

Economic Impacts of the University of California, Riverside



Fiscal Year 2009-10

Prepared for:

UNIVERSITY OF CALIFORNIA, RIVERSIDE

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1. INTRODUCTION

BACKGROUND

CBRE Consulting (“CBRE Consulting”) was retained by the Riverside Campus of the University of California (“UC Riverside” or “university”) to conduct a study of the economic impacts of UC Riverside on the following geographic areas:

- City of Riverside;
- Riverside County;
- Inland Southern California region, defined as Riverside and San Bernardino counties;
- State of California; and
- United States.

This study focuses on the quantifiable economic impact of UC Riverside during Fiscal Year 2009-10, providing the university with a current understanding of its relationship to the local, regional, and state economies.

UC Riverside is one of 10 campuses of the University of California. Enrollment growth at the campus has been substantial, increasing at an average annual rate of 2% since the mid-2000s. Enrollment is anticipated to rise modestly in the coming years, increasing about 1% annually by 2015; growth in academic offerings is anticipated to continue, such as the recent approval for the formation of a medical school, which will be the fifth medical school in the University of California system. This new medical school creates a specific growth opportunity for the expansion of offerings at UC Riverside.

SCOPE OF WORK

In undertaking this assignment, CBRE Consulting obtained information from the university and analyzed the impact of university operations and related university activities. UC Riverside’s spending on goods, services, payroll, and construction; employment; research; students; and visitors and retirees were all examined to create an overall picture of the university’s economic impact. Financial data were gathered, including the university’s payroll, purchasing, and student budget. CBRE Consulting used the IMPLAN input-output model to calculate the indirect and induced economic impacts of UC Riverside’s spending on the study’s geographic areas.

To the extent possible, all data were gathered for the study’s five geographic areas. The most recent fiscal year for which data were available was FY 2009-10; thus, all data collected and analyzed are for this period.

REPORT ORGANIZATION

The report includes nine sections and two appendices. A number of tables and figures are inserted into each section as warranted. The list of sections includes:

1. Introduction
2. Methodology
3. Summary of Economic Activities and Findings
4. University Purchasing and Payroll
5. Research at UC Riverside
6. UC Riverside Spending Impacts
7. University Student Impacts
8. Visitor and Retiree Impacts
9. Medical School Impacts

The appendices include detailed information about the economic impact methodology and a methodology on student spending.

2. METHODOLOGY

DATA COLLECTON AND PRESENTATION

This study updates earlier economic impact studies conducted for UC Riverside. The first study was prepared by CBRE Consulting for FY 2004-05. At that time, a computerized model was prepared and disseminated to the university for the purpose of periodic updates prepared by university staff. Several interim updates were then conducted by staff. For the FY 2009-10 analysis, CBRE Consulting was retained to refresh the model, to expand the analysis to include impacts within the United States, to prepare impact projects associated with the university's new medical school, and to prepare a summary report highlighting the findings.

The university's Office of Strategic Communication spearheaded the effort to obtain and synthesize the FY 2009-10 data under CBRE Consulting's direction. CBRE Consulting then processed the data, reviewed it for reasonableness, incorporated it into the model, and generated the model outputs. In addition, the underlying IMPLAN economic data were refreshed, reflecting the most current available data set. Some model adjustments were required pursuant to this data refresher because of subsequent changes in the underlying economic data.

This report highlights the relevant economic impact-model outputs pertaining to the university's FY 2009-10 economic impacts. All findings are relevant to this fiscal year. Thus, the dollar figures are presented for FY 2009-10, with January 2010 comprising a reasonable proxy. The version of the model used to generate these outputs has been conveyed to the university and is again under the stewardship of UC Riverside.

THE CONCEPT OF ECONOMIC MULTIPLIERS

The impact of UC Riverside on the local, regional, state, and national economies is greater than the total of the university's direct spending on payroll, goods and services, and construction. This is because money spent by the university is spent again by the university's employees and local businesses. Employees use their salaries and wages to purchase goods and services from other businesses. Businesses make their own purchases and hire employees, who also spend their salaries and wages throughout the local, regional, state, and national economies. A chain reaction of indirect and induced spending continues, with subsequent rounds of additional spending gradually diminished through savings, taxes, and expenditures made outside the state and nation. This economic ripple effect is measured by what is known as an "input-output" economic model, which uses a series of "multipliers" to provide estimates of the number of times each dollar of "input," or direct spending, cycles through the economy in terms of "indirect and induced output," or additional spending, personal income, and employment.

The types of economic impacts measured by multipliers can be defined in the context of this study as follows:¹

- **Direct impacts** refer to impacts from the economic activities associated with UC Riverside.
- **Indirect impacts** measure output (gross sales), jobs, and labor income associated with the businesses and organizations that support UC Riverside's activities.
- **Induced impacts** accrue when UC Riverside employees and indirect industry employees spend their wages on local goods and services. These expenditures in turn stimulate other sectors in the local economy.

IMPLAN MODEL: DESCRIPTION AND APPLICATION

There are several input-output models used by economists to estimate multiplier effects, or final demand multipliers. CBRE Consulting used the IMPLAN input-output model to develop the estimates of UC Riverside's spending, income, and employment impacts. This model, initially developed by the U.S. Department of Agriculture, is described in Appendix A. The IMPLAN model examines inter-industry relationships in the local, regional, and national economies. CBRE Consulting relied on IMPLAN to provide estimates of indirect and induced output, employment, and income impacts based on multipliers for the study's five geographic areas.

IMPLAN multipliers indicate the ratio of direct impacts to indirect and induced impacts. For example, a spending multiplier of 0.25 indicates that \$1.00 of direct spending generates an additional \$0.25 in indirect and induced spending. Put differently, a spending multiplier of 0.25 can be interpreted as indicating that \$1.00 of direct spending generates total spending of \$1.25. In the case of employment impacts, the multipliers measure the number of full-time equivalent (FTE) jobs supported by \$1 million in direct spending, e.g., an employment multiplier of 10 indicates that \$1 million in spending generates 10 indirect and induced FTE jobs.

Unless otherwise indicated, the reader should interpret the multipliers and impacts described in the following sections as cumulative. This is multipliers and impacts attributed to larger geographic areas are inclusive of the multipliers and impacts found in smaller or subordinate geographic areas. For example, the impact of the university's spending in Riverside County includes the impact of the university's spending in the City of Riverside. Instances where tables and figures present non cumulative impacts are labeled as such, with geographic areas labeled "other Riverside County," "other Inland Southern California," "other California," and "other U.S."

¹ Indirect impacts are the changes in inter-industry purchases as they respond to new demands of directly affected industries. Induced impacts typically reflect changes in spending from households as income increases or decreases due to changes in production. For more explanation of indirect and induced impacts, see Appendix A.

3. SUMMARY OF ECONOMIC ACTIVITIES AND FINDINGS

UC RIVERSIDE ECONOMIC ACTIVITIES

UC Riverside’s economic impacts are the result of direct economic activities generated by the university. At its most basic level, this includes the jobs generated by the university, purchases made by the university, wages paid by the university, and spending generated by university students, visitors, and retirees. A summary of this information for FY 2009-10 is presented in **Table 1A** and **Table 1B**. The information in these tables includes data generated by UC Riverside and study estimates, which in turn drive the economic impact analysis.

Table 1A: UC Riverside Operating Characteristics, FY 2009-10	
Impact Category	Number
UC Riverside Employees	
Head Count (full-time and part-time)	6,985
Full-time Equivalent	4,772
UC Riverside Spending - Total	
Salaries and Wages	\$254,853,483
Goods and Services	\$101,947,786
Construction	\$56,083,626
Total	\$412,884,894
UC Riverside Spending - in CA	
Salaries and Wages (exc. students)	\$251,622,553
Goods and Services	\$66,830,705
Construction	\$54,495,872
Total	\$372,949,129

Table 1B: UC Riverside Student, Visitor, and Retiree Characteristics, FY 2009-10	
Impact Category	Number
Students	
Main Campus	19,439
UNEX Enrollments	21,178
International	2,536
Spending in CA	\$233,365,386
Total Spending	\$240,416,623
Visitors	
Number	119,749
Total Spending	\$1,348,845
UC Riverside Retirees	
Number	1,705
Retirement Payments	\$51,824,763
Spending in CA	\$36,393,421
Total Spending	\$37,526,334

Note: Figures may not add due to rounding.
Sources: UC Riverside, and CBRE Consulting.

As **Table 1A** indicates, UC Riverside employed 6,985 people with an aggregate payroll of \$254.9 million in FY 2009-10. Full-time equivalent employment totaled 4,772. In addition, the university had operating expenses of \$101.9 million with an additional \$56.1 million spent on capital projects. Of all these expenditures, \$372.9 million was made in California, comprising approximately 90% of

all expenditures. **Table 1B** indicates that an additional \$51.8 million in payments was made to UC Riverside retirees, who numbered 1,705 during the fiscal year and in turn spent \$37.5 million, including \$36.4 million in California.² UC Riverside students, including undergraduate, graduate, and all University Extension students, spent an estimated \$240.4 million, of which \$238.1 million was spent in California. UC Riverside commencement ceremonies, academic programs, libraries, museums, performances, and athletic events attracted at least about 120,000 visitors who spent an estimated \$1.3 million locally. These figures indicate that UC Riverside is responsible for \$644.1 million in total direct spending in California and \$692.2 million nationwide. The primary economic activities associated with UC Riverside are captured in this analysis, including university spending on wages and payroll (37%), goods and services (15%), and capital expenditures (8%), cumulatively accounting for a total of approximately 60% of all spending in FY 2009-10. Student spending then accounted for an estimated 35% of all direct expenditures, followed by retiree spending at 5%, and visitor spending at only a relatively modest amount.

The data in **Table 1A** and **Table 1B** comprise the university's primary, or direct, economic impacts. These direct activities have indirect and induced economic impacts in the City of Riverside, Riverside County, Inland Southern California, the state of California, and the United States in the form of increased output, jobs, and employee compensation in a variety of industries that supply goods and services to UC Riverside and its affiliated population. As the largest employer in the City of Riverside, and one of the largest in all of Riverside County, these impacts provide a substantial economic boost to all of its constituent geographic areas.

ECONOMIC IMPACTS OF UC RIVERSIDE

Each type of UC Riverside economic impact was differentiated by geographic area and by type of economic activity. The findings summarized in **Table 2** indicate total national spending impacts of \$1.4 billion as well as 16,335 jobs and \$603.2 million in earnings. Most of these impacts occurred within the State of California, with statewide impacts totaling \$1.1 billion in spending impacts, 13,340 jobs, and \$503.8 million in earnings.

The majority of the university's statewide impacts were contained to Inland Southern California, with \$757.9 million of spending impacts, 11,999 jobs, and \$380.7 million in earnings. Relative to the state impacts Inland Southern California made up 70%, 90%, and 76% of the statewide impacts, respectively. Thus, in addition to the entire statewide economy being enriched by UC Riverside's operations, the university's local region is reaping tremendous economic benefits in addition to the university's critical role as an educational institution and source of human capital development.

² These payments were not made directly by UC Riverside, but rather by the University of California Office of the President. Nevertheless, these payments provided a stimulus for economic activity, including substantial amounts of estimated retiree spending in the local and regional economies.

Table 2: Summary of Economic Impacts by Geography, FY 2009-10			
Geography/Category	Total University Impacts	Total Student, Visitor, and Retiree Spending Impacts	Combined Impacts
City of Riverside			
Total Spending	\$203,198,133	\$162,962,748	\$366,160,881
Total Jobs	7,585	1,689	9,274
Total Personal Income	\$151,739,067	\$56,668,107	\$208,407,174
All Riverside County			
Total Spending	\$405,572,252	\$222,382,635	\$627,954,887
Total Jobs	8,869	2,227	11,095
Total Personal Income	\$254,228,586	\$75,226,054	\$329,454,640
All Inland Southern California			
Total Spending	\$480,428,126	\$277,519,094	\$757,947,220
Total Jobs	9,216	2,783	11,999
Total Personal Income	\$288,088,172	\$92,638,884	\$380,727,056
Total All California			
Total Spending	\$658,453,239	\$416,677,671	\$1,075,130,910
Total Jobs	9,885	3,455	13,340
Total Personal Income	\$368,059,709	\$135,778,532	\$503,838,242
Total All U.S.			
Total Spending	\$847,245,366	\$551,208,649	\$1,398,454,015
Total Jobs	11,159	5,176	16,335
Total Personal Income	\$426,390,521	\$176,823,155	\$603,213,676

Note: Figures may not add due to rounding.

Sources: UC Riverside; and CBRE Consulting.

Not only is the Inland Southern California region gaining economic benefits from UC Riverside's operations and spending generated by students, visitors, and retirees, but benefits are very strong also at the city and county level. Economic benefits generated at the city level total \$366.2 million in spending, 9,274 jobs, and \$208.4 million in earnings. While much of this comprises direct benefits generated by the university, significant multiplier impacts are evident, such as 0.33 jobs created in just the City of Riverside for each direct university job. A significant gain in economic benefits was achieved at the county level, with spending impacts totaling \$628.0 million, accompanied by 11,095 jobs and \$329.5 million in earnings.

As demonstrated by the economic impact findings, UC Riverside is an economic powerhouse within the Inland Southern California region and California. As the university continues to grow, with enrollment anticipated to increase modestly in the future, these impacts will only increase. This is especially relevant to the establishment and growth of the university's medical school, approved by the University of California Board of Regents in 2008. That will be the first new public medical school in California in more than four decades. The school is currently building the necessary infrastructure to open its doors to students. Once this occurs, and the school achieves its maximum anticipated staffing and enrollment, the university's economic impacts are projected to increase by \$125.1 million in spending, 1,859 jobs, and \$68.1 million in earnings. These figures comprise about a 13% to 14% increase in the university's economic impacts. These projections were developed based on staffing, spending, and enrollment projections prepared by the university, assuming the medical school economic impacts are comparable to the university's economic impacts. Thus, the UC Riverside School of Medicine will strengthen the university's economic role as well as achieve its unique mission to expand and diversify the region's physician work force and to develop research and health care delivery programs that will improve the health of people living in Inland Southern California.

4. UNIVERSITY PURCHASING AND PAYROLL

SOURCES OF UNIVERSITY REVENUE

UC Riverside is a significant economic force in Inland Southern California by virtue of its position as a major employer and a major purchaser of goods and services. The impact of the university on the local economy can be measured to some degree by the amount of revenue it collects from outside the region, revenue that is then used to finance spending on payroll, goods and services, and construction within the region. The more revenue UC Riverside collects from outside the Inland Southern California region, the greater the net contribution to the local economy. Similarly, the more revenue UC Riverside collects from outside the state, the greater the net contribution to the California economy.

In FY 2009-10, university revenues totaled \$544.4 million, of which approximately 72% came from sources outside of Inland Southern California (see **Table 3**). Revenues from state government accounted for the largest share of UC Riverside’s revenues generally as well as the revenues from outside of Inland Southern California.

Table 3: Sources of UC Riverside Revenue, FY 2009-10			
Revenue Source	Total Revenue	Revenue from Outside Inland Southern California	Percent from Outside Inland Southern California
State Government	\$172,901,000	\$172,901,000	100%
Federal Government (1)	\$109,431,000	\$109,431,000	100%
Tuition and Fees	\$160,544,000	\$112,000,523	70%
Private Gifts and Contracts	\$27,098,000	\$0	N/A
Local Government	\$3,596,000	\$0	0%
Local Sales and Services (2)	\$59,077,000	\$0	0%
Other Sources	\$11,795,000	\$0	0%
Total	\$544,442,000	\$394,332,523	72%

Note: Figures may not add due to rounding.

Sources: 2009-10 Annual Financial Report, Schedule 6-A, UC Office of the President; and CBRE Consulting.

(1) Includes all investment income, endowment income, and any private gifts and contracts from companies, governments, or organizations from outside Inland Southern California.

(2) Includes sales and services to city governments.

Other sources of revenues originating from outside the region include the federal government, as well as a share of tuition and fees. A majority of UC Riverside students originally come from outside Inland Southern California and some pay out-of-state tuition. A summary of UC Riverside’s revenues for FY 2009-2010 is included in **Table 3**, along with the estimated percentage share of each source of revenue generated from outside Inland Southern California.

UC RIVERSIDE SPENDING

In FY 2009-10, UC Riverside spent nearly \$412.9 million on payroll, goods and services, and construction.³ This total reflects expenditures made both in California as well as across the country. Approximately \$283.4 million, or 69%, of this total was spent in Inland Southern California, as shown in **Table 4**. Thus, the majority of the university’s spending was concentrated in Inland Southern California. Since approximately \$62.7 million of the university’s revenue came from local sources,⁴ this means that UC Riverside made a net contribution of approximately \$220.7 million to the local economy. Put another way, the university spent approximately \$4.50 in the Inland Southern California region for every \$1.00 in revenue received from within Inland Southern California.

Table 4: UC Riverside Spending, FY 2009-10			
Source	Total Spending	Spending Within Inland Southern California	
		Amount	Percent
Salaries and Wages	\$254,853,483	\$214,685,331	84%
Goods and Services	\$101,947,786	\$19,192,417	19%
Construction	\$56,083,626	\$49,533,365	88%
Total	\$412,884,894	\$283,411,113	69%

Note: Figures may not add due to rounding.
 Sources: UC Riverside Office of Academic Planning and Budget/Accounting, Office of Capital and Physical Planning, and Office of Design and Construction; and CBRE Consulting.

³ For the purposes of this analysis, payroll includes salaries, wages, and irregular pay, such as stipends and payouts of accrued vacation and sick time. Payroll does not include employee health care, retirement, or other benefits.

⁴ Comprising local government and local sales and services in Table 2.

Total Employment and Payroll. In FY 2009-10, UC Riverside paid approximately \$254.9 million in salaries, wages, and other pay to an estimated 4,118 non student and 2,867 student employees, totaling 6,985 employees.⁵ The payroll expenditures consist of salaries, wages, stipends, payouts of accumulated vacation time, and other forms of direct monetary compensation. In addition to the payroll expenditures cited in **Table 4**, UC Riverside spent an additional 27% above the wage and salary base on retirement and health benefits in FY 2009-10.

UC Riverside is a major employer in the City of Riverside, ranking as the city’s largest employer, followed closely by Riverside County. The top 10 employers in the City of Riverside in 2010 had a total of approximately 30,200 employees, as shown in **Table 5**. UC Riverside accounted for approximately 23% of total employment among the top 10 City of Riverside employers.

Rank	Employer	Employees (1)	Industry
1	University of California at Riverside	6,985	Higher Education
2	County of Riverside	6,395	Government
3	Riverside Unified School District	3,867	Education
4	Kaiser Permanente	3,000	Health care
5	City of Riverside	2,510	Government
6	Riverside Community College District	1,669	Higher Education
7	Alvord Unified School District	1,669	Education
8	Riverside County Office of Education	1,650	Education
9	Riverside Community Hospital	1,600	Health care
10	Riverside Medical Clinic	872	Health care
	Total Top 10 Employment	30,217	

Sources: City of Riverside, Public Information Representative; and CBRE Consulting.

(1) Employee figures reflect total head count, not full-time equivalents, and include part-time employees.

The university is also a major employer in Inland Southern California, ranking as one of the largest employers in the region. The university’s role as a major employer provides economic stability, despite the current recession. Employment at UC Riverside is somewhat buffered from downturns in the local economy because most of the jobs are funded from revenue sources outside of the Inland Southern California region and are not market-dependent.

⁵ This is a total employment count, not a full-time equivalent (FTE) count.

Employment and Payroll by Area. UC Riverside’s FY 2009-10 employment of 6,985 people included 3,495 full-time (FT) employees and 3,490 part-time (PT) employees. Assuming a ratio of 3 part-time to 1 full-time employee, it is estimated that UC Riverside employed approximately 4,772 employees on an FTE basis.

Table 6 shows the location of residence of UC Riverside’s non student and student employees in FY 2009-10. Approximately 3,360 employees, or about 48%, lived in the City of Riverside. A total of 1,411 university employees, or 20%, lived elsewhere in Riverside County, and an additional 649 employees, approximately 9%, lived elsewhere in the Inland Southern California region.

Employees (1)	City of Riverside		Other Riverside County		Other Inland Southern California		Other California		Other U.S.		Total	
	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT	FT	PT
Faculty	579	53	112	34	64	17	197	49	13	1	965	154
Staff	1,230	271	777	120	274	50	165	78	27	7	2,473	526
Students	27	1,203	11	357	8	236	10	995	1	19	57	2,810
Total	1,836	1,527	900	511	346	303	372	1,122	41	27	3,495	3,490
Payroll	\$139,256,192		\$52,769,004		\$22,660,136		\$36,937,222		\$3,230,930		\$254,853,483	

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Academic Planning and Budget, and CBRE Consulting.

(1) Employment figures reflect actual head count, not full time equivalents.

Approximately \$214.8 million, or 84% of payroll paid by UC Riverside in FY 2009-10, went to Inland Southern California residents. Of that, approximately \$139.3 million went to employees living in the City of Riverside, or about 55% of total payroll. About \$36.9 million, or 14%, was paid to employees living outside of the Inland Southern California region and within California.

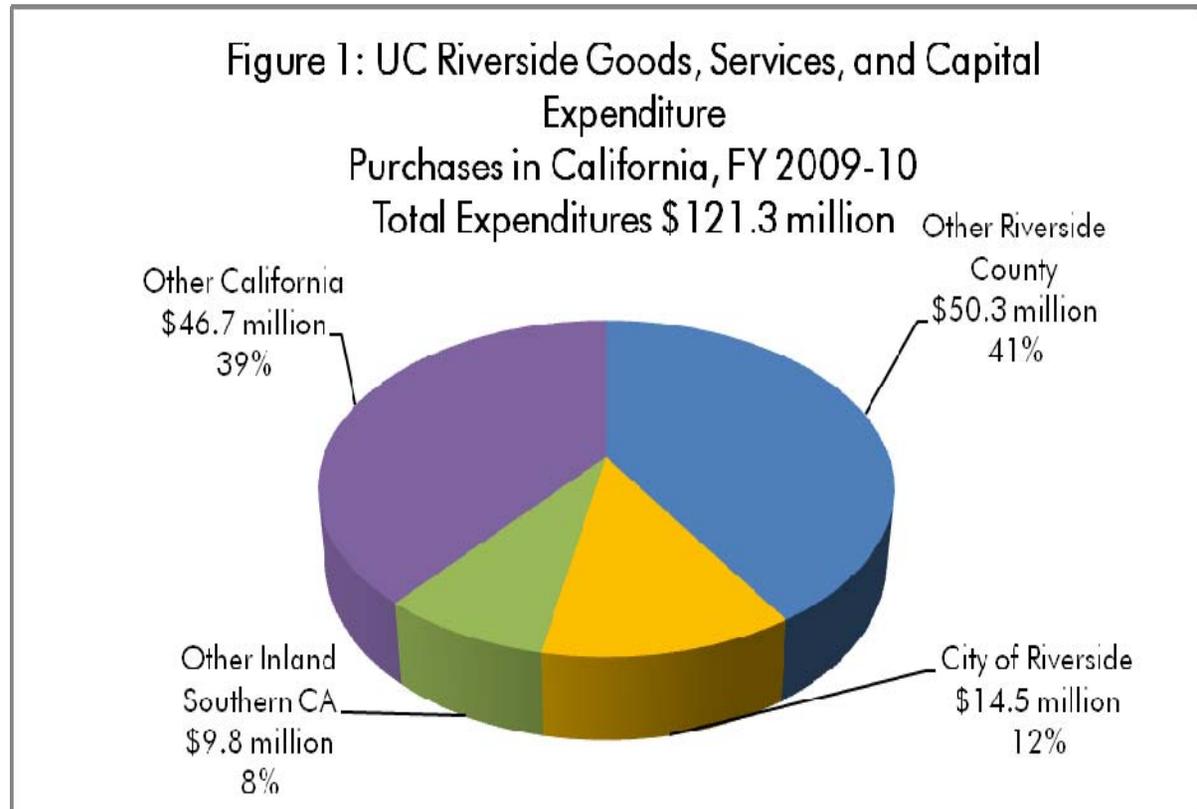
Goods and Services Purchasing and Construction Expenditures

In FY 2009-10, UC Riverside purchased more than \$101.9 million worth of goods and services and, on a cash (versus accrual) basis, spent \$56.1 million on capital expenditures throughout the country. These expenditures totaled \$158.0 million.

Location of Purchasing. Of the approximately \$158.0 million spent on goods, services, and construction by UC Riverside in FY 2009-10, \$121.3 million was spent in the State of California. The locational distribution of these expenditures within the state is depicted in Figure 1.

As shown in Figure 1, of the \$121.3 million total spending in California, \$14.5 million, or 12%, was paid to vendors in the City of Riverside.⁶ An additional \$50.3 million, or 41%, was paid to vendors elsewhere in Riverside County and \$9.8 million, or 8%, was paid to vendors elsewhere in Inland Southern California. An estimated \$46.7 million, or 39%, was paid to vendors elsewhere in the State of California.

Construction Expenditures. As cited previously, UC Riverside spent \$56.1 million in FY 2009-10 on construction expenditures. On an accrual basis, additional capital expenditures are evident, as demonstrated by the list of capital projects presented in Table 7.



⁶ For the purpose of attributing the appropriate location, UC Riverside construction expenditures have been separated into two categories – hard costs and soft costs. Soft-cost spending is attributed to the geography in which the supplier is located, while hard-cost spending is attributed to the county in which the construction project occurred.

Table 7: Major UC Riverside Capital Projects, FY 2009-10	
Project	Annual Payments
Materials Science and Engineering Building	\$23,164,833
Health Sciences (Research) Building	\$19,981,246
Barbara and Art Culver Center of the Arts	\$4,897,294
East Campus Child Development Center	\$2,101,734
Geology Building Reconstruction	\$2,632,801
Entomology Building Reconstruction	\$1,709,629
Highlander Union Building	\$1,446,796
Coffee Bean & Tea Leaf Pavilion	\$638,038
Genomics Building	\$2,035,415
Glen Mor Housing	\$1,357,410
Lab Renovation	\$590,721
All Others	\$4,139,994
Total	\$64,695,911

Sources: UC Riverside Office of Capital and Physical Planning, and CBRE Consulting.

This list of capital projects from FY 2009-10 is dominated by two major construction projects: the Materials Science and Engineering Building; and the Health Sciences (Research) Building. Yet many other capital improvements occurred during FY 2009-10, as typically occurs, although the payments change on an annual basis.

5. RESEARCH AT UC RIVERSIDE

THE SIGNIFICANCE OF UNIVERSITY RESEARCH

UC Riverside's research contributes to the economy of Inland Southern California and the State of California in several important ways. First, because most research funding is sponsored by the federal government, with a lesser amount from foundations and major corporations, university research is a significant generator of local jobs and income. It is, in effect, a major export industry, bringing into Inland Southern California tens of millions of dollars from sources outside the region. Second, some products of university research may have potential commercial application and may provide the basis for the creation of new enterprises or the expansion of existing ones. Finally, the presence of a large academic research complex in the region serves as a magnet for corporate research and development centers and related enterprises that need highly skilled university graduates.

Equally important, the research conducted at the numerous centers and institutes at UC Riverside helps advance the knowledge and understanding of issues of great importance in today's society and contributes to the development of technologies that improve the quality of life locally, nationally, and internationally. UC Riverside research focuses on a wide variety of important and timely issues such as transportation, agriculture, the environment, and even national security.

Research is one of the primary missions of the University of California and each campus has distinctive research foci. At UC Riverside, in addition to academic departments, there are a multitude of research centers and research groups and programs. These research centers span the fields of engineering, humanities, social sciences, natural and agricultural sciences, education, and urban planning. The programs of these research centers contribute to the technical, social, and economic development of Inland Southern California and beyond. In addition, the research conducted at the university helps to inform policy-makers at the local, state, and national levels, contributing to standards and regulations that help protect public health and safety and promote the general well-being.

UNIVERSITY RESEARCH AS AN EXPORT INDUSTRY

Spending associated with sponsored research projects at UC Riverside during FY year 2009-10 totaled \$115.5 million.⁷ As **Table 8** shows, the federal government provided 68% of the funding for the university's research expenditures in FY 2009-10, with the National Science Foundation, the Department of Health and Human Services (including the National Institutes of Health), and the Department of Defense accounting for the lion's share of federal funding sources.

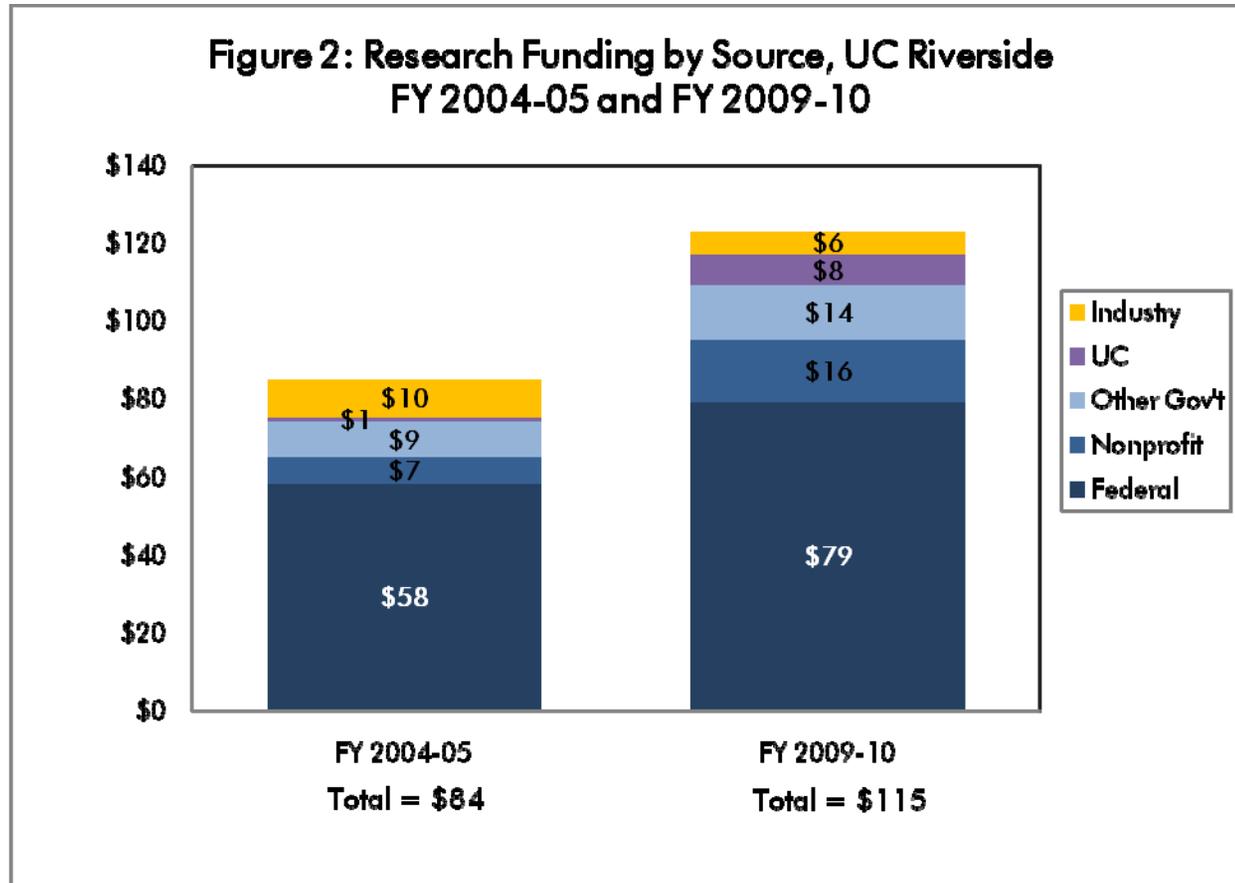
⁷ The impact of UC Riverside research spending was included in the estimated economic impacts discussed in section 6.

Table 8: Sources of Funding for UC Riverside Sponsored Research, FY 2009-10		
Source	Amount	Percent of Total
Federal Government		
Health and Human Services	\$20,305,418	18%
National Science Foundation	\$23,640,510	20%
NASA	\$363,226	0%
Department of Defense	\$13,384,913	12%
Department of Energy	\$6,072,965	5%
Department of Education	\$7,384,064	6%
All Other Federal Agencies	\$7,352,537	6%
Subtotal	\$78,503,633	68%
Non-Federal Government		
State, Local, and Foreign Governments	\$13,681,066	12%
Foundations and Other Nonprofits	\$9,644,511	8%
Industry	\$5,908,793	5%
University of California	\$7,718,847	7%
Subtotal	\$36,953,217	32%
Total	\$115,456,850	100%

Source: UC Riverside Office of Research.

Much of the research that occurred at UC Riverside in FY 2009-10 was part of ongoing, multi-year research projects, and the funding sources include numerous long-term awards and grants. Spending in FY 2009-10 was supported by grants received in prior years.

Research funding has increased significantly at UC Riverside over time, due in large part to strong growth in federal funding and the rising research stature of the UC Riverside campus (see **Figure 2**). Research awards totaled \$84.2 million in FY 2004-05. Thus, funding increased by almost 40% over the five-year period leading up to FY 2009-10.



Research funds provide considerable economic value to the region, with the funds turning over multiple times through employment of personnel and purchase of goods. A primary added value is in the knowledge transfer within the region and nation.

The pattern of research spending shown in **Table 9** indicates that the College of Natural and Agricultural Sciences dominates in the acquisition of research funding, with \$49.0 million in research dollars expended in just FY 2009-10. This college is followed by the Bourns College of Engineering, with an additional \$25.5 million in research spending during the fiscal year.

Table 9: Sponsored Research Spending by UC Riverside College/School/Division, FY 2009-10

Department	Amount	Percent of Total
College of Natural & Agricultural Sciences	\$49,039,396	51%
Bourns College of Engineering	\$25,496,464	27%
All Other Divisions	\$8,185,410	9%
College of Humanities, Arts & Social Sciences	\$5,410,375	6%
Graduate School of Education	\$4,386,914	5%
Biomedical Sciences	\$2,988,673	3%
Total	\$95,507,232	100%

Sources: UC Riverside Office of Research, and CBRE Consulting.

Together, these two academic units accounted for 78% of all sponsored research spending in FY 2009-10. In addition, these and all the department research spending significantly contribute to the economic impacts of UC Riverside’s spending.

FROM THE LABORATORY TO THE MARKETPLACE

UC Riverside policy encourages the practical application of research for the public benefit. To this end, the university’s Office of Technology Commercialization assists in the disclosure and development of campus researchers’ invention properties and encourages further technical innovations. This office also coordinates with other agencies to promote regional economic development based on UC Riverside technologies and provides oversight on the costs and benefits of intellectual property development. In FY 2009-10, UC Riverside researchers reported 54 inventions, with 288 cumulative inventions. A total of 29 first and 36 secondary U.S. patent applications were filed and four patents were issued. As of June 2010, the University had 88 active U.S. patents. The university also had 32 active license agreements as of June 2010, with an additional 170 active plant-license agreements at the end of the year.

The technologies developed through research at UC Riverside offer strong promise for commercial application. The commercialization of these technologies could, over time, yield significant economic benefits to the Inland Southern California region, the State of California, and the nation.

6. UC RIVERSIDE SPENDING IMPACTS

SPENDING IMPACTS

This section discusses the “total” economic impacts – including direct, indirect, and induced economic impacts – of university purchases of goods and services, payroll expenditures, and spending on construction projects. The analysis estimates total impacts in three distinct ways: spending, employment, and income, all estimated at the city, county, regional, state, and national levels.

The methodology of estimating indirect and induced economic impacts is based on estimates of direct university spending in particular geographic areas. In order to estimate direct university spending in this way, UC Riverside geographically sorted vendors and employees who received payments from the university during FY 2009-10. Appendix A provides further detail on the assumptions and methodology used in deriving these estimates.

Geographic Distribution

In FY 2009-10, direct spending by UC Riverside on goods and services purchases, payroll, and construction projects throughout the United States totaled \$341.4 million (see **Table 10**).⁸ This direct spending led to an estimated \$505.8 million in indirect and induced spending throughout the nation, for an estimated \$847.2 million in total spending impact by UC Riverside during the fiscal year.

Many of these national impacts were contained within the State of California, where direct spending by UC Riverside on goods and services purchases, payroll, and construction projects totaled \$301.8 million (see **Table 10**).⁹ This direct spending led to an estimated \$356.7 million in indirect and induced spending throughout the state, for an estimated \$658.5 million in total spending impact by UC Riverside during the fiscal year.

⁸ For the purposes of the analysis of total economic impacts, the university direct payroll number has been reduced by over \$35.0 million, which is the estimated share of total payroll received by student employees. CBRE Consulting measures the impact of student spending in a separate analysis; therefore, to avoid double counting, students’ share of the total payroll is excluded from the analysis of university payroll impacts. Payroll figures also include disposable income, for income taxes, and not total income.

⁹ For the purposes of the analysis of total economic impacts, the university direct payroll number has been reduced by over \$35.0 million, which is the estimated share of total payroll received by student employees. CBRE Consulting measures the impact of student spending in a separate analysis; therefore, to avoid double counting, students’ share of the total payroll is excluded from the analysis of university payroll impacts. Payroll figures also include disposable income, net an allocation for income taxes, and not total income.

Within the City of Riverside, direct university spending in FY 2009-10 totaled \$96.1 million, and indirect and induced spending impacts are estimated at approximately \$107.1 million. This indicates that the university generated approximately \$203.2 million in total spending impacts within the City of Riverside in FY 2009-10, which is approximately 24% of the university’s total national spending impact.

Riverside County accounted for the lion’s share of the university’s direct spending in Inland Southern California, with county-level direct spending totaling \$195.2 million in FY 2009-10. University direct spending in Riverside County generated an estimated \$210.4 million in indirect and induced spending impacts, for an estimated total spending impact of \$405.6 million within the county. The spending impacts in Riverside County accounted for 48% of the university’s total national impacts.

Table 10: Total Spending by Geography, FY 2009-10

Geography	Direct Spending (1)	Multiplier	Indirect and Induced Spending	Total Direct, Indirect, and Induced Spending	Percentage of Total Impacts
City of Riverside	\$96,074,882	1.1150	\$107,123,251	\$203,198,133	24%
All Riverside County	\$195,155,699	1.0782	\$210,416,553	\$405,572,252	48%
All Inland Southern CA	\$229,977,921	1.0890	\$250,450,205	\$480,428,126	57%
All California	\$301,755,744	1.1821	\$356,697,495	\$658,453,239	78%
All U.S.	\$341,422,391	1.4815	\$505,822,975	\$847,245,366	100%
TOTAL	\$341,422,391	1.4815	\$505,822,975	\$847,245,366	100%

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Academic Planning and Budget/Accounting, Office of Capital and Physical Planning, Office of Design and Construction, and CBRE Consulting.

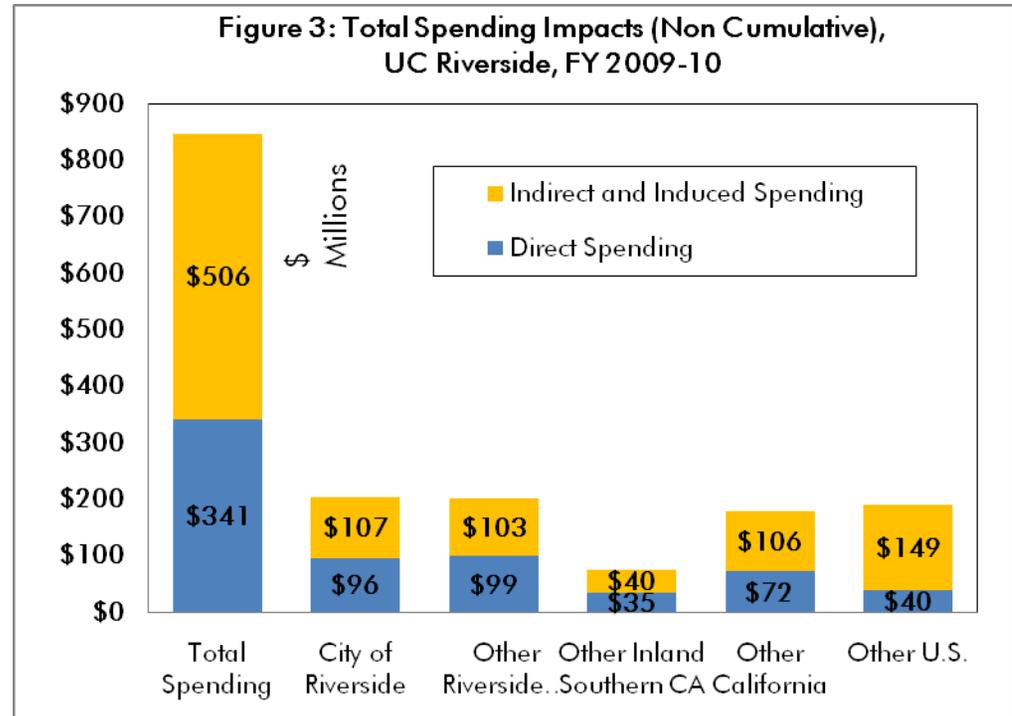
(1) Spending and multiplier calculations are cumulative of all inclusive geographies. Spending figures are less student payroll (which totals over \$35.0 million). Direct spending also only includes disposable income, which is the amount of money households have available for spending and saving after income taxes have been accounted for.

Finally, approximately \$230.0 million of the university's direct spending occurred within Inland Southern California. This spending generated an additional \$250.5 million in indirect and induced spending in Inland Southern California, for a total spending impact of \$480.4 million. This indicates that approximately 57% of the university's total national spending impact was concentrated within Inland Southern California.

Figure 3 shows the spending impacts broken down by geography, indicating the discrete share of impacts for the City of Riverside, other Riverside County, other Inland Southern California, Other California, and Other U.S.

Spending Multipliers

The estimates of indirect and induced spending reflect multipliers for the university's spending at the national, state, regional, county, and city level. **Table 10** shows that the average national multiplier for UC Riverside's direct spending is 1.48, which indicates that for every \$1.00 of UC Riverside direct spending in the nation, there is an estimated additional \$1.48 in indirect and induced spending throughout the nation. The multiplier for the City of Riverside is 1.115, which indicates that \$1.00 of direct university spending in the City of Riverside supports an additional \$1.12 in indirect and induced spending. The spending multipliers for Riverside County, Inland Southern California, and the State of California indicate that \$1.00 of direct university spending generates \$1.08 in indirect and induced spending in the Riverside County, \$1.09 in Inland Southern California, and \$1.18 throughout the State.



EMPLOYMENT IMPACTS

Employment impacts and multipliers for UC Riverside are summarized in **Table 11** and **Figure 4**. Based on IMPLAN multiplier estimates, spending by UC Riverside in FY 2009-10 supported 11,159 jobs throughout the United States, with 9,885 in the State of California.

Table 11: Total FTE Jobs Produced by UC Riverside Spending by Geography, FY 2009-10						
Geography (1)	Direct Jobs (UCR Employment)	Direct Spending	Multiplier (2)	Indirect and Induced Jobs (FTE)	Total Direct & Indirect Jobs	Percent of Total Jobs
City of Riverside (3)	6,985	\$84,648,324	7.0901	600	7,585	68%
All Riverside County (3)	6,985	\$176,905,257	10.6485	1,884	8,869	79%
All Inland Southern CA (3)	6,985	\$208,223,533	10.7148	2,231	9,216	83%
All California (3)	6,985	\$276,495,660	10.4886	2,900	9,885	89%
All U.S. (3)	6,985	\$315,747,654	13.2198	4,174	11,159	100%
TOTAL	6,985	\$315,747,654	13.2198	4,174	11,159	100%

Note: Figures may not add due to rounding.

Sources: Office of Academic Planning and Budget, UC Riverside; and CBRE Consulting.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Job multipliers are calculated per \$1 million of output.

(3) The payroll component of spending is multiplied by 86%, which is an estimate of the share of payroll comprising disposable income.

Roughly 1/3 of these jobs were indirect and induced jobs – or jobs in addition to the direct employment of university faculty, staff, and students. This reflects an average indirect and induced jobs multiplier of 13.2 nationally and 10.5 statewide, which indicates that \$1 million in university spending supported approximately 13.2 jobs nationally and 10.5 jobs statewide in addition to the direct

employment of the university. Looking at this information another way, UC Riverside supported approximately 0.60 indirect and induced jobs nationally and 0.42 indirect and induced jobs statewide for every direct university job.

In the City of Riverside, university spending supported 7,585 total FTE jobs, 600 of which were indirect and induced jobs. This reflects an employment multiplier of 7.09 indirect and induced jobs per \$1 million in university spending within the Riverside economy. Within the City of Riverside, the university supports just under 0.09 indirect and induced jobs for every direct university job.

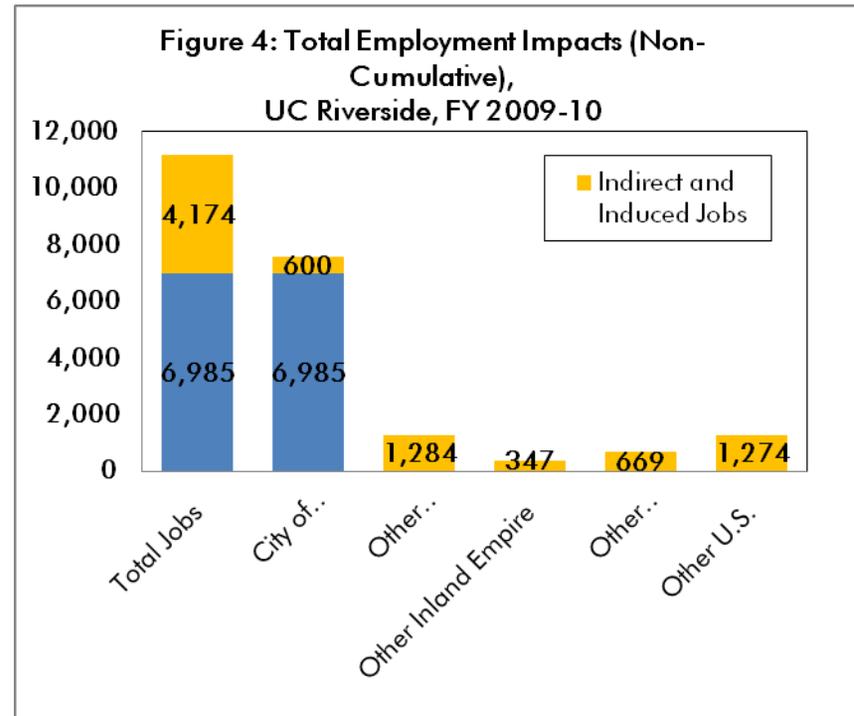
In Riverside County, university spending supported 8,869 total FTE jobs, 1,884, or 21%, of which were indirect and induced jobs. This reflects an employment multiplier of 10.65 indirect and induced jobs per \$1 million in university spending.

In all of Inland Southern California, UC Riverside supported an estimated 9,216 FTE jobs, 2,231 of which were indirect and induced jobs, reflecting an average employment multiplier of 10.71 indirect and induced jobs per \$1 million of university spending in just Inland Southern California.

While the employment multipliers are greatest at the national level, the City of Riverside received a large share of the overall employment impacts. Of the total jobs generated by university spending in FY 2009-10, 68% were located within the City of Riverside. Excluding direct university employment, the City of Riverside benefited from 14% of the indirect jobs generated statewide by university spending.

PERSONAL INCOME IMPACTS

Personal income impacts are shown in **Table 12** and **Figure 5**. Spending by UC Riverside in FY 2009-10 generated total personal income of approximately \$426.4 million nationally and \$368.1 million in the State of California. The national total reflects the impact of approximately \$218.4 million in direct UC Riverside payroll, which, along with other university spending impacts, generated \$341.4 million in direct spending. This direct spending in turn created \$243.0 million in indirect and induced personal income – or income in



addition to the direct payroll of university faculty and staff. The comparable statewide figures include \$215.4 million in direct UC Riverside payroll, \$301.8 million in direct spending, and \$187.6 million in indirect and induced personal income. Notably, many figures roll up into the total personal income figures, and thus many of the figures reported in **Table 12** are not additive.

The indirect and induced personal-income impacts are generated by the direct spending associated with UC Riverside payroll as well as goods and services purchases and capital expenditures. The estimated personal income multiplier associated with the university’s direct spending impacts nationally was 0.71 in FY 2009-10, which indicates that \$1.00 of direct spending generated \$0.71 in personal income throughout the nation. The statewide multiplier was only somewhat lower at 0.62.

Table 12: Total Personal Income from UC Riverside Payroll Expenditures by Geography, FY 2009-10						
Geography	Direct Income (UCR Payroll) (1)	Direct Spending (2)	Multiplier (2)	Indirect and Induced Income	Total Personal Income Generated	Percent of Total Income Impacts
City of Riverside	\$123,549,510	\$96,074,882	0.7299	\$70,120,797	\$151,739,067	36%
All Riverside County	\$171,547,792	\$195,155,699	0.6347	\$123,868,288	\$254,228,586	60%
All Inland Southern CA	\$191,027,448	\$229,977,921	0.5770	\$132,699,684	\$288,088,172	68%
All California	\$215,426,235	\$301,755,744	0.6218	\$187,630,542	\$368,059,709	86%
All U.S.	\$218,388,048	\$341,422,391	0.7117	\$242,999,541	\$426,390,521	100%
TOTAL	\$218,388,048	\$341,422,391	0.7117	\$242,999,541	\$426,390,521	100%

Note: Figures may not add due to rounding.

Source: Office of Academic Planning and Budget, Office of Capital and Physical Planning, Office of Design and Construction, Accounting Services, UC Riverside, CBRE Consulting.

(1) Income is less student payroll.

(2) Spending and multiplier calculations are cumulative of all inclusive geographies. Direct spending includes disposable income, which is less than payroll given an allocation for income taxes.

UC spending within the City of Riverside contributed to nearly \$151.7 million in personal income for Riverside residents. This amount increased to \$254.2 million in all of Riverside County and \$288.1 million throughout Inland Southern California. The greatest increment in personal income impacts occurred at the state level, with personal income impacts totaling \$368.1 million as noted above.

SUMMARY OF IMPACTS BY GEOGRAPHY

The estimated spending, employment, and personal income impacts of UC Riverside spending in the City of Riverside, Riverside County, Inland Southern California, State of California, and the United States are summarized in **Table 13**.

In FY 2009-10, the impact of spending by UC Riverside in the City of Riverside was \$203.2 million in total spending, 7,585 jobs, and \$193.7 million in personal income. UC Riverside’s spending generated an additional impact of approximately \$202.4 million in total spending, 1,284 jobs, and \$101.7 million in personal income elsewhere in Riverside County. Elsewhere in Inland Southern California, UC Riverside generated an additional impact of \$74.9 million in spending, 347 jobs, and \$28.3 million in personal income. UC Riverside spending contributed an additional \$178.0 million in total spending, 669 jobs, and \$79.3 million in personal income elsewhere in the state. The incremental impacts in the rest of the United States were \$188.8 million in spending, 1,274 jobs, and \$58.3 million in personal income.

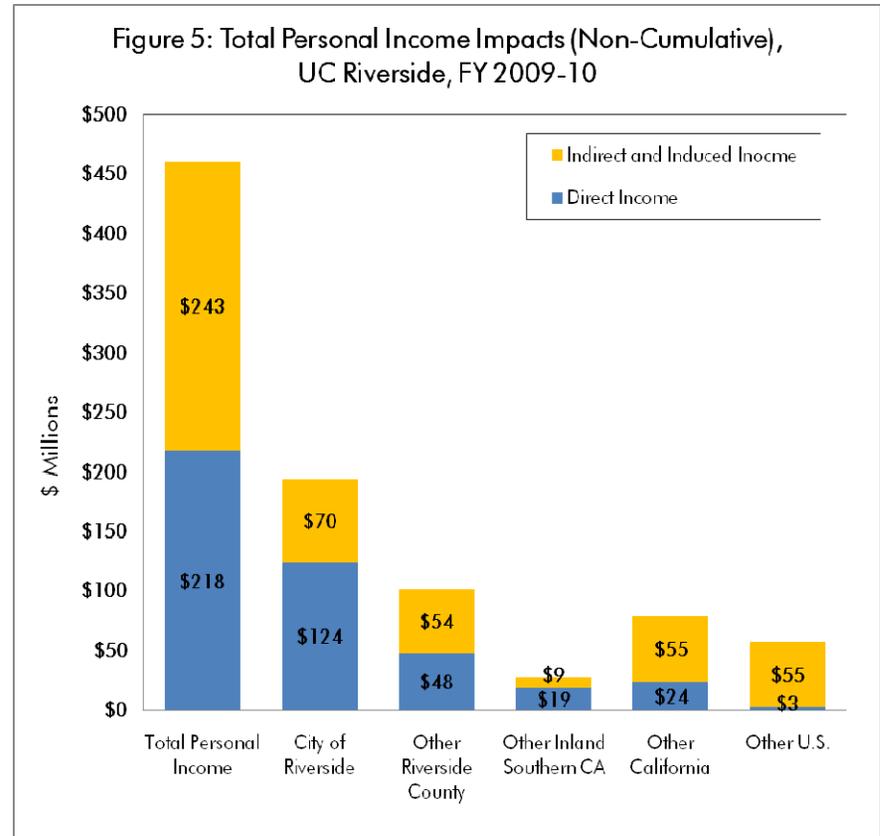


Table 13: Summary of UC Riverside Impacts by Geography (Non-Cumulative), FY 2009-10, \$s in millions

Category	City of Riverside	Other Riverside County	Other Inland Southern CA	Other California	Other U.S.	Cumulative Statewide	Cumulative National
Spending							
Direct	\$96.1	\$99.1	\$34.8	\$71.8	\$39.7	\$301.8	\$341.4
Indirect	\$107.1	\$103.3	\$40.0	\$106.2	\$149.1	\$356.7	\$505.8
Total Spending	\$203.2	\$202.4	\$74.9	\$178.0	\$188.8	\$658.5	\$847.2
Employment							
Direct	6,985	0	0	0	0	6,985	6,985
Indirect	600	1,284	347	669	1,274	2,900	4,174
Total Jobs	7,585	1,284	347	669	1,274	9,885	11,159
Income							
Direct (1)	\$123.5	\$48.0	\$19.5	\$24.4	\$3.0	\$215.4	\$218.4
Indirect	\$70.1	\$53.7	\$8.8	\$54.9	\$55.4	\$187.6	\$243.0
Total Income	\$193.7	\$101.7	\$28.3	\$79.3	\$58.3	\$403.1	\$461.4

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Academic Planning and Budget/Accounting, Office of Capital and Physical Planning, and Office of Design and Construction, and CBRE Consulting.

(1) Income is less student payroll.

In all, UC Riverside’s total economic impact in California was \$658.5 million in total spending, 9,885 jobs, and \$403.1 million in personal income in FY 2009-10. The impacts in total at the national level are much greater, comprising \$847.2 million in total spending, 11,159 jobs, and \$461.4 million in personal income.

7. UNIVERSITY STUDENT IMPACTS

UC RIVERSIDE GRADUATES AND THE REGION’S SKILLED LABOR FORCE

UC Riverside’s highly skilled graduates are perhaps the university’s most significant contribution to the state and regional economies. In FY 2009-10, UC Riverside conferred 3,822 degrees, including 3,189 bachelor’s, 438 master’s, and 195 doctoral degrees. **Table 14** illustrates total degrees awarded and highlights select degree programs.

Table 14: Select Degree Programs By Number of Degrees Conferred, FY 2009-10				
Field of Study	Bachelor	Master	Doctorate	Total
All Degree Programs	3,189	438	195	3,822
Select Degree Programs				
Business Administration	536	0	0	536
Biochemistry	83	34	3	120
Biology	239	0	3	242
Biomedical Sciences	0	0	1	1
Chemistry	20	13	9	42
Biological Sciences	113	0	0	113
Interdepartmental Graduate Programs (1)	0	4	24	28
Neuroscience	35	0	0	35
Physics	10	6	9	25
Chemical and Environmental Engineering	36	8	12	56
Computer Science and Engineering	9	18	17	44
Electrical Engineering	26	30	8	64
Mechanical Engineering	55	7	5	67

Sources: Office of Academic Planning and Budget, UC Riverside; and CBRE Consulting.

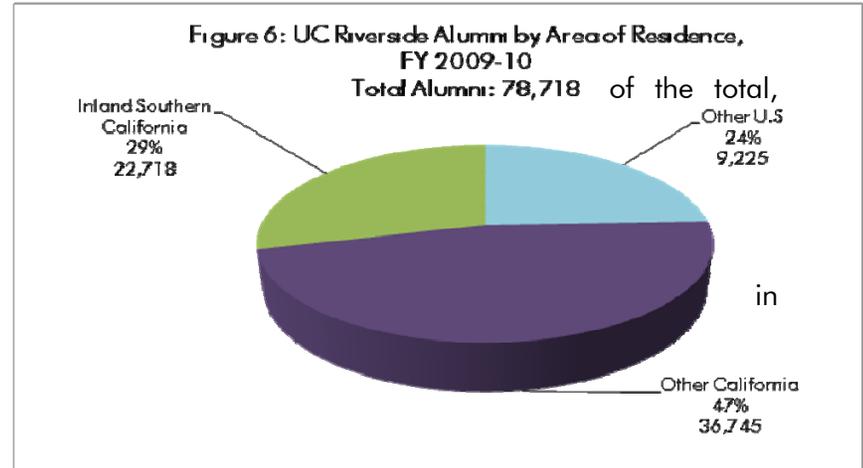
(1) Interdepartmental Graduate Programs include: Cell, Molecular and Developmental Biology; Environmental Toxicology; Evolution Ecology & Organismal Biology; Genetics, Genomics & Bioinformatics; and Microbiology.

UC Riverside plays a major role in supporting the growth of the Inland Southern California economy by providing a steady stream of bachelor’s, master’s and doctoral degree recipients to the local work force each year.

UC RIVERSIDE GRADUATES IN INLAND SOUTHERN CALIFORNIA

Of the 78,718 total alumni who have graduated from UC Riverside since 1954, 59,493, or over 75%, lived in the State of California in 2010, as shown in **Figure 6**.¹⁰ Of these alumni, nearly 23,000, or 29% lived in Inland Southern California. The remaining 19,225, or 24%, lived outside of California.

As the data in **Table 15** indicate, from 2008 to 2010 between 69% and 71% of new freshmen came to UC Riverside from outside Inland Southern California. Upon graduation, many of these residents remain in the area. As of 2010, the percentage of graduates residing in Inland Southern California was 29%. This indicates that UC Riverside is providing a critical role in attracting human capital to the region, and retaining them thereafter to help enhance the region’s economic base.



County	2008	2009	2010
Riverside	17.0%	16.2%	17.2%
San Bernardino	13.5%	12.9%	13.0%
Total from Inland Southern California	30.6%	29.1%	30.2%
Total from Outside Inland Southern California	69.4%	70.9%	69.8%

Sources: Office of Academic Planning and Budget, UC Riverside, and CBRE Consulting.

STUDENT SPENDING IMPACTS

UC Riverside students fuel the local economy through their spending.¹¹ Based on residential data from the Office of Governmental and Community Relations and Technology Collaboration, and spending estimates from the Financial Aid Office, the approximate location

¹⁰ For the purposes of determining alumni residence, alumni are defined as those who have received graduate or undergraduate degrees from UC Riverside.

and amount of spending by UC Riverside students can be determined. As shown in **Table 16**, approximately 9,483 students lived in the City of Riverside in FY 2009-10, representing 49% of total enrollment. An additional 2,263 students, or 12%, lived elsewhere in Riverside County and 1,875 students, or 10%, lived elsewhere in Inland Southern California. The remaining 5,818 students, or 30%, lived elsewhere in California.¹²

Table 16: UC Riverside Students by Location, FY 2009-10						
Student Category	City of Riverside	Other Riverside County	Other Inland Empire	Other California	Other (1)	Total
Undergraduate						
On-Campus	5,691	N/A	N/A	N/A	N/A	5,691
Off-Campus	<u>2,280</u>	<u>2,000</u>	<u>1,705</u>	<u>5,314</u>	<u>N/A</u>	<u>11,299</u>
Total Undergraduate	7,971	2,000	1,705	5,314	N/A	16,990
Graduate						
On-Campus	249	N/A	N/A	N/A	N/A	249
Off-Campus	<u>1,263</u>	<u>263</u>	<u>170</u>	<u>491</u>	<u>N/A</u>	<u>2,187</u>
Total Graduate	1,512	263	170	491	N/A	2,436
Total	9,483	2,263	1,875	5,805	13	19,439

Sources: UC Riverside Office of Governmental and Community Relations and Technology Collaboration, and CBRE Consulting.

(1) UC Riverside records were unable to identify addresses for approximately 13 students.

As presented in **Table 17**, Financial Aid Office data show a fairly economical pattern of annual student spending, suggesting that the estimates are a conservative approximation of actual student spending. The average spending for each student includes rent, food, transportation, and personal expenses during FY 2009-10. Spending for on-campus housing and meal plans, tuition, registration fees, books, and supplies are not included in this analysis, as these items represent university revenues rather than contributions to the local

¹¹ This first discussion focuses on student impacts of “regular” UC Riverside students, as opposed to students enrolled in UC Riverside’s UNEX Programs. The impact of UNEX students is discussed separately later in this section.

¹² These figures are inclusive of the limited number of students with unknown addresses. The breakdown by location of residence is also dependent upon addresses on file with the Registrar’s Office and may not reflect actual current addresses for all students.

economy.¹³ The budgets for graduate students are higher than for undergraduates because graduate students are older and more likely to have families.

Table 17: Estimated Average Annual Student Spending, FY 2009-10					
Student Category	Rent	Food	Personal	Transportation	Total
Undergraduate					-
On-Campus	N/A	\$2,785	\$1,750	\$1,300	\$5,835
Off-Campus	\$7,014	\$2,386	\$2,000	\$2,100	\$13,500
Graduate					
On-Campus	N/A	\$2,001	\$1,750	\$1,300	\$5,051
Off-Campus	\$8,714	\$3,386	\$2,000	\$2,100	\$16,200

Source: UC Riverside Office of Financial Aid.

Table 18 estimates total spending of undergraduate and graduate students based on their location of residence. CBRE Consulting and UC Riverside staff created assumptions about student spending patterns in the City of Riverside and the surrounding areas. These estimated “capture rates” are based on several factors, such as students’ residential locations, the distribution of retail and entertainment venues, and the expectation that students who do not live in Riverside make expenditures there because of time spent on and around campus.¹⁴ Based on these assumed capture rates and the data on average student spending provided by the Financial Aid Office, it is estimated that UC Riverside undergraduate and graduate students spent \$89.9 million in the City of Riverside, an additional \$30.1 million elsewhere in Riverside County, \$29.8 million elsewhere in Inland Southern California, an additional \$67.9 million in the rest of California, and \$4.7 million in the rest of the U.S.

¹³ To be conservative, this analysis assumes that all books and supplies are purchased at on-campus bookstores.

¹⁴ Full details on the capture-rate estimates and all other background calculations related to student spending are provided in Appendix B.

Table 18: Estimated Annual Student Spending by Geography (Non-Cumulative), FY 2009-10							
Student Category	Total Students	City of Riverside	Other Riverside County	Other Inland Southern CA	Other California	Other U.S.	Total (1)
Undergraduate	16,990	\$68,586,150	\$25,836,960	\$26,288,938	\$60,906,698	\$4,124,738	\$185,743,485
Graduate	2,436	\$21,318,162	\$4,263,411	\$3,514,394	\$6,977,465	\$613,666	\$36,687,099
Total (2)	19,426	\$89,904,312	\$30,100,371	\$29,803,333	\$67,884,163	\$4,738,404	\$222,430,584

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Financial Aid; and CBRE Consulting.

(1) Total spending excludes on-campus housing and meal plans, registration and fees, books and supplies, and non-resident tuition.

(2) Does not include 13 students with unknown addresses (see Table 16).

The \$222.4 million in UC Riverside student spending generated additional sales and wages to other businesses and employees within the City of Riverside, Riverside County, Inland Southern California, and the State of California.

Table 19 shows the total direct, indirect, and induced spending, jobs, and income within these geographic study areas attributable to UC Riverside student spending.

Table 19: Student Spending Impacts at UC Riverside, FY 2009-10

Category	City of Riverside	All Riverside County	All Inland Southern CA	All California	All U.S.
Student Spending (1)	\$89,904,312	\$120,004,684	\$149,808,016	\$217,692,180	\$222,430,584
Spending					
Multiplier	0.4521	0.4520	0.4677	0.5228	1.0142
Indirect/Induced Spending	\$40,644,250	\$54,244,832	\$70,060,307	\$113,815,540	\$225,592,001
Total Direct, Indirect, and Induced Spending	\$130,548,562	\$174,249,515	\$219,868,323	\$331,507,720	\$448,022,585
Jobs					
Multiplier (2)	15.8527	15.3406	15.4853	12.9290	19.5528
Indirect and Induced Jobs (FTE)	1,425	1,841	2,320	2,815	4,349
Income					
Multiplier	0.5331	0.5151	0.5090	0.4993	0.6473
Total Personal Income Generated	\$47,928,254	\$61,809,631	\$76,245,930	\$108,697,558	\$143,990,206

Note: Figures may not add due to rounding.

Source: Office of Financial Aid, Office of Governmental and Community Relations and Technology Collaboration UC Riverside; CBRE Consulting

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Employment multipliers are calculated per \$1 million of output.

Total direct, indirect, and induced UC Riverside student spending throughout the nation was estimated at \$448.02 million, of which \$225.6 million was indirect and induced spending. Direct student spending also supported 4,349 jobs nationwide and generated \$144.0 in national personal income. Comparable figures throughout California included \$331.5 million in total direct, indirect, and induced spending, \$113.8 million in indirect and induced spending, 2,815 jobs, and personal income totaling \$108.7 million.

The City of Riverside received a considerable share of student spending impacts. An estimated \$130.5 million of direct, indirect, and induced spending occurred in the City of Riverside as a result of student spending. This spending also resulted in an additional \$47.9 million in earned wages and 1,425 jobs within the city. Throughout Riverside County student spending impacts increased to \$174.2 million, with direct student spending supporting 1,841 jobs in Riverside County and generating \$61.8 million in personal income. Finally, the Inland Southern California student spending impacts increased to \$219.9 million, of which \$70.1 million was indirect and induced spending. Direct student spending supported 2,320 jobs and generated \$76.2 million in personal income in Inland Southern California. These figures indicate that almost half of the student spending impacts remain in Inland Southern California, but a substantial one-fourth of impacts spill over to benefit other California locations.

UNIVERSITY EXTENSION (UNEX) STUDENT SPENDING IMPACTS

University Extension, which is commonly referred to as “UNEX,” is the continuing education and international extension branch of UC Riverside. UNEX offers two distinct programs. One program is focused on the professional and continuing education needs of adult learners in the Inland Southern California region and other nearby areas of Southern California. The second program is an international extension program that attracts foreign students to week-, month- and semester-long educational opportunities at UC Riverside. Because continuing education and international students differ significantly in their spending habits, this analysis assesses the spending impacts of these two groups of UNEX students separately.

Unex Continuing Education Students

UC Riverside’s UNEX Continuing Education program offers 3,120 courses in a wide variety of academic fields ranging from agriculture and landscaping to information technology and health and behavioral sciences. UNEX program officers estimate that there were 21,178 enrollments in continuing education courses in FY 2009-10.¹⁵ The vast majority of UC Riverside’s continuing education students are working adults who attend courses in the late afternoon or evening, with individual courses meeting an average of 10 times each. UNEX officials in the past have estimated that at least 70% of the enrollments are generated by students who live outside of the City of Riverside.

Based on this information, CBRE Consulting estimated the potential direct spending impacts of continuing education students on the City of Riverside. Assuming two out of every three visits to campus generate average spending of \$13.70 per visit, and setting aside the spending of the estimated share of students assumed to live in the City of Riverside, CBRE Consulting estimates that in FY 2009-10,

¹⁵ The number of enrollments is equivalent to the number of people taking courses each year. While individual continuing-education students may be enrolled in more than one course during the year, this analysis treats each enrollment separately, as the enrollments provide the basis for estimates of student spending impacts.

continuing education students generated approximately \$1.4 million in annual spending in the City of Riverside that otherwise would not have occurred.¹⁶ This estimate and the associated impacts are presented in **Table 20**.

Table 20: Continuing Education Student Spending Impacts at UC Riverside, FY 2009-10					
Category	City of Riverside	All Riverside County	All Inland Southern CA	All California	All U.S.
Continuing Education Student Spending (1)	\$1,360,750	N/A	N/A	N/A	N/A
Spending					
Multiplier	0.5982	0.6009	0.6067	0.8334	1.8368
Indirect/Induced Spending	\$813,960	\$817,674	\$825,513	\$1,133,996	\$2,499,474
Total Direct, Indirect, and Induced Spending	\$2,174,710	\$2,178,424	\$2,186,263	\$2,494,746	\$3,860,224
Jobs					
Multiplier (2)	20.8787	21.2707	21.2798	21.9845	28.5503
Indirect and Induced Jobs (FTE)	28	29	29	30	39
Income					
Multiplier	0.5507	0.5680	0.5808	0.6554	0.9095
Total Personal Income Generated	\$749,383	\$772,922	\$790,377	\$891,890	\$1,237,611

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Financial Aid and University Extension, and CBRE Consulting.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Employment multipliers are calculated per \$1 million of output.

This \$1.4 million in direct spending of continuing education students in Riverside generated additional spending, income, and employment within the City of Riverside as well as elsewhere throughout the county, region, state, and nation as depicted in **Table 20**. Total direct, indirect, and induced continuing-education student spending throughout the nation was estimated at \$3.9 million, of

¹⁶ \$13.70 figure is the estimated cost of a light dinner; the CBRE Consulting estimate of \$1.4 million reflects the following calculations and assumptions = 21,178 (number of enrollments) x 10 (average campus visits per enrollment) x 0.7 (share of enrollments by non-Riverside residents) x 0.67 (share of visits assumed to generate spending) x \$13.70 (estimated cost of a light dinner). The \$13.70 estimated cost is an inflation-adjusted figure from a prior UC Riverside economic impact analysis.

which \$2.5 million was indirect and induced spending. Direct continuing student spending also supported 39 jobs nationwide and generated \$1.2 million in personal income nationwide. Within California the spending impacts totaled \$2.2 million, with 29 jobs created and personal income rising by \$0.8 million.

The City of Riverside received the majority of the continuing student spending impacts. An estimated \$2.2 million of direct, indirect, and induced spending occurred in the City of Riverside as a result of student spending. This spending resulted in an additional \$0.7 million in earned wages and 28 jobs within the city. Because most of the continuing student impacts occurred in the City of Riverside, the other study geographic areas gained only modest economic benefits from this type of economic activity.

UNEX International Students

Table 21 indicates total spending of UNEX international extension students based on their type and location of residence. A total of 2,536 international students attended UC Riverside for periods ranging from four weeks to a full school year, which equates to 735 students on an FTE basis.

UNEX international extension students have several housing options, including on-campus UC Riverside housing, off-campus apartment rentals, and home-stay (living with a local family). Off-campus and home-stay students generally live in Riverside, although some live elsewhere in the Inland Southern California region. Because students' expenditures on rent, food, and transportation differ based on where students live, estimates of international student spending impacts reflect these differences.

Estimates of international student spending were based in part on the Financial Aid Office survey of regular UC Riverside undergraduate students, with refinements made by CBRE Consulting and former UNEX office staff to reflect the unique experiences of international students. The one major way in which the spending of international students differs from that of regular UC Riverside students is with respect to personal expenditures. For the vast majority of international students, the journey to the U.S. to attend classes at UC Riverside also provides an opportunity for vacation and further travel – and their spending reflects the habits of both students and tourists. Accordingly, based upon prior estimates updated for inflation, the analysis assumes that each international student, whether attending weeklong or semester-long courses at UC Riverside, spends an average of \$4,560 per visit to the U.S. Based on UNEX office staff information, this spending typically includes fashion and electronic items not readily available back home for many international students.

Based on this spending estimate, as summarized in **Table 21**, CBRE Consulting estimated that UC Riverside international students' direct spending totaled approximately \$6.2 million in the City of Riverside, an additional \$2.2 million elsewhere in Riverside County, \$1.5 million elsewhere in Inland Southern California, an additional \$5.8 million in the rest of California, and an additional \$2.3

million elsewhere in the nation.¹⁷ Including indirect and induced impacts, international student spending generated \$38.4 million in spending, 430 jobs, and \$14.2 million in personal income throughout the United States. Of this, \$24.7 million in spending impacts, 271 jobs, and \$9.7 million in personal income were generated in the State of California.

Table 21: International Student Spending Impacts at UC Riverside, FY 2009-10					
Category	City of Riverside	All Riverside County	All Inland Southern CA	All California	All U.S.
International Student Spending (1)	\$6,226,154	\$8,421,588	\$9,887,303	\$15,673,207	\$17,986,039
Spending					
Multiplier	0.4113	0.4390	0.4698	0.5762	1.1322
Indirect/Induced Spending	\$2,561,025	\$3,697,301	\$4,645,468	\$9,031,457	\$20,364,019
Total Direct, Indirect, and Induced Spending	\$8,787,179	\$12,118,889	\$14,532,771	\$24,704,664	\$38,350,058
Jobs					
Multiplier (2)	14.6079	15.5718	16.6148	17.2862	23.9264
Indirect and Induced Jobs (FTE)	91	131	164	271	430
Income					
Multiplier	0.4362	0.4860	0.5199	0.6159	0.7916
Total Personal Income Generated	\$2,715,650	\$4,093,182	\$5,139,936	\$9,653,857	\$14,237,555

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Financial Aid and University Extension; and CBRE Consulting.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Employment multipliers are calculated per \$1 million of output.

TOTAL STUDENT SPENDING IMPACTS

As shown in **Table 22**, total direct, indirect, and induced impacts of spending by UC Riverside’s student population in FY 2009-10 throughout the United States was estimated at \$488.9 million; \$248.5 million was indirect and induced spending. Student spending

¹⁷ Full details on international student budget estimates in Appendix B.

also supported 4,818 jobs throughout the United States and generated \$159.5 million in personal income. Total impacts in California were also strong, including \$357.3 million in total spending, 3,115 jobs, and \$119.2 million in personal income.

Table 22: Total UC Riverside Student Spending Impacts (Non-Cumulative), FY 2009-10, \$ in millions							
Category	City of Riverside	Other Riverside County	Other Inland Sern CA	Other California	Other U.S.	Cumulative Statewide	Cumulative National
Total Student Spending (1)	\$97.5	\$30.9	\$31.3	\$73.7	\$7.1	\$233.4	\$240.4
Spending							
Multiplier	0.4515	0.4765	0.5364	0.6577	17.6529	0.5313	1.0334
Indirect/Induced Spending	\$44.0	\$14.7	\$16.8	\$48.4	\$124.5	\$124.0	\$248.5
Total Spending	\$141.5	\$45.7	\$48.0	\$122.1	\$131.5	\$357.3	\$488.9
Jobs							
Multiplier (2)	15.8434	14.7549	16.3747	8.1760	241.5117	13.3498	20.0416
Indirect and Induced Jobs (FTE)	1,545	456	512	602	1,703	3,115	4,818
Income							
Multiplier	0.5272	0.4940	0.4957	0.5031	5.7043	0.5110	0.6633
Total Personal Income Generated	\$51.4	\$15.3	\$15.5	\$37.1	\$40.2	\$119.2	\$159.5

Note: Figures may not add due to rounding.

Sources: UC Riverside Office of Financial Aid and University Extension; and CBRE Consulting.

(1) Includes all UC Riverside students, including UNEX students.

(2) Employment multipliers are calculated per \$1 million of output.

Overall, in FY 2009-10, the impact of spending by students in the City of Riverside was \$141.5 million in total spending, 1,545 jobs, and \$51.4 million in personal income. UC Riverside student spending generated an additional impact of approximately \$45.7 million in total spending, 456 jobs, and \$15.3 million in personal income elsewhere in Riverside County. Elsewhere in Inland Southern California, UC Riverside students generated an additional impact of \$48.0 million in spending, 512 jobs, and \$15.5 million in

personal income. UC Riverside student spending contributed an additional \$122.1 million in total spending, 602 jobs, and \$37.1 million in personal income elsewhere in the state, with yet more in the rest of the nation.

Notably, student impacts compare quite favorably with the total university impacts presented in **Table 13**. In total, student spending is equal to approximately 60% of university spending. This means that students as a whole have 60% of the spending potential as the entire university. On a relative basis, however, student spending impacts on the national level continue to be equal to about 60% of university spending impacts. However, student job and personal income impacts are less on a relative basis, with student job impacts equal to 43% of university job impacts and student personal income impacts equal to 35% of university personal spending impacts. This difference is attributable to the difference in type of spending that occurs, with student spending being mostly household related and university spending including spending with a wide array of industry sectors. Nevertheless, student spending comprises a very significant component of the university's economic impact in California and throughout the study's geographic areas.

8. VISITOR AND RETIREE IMPACTS

In addition to the direct spending of UC Riverside and its students, the university attracts visitors and also anchors UC Riverside retirees to the local area. Their presence in turn also supports the local, regional, state, and national economies.

CAMPUS VISITOR SPENDING IMPACTS

Each year, UC Riverside attracts tens of thousands of visitors to its conferences, libraries, museums, performances, and athletic events. While no comprehensive source of data exists to measure the total number of visitors to the UC Riverside campus, the university keeps records of attendance at certain campus events that give an estimate of the number of annual visitors. According to information obtained from a variety of university offices, including the Office of Governmental and Community Relations & Technology Collaboration, at least 120,000 visitors came to the UC Riverside campus during FY 2009-10 for a variety of events. **Table 23** details a list of these events and estimated visitor attendance at UC Riverside during that time period.

It should be noted that the estimates of event attendance shown in **Table 23** were gathered with great effort to estimate only visitor attendance and to exclude UC Riverside students, staff, and faculty. Therefore, the economic impacts attributed to attendance can be interpreted as being in addition to the impacts of student, staff, and faculty, which were estimated separately and discussed previously in this report.

Many UC Riverside visitors spend their entire stay on the campus and therefore are not likely to spend anything in the City of Riverside or elsewhere in the Inland Southern California region. However, it is also likely that many visitors shop and eat outside of the campus, and some stay in local hotels.

Table 23: Estimated Visitor Attendance at UC Riverside, FY 2009-10

Event	Attendance	Event	Attendance
Commencement	35,000	Grad Fair	200
Campus Tours	26,000	Retiree and Emeriti Faculty Luncheons	200
Botanic Gardens	24,500	Donors & Scholars Recognition	193
Athletics	13,000	Chancellor's Dinner to Benefit Merit Scholarships	192
UNEX Conference Center	12,000	Orbach Science Library Dedication	125
Total Bourns COE	1,225	Campus Chapter Events	108
Cultural Events/UCR Presents	1,000	Campus Memorial	90
Cesar Chavez 5k Run/Walk	989	GCRTC - Tomas Rivera	69
Total CHASS	600	Alumni Board Meetings	54
Total CNAS	600	Pioneer Reunion Steering Committee Meetings	51
Graduate School of Education	600	Emeritus Awards Reception	47
GCRTC - CUC	550	Student Alumni Association Career Conferences	45
Parents Association Meetings	450	Advocacy Committee Meetings	40
Various Homecoming Events	413	External Relations Committee Meetings	40
Anderson GSM	400	Staff Recognition Awards Ceremony	20
Governor's Renewable Energy Conference	365	Student Alumni Association General Meetings	20
Hays Press-Enterprise Lecture	287	Pre-Business Mentor Program	14
GCRTC - Affiliates	250	Discovery Days Parents Association Tabling	12
TOTAL			119,749

Sources: UC Riverside Office of Event Management and Protocol, Office of Governmental & Community Relations and Technology Collaboration, Bourns College of Engineering, College of Humanities, Arts, and Social Sciences, College of Natural and Agricultural Sciences, A.Gary Anderson Graduate School of Management (School of Business Administration), and Graduate School of Education.

Based on information regarding the nature of the various events – including profile of attendees, length of stay, and activities conducted – CBRE Consulting sorted campus visitors into three categories: short-day visitors; long-day visitors; and overnight visitors. A conservative estimate of average-per-visitor spending was made for each of the spending categories. For short-day visitors, it was assumed that 75% incurred no local spending. The remaining 25% were estimated to spend \$6 per person, to reflect the fact that some short-day visitors might have purchased a cup of coffee and a snack while on their trip to campus. For long-day visitors, 50% were assumed to incur no local expenditures, and the remaining 50% were estimated to spend \$30 per person, to reflect the fact that some long-day visitors might have purchased a meal and incidentals during their day on campus. Finally, for overnight visitors, it was assumed that 20% made no purchases, while it was assumed that the remaining 80% spent on average \$110 per day, to reflect the cost of hotel accommodations and one meal.¹⁸

Based on the preceding methodology, CBRE Consulting estimated that visitors to UC Riverside campus events generated \$1.3 million in total spending in Riverside during FY 2009-10. This visitor spending generated additional sales, wages, and jobs within the city of Riverside and beyond. It was estimated that this direct spending supported an additional \$0.8 million in indirect and induced spending in the city of Riverside, as well as 25 total jobs and \$0.7 million in personal income. **Table 24** shows the additional indirect and induced spending, income, and jobs within the city, county, region, state, and nation. Most of the impacts, however, are localized to the City of Riverside.

¹⁸ Average university rate at local hotels is \$128 per night according to university analysis; the study assumes an average occupancy of 1.5 persons per room.

Table 24: Visitor Spending Impacts at UC Riverside, FY 2009-10					
Category	City of Riverside	All Riverside County	All Inland Southern CA	All California	All U.S.
Visitor Spending (1)	\$1,348,845	N/A	N/A	N/A	N/A
Spending					
Multiplier	0.6052	0.6095	0.6153	0.8290	1.7761
Indirect/Induced Spending	\$816,376	\$822,120	\$829,925	\$1,118,223	\$2,395,662
Total Direct, Indirect, and Induced Spending	\$2,165,221	\$2,170,965	\$2,178,770	\$2,467,068	\$3,744,507
Jobs					
Multiplier (2)	18.7546	19.0927	19.2224	19.7638	25.8720
Indirect and Induced Jobs (FTE)	25	26	26	27	35
Income					
Multiplier	0.5417	0.5574	0.5687	0.6415	0.8896
Total Personal Income Generated	\$730,612	\$751,836	\$767,025	\$865,238	\$1,199,995

Note: Figures may not add due to rounding.

Source: CBRE Consulting.

(1) Spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Job multipliers are calculated per \$1 million of output.

UC RIVERSIDE RETIREE IMPACTS

According to data from the UC Office of the President, in January 2010 there were approximately 1,705 retired employees from UC Riverside, 1,412 of whom lived in the State of California.¹⁹ Of these California retirees, 621, or 44%, lived in the City of Riverside, and 287, or 20%, lived elsewhere in Riverside County. An additional 188, or 13%, lived elsewhere in Inland Southern California. Total annual payments to retirees in the Inland Southern California region during the fiscal year were \$33.5 million, with \$21.8 million received by retirees in the City of Riverside, \$7.1 million received by retirees elsewhere in Riverside County, and \$4.7 million received by retirees elsewhere in Inland Southern California.

¹⁹ Figure also includes the beneficiaries of deceased UC Riverside retirees.

Table 25 indicates that total direct, indirect, and induced spending generated by payments received by UC Riverside retirees throughout the nation was \$57.2 million. Direct retiree payments also supported 323 jobs and generated \$16.2 million in personal income in the United States. Comparable figures for California impacts include \$55.5 million in spending impacts, 313 jobs, and nearly \$15.7 million in personal income. Thus, the strong majority of retiree impacts occur within California.

Table 25: Retirement Payment Impacts from UC Riverside, FY 2009-10					
Category	City of Riverside	All Riverside County	All Inland Southern CA	All California	All U.S.
Retiree Payroll by Retiree Location (1)	\$21,749,890	\$28,814,112	\$33,532,639	\$43,635,272	\$44,525,710
Retiree Spending by Geography (2)	\$15,290,990	\$23,517,317	\$28,742,999	\$36,393,421	\$37,526,334
Spending					
Multiplier	1.2613	1.3464	1.3483	1.5251	1.5251
Indirect/Induced Spending	\$3,996,085	\$8,147,525	\$10,009,969	\$19,110,053	\$19,704,941
Total Direct, Indirect, and Induced Spending	\$19,287,075	\$31,664,841	\$38,752,968	\$55,503,474	\$57,231,275
Jobs					
Multiplier (3)	7.8000	8.5000	8.5000	8.6000	8.6000
Indirect and Induced Jobs	119	200	244	313	323
Income					
Multiplier	0.2972	0.3316	0.3373	0.4306	0.4306
Total Personal Income Generated	\$4,544,207	\$7,798,483	\$9,695,617	\$15,669,988	\$16,157,789

Note: Figures may not add due to rounding.

Sources: UC Office of the President, and CBRE Consulting.

(1) Retirement payroll is cumulative of all inclusive geographies.

(2) Retiree spending and multiplier calculations are cumulative of all inclusive geographies.

(2) Job multipliers are calculated per \$1 million of output.

The City of Riverside received the biggest share of retiree spending impacts. It is estimated that \$19.3 million, or 34%, of national direct, indirect, and induced spending occurred in the City of Riverside as a result of retirees' spending. This spending also resulted in \$4.5 million in earned wages and 119 jobs within the city. Comparable impacts in Riverside County include \$31.7 million of total spending, 200 jobs, and \$7.8 million in personal income. Finally, within all of Inland Southern California, retiree spending impacts totaled \$38.8 million, accounting for 244 jobs and \$9.7 million in personal income.

9. MEDICAL SCHOOL IMPACTS

MEDICAL SCHOOL DEVELOPMENT

As the first new public medical school in California in more than four decades, the UC Riverside School of Medicine will serve a rapidly growing region that already has a severe physician shortage. Approved for establishment by the University of California Board of Regents in 2008, the school is currently building the necessary infrastructure to open its doors to students.

Inland Southern California is home to more than 4.2 million people, but has just a little over half the physicians per capita than the state as a whole. In fact, according to the California HealthCare Foundation, Riverside County is the only California county of more than 1 million people to have fewer than 100 M.D. physicians per 100,000 people. The shortage in primary care specialties is particularly acute: Riverside and San Bernardino counties have 36 and 44 primary care M.D.s per 100,000 people, far fewer than the 60 to 80 considered sufficient to meet demand.

Building on its successful 34-year medical education partnership with the UCLA medical school, UC Riverside's full, four-year medical school will have a mission to expand and diversify the region's physician work force and to develop research and health care delivery programs that will improve the health of people living in Inland Southern California. To achieve this mission, which is unique to U.S. medical schools, UC Riverside is creating a new paradigm for training physicians by:

- Focusing on **regional** work force needs with a focus on primary care specialties, rather than simply training more doctors;
- Emphasizing to the greatest extent possible **ambulatory-based clinical training**, rather than training medical students and residents exclusively in hospital settings; and
- Becoming a **catalyzing partner** with the region's health care providers, community members, researchers, and educators to confront the unacceptable health outcomes of people living in our region.

This bold new initiative is led by G. Richard Olds, M.D., UC Riverside's vice chancellor for health affairs and founding dean of the UC Riverside School of Medicine, who is also an internationally recognized tropical disease authority and medical education innovator. Dr. Olds has assembled his core leadership team and has established affiliations with several regional hospitals and community clinic organizations, as well as a large, multispecialty practice group. These affiliates, which will expand in number as the medical school grows, will serve as the medical school's partners for clinical training of medical students and residency training programs.

Construction on the first research building solely dedicated to the medical school has been completed. The School of Medicine Research Building provides modern biomedical research laboratories and associated support space to house new faculty and their research groups. Currently under way is construction to enlarge and renovate UC Riverside's existing biomedical sciences teaching

complex to accommodate expanded medical student enrollment; this building will become the School of Medicine Education Building, accommodating a total medical student enrollment of 320.

The unique geographic and demographic circumstances of Inland Southern California also present the opportunity for building a medical school tightly aligned with regional health care needs, but also developing innovations that will have broad application to the needs of the nation generally. The framework for addressing this aspect of the medical school mission will be the Center for Promotion of Healthy Communities. The center will address the health care challenges of Inland Southern California through innovative, research-based approaches involving community partnerships, prevention and proactive health screening/monitoring, and the design and implementation of novel health care delivery models.

Also planned is a Center for Healthy Aging, located at UC Riverside's Palm Desert Graduate Center. As conceived, the center would provide selected clinical/consultative services to seniors, serving as a platform for educational and research activities for the medical school, and developing innovative health care models applicable to geriatric medicine generally.

PROSPECTIVE ECONOMIC IMPACTS

During FY 2009-10, the medical school staff numbered about 50, with staff salaries totaling \$6.9 million and non-salary expenditures totaling \$6.0 million. For comparison purposes, this amount includes employment and expenditures associated with the UCR Division of Biomedical Sciences, which in 2011 was organizationally embedded in the School of Medicine. The division currently operates the two-year medical education program in partnership with UCLA – the UCR/UCLA Thomas Haider Program in Biomedical Sciences enrolling 56 first- and second-year students – as well as a Ph.D. program in biomedical sciences.

These direct jobs, salaries, and expenditures were subsumed within the university's direct impacts previously analyzed. Based on the economic impact findings for the university, and assuming that patterns for the medical school are similar to the university as a whole (such as residential distribution of employees and geographic distribution of spending), the medical school's economic impacts in FY 2009-10 are summarized in **Table 27**. Compared to the findings for just the university in **Table 13**, the medical school and biomedical sciences division contributed about 3% of the university's impacts, with the medical school's national impacts including \$28.2 million in spending impacts, 356 jobs, and \$13.7 million in personal income.

Table 26: Estimated and Projected Medical School Impacts by Geography			
Geography/Category	FY 2009-2010 Impacts	FY 2021-2022 Impacts	Incremental Impacts
City of Riverside			
Total Spending	\$6,886,255	\$44,756,040	\$37,869,785
Total Jobs	139	957	818
Total Personal Income	\$2,856,618	\$19,293,298	\$16,436,680
All Riverside County			
Total Spending	\$10,867,573	\$72,127,152	\$61,259,579
Total Jobs	207	1,429	1,222
Total Personal Income	\$5,593,624	\$38,279,839	\$32,686,214
All Inland Southern California			
Total Spending	\$13,556,821	\$88,272,400	\$74,715,579
Total Jobs	243	1,655	1,412
Total Personal Income	\$7,242,660	\$49,004,423	\$41,761,763
Total All California			
Total Spending	\$20,652,670	\$124,074,340	\$103,421,669
Total Jobs	302	1,995	1,694
Total Personal Income	\$11,089,574	\$71,199,655	\$60,110,080
Total All U.S.			
Total Spending	\$28,174,414	\$153,221,255	\$125,046,841
Total Jobs	356	2,215	1,859
Total Personal Income	\$13,658,007	\$81,717,667	\$68,059,660

Note: Figures may not add due to rounding. Sources: UC Riverside, and CBRE Consulting.

By FY 2021-22 it is anticipated the medical school will be more mature and more fully established. At that time, projections prepared by the School of Medicine suggest dedicated staff could total approximately 620 with payroll totaling \$48.2 million and operating expenses totaling \$22.4 million. The resulting economic impacts at the national level, summarized in **Table 26**, are projected to comprise \$153.2 million in spending impacts, 2,215 jobs, and \$81.7 million in personal income.

The incremental difference between the medical school's projected and current economic impacts in **Table 26** totals \$125.0 million in spending impacts, 1,859 jobs, and \$68.1 million in personal income at the national level. These are all net incremental impacts that will benefit the economy solely due to the operation of the university's medical school. The greatest areas anticipated to most strongly experience these impacts include the City of Riverside and Other California. The City of Riverside's impacts include \$37.9 million in spending impacts, 818 jobs, and \$16.4 million in personal income impacts. In Other California, the impacts will include \$28.7 million in spending impacts, 282 jobs, and \$18.3 million in personal income impacts. All other study geographies will also reap benefits from the medical school's growth and maturation, but these are the geographies that will benefit the most.

By Fiscal Year 2021-22 the university's economic impacts are sure to increase over the levels estimated for Fiscal Year 2009-2010 even absent the planned growth of the medical school. The growth impacts of the medical school, however, will be a strong component. Compared to the FY 2009-2010 findings for just the university's operations (not included student, visitor, or retiree spending), the medical school's net incremental impacts will boost the university's impacts over current levels by about 13% to 14%. Thus, the UC Riverside School of Medicine will strengthen the university's economic role as well as achieve its unique mission to expand and diversify the region's physician work force and to develop research and health care delivery programs that will improve the health of people living in Inland Southern California.

APPENDICES

APPENDIX A: ECONOMIC IMPACT METHODOLOGY

The Mechanics of the Input-Output Model

Economic multipliers are generated through the use of input-output models. These are statistical models that quantify relationships among industries. They examine the pattern of purchases by industries and the associated distribution of jobs and wages by industry. Input-output models identify, for example, all the industries from which a construction contractor purchases its supplies and in what proportion. In turn, the model then identifies the industries that are suppliers to these suppliers, or “second-generation” suppliers. This continues until all major purchases are accounted for contributing to the construction contractor’s original purchases. These original purchases are called the “direct sales.” All other associated sales from within the supply chain are considered “indirect and induced sales.” There are other indirect and induced effects associated with the contractor purchases. These include retail and other expenditures made by the construction workers paid to use the materials purchased by the construction contractor.

The size of these indirect and induced effects depends upon the definition of the region being looked at as well as the nature of the economy within the region. A large region with a closed economy, which means that most needs are being met by industries located within the region, would keep many of the sales, earnings, and jobs impacts within the region. In a region like this, the multiplier effects would be relatively large, with a large share of the effects captured within the region. In contrast, a small region with an open economy, which means an economy with a limited array of producers providing goods and services, would leak sales to other regions. Because many purchases would be made from industries outside the local economy, the multiplier impacts on the local economy would be minimized.

Indirect and Induced Impacts Defined

Input-output models measure output, or impacts, in two different ways: “indirect” impacts and “induced” impacts. “Indirect” impacts are the changes in inter-industry purchases as they respond to new demands of directly affected industries. In the case of UC Riverside, indirect impacts reflect the spending that UC Riverside’s suppliers make when purchasing goods and services from second-, third- and fourth-generation suppliers in order to meet the demand generated by UC Riverside. Indirect impacts of UC Riverside spending also include the share of suppliers’ payroll (or employees wages) that is supported by UC Riverside spending. For example, when UC Riverside constructs a new library building, the general contractor purchases lumber, rents construction equipment, hires engineers, and employs construction workers to build the library. The spending on the raw materials, equipment rentals, engineer fees, and employee payroll that is generated by the UC Riverside contract reflects the indirect impacts of UC Riverside construction spending. UC

Riverside construction spending also supports a certain number of jobs and generates a share of the personal income of the employees of these suppliers. This represents the indirect employment and personal income impacts of UC Riverside construction spending.

On the other hand, “induced” impacts typically reflect changes in spending from households as income increases due to additional production. In the case of UC Riverside, induced impacts reflect the additional spending by the employees of UC Riverside suppliers. Using the UC Riverside construction example, the additional wages received by the employees of the general contractor, lumberyard, equipment rental company, and engineering firm “induce” spending at the grocery store, movie theater, and clothing store. The jobs and income that result from these consumer purchases are considered induced employment and personal income impacts.

The IMPLAN Input-Output Model

There are several input-output models commonly used by economists to estimate indirect and induced economic impacts. Because of the difficulty of measuring these effects, all of the models have limitations. Still, economists generally agree that the models can provide an approximate measure of the indirect and induced spending, jobs, and personal income generated by a given amount of direct spending in a particular geographic area. To calculate the multiplier effects of UC Riverside’s spending, CBRE Consulting used an input-output model developed by the U.S. Department of Agriculture known as IMPLAN (IMPact Analysis for PLANning).

The IMPLAN model organizes the economy into 440 separate industries and has comprehensive data on every area of the United States. CBRE Consulting organized all university purchasing and payroll into the IMPLAN industry classifications and used the 2009 IMPLAN tables of multipliers for the City of Riverside, Riverside County, Inland Southern California, and the State of California to calculate the total effect of UC Riverside’s spending for FY 2009-10. The IMPLAN model is based on incorporating regional purchase coefficients, which measure trade flows, i.e., the proportion of local demand purchased from local producers.

Methodology for Estimating Direct, Indirect, and Induced Economic Impacts

In conducting this analysis of UC Riverside’s total spending impacts, CBRE Consulting worked with the university to limit the estimates of direct spending to those expenditures that could be identified as having occurred in a specific location. For example, the spending associated with a catered event on the UC Riverside campus is counted as direct spending in the location of the vendor providing the catering. Another important note regarding the assumptions for the geography of impacts is that jobs are counted in the location of the employer, while payroll is assumed to reflect the address of the employee. For example, for FY 2009-10, all direct employment by UC Riverside occurs in the City of Riverside, yet direct university payroll is broken down based on whether the employees live in the City of Riverside, Riverside County, Inland Southern California, or elsewhere in California.

The impact of university payroll is analyzed differently than the impact of the university’s goods and services purchasing and capital expenditures. This is because the university’s payroll is a direct expenditure of the university but is also direct income to the residents

who are UC Riverside employees. The full amount of UC Riverside's payroll is counted as direct income, based on employees' places of residence. However, the indirect spending, employment, and income impacts of UC Riverside's payroll are based on the spending of UC Riverside employees. Employee spending reflects an assumption, provided by IMPLAN, that employee disposable income is equal to 86% of earned income. However, this disposable income is not all spent within the location in which the employee lives. Therefore, it was necessary for CBRE Consulting to create assumptions for employee household spending patterns in the City of Riverside and the surrounding geographies. These estimated "capture rates" are based on several factors, such as the distribution of retail and entertainment venues, the expectation that employees who do not live in Riverside make expenditures there because of time spent at the university, and a baseline assumption that 30% of disposable household income is spent on housing (both rent and mortgage payments) within the employees' home geography. These geographically specific capture rates were then applied to total disposable income and aggregated within their respective geographies to arrive at a total of indirect impacts of university payroll expenditures. Induced spending, employment and income multipliers were then applied to the calculated indirect spending estimates in the same way that they were applied to goods and services purchasing and capital expenditures.

Expenditures Excluded from Baseline Estimates of UC Riverside Spending

In addition to reimbursements and other expenditures for which the location of purchasing could not be determined, this analysis excludes several other categories of university expenditures from the direct expenditure estimates that form the basis for measuring the indirect and induced economic impacts. These categories include accounting expense items such as the depreciation of physical property, as well as financing costs including interest payments, insurance costs, and employee benefits.

Benefits contributions are excluded because they do not contribute to economic demand in the same way payroll expenditures do. Rather than contributing directly to income, retirement benefits made in FY 2009-10 contribute to wealth accumulation, since these benefit contributions will be spent sometime in future years. Instead, this study includes the impact of the spending by UC Riverside retirement beneficiaries who received and presumably spent their retirement income during FY 2009-10. The estimate of indirect and induced impacts from retiree payments reflects the same methodology as was used to calculate the impact of UC Riverside payroll.

UC Riverside expenditures for health care benefits are not considered in the analysis because the amount of the health benefit contribution is not necessarily equal to the value of the health care-related goods and services purchased by UC Riverside employees. Furthermore, the location of the actual purchase of health-care related goods and services is difficult to track based on the patterns of UC Riverside health benefits contributions and therefore does not lend itself to inclusion in this type of analysis.

Despite the exclusion of employee benefits contributions from the analysis of the university's economic impact, these sizable contributions do play an important role of supporting the personal and financial needs of UC Riverside employees and undoubtedly make important yet distinct economic contributions to the local, regional, and state economies.

Finally, for the purposes of the analysis of total economic impacts, the university direct payroll number has been reduced by approximately \$35 million, which is the estimated share of total payroll received by student employees. CBRE Consulting measures the impact of student spending in a separate analysis; therefore, to avoid double counting, this share of the total payroll is excluded from the analysis of university payroll impacts.

APPENDIX B: STUDENT SPENDING METHODOLOGY

Student Spending Methodology

Aggregate student spending estimates were calculated using three main inputs of data. The first is the estimated average annual student budgets provided by the Office of Financial Aid. The second is student enrollment by category and location of residence provided by the Office of Academic Planning and Budget. The third input includes spending capture rates that estimate the percentage of student spending that occurred in the City of Riverside, other Riverside County, other Inland Southern California, other California, and other United States. These capture rates reflect several factors, such as the residential location of students, the distribution of retail and entertainment venues, and the expectation that students who do not live in Riverside make expenditures there because of time spent on or around campus. For example, for students living off campus in the City of Riverside, 80% of spending is assumed to occur within the City of Riverside, 7.5% within Other Riverside County, 7.5% within Other Inland Southern California, 2.5% within Other California, and the remaining 2.5% within the rest of the United States. These percentages were then applied to the estimated average annual budget multiplied by the number of enrolled students by geography. This process was repeated for every student category by location to arrive at an aggregate student spending estimate.

The reader should be aware of one limitation in interpreting the estimates of UC Riverside student spending impacts. The analysis in this report does not discount student spending impacts in Riverside, Riverside County, or Inland Southern California by taking into account the share of student spending that can be attributed to commuter students, or students who live locally with family and would be spending money in the community whether or not they attended UC Riverside. There is no way to estimate how these students' spending habits may have been different if there were no UC campus in Riverside. Perhaps some of them would have moved out of the community to attend another college, or some might have commuted to a different college nearby. But it is realistic to assume that some of their spending would have occurred in the Riverside area even if they had not attended UC Riverside. However, the fact that their attendance at UC Riverside anchors them in the Riverside community, and therefore encourages them to spend their money in the greater Riverside area, renders it reasonable to attribute a significant portion of the impact of their spending to the presence of UC Riverside.

International Student Spending Methodology

Informed by average student budget estimates from the Financial Aid Office, CBRE Consulting and University Extension created budget estimates for international students based on housing type and geography. Rent budgets for off-campus students were assumed to be the same as regular students on an FTE basis. However, the rent budget for home-stay students is based on University Extension figures and is larger because it also includes the cost of certain meals. Conversely, the food budget for home-stay students is less than those for other international students, who are assumed to spend the same as regular students. The transportation budget for all

international students is assumed to be the same as regular students. The personal budget for international students has been applied on a total student basis rather than an FTE basis to reflect the larger amount of discretionary income that most international students coming to the United States through the UC Riverside Extension program have. Specific geographic capture rates were applied to personal spending based on university sponsored trip information provided by University Extension.

ASSUMPTIONS AND GENERAL LIMITING CONDITIONS

CBRE Consulting has made extensive efforts to confirm the accuracy and timeliness of the information contained in this study. Such information was compiled from a variety of sources, including interviews with UC Riverside officials, review of UC Riverside documents, and other third parties deemed to be reliable. Although CBRE Consulting believes all information in this study is correct, it does not warrant the accuracy of such information and assumes no responsibility for inaccuracies in the information by third parties. We have no responsibility to update this report for events and circumstances occurring after the date of this report.

The accompanying analyses are based on estimates and assumptions developed in connection with the study. In turn, these assumptions, and their relation to the projections, were developed using currently available economic data and other relevant information. Economic impacts discussed in this report are estimates; CBRE Consulting does not represent these data to be actual measures of the economic impact of the UC Riverside. Instead, economic impacts are estimated based on spending data provided by UC Riverside, reasonable assumptions regarding spending patterns and habits of employees, students, visitors and retirees, and the multiplier estimates of the IMPLAN input-output model. Actual UC Riverside economic impact may vary from the estimates provided herein.