsmark Architects	Berkeley	Architecture
Scharffen Berger Chocolate Maker	Berkeley	Chocolate Confections
Chez Panisse	Berkeley	Restaurant
EcoTimber	Berkeley	Wood Products
Sun Microsystems	Palo Alto	Network Systems
Amot Controls	Richmond	Electronic Parts
Gap, Inc	San Francisco	Apparel
Media Arts Group, Inc.	San Jose	Home Decorations
Corio, Inc.	San Jose	Software
Intel Corporation	Santa Clara	Semiconductor

## *Profiles of Selected Bay Area Companies Founded by UC Berkeley Alumni*

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### *Intel Corporation, Santa Clara, CA*

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 are standard equipment on a wide range of computer systems.

#### **UC Berkeley Affiliate**

Andrew S. Grove, Chemical Engineering, Ph.D. (1963); Founder; President (1979-87), CEO (1987-97), Chairman and CEO (1997-98)

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### *Chez Panisse, Berkeley, CA*

Chez Panisse was opened in 1971 by Alice Waters and some idealistic friends, who were convinced that the best-tasting food is organically grown and harvested in ways that are ecologically sound, by people who are taking care of the land for future generations. The quest for such ingredients has largely determined the restaurant's cuisine. Chez Panisse has gained a reputation worldwide and is credited for inventing what is now known as California cuisine.

Waters has also been instrumental in bringing nutritious and healthier food to schools. She helped start the Edible Schoolyard in Berkeley, a program that teaches children about healthy eating by involving them in the cultivation of school-based gardens and the preparation of food they have grown. As a result, not only do many Berkeley schools have similar schoolyard gardens, but there may be as many as 3,000 school gardens in California. Waters is the founder and president of Chez Panisse Foundation, which helps to underwrite cultural and educational programs such as the one at the Edible Schoolyard.

#### **UC Berkeley Affiliate**

Alice Waters, French Cultural Studies (1967); Executive Chef and Owner; Founder and President, Chez Panisse Foundation

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### *Sun Microsystems, Inc, Palo Alto, CA*

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 such industries as energy, telecommunications, manufacturing, financial services, education, retail, government, and healthcare.

#### **UC Berkeley Affiliate**

Bill Joy, Electrical Engineering and Computer Science, M.S. (1982); Founder; Chief Scientist and CEO (1998 - present)

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### *EcoTimber International, San Rafael, CA*

Since 1992, EcoTimber has promoted forest conservation worldwide by selling sustainably harvested and reclaimed wood products. EcoTimber's suppliers' forestry practices guarantee a

perpetual yield of high-quality timber while maintaining or restoring healthy, self-regenerating forest ecosystems. EcoTimber specializes in wood products from forests that are certified well-managed according to the rules of the Forest Stewardship Council (FSC). The company also offers wood that is reclaimed from old buildings and wood alternatives such as bamboo.

**UC Berkeley Affiliate**

Aaron Maizlish, BA, Geography, 92; B.A., Development Studies, 92; Co-Founder

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***Gap, Inc., San Francisco, CA***

Gap Inc. is a leading international retailer of clothing, accessories and personal care products for men, women, and children under the Gap, Banana Republic, and Old Navy brand names.

**UC Berkeley Affiliate**

Donald Fisher, 1951, B.S., Haas School of Business; Founder and Chairman Emeritus

**LIFELONG LEARNING**

***UC Berkeley Extension***

Since 1891, UC Berkeley Extension programs have provided continuing education and enrichment courses for Bay Area residents. With locations in Berkeley, San Francisco, Oakland, and Redwood City, classes are accessible to many Bay Area residents and are offered evenings and weekends to accommodate working students. UC Extension holds public events and lectures and provides sliding-scale opportunities for disadvantaged learners at its educational therapy clinics in Berkeley and San Francisco. Annually, about 35,000 students enroll in more than 1,000 traditional and online courses.

Certificate programs in such fields as computer science, business, and engineering, enable students to acquire the needed skills, analytical tools, and resources to gain expertise relevant to employment in some of the region's leading industries. Professional courses include continuing education credits for professionals, 23 certificate programs, and 22 professional sequences.

There are also short, highly specialized series that focus on such subjects as Aging and Mental Health, Business Intelligence and Data Warehousing, Microarray Technology, Paralegal Studies, Child and Adolescent Treatment, Treatment of Mood Disorders, and Wine Studies.

UC Extension courses satisfy the licensing requirements of many professional association and boards, such as the American Psychological Association; Board of Registered Nursing; California Association of Alcohol and Drug Abuse Counselors; Certified Public Accountant, California Board of Accountancy; California Commission on Teacher Credentialing; U.S. EPA and California Department of Health Services; Certified Financial Planner, Board of Standards; Project Management Institute; Marriage and Family Therapist and Licensed Clinical Social Worker; California Board of Behavioral Sciences; and Mandatory Continuing Legal Education, State Bar of California.

However, many students also enroll in Extension courses for personal enrichment, which accounts for the continuing popularity of courses in History, Literature, and Religion.

Throughout the year, University Extension presents free and low-cost programs in locations around the Bay Area that examine contemporary issues, trends, and ideas. Recent topics have included nanotechnology, sustainable development, new findings on depression, and the annual forum on the American presidency.

### ***Haas School of Business Center for Executive Development***

The Berkeley Center for Executive Development delivers executive education and custom programs to businesses around the globe, drawing on the rich resources, talent, and perspectives of top-level business educators and researchers from UC Berkeley's Haas School of Business and elsewhere. The Berkeley Executive Development programs deliver content that is current, innovative, results-driven, and responds to the needs of executives.

### ***Other Educational Programs***

Many campus departments offer workshops, seminars, lectures, and courses that the public can attend. The following are a few examples:

- UC Berkeley Summer Sessions are open to the public; local seniors may audit classes for a nominal fee.
- UC Berkeley School of Optometry offers continuing education courses, symposia, and workshops.
- UC Berkeley-sponsored lectures, workshops, and conferences are often available to the general public at reasonable or no cost.

## TRANSFORMING LIVES THROUGH RESEARCH AND SERVICE

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The University of California, Berkeley, offers many services and benefits to the local community, the region, and the state of California that go beyond its economic impacts. As a major research university and land grant college, public service is one of UC Berkeley's primary missions. The University's commitment to public service takes many forms, including:

- Research in the public interest, focusing on important social problems, public policy concerns, health and welfare, transportation, technology, and other key issues that lead to improvements in the quality of life for California residents.
- Community engagement programs, including service learning courses, partnership projects, and volunteer assistance that support K-12 schools, local cities, neighborhoods, and families, and that expand the capacity of local communities to serve their residents.
- Cultural and recreational programs provided by the campus and accessible to the public.
- Sustainable environmental practices and "green" policies.

The *Washington Monthly* annual college guide uses three indicators to measure how much a school benefits the country: (1) how well it performs as an engine of social mobility, (2) how well it fosters scientific and humanistic research, and (3) how well it promotes an ethic of service to the country. Its September 2006 assessment, which ranked UC Berkeley second in the nation, concluded, "By our yardstick, University of California, Berkeley is about the best thing for America we can find. It's good by all of our measurements."

### RESEARCH IN THE PUBLIC INTEREST

UC Berkeley engages in research that has practical benefits for the State of California and the general public. UC Berkeley investigators anticipate and respond to some of society's most important issues. The impact of this research is not only improved quality of life, but also economic benefits in terms of reduced public costs or greater productivity.

The following are some examples of UC Berkeley research projects in the public interest:

#### ***Protecting the Environment/Energy Conservation***

- A UC Berkeley study examining how San Francisco car co-ops (car sharing) impact the way people travel, and the

#### **"The Rosenfeld Effect" — How One Man Changed California's Energy Consumption**

UC Berkeley Emeritus Professor Art Rosenfeld has spent the past 33 years looking for ways to save energy. His interest began during the energy crisis of the mid-1970s, as Dr. Rosenfeld, working at Lawrence Berkeley National Laboratory, considered the various ways we consume energy daily in our homes, offices, and institutions. His findings and recommendations, and the research of Dr. Rosenfeld and his colleagues at the Berkeley lab, have been incorporated into new technologies as well as state policies and standards, leading to energy-efficient refrigerators, light bulbs, windows, heaters, and air conditioners. The result: California residents now use 30% less electricity per capita than the rest of the country. The "Rosenfeld Effect" has been credited with saving \$228 billion in energy efficiency, the equivalent of 21% of U.S. electricity consumption last year. In the process, Dr. Rosenfeld has inspired a generation of young researchers who are pursuing energy research worldwide.

effect on public transit ridership, gas use, vehicle emissions, and ownership found that 30% of City CarShare members sold their cars and that use of public transit/walking/biking has increased. Each day, City CarShare saves 720 gallons of gasoline and 20,000 pounds of carbon dioxide emissions.

- Through the FOGG (Flux Observations at the Golden Gate) project, UC Berkeley researchers are studying everything from nutrients and salt to contaminants and invasive species that move through San Francisco Bay. Their findings could impact everything from the preservation of delicate ecosystems to the quality of our drinking water.
- To meet the objectives of the California Energy Commission to conserve energy, UC Berkeley researchers are working to create inexpensive and “smart” thermostats and electricity meters that could be installed in all California residences.
- A team of researchers at UC Berkeley and Lawrence Berkeley National Laboratory is working on the conversion of solar energy into a carbon-neutral form of energy that provides the country with renewable energy security, and helps sustain our world in an environmentally friendly manner.
- Adjunct Assistant Professor of Environmental Science Matteo Garbelotto developed a treatment effective in preventing or slowing down Sudden Oak Death as well as an innovative technique to make it significantly easier to administer. Tens of thousands of coastal oak trees from Big Sur to the Oregon border have died from the disease.

### ***Towards a Healthier World***

- UC Berkeley researchers are working to reduce the risk of type 2 diabetes in overweight 9- and 10-year-old African American children in Oakland through a community-based program that includes research, extension, and educational components.
- UC Berkeley researchers are developing sustainable strategies to reduce pesticide exposure among California’s farm workers and their families, and will work with state and local authorities to incorporate them into public policy and education programs.
- UC Berkeley researchers identified the genetic factors that predispose people to multiple sclerosis, lupus, and rheumatoid arthritis.
- A three-year Health Sciences Initiatives study at UC Berkeley will help establish a sophisticated surveillance system that will track the associations between diseases and environmental pollutants such as traffic exhaust and pesticides, and identify communities where these contaminants may be causing health problems. This complements the ongoing study of the relationship between air pollution and asthma among children in Fresno.
- Researchers at the Center for Health and Assessment of Mothers and Children in Salinas (CHAMACOS) at UC Berkeley’s School of Public Health are studying the relationship between the environment and children's health and working to develop interventions that reduce the incidence of environmentally-related childhood disease. They are also educating farm workers about preventing exposure and will work with state and local authorities to incorporate their programs into public policies and education programs.
- A collaborative effort between researchers at UC Berkeley and Intel has resulted in a new vision care center in rural India, where thousands of patients now receive quality eye care,

thanks to new technology based on "Wi-Fi" wireless networks. This technology enables eye specialists to interview and examine patients remotely via a high-quality video conference. Researchers estimate that in the coming year, half a million people in India will benefit from this project.

### ***Advances in Technology***

- Bay Area drivers can now get information on current traffic conditions while commuting, thanks to technology developed by UC Berkeley researchers. Changeable Message Signs (CMS) automatically display freeway drive times. The system began operating in May 2005 on Interstate 80, showing trip times from Berkeley to Oakland and San Francisco and to the Carquinez Bridge and Marin County. The system has now expanded to other Bay Area locations.
- The Technology-Enhanced Learning in Science Center (TELS) at UC Berkeley brings together university professors and middle and high school teachers to improve the quality of science education. Research at TELS focuses on how instructional technology can improve science education in the classroom in grades 6–12. Increasing numbers of teachers are successfully using technology to explain scientific concepts to their students.
- UC Berkeley research on the application of nuclear magnetic resonance (NMR) spectroscopy to lithium battery electrode materials and fuel cell electrocatalysts could one day lead to the widespread commercial use of electric vehicles.

#### **Learning From Sticky Gecko Toes**

How geckos manage to run across ceilings had been a mystery for years. Professor Robert Full found that the answer lies in the structure of a gecko toe, which has millions of microscopic hairs, or setae, on its bottom. Setae don't stick by glue or suction, but take advantage of van der Waals forces — forces of weak intermolecular attraction. Just a dime-sized amount of setae could lift a small child without leaving a residue and latch on more easily than Velcro.

Based on principles from nature, Full and researchers from several other universities are developing synthetic copies of these microscopic hairs. The team has filed patents and is partnering with several companies to develop an adhesive with such diverse uses as moving delicate fiber-optic pieces, attaching glueless bandages, and securing equipment to the exterior of a space station. Artificial setae are being used by the team to build the most mobile robot yet — unfazed by slippery vertical surfaces and able to hang from the roof.

Full is developing a new center at Berkeley for biological inspiration at [ciber.berkeley.edu](http://ciber.berkeley.edu) that will allow undergraduates from diverse disciplines to make original discoveries and design their own nature-inspired robots.

### ***Fighting World Poverty and Disease***

- The Blum Center for Developing Economies sponsors new education programs and convenes resources to combat global poverty. The Center focuses on implementing solutions extrapolated from cutting edge research while engaging students in transformative service programs.
- A major grant from the Gates Foundation is funding a collaborative effort by UC Berkeley researchers and the nonprofit pharmaceutical company OneWorld Health to make affordable anti-malarial drugs available to people in developing countries. Approximately

300 to 500 million people are infected each year with malaria and 1.5 million die of the disease, especially children in Africa and Asia.

### **SOCIALLY RESPONSIBLE LICENSING**

Only about 10% of global research and development funds are devoted to 90% of the world's health problems, such as infectious diseases. For-profit companies have little incentive to develop drugs for poor people. UC Berkeley's socially responsible licensing program is an intellectual property management strategy to stimulate research support and maximize the benefits to society of technologies developed on the Berkeley campus.

In a variety of ways, such as fostering new and innovative university industry partnerships, partnering with social entrepreneurs and non-profits, and revenue sharing arrangements with governments in the developing world, UC Berkeley works to accelerate widespread availability of technology and healthcare.

#### **Socially Responsible Licensing**

In 2004, UC Berkeley and the government of Samoa agreed to divide equally any commercial proceeds from a promising anti-AIDS drug based on Samoan plant medicine.

A UC Berkeley research project seeks to develop a cheap, genetically engineered version of the anti-malarial drug artemisinin. The University agreed to provide royalty-free licenses to its partners to translate the research into a commercially manufactured synthetic drug that would be sold at cost in the developing world.

In the case of AIDS, which affects people in developed and developing countries, the University has another option: in exchange for the right to earn profits in the industrialized world, commercial partners must make a therapy or technology available free, or at cost, in poorer countries.

Berkeley's program is the exception among university licensing offices.

### **INFORMING PUBLIC POLICY AND PROVIDING EXPERTISE**

From expert testimony at federal and state legislative hearings, to evaluating educational and social programs, to addressing critical social problems, the faculty at UC Berkeley provide technical assistance and expertise to policymakers and government agencies at local, state, and federal levels. Some examples include:

- A UC Berkeley faculty member is researching the demographic, economic, and environmental impacts of a state population projected to hit 50 million within the next 20 to 25 years.
- The Quality Assurance in Long-Term Care study assists the California Department of Health Services, insurers, and care management agencies to assure the quality of care management services provided as part of the California Partnership for Long Term Care. The project will examine quality assurance of case management; the reliability of the eligibility assessment; and the adequacy, implementation, and monitoring of the care plan.
- Architecture Professor Mary Comerio, an expert in the social and economic consequences of disaster losses, has helped the City of Berkeley in its disaster planning.
- UC Berkeley professors Robert Bea and Ray Seed have been studying the causes of the levee and flood wall collapses in New Orleans as a result of Hurricane Katrina and evaluating their reconstruction. They will apply what they learn in New Orleans to

California's levees in the San Joaquin Delta, which are very vulnerable to damage from earthquakes. According to Professor Seed, if these levees break, most of Southern California will lose its water supply for months or even years.

- PACE (Policy Analysis for California Education), a cooperative venture of the UC Berkeley and Stanford schools of education, is an independent policy research center that provides analysis and assistance to California policymakers, education professionals, and the general public. A recent PACE study examined how public funds might be effectively targeted to yield strong enrollment demand by parents and discernible effects on young children's early development and school readiness.
- The California Department of Education contracted with UC Berkeley to evaluate schools that implemented the Pupil Nutrition, Health and Achievement Act of 2001 (SB 19/56), which regulated the amount of fat and sugar in foods and beverages supplied by the schools. Researchers found that students not only ate more nutritious food, but campus food service departments' revenues also increased.
- Professor Elizabeth Deakin, head of the UC Transportation Center, has worked with the California Department of Transportation on ways to improve its planning processes to better reflect social, economic, environmental, and technological change; with the Bay Area Rapid Transit District on policies for better integrating land use and transit investment; served on the Alameda County Transportation Commission, and chaired the City of Berkeley Transportation Commission for nine years.

## COMMUNITY ENGAGEMENT PROGRAMS

UC Berkeley sponsors over 200 community service programs serving K-12 schools, youth and families, seniors, disabled persons, and underserved urban and rural neighborhoods. Students engage in public service through service learning courses, K-12 outreach programs, volunteer projects, and internships locally, statewide, and nationally. An online guide to UC Berkeley community service programs and resources for the benefit of the public is at [calinthecommunity.berkeley.edu](http://calinthecommunity.berkeley.edu). Annually, UC Berkeley faculty, staff, and students devote more than 300,000 hours to public service, serving about 250,000 people in the community and across California – a monetary value of over \$6 million.<sup>3</sup>

### *Service Learning Courses*

There are close to 100 academic courses at UC Berkeley that require community service as an integral part of the course, taught by 98 faculty members, with an estimated enrollment of 1,865 students annually. Many UC Berkeley departments offer service learning courses, including the sciences, arts, education, public health, public policy, and law, among others. An example is **Planning for Sustainability**, in the **College of Environmental Design**. This course examines how the concept of sustainable development applies to cities and urban regions and gives students insight into a variety of contemporary urban planning issues through the sustainability lens. Through classroom discussion and student projects, students examine how to coordinate the goals of environment, economy, and equity at different scales of planning, including the region,

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<sup>3</sup> Independent Sector ([www.independentsector.org](http://www.independentsector.org)) annually calculates the value of volunteer time based on Bureau of Labor Statistics data.

the city, the neighborhood, and the site. In **Community Law Practice, Boalt Hall** students integrate classroom study of important issues relating to community-based legal services for low-income people with actual practice experiences serving such clients at the **East Bay Community Law Center**.

Field work, or internships, are often required for graduate professional degrees. Field work is a core element of the curriculum of the **School of Social Welfare**, encompassing about half of the required units in the Master's program. Graduate students are required to complete 1,120 hours of supervised field work where knowledge and experience are integrated and skills are tested and refined in real-life situations. Interns serve in social service agencies, schools, hospitals, legislative offices, and nonprofit organizations. Areas of expertise include health, mental health, children and family services, gerontology, school social work, law and policy, and management and planning. Given an average of 180 students in field work positions at any given time for between 16-24 hours per week, this annually equals a contribution of over 100,000 hours of service in over 85 organizations that serve some of the most disadvantaged groups in Bay Area communities.

### *Academic Department Outreach*

Many schools, colleges, and departments organize community service, outreach, and other projects in their particular fields. For example, the **School of Public Health** helped bring about changes in food access, housing, crime, and safety in San Francisco's Tenderloin district. It created the **UC Berkeley Parents Guide**, part of an information kit distributed under the California First 5 program to 500,000 new parents across the state.

To assist California Native Americans who are trying to learn and preserve their disappearing languages, every two years, the **Department of Linguistics** organizes a two-week "**Breath of Life Language Workshop**" on the Berkeley campus. UC Berkeley scholars have been documenting these languages for over a century, and UC Berkeley's archives are rich treasure troves of materials, including recordings of California Indian languages. Workshop activities for the 50 participants include learning how to find library materials, learning the fundamentals of linguistics, understanding the grammar of their languages, and how to glean language they can use in their daily lives from the field notes and recordings. Each participant is teamed with a graduate student or faculty mentor.

**The Mathematics Diagnostic Testing Program (MDTP)** provides free services and diagnostic materials – from pre-Algebra to Calculus Readiness – to California teachers to help them better prepare their students for future study of mathematics. The diagnostic materials are designed to help teachers identify their students' strengths and weaknesses to inform their teaching and curricular decisions. MDTP also provides multiple-choice tests as well as written response materials and holds conferences and professional development opportunities for math teachers.

### *Student Civic Engagement and Volunteer Projects*

The major hub of student community engagement on the UC Berkeley campus is the **Cal Corps Public Service Center**, which develops leadership skills of UC Berkeley students through community-based internships, student-initiated service projects, and a wide range of volunteer opportunities from short-term projects and alternative breaks initiatives to year-long

commitments. Cal Corps sponsors a database that matches students with community service opportunities in over 100 community partner organizations in the Bay Area. The **Cal-in-Berkeley** internship program places over 40 UC Berkeley students each year in local government, school districts, and non-profit organizations for project-based unpaid internships. Each Cal-in-Berkeley intern provides at least 110 hours of service from November to May in policy research and analysis, program planning/management and assessment, or non-profit management (marketing, fundraising, event planning, strategic planning, etc.).

In addition, many student groups organize and implement community service programs throughout the year, including the Residence Hall Assembly, Panhellenic Association and Interfraternity Council, student honor societies, and student ethnic associations. Over 100 registered student organizations provide community service.

UC Berkeley students often continue their public service after graduation. For example, as of February 2006, UC Berkeley had produced more than 3,200 Peace Corps volunteers since the Peace Corps' inception – the largest number from any university in the country.

### ***University/Community Partnerships***

UC Berkeley partners with the local community on programs designed to improve the quality of life for local residents, with mutual benefit for the university and the community. One such partnership is **The Berkeley Alliance**, a nonprofit organization established in 1997 and jointly funded by UC Berkeley, the City of Berkeley, and the Berkeley Unified School District. Dedicated to improving educational, social, health, and economic outcomes for Berkeley residents, the Alliance develops initiatives in such areas as education, children and youth services, diversity, volunteerism, sustainability, and community development.

In 2006, under an agreement between the City of Berkeley and UC Berkeley, Chancellor Robert Birgeneau established a **Community Partnership Fund**, which awards grants to community-based organizations that partner with the university on neighborhood improvement and community service projects. In 2006, about \$200,000 in grants was awarded to 15 community organizations for a wide range of programs benefiting the environment, the health and welfare of children, neighborhood parks and streetscape, arts and cultural programs, among others.

**The Institute of Urban and Regional Development** fosters University/community partnerships through its Center for Cities and Schools and the Center for Community Innovation. Its programs link faculty and graduate student expertise with local youth and community organizations seeking to improve their neighborhoods and cities.

The **Center for Educational Partnerships** develops and implements programs and strategies to improve academic preparation, expand educational opportunities, and ensure access to higher education, including to the University of California, for low-income and educationally disadvantaged students from the Bay Area. **Through Kindergarten to College: UC Berkeley in the Schools**, the University works with communities and schools to support children, families, and teachers. Dozens of outreach programs focus on educational access in the Bay Area, but UC Berkeley outreach also has an impact that stretches throughout Northern California and the nation.

### *Cultural and Recreational Programs*

UC Berkeley offers a wide range of cultural and recreational programs that are open to local residents and visitors to the area, enhancing the quality of life for the community. A few examples are described below:

#### *— Museums*

UC Berkeley has approximately 80 collections covering a wide variety of disciplines and media. The major museums on campus are the **Berkeley Art Museum & Pacific Film Archive** and the **Berkeley Natural History Museums**, which include the Phoebe Hearst Museum of Anthropology, UC Botanical Garden, Essig Museum of Entomology, University and Jepson Herbaria, Museum of Paleontology, and Museum of Vertebrate Zoology. These collections are open to the public at nominal cost or free.

The **Lawrence Hall of Science** offers hands-on science and interactive exhibits for children, families, and schools. The Hall's classes and camps make learning science and math fun for children from preschool through high school, while teacher workshops, family science and math programs, and LHS-developed instructional materials help to enrich the classroom and home.

#### *— Performing Arts*

For over 100 years, **Cal Performances** has brought world-class artists to the Berkeley campus for the benefit of the local and regional audience.

Cal Performances' community programs serve over 30,000 Bay Area residents in over 100 arts education and humanities programs offered on the UC Berkeley campus, in local schools, and throughout the community. The **SchoolTime** series brings local school children to the campus to enjoy matinee performances by the same top-caliber artists who perform in the regular season at a nominal cost of \$4 per ticket. Study guides and professional development workshops help teachers bring the arts into the curriculum through pre- and post-performance discussion and activities. **AileyCamp**, the nationally acclaimed youth program, conceived by Alvin Ailey American Dance Theater and administered by Cal Performances, teaches dance and life lessons to Berkeley and Oakland middle school students during a six-week summer program. AileyCamp uses dance as a vehicle for developing self-esteem, self-discipline, creative expression, and critical thinking skills among underserved 6th, 7th, and 8th grade students.

The **Department of Music** offers evening and weekend concerts at Hertz and Morrison Halls and free noon-hour concerts on Wednesdays at Hertz Hall. The **Department of Theater, Dance, and Performing Arts** sponsors performances and workshops. **Lunch Poems**, a free, monthly poetry reading held at the Morrison Library, featuring distinguished faculty, students, and staff who read and discuss their own or their favorite poems, is open to the public.

#### *— University Library*

The **UC Berkeley Library** is ranked second among public university libraries in the United States and fifth overall with a collection of over 10 million volumes. Its rare and specialized collections serve educators and scholars from around the state and the world. Individuals can borrow materials from the UC Berkeley library by placing a request through their local library or

by purchasing a borrowing privilege card for an annual fee. Many campus libraries have open stacks and visitors can use most collections on site.

— *Public Lectures and Educational Events*

Hundreds of workshops, lectures, and symposia held on the UC Berkeley campus and sponsored by various academic departments are often free and open to the public. The **School of Journalism** hosts several public events throughout the year with distinguished speakers from the media, politics, business and other fields at nominal cost. The **Graduate Council Lecture Series** sponsors free public lectures by eminent scholars.

Conferences on important societal issues are hosted on the Berkeley campus for educators and other professionals, business community leaders, and the general public.

— *UC Berkeley Online*

UC Berkeley has been making academic content available to the public online since 2001, when its **Educational Technology Services (ETS)** division began webcasting lectures and special events to students and the public. The ETS website hosts the full array of the campus's growing inventory of video content supplied by taped events and lecture rooms that are wired for automated webcasting.

In September 2006, UC Berkeley began offering educational content, including course lectures and symposia, free of charge, through Google Video at [video.google.com/ucberkeley.html](http://video.google.com/ucberkeley.html). Because of the quality and quantity of these offerings, UC Berkeley is the first university with its own page on the Google Video web site. The University is making more than 250 hours of content available through Google Video, with more content to be added in the future.

The Berkeley Art Museum and Pacific Film Archive initiated the **Museums and Online Archive of California Project (MOAC)** project at [bampfa.berkeley.edu/moac](http://bampfa.berkeley.edu/moac), which provides easy web access to historical and cultural materials housed at 11 public and private museums across the state. In addition to BAM/PFA, the Hearst Museum, Bancroft Library, and the Museum of Paleontology also participate in the project.

Several academic departments and museums have posted educational material and exhibits online, such as the **Museum of Paleontology** exhibits at [ucmp.berkeley.edu/exhibits/index.php](http://ucmp.berkeley.edu/exhibits/index.php).

— *Open House at UC Berkeley*

On **Cal Day**, held each April, the campus opens its museums, classrooms, performing venues, sports facilities, and lecture halls to the public. From panel discussions by UC Berkeley Nobel Laureates to poetry readings to “bug displays” and hands-on science programs for children, Cal Day offers the public an opportunity to sample the academic, recreational, and cultural programs of the university. Tens of thousands of people attend annually.

In the fall, **Homecoming Weekend** provides the public with the opportunity to attend lectures by UC Berkeley faculty on research topics of interest to the public.

— *Recreational Resources*

**Cal Recreational Sports** offers quality youth programs during the summer and throughout the academic year, including sports camps, Cal Adventures Camps (rock climbing, sailing, sea kayaking, windsurfing), social skills and leadership training, and art camps. Partial and full scholarships are available to low-income families.

**CalSTAR**, another Recreational Sports program, provides physical recreational activity for disabled persons. CalSTAR benefits include: a discounted membership to the Cal Rec Club, free volunteer assistants to help with workouts, and 50% off most CalFIT classes. CalSTAR volunteers can earn a free membership to the Cal Rec Club by volunteering for 12 hours a month.

The UC Berkeley campus has open lawn areas for informal recreational use; public picnic areas; fire trails in the hills for joggers, hikers, and bicycles; a walking/running track at the Clark Kerr campus; a basketball court, lawn, public concert stage and community gardens at People's Park; and other recreational resources that are available to the community at no cost. In addition, community members can sign up for fee-based programs through the Cal Rec Center.

— *Intercollegiate Athletics*

UC Berkeley hosts 27 men's and women's intercollegiate sports teams, one of the largest programs in the country. Local and Bay Area residents enjoy attending Cal's home games, many at nominal ticket cost or for free.

The Department of Intercollegiate Athletics also conducts many public service and outreach programs, including fundraising for charity, mentoring middle school students, and Come to College days that combine sports and educational activities.

## ENVIRONMENTAL POLICIES AND PRACTICES

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The University of California system and the UC Berkeley campus have made a commitment to uphold sustainable environmental policies. In July 2003, the UC Regents adopted the “Green Building Policy and Clean Energy Standard” calling for UC to adopt principles of energy efficiency and sustainability in its capital projects to the fullest extent possible. In addition, the policy calls for the University to minimize its impact on the environment and reduce non-renewable energy use by purchasing green power from the electrical grid, promoting energy efficiency, and creating local renewable power sources.

At UC Berkeley, the movement toward environmentally sustainable practices and policies has been led by students, staff and faculty who serve on the Chancellor’s Advisory Committee on Sustainability (CACS), established in 2003 to:

- Engage the campus in an ongoing dialogue about reaching environmental sustainability
- Integrate environmental sustainability with existing campus programs in education, research, operations, and public service
- Instill a culture of sustainable long-range planning and forward-thinking design.

In April 2005, CASC issued its first sustainability assessment summarizing progress that had been made—and opportunities for future improvement—in the areas of energy use, water, built environment, transportation, purchasing and waste, land use, food, health and wellbeing, and academics and culture. The full report is online at [sustainability.berkeley.edu/assessment.html](http://sustainability.berkeley.edu/assessment.html).

The 2005 sustainability assessment shows that the campus has made substantial improvements in energy conservation, recycling, sustainable food purchasing and practices, reduction in hazardous chemical waste generation, and academic programs and organizations that encourage the study and practice of environmental sustainability.

The UC Berkeley Chancellor provides annual grants to students, faculty, and staff for materials and supplies to enable members of the UC Berkeley campus community to undertake projects that will create a greener, more environmentally sustainable campus. In addition, annual Sustainability Awards recognize individuals and groups whose actions have greatly helped increase the sustainability of the campus. Other campus organizations working to make operations at UC Berkeley more sustainable include:

- Associated Students of UC (ASUC) Office of Sustainability
- Berkeley Environmental Alumni Network (BEAN)

### 2006 Green Fund Grant Recipients

- **Strawberry Creek Grinnell Natural Area Restoration Project** for purchase of native plants
- **Berkeley Energy Alliance for Renewables (BEAR Biodiesel) Project** to convert used vegetable oil from campus dining halls into biodiesel for campus vehicles
- **ASUC Sustainability Team (STeam)** to support its student-intern program
- **Student Organic Gardening Association (SOGA) Project** to propagate more than 5,000 plants a year for local school and community-garden projects
- **The Green Room Project** for expansion of its demonstration areas

- Cal Climate Action Partnership (CalCAP)
- Residential Sustainability Education Coordinators
- Students for a Greener Berkeley

Cal Dining is an environmental leader in the college food service industry. In 2004, the Crossroads student dining commons was certified as a Bay Area Green Business by Alameda County, meaning that Crossroads meets specific criteria aimed at conserving energy and water, reducing waste, and preventing pollution. In March 2006, Cal Dining received the nation's first organic certification on a college campus. All campus dining halls are certified and serve 100% organic salad bars.

In July 2006, UC Berkeley was one of three recipients of the Flex Your Power Award, California's top energy efficiency award. UC Berkeley was recognized for engaging faculty, staff and students in its highly successful conservation efforts, which included creating the Green Building Research Center and holding contests like "Blackout Battles," in which residence halls competed to lower their energy use. Thanks to a number of actions taken, more than 10 million kilowatt hours and about \$1 million a year in power costs are saved annually on the Berkeley campus.

In Fall 2006, UC Berkeley joined the California Climate Action Registry, pledging to measure, report, and reduce greenhouse gas emissions as a means of mitigating climate change. The campus joined more than 75 major companies, government agencies, and organizations that have committed to track and make public their greenhouse gas emissions through the registry.

UC Berkeley has also been named one of the "Best Workplaces for Commuters" each year since 2002. The award denotes an environmentally conscious organization offering cost-effective commuter benefits to its employees. Established by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Transportation (DOT), this program publicly recognizes employers whose commuter benefits reach the National Standard of Excellence. UC Berkeley's low rate of single-occupancy vehicle use is one of the best in the Bay Area. All UC Berkeley students receive unlimited use passes on the AC Transit system, funded through their registration fees. Staff and faculty also may purchase bus passes at a considerable discount through the campus "Bear Pass" program.

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Gary	Baldwin	Executive Director, CITRIS, College of Engineering
Greta	Bradlee	Analyst, Government and Community Relations
Janet	Brewster	Planning Analyst, Physical & Environmental Planning, Facilities Services
Pamela	Brown	Analytical Studies Coordinator, Office of Planning & Analysis
Thomas	Devlin	Director, Career Center
Shelley	Dommer	Information Systems Support, Human Resources and Benefits, UC Office of the President
David	Dowall	Professor, College of Environmental Design
LaDawn	Duvall	Director, Visitor Services
John	Ellis	Controller, UC Berkeley
Bernadette	Emrick	Operations Manager, Office of Technology Transfer
George	Goldman	Retired Faculty, Agricultural & Resource Economics
Laurie	Goldman	Director, Planning and Analysis, Vice Chancellor, Research
Allegra	Harris	Student Intern, Government and Community Relations
Auna	Harris	Manager, Payroll Office
Irene	Hegarty	Director, Community Relations
Dwight	Hendrix	Assistant Manager, Disbursements
Paul	Jenny	Assistant Vice Chancellor, Budget
Mary	Keegan	Director, Communications, University Relations
David	Kolsom	Strategic Sourcing Manager, Purchasing Operations
Veronica	Lanier	Acting Director, Office of Technology Transfer
Alan	Lightfeldt	Student Intern, Government and Community Relations
Dorothy	Lawrence	Manager, Disbursements
Em Marie	Mandoriao-Furuya	Principal Analyst, Budget & Finance, Administration

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<sup>4</sup> Persons are identified by their titles at the time of their work on this project.

Jeff	Marble	Information Services Coordinator, Visitor Services
Pat	Mashhoon	Principal Administrative Analyst, Payroll Office
Neil	Maxwell	Director, Information Systems, Sponsored Projects Office
Kellie	McElhaney	Executive Director, Center for Responsible Business, Haas School of Business
Nancy	McFarland	Assistant Director, Employer Relations & Recruiting, Career Center
Rannah	McIntosh	Associate Director, Information Systems, University Relations
Elaine	Meckenstock	Manager, Budget & Finance, Administration
Mary	Miller	Manager, Conference Services, Housing and Dining Operations
Carol	Mimura	Assistant Vice Chancellor, Intellectual Property & Industry Research Alliances
Doreen	Moreno	Manager, Community Relations
Priscilla	Muha	Associate Director, Financial Aid
Wanda	Ogletree	CADS Programmer Analyst, University Relations
John	Ollila	Senior Research Analyst, University Relations
Robert	Price	Associate Vice Chancellor, Research
Christine	Shaff	Communications Manager, Facilities Services
Carol	Stewart	Fiscal/Policy Analyst, Financial Aid
Carol	Sypher	Budget Director, Capital Projects, Facilities Services
David	Trinkle	Director, Federal Research Development, Government and Community Relations
Jane	Turbiner	Office Manager, Government and Community Relations
Alan	Underwood	Principal Analyst, Office of Planning & Analysis
Lisa	Vanderfin	Manager, Financial Services – General Accounting, Administration
Megan	Voorhees	Director, Cal Corps Public Service Center
Barbara	Wezelman	Senior Budget Coordinator, Budget Office, Administration

## APPENDICES

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### **APPENDIX A: ASSESSING UC BERKELEY’S FISCAL IMPACTS ON THE CITY OF BERKELEY—FOR FUTURE STUDY**

This report examines the effects of UC Berkeley — its research activities, spending, employment, public service, and other economic and social impacts—on the state of California, the San Francisco Bay Area, and the local community. Those activities produce enormous benefits for the economy and enhance the quality of life of local and Bay Area residents. A separate analysis is necessary to assess the fiscal impact of the UC Berkeley campus on the City of Berkeley.

Fiscal impact is defined as the difference between the direct costs to provide public services to the University offset by revenues paid by the University and/or generated by the University’s activities, programs, and facilities. An accurate and complete analysis of fiscal impact requires the cooperation of local agencies in order to verify costs and revenues, which was not possible to secure for the benefit of this report. However, some observations can be made concerning the balance of fiscal costs and benefits of UC Berkeley to the City of Berkeley.

In June 2004 the City of Berkeley issued a draft interim report on the fiscal impact of UC Berkeley, prepared by Economic Planning Systems, Inc. based on 2002-2003 data, which concluded that City services cost an estimated \$11 million net annually over University-generated revenues received by the City. After a thorough review of the interim report, UC Berkeley staff questioned many of its assumptions and calculations of costs and discovered omissions in the estimates of revenues received. Because the report was not subsequently corrected or re-issued as a final document, the issue of the University’s fiscal impact is unresolved.

### **WHAT DO MUNICIPAL SERVICES TO THE UNIVERSITY COST?**

UC Berkeley has often been described as a “city within a city,” with a campus community of approximately 45,000 students, faculty, and staff within a city of 102,700 total residents. Many services that a city provides to its residents the University provides to the campus community—for example, police services; transportation services; parking facilities; student housing; and recreational, environmental, health, and safety programs. Some of these campus services are also available for community use. Other services the City of Berkeley provides to the campus.

In estimating the fiscal impact of providing municipal services to the campus, two methods can be used. One is to use the actual, or marginal, costs attributable to the campus. For example, to determine the cost of providing fire services, one would use the number of calls for service from the campus to the Berkeley Fire Department multiplied by the average cost per call and offset by any reimbursement for service calls. Where such data are not maintained by the City, then assumptions must be made based on the estimated share of general fund costs to provide the service, divided by the number of persons or households being served. Since many UC Berkeley students, staff, and faculty are also tax-paying residents of Berkeley, this calculation is complex.

These two methodologies can produce sharply different results. For example, the City has verified that UC Berkeley was responsible for about 4% of the total annual calls for service to the Berkeley Fire Department, with many of those calls being emergency assistance reimbursed by individual health insurance. In the Draft Fiscal Impact Study, however, an estimated 24% of the total expenditures of the Berkeley Fire Department (including grant-funded and bond-funded expenditures and services that the University provides for itself) was attributed to UC Berkeley based on a service population estimate. The difference in annual costs based on these two methodologies is at least \$5 million.

Estimating the net cost of police services is also complex. As a large campus located in a densely populated urban environment, UC Berkeley incurs greater costs for its own police department than campuses in less-populated, suburban areas. In 2005-2006 UC Berkeley spent about \$9 million on police services for its population of approximately 45,000 students, faculty, and staff. This calculates to about \$200 on a per capita basis. Much of the campus's police activity addresses crimes and disturbances committed by non-students on or near the UC Berkeley campus. In turn, the City's police department responds to disturbances that relate to campus activities, such as protest demonstrations or student social events, and to calls for service from students or UC staff who are victims of personal or property crimes off campus. The City and campus police departments provide mutual aid, and both patrol the areas proximate to the campus. In addition, the University pays the City to provide additional policing associated with football games.

The City's costs for police services attributable to the campus are offset by the University's costs of providing police services off campus in the city. The City's 2004 Fiscal Impact Study included nearly \$3 million in annual police costs attributable to the University. However, in later discussions between City and University staff, it was acknowledged that the costs and benefits were balanced.

The City also bears the cost of sewer and storm drain infrastructure, street repairs, and parks. Since 1990, the University and City have negotiated these costs under agreements associated with the University's Long Range Development Plans.

## **REVENUES PAID OR GENERATED BY UC BERKELEY**

### ***Property Tax Exemption/Special Assessments***

In 2004, approximately 42% of the City's general fund budget came from general property tax revenues; it is the single greatest source of revenue for the City. Other sources include bonds; grants; enterprise funds (e.g., parking fees, permit fees); special revenue funds, including special assessments (5% of total revenue), gas taxes, debt service; and other special funds. As a state entity, the University is exempt from paying property taxes on its properties and on privately owned properties leased by the University, including local special assessments and parcel taxes. However, it does contribute a number of direct and indirect tax revenues to the City.

### ***Direct Tax Revenues***

The University generates revenues to the City of Berkeley through sales taxes paid by or generated by the campus. The City receives a percentage of the sales taxes paid by the University on taxable goods and services purchased by the University in the City of Berkeley, as well as on taxable goods and services sold by the University.

The City of Berkeley and UC Berkeley are currently working on new procedures to recover use taxes attributable to the University's purchases from out-of-area vendors, which will increase revenues to the City.

The City also receives in lieu/gas tax revenues which are based on population, a portion of which is due to the presence of the University.

### ***Indirect Tax Revenues***

Although the Draft 2004 Fiscal Impact Study did not include indirect revenues generated by the University, asserting that they are "highly speculative," they can be estimated and are often included in fiscal impact analyses to provide an accurate picture of costs and revenue.

For example, the City of Berkeley levies a 12% transient occupancy tax on hotel lodging receipts. Many of these hotel stays are generated by visitors to the campus. While it is not possible to confirm a precise number, the Berkeley Convention and Visitors Bureau has estimated that, conservatively, 60% of hotel guests in the city are UC Berkeley visitors. In 2005-2006, the City received \$2.7 million in transient occupancy tax receipts. One might conclude, therefore, that UC Berkeley visitors generated an estimated \$1.6 million of that amount.

Other indirect revenues are sales taxes generated by UC Berkeley's student, staff, and visitor spending. Again, this cannot be computed exactly but can be estimated using data on average spending per person.

### **NEGOTIATED AGREEMENTS**

UC Berkeley has agreed to pay the City of Berkeley for certain costs under negotiated agreements, often arising out of the University's Long Range Development Plans. In 2005-2006, the UC Berkeley campus paid \$550,509 directly to the City of Berkeley for fire and hazardous material training, sewer hook-up fees, and water and sewer capital improvements, negotiated under a 1990 Mitigation Implementation Agreement. Under a new agreement reached in 2005, the University has agreed to pay for fire services and equipment, storm drains and sewer infrastructure, transportation demand management projects and studies, and a community improvement grant program. The annual payment is \$1.2 million in the first year, with 3% annual increases, totaling over \$22 million from 2005-2020.

Other agreements between the City of Berkeley and the University have resulted from UC Berkeley capital projects (e.g., the construction of Haas Pavilion) or "partnership" agreements reached on an ad hoc basis setting out shared costs or campus voluntary contributions.

## **IN-KIND CONTRIBUTIONS**

Other offsetting in-kind contributions are provided by the University to the City, e.g., recreational resources available to the community, free technical assistance provided by UC Berkeley faculty or staff, and student and faculty volunteer efforts. Although generally these are not quantified in terms of dollar costs or hours, they effectively expand the city's capacity to serve its residents.

## **CONCLUSION**

As university campuses have grown and developed over time, the balance of municipal costs and benefits has become a topic of intense debate. This is especially true during periods of budget constraints. The economic and social benefits of UC Berkeley to the local community must be considered in context with the cost of providing municipal services to the campus and the offsetting direct and indirect revenues to the City generated by the University. UC Berkeley welcomes the opportunity to continue a dialogue with the City of Berkeley on these issues.

## **APPENDIX B: SELECTED UC BERKELEY WEBSITES**

The following websites contain further information on the economic impacts and social benefits of UC Berkeley:

### ***General Information***

- UC Berkeley Homepage [www.berkeley.edu](http://www.berkeley.edu)
- Community Relations [communityrelations.berkeley.edu](http://communityrelations.berkeley.edu)

### ***Research and Economic Development***

- Intellectual Property & Industrial Research Alliances [ipira.berkeley.edu](http://ipira.berkeley.edu)
- Office of Technology Licensing [ipira.berkeley.edu/page.php?nav=27?](http://ipira.berkeley.edu/page.php?nav=27?)

### ***Building a Knowledge Economy***

- Academic Departments and Programs [www.berkeley.edu/academics/departments/a.html](http://www.berkeley.edu/academics/departments/a.html)
- Haas School of Business Executive Education [haas.berkeley.edu/execed.html](http://haas.berkeley.edu/execed.html)
- UC Berkeley Online [video.google.com/ucberkeley](http://video.google.com/ucberkeley)
- UC Extension [unex.berkeley.edu](http://unex.berkeley.edu)

### ***Research in the Public Interest***

- Blum Center for Developing Economies [blumcenter.berkeley.edu](http://blumcenter.berkeley.edu)
- Center for Information Technology Research in the Interest of Society (CITRIS) [www.citris-uc.org/](http://www.citris-uc.org/)
- Fire Information Engine [firecenter.berkeley.edu/toolkit/](http://firecenter.berkeley.edu/toolkit/)
- Health Sciences Initiative [healthsciences.berkeley.edu](http://healthsciences.berkeley.edu)
- Institute of Urban and Regional Development (IURD) [www-iurd.ced.berkeley.edu/](http://www-iurd.ced.berkeley.edu/)
- IURD Center for Cities and Schools [www.citiesandschool.org](http://www.citiesandschool.org)
- IURD Center for Community Innovation [www-iurd.ced.berkeley.edu/cci/index.html](http://www-iurd.ced.berkeley.edu/cci/index.html)
- Vice Chancellor, Research [research.chance.berkeley.edu](http://research.chance.berkeley.edu)

### ***Public Service and Community Resources***

- Cal Corps Public Service Center [calcorps.berkeley.edu](http://calcorps.berkeley.edu)
- Cal Day [www.berkeley.edu/calday](http://www.berkeley.edu/calday)
- Cal in the Community [calinthecommunity.berkeley.edu](http://calinthecommunity.berkeley.edu)
- Cal Performances [calperfs.berkeley.edu/](http://calperfs.berkeley.edu/)
- Center for Educational Partnerships (CEP) [students.berkeley.edu/apa/](http://students.berkeley.edu/apa/)

- CEP Kindergarten to College: UC Berkeley in the Schools [students.berkeley.edu/outreach](http://students.berkeley.edu/outreach)
- Fire Information Engine [firecenter.berkeley.edu/toolkit/](http://firecenter.berkeley.edu/toolkit/)
- Institute of Urban and Regional Development (IURD) [www-iurd.ced.berkeley.edu/](http://www-iurd.ced.berkeley.edu/)
- IURD Center for Cities and Schools [www.citiesandschool.org](http://www.citiesandschool.org)
- IURD Center for Community Innovation [www-iurd.ced.berkeley.edu/cci/index.html](http://www-iurd.ced.berkeley.edu/cci/index.html)
- Museum of Paleontology exhibits [ucmp.berkeley.edu/exhibits](http://ucmp.berkeley.edu/exhibits).
- Museums and Online Archive of California Project (MOAC) [bampfa.berkeley.edu/moac](http://bampfa.berkeley.edu/moac)
- Recreational Sports [calbears.berkeley.edu](http://calbears.berkeley.edu)
- UC Berkeley Libraries [lib.berkeley.edu/](http://lib.berkeley.edu/)

***Environmental Policies and Practices***

- Chancellor's Advisory Committee on Sustainability [sustainability.berkeley.edu/](http://sustainability.berkeley.edu/)
- Sustainability Assessment [sustainability.berkeley.edu/assessment.html](http://sustainability.berkeley.edu/assessment.html)