Closing the Gap: Meeting California's Need for College Graduates

Technical Appendix

Hans Johnson

Ria Sengupta

with contributions from Patrick Murphy

Description

In Appendix A we describe the data, definitions, and methods used in this report. In Appendix B we provide data on our baseline, moderate-growth, and ambitious college graduate pathway projections. Then, in Appendix C, we list the transfer numbers to CSU and UC by community college and race/ethnicity in 2007–08. Finally, in Appendix D we describe the rationale behind the components of per-pupil expenditures that were chosen for this report.

Contents

Supported with funding from The William and Flora Hewlett Foundation

PPIC PUBLIC POLICY INSTITUTE OF CALIFORNIA

CA2025 www.ca2025.org

Appendix A
Data, Definitions, and Methods

Community College Data, Definitions, and Growth Scenarios

To measure trends in transfers, we use full-time equivalent credit enrollment and full-year transfer count data from CPEC. Specifically, we estimate the ratio of transfer counts to the average of 1,000 FTE enrollment in the four years preceding the year of transfer. The four-year average FTE figure gives a metric that is comparable over time, but does not make assumptions about which students to include as transfer-seeking. We use the average over four years because past PPIC research has shown that those who transfer to a four-year institution spend four years, on average, in the community college system.

The full-year transfer count figure is defined as the number of transfers from community colleges to UC or CSU in a specific year. Although we would ideally want to include transfers to independent institutions as well, these data are not available for all relevant institutions in California. FTE enrollment is calculated using the number of units attempted and excludes noncredit enrollment. At the California community colleges, a full-time undergraduate student is presumed to take 12 units.

The various growth scenarios categorize individual community college campuses into peer groups. These peer groups were created by the California Community College Chancellor's Office for the 2008 "Accountability Reporting for the Community Colleges" report. We use the Degree/Certificate/Transfer Student Progress and Achievement Rate peer group definitions that divide colleges into six groups on the basis of the three following college characteristics: the percentage of students age 25 years and older, the percentage of students taking at least one credit basic skills course, and the bachelor's degree attainment of the college's service area population age 25 years and older.[1] Two colleges, Folsom Lake College and West Hills College Lemoore, were not assigned peer groups by the CCCCO. We assigned a

[1] For more information on CCCCO peer groups, visit http://www.cccco.edu/Portals/4/TRIS/research/ARCC/arcc_2008_final.pdf. .

peer group to Folsom Lake College on the basis of its geography and demographics. We combined West Hills College Lemoore transfer counts with its sister college, West Hills College Coalinga. Appendix C shows each college and its transfer rate per 1,000 FTE for 2007–08.

The baseline scenario for community college transfers shows the total transfers produced if the current ratio of transfers to community college enrollment is maintained. Enrollment projections are based on our demographic model, with enrollments in the early years of the projection period consistent with those of the California Department of Finance.

The moderate growth scenario shows the total transfers produced if, at the campus level, each racial/ethnic category in each college peer group decreased by one-third the gap between its transfer rate and the average of the two highest transfer rates in its racial/ethnic and peer group. (We use the average of the two highest transfer rates in the peer group rather than simply the highest rate to avoid complications with outlier colleges.) If the racial/ethnic group with the highest transfer rates had less than 100 FTE, we used the next highest transfer rate as the "target" transfer rate.

The ambitious growth scenario shows the total transfers produced if, at the campus level, each racial/ethnic category in each college peer group increased its transfer rate to match the average of the two colleges in its racial/ethnic and peer group with the top two transfer rates. Again, if the group with the highest or second-highest transfer rate had less than 100 FTE, we took the next-highest transfer rate. Colleges with a transfer rate at or above the average of the top two in its racial/ethnic and peer group maintained its current transfer rate.

UC and CSU Data, Definitions, and Growth Scenarios

Data on UC enrollees and graduation rates were obtained from the University of California StatFinder data system available at the University of California Office of the President Web site. Data on CSU enrollees and graduation rates were obtained from the CSU Division of Analytic Studies online data. For both systems, we use first-time freshman six-year graduation rates (defined as the percentage of the 2001 entering cohort who graduated in the 2006–07 school year) and transfer four-year graduation rates (defined as the percentage of the 2003 entering cohort who graduated in the 2006–07 school year).

For both UC and CSU, the baseline growth scenario shows total bachelor's degrees produced if the ratio of bachelor's degrees to enrollment is maintained. Projections of enrollments are driven by our demographic model and are held to be consistent with projections developed by the Department of Finance for the CSU system and with projections developed by the University of California Office of the President for the first part of the projection period in which the Department of Finance and UCOP projections are available.

For UC, the moderate growth scenario shows the total graduates produced if the six-year dropout rate decreased by one-fourth. For CSU, the moderate growth scenario shows the total graduates produced if the graduation rate gap between UC and CSU for each combination of race/ethnicity and student type (first-time freshman or transfer) decreased by one-half current levels as a result of an improvement at CSU.

For UC, the ambitious growth scenario shows the total graduates produced if the six-year dropout rate decreased by one-half. For CSU, the ambitious growth scenario shows the total graduates produced if the graduation rate gap between UC and CSU for each combination of race/ethnicity and student type (first-time freshman or transfer) decreased by three-fourths current levels as a result of an improvement at CSU.

College Attendance Rate Data and Definitions

Direct college attendance rate data are from the California Postsecondary Education Commission data system. The baseline growth scenario shows total college enrollment if the current college attendance rates are maintained. The moderate growth scenario shows total college enrollment if college attendance rates increase 10 percent, and the ambitious scenario shows total enrollment if college attendance rates increase almost 20 percent.

Methods for Demographic and Economic Projections

Our economic and demographic projections of the demand for and supply of college graduates are based on continuations of past trends. The demographic projections are the basis for determining the future supply of college graduates. We use a standard cohort component projection model in which the population is aged over time by adding births and in-migrants and by subtracting deaths and out-migrants. Rates of mortality, migration, and fertility specific

to age, ethnicity, gender, and nativity (U.S.-born and foreign-born) are applied to a base population (2005) and allowed to change in the future in accordance with patterns observed empirically from 1990 to 2005. The projections are not identical to but closely match those of the California Department of Finance; the primary difference is that the PPIC projections include nativity—an important characteristic that is necessary for applying educational outcomes. Past trends in educational attainment by ethnicity, age, gender, and nativity are applied to the population projections to develop projections of the supply of adults by educational attainment level. We hold education levels constant for nonmigrating cohorts over age 40 and allow education levels to change in the future for younger cohorts. The projections assume that California will continue to attract college graduates from migration, primarily international, concentrated in young adult age groups.

The economic projections—which form the basis for estimating the future demand for college-educated workers—extend past trends in educational attainment within and across occupations and industries. Specifically, educational attainment distributions are applied to projections of employment by industry and by occupation developed by the California Economic Development Department. Those distributions change over the projection period consistent with the empirical record of the recent past.

The population projections are compared to the economic projections to determine the difference, or gap, between population supply and economic demand for college graduates. In the comparison, we adjust for the higher labor force participation rates of college graduates as compared to adults of other education levels. We use the difference between the supply and demand to determine how many more bachelor's degrees the state would have to produce above the baseline projections to close the gap by 2025. We develop three scenarios of baccalaureate production: a baseline projection that is consistent with the demographic projections, a moderate increase scenario, and an ambitious increase scenario.

Our baseline scenario assumes that current policies and practices will continue to 2025. Specifically, we generally assume that current trends in college attendance rates and graduation will continue. However, we do incorporate the latest higher education projections by the University of California Office of the President and the Department of Finance. Those projections include some slight modifications to current levels of college attendance rates, but

the modifications are not large and are consistent with past trends. For example, UC projects enrollment of 9.2 percent of California's public high school graduates in 2020, up from 8.3 percent in 2007 (the figure was 6.5% in 1989).

For further details and descriptions of the projections, see Reed (2008) for projections of workforce need by educational attainment and Johnson and Reed (2007) and Hanak and Baldassare (2005) for population projections by educational attainment.

Appendix B
College Graduation Pathway Projections

Table B.1. Total number of bachelor's degrees awarded in the baseline scenario

Year	Total Number	Number Awarded at CSU and UC	Number Awarded at Private Colleges in California
1990	97,917	74,366	23,551
1991	97,016	77,302	19,714
1992	104,549	83,313	21,236
1993	108,139	86,795	21,344
1994	108,829	86,134	22,695
1995	107,965	83,207	24,758
1996	107,795	82,540	25,255
1997	106,002	81,985	24,017
1998	109,598	83,104	26,494
1999	111,163	85,980	25,183
2000	120,273	88,344	31,929
2001	119,649	90,050	29,599
2002	127,794	96,179	31,615
2003	132,300	98,837	33,463
2004	137,795	104,320	33,475
2005	147,424	107,630	39,794
2006	151,250	110,990	40,260
2007	153,245	112,474	40,771
2008	*158,961*	*116,669*	*42,292*
2009	*166,939*	*122,525*	*44,414*
2010	*168,391*	*123,591*	*44,801*
2011	*174,750*	*128,258*	*46,492*
2012	*172,591*	*126,673*	*45,918*
2013	*177,389*	*130,194*	*47,195*
2014	*189,491*	*139,077*	*50,414*
2015	*188,369*	*138,253*	*50,116*
2016	*187,132*	*137,345*	*49,787*
2017	*186,846*	*137,136*	*49,711*
2018	*187,101*	*137,323*	*49,778*
2019	*185,801*	*136,368*	*49,432*
2020	*183,735*	*134,852*	*48,883*
2021	*181,180*	*132,977*	*48,203*
2022	*181,377*	*133,121*	*48,255*
2023	*181,011*	*132,853*	*48,158*
2024	*181,040*	*132,874*	*48,166*
2025	*179,860*	*132,008*	*47,852*
Total, 2007–2025	3,385,209	2,484,571	900,639

Note: Data in italics are PPIC projections.

Table B.2. Total number of bachelor's degrees awarded in the moderate growth scenario

Year	Total Number	Number Awarded at CSU and UC	Number Awarded at Private Colleges in California
1990	97,917	74,366	23,551
1991	97,016	77,302	19,714
1992	104,549	83,313	21,236
1993	108,139	86,795	21,344
1994	108,829	86,134	22,695
1995	107,965	83,207	24,758
1996	107,795	82,540	25,255
1997	106,002	81,985	24,017
1998	109,598	83,104	26,494
1999	111,163	85,980	25,183
2000	120,273	88,344	31,929
2001	119,649	90,050	29,599
2002	127,794	96,179	31,615
2003	132,300	98,837	33,463
2004	137,795	104,320	33,475
2005	147,424	107,630	39,794
2006	151,250	110,990	40,260
2007	153,245	112,474	40,771
2008	*161,505*	*118,831*	*42,673*
2009	*172,324*	*127,102*	*45,222*
2010	*176,604*	*130,572*	*46,033*
2011	*186,205*	*137,995*	*48,211*
2012	*186,847*	*138,791*	*48,056*
2013	*195,114*	*145,261*	*49,853*
2014	*211,761*	*158,006*	*53,755*
2015	*213,874*	*159,933*	*53,942*
2016	*215,869*	*161,772*	*54,097*
2017	*218,988*	*164,457*	*54,532*
2018	*222,796*	*167,663*	*55,133*
2019	*224,787*	*169,507*	*55,280*
2020	*225,844*	*170,645*	*55,199*
2021	*226,268*	*171,301*	*54,966*
2022	*230,137*	*174,568*	*55,570*
2023	*233,348*	*177,339*	*56,009*
2024	*237,120*	*180,542*	*56,578*
2025	*239,344*	*182,569*	*56,775*
Total, 2007–2025	*3,931,981*	*2,949,327*	*982,654*

Note: Data in italics are projections.

Table B.3. Increase in the number of bachelor's degrees awarded from the baseline to the moderate scenario

				Source of Increase				
Year	Total Number, Baseline Scenario	Total Number, Moderate Scenario	Increase in Number from Baseline to Moderate Scenario	Number Awarded at Private Colleges	Total Number Awarded at CSU and UC	Number Awarded at UC and CSU due to Higher Completion Rates	Number Awarded at UC and CSU due to Transfers from CCC	Number Awarded at UC and CSU due to Increased college-going
2008	158,961	161,505	2,543	381	2,162	1,973	189	-
2009	166,939	172,324	5,385	808	4,577	3,371	1,206	-
2010	168,391	176,604	8,213	1,232	6,981	4,329	2,652	-
2011	174,750	186,205	11,455	1,719	9,737	4,375	2,598	2,764
2012	172,591	186,847	14,256	2,138	12,118	5,419	3,276	3,423
2013	177,389	195,114	17,725	2,658	15,067	6,782	4,000	4,284
2014	189,491	211,761	22,269	3,341	18,929	8,669	4,783	5,477
2015	188,369	213,874	25,506	3,826	21,680	9,924	5,487	6,269
2016	187,132	215,869	28,738	4,310	24,427	11,244	6,080	7,103
2017	186,846	218,988	32,142	4,821	27,321	12,605	6,754	7,962
2018	187,101	222,796	35,695	5,355	30,340	14,031	7,446	8,864
2019	185,801	224,787	38,987	5,848	33,139	15,356	8,082	9,701
2020	183,735	225,844	42,110	6,316	35,793	16,483	8,897	10,413
2021	181,180	226,268	45,087	6,763	38,324	17,570	9,654	11,100
2022	181,377	230,137	48,761	7,315	41,447	19,139	10,217	12,091
2023	181,011	233,348	52,337	7,851	44,486	20,518	11,007	12,962
2024	181,040	237,120	56,080	8,412	47,668	21,948	11,856	13,865
2025	179,860	239,344	59,483	8,923	50,561	23,314	12,519	14,728
2008-2025	3,231,964	3,778,735	546,772	82,017	464,757	215,633	116,537	132,587

Table B.4. Total number of bachelor's degrees produced in the ambitious growth scenario

Year	Total Number	Number Awarded at CSU and UC	Number Awarded at Private Colleges in California
1990	97,917	26,261	23,551
1991	97,016	27,172	19,714
1992	104,549	29,648	21,236
1993	108,139	31,130	21,344
1994	108,829	30,776	22,695
1995	107,965	29,700	24,758
1996	107,795	29,721	25,255
1997	106,002	29,772	24,017
1998	109,598	29,608	26,494
1999	111,163	31,166	25,183
2000	120,273	32,741	31,929
2001	119,649	33,067	29,599
2002	127,794	34,716	31,615
2003	132,300	37,125	33,463
2004	137,795	38,579	33,475
2005	147,424	40,862	39,794
2006	151,250	41,640	40,260
2007	153,245	41,587	40,771
2008	*163,921*	*120,866*	*43,055*
2009	*177,439*	*131,410*	*46,030*
2010	*184,406*	*137,142*	*47,265*
2011	*197,088*	*147,159*	*49,929*
2012	*200,391*	*150,196*	*50,195*
2013	*211,953*	*159,441*	*52,512*
2014	*232,917*	*175,821*	*57,095*
2015	*238,105*	*180,337*	*57,767*
2016	*243,170*	*184,762*	*58,408*
2017	*249,524*	*190,170*	*59,353*
2018	*256,706*	*196,219*	*60,487*
2019	*261,824*	*200,696*	*61,128*
2020	*265,848*	*204,333*	*61,516*
2021	*269,101*	*207,371*	*61,729*
2022	*276,460*	*213,576*	*62,884*
2023	*283,068*	*219,209*	*63,859*
2024	*290,396*	*225,406*	*64,990*
2025	*295,853*	*230,156*	*65,697*
Total, 2007–2025	*4,451,415*	*3,315,857*	*1,064,670*

Note: Data in italics are projections.

Table B.5. Growth in the number of bachelor's degrees produced from the baseline to the ambitious scenario

				Source of Increase				
Year	Total Number, Baseline Scenario	Total Number, Ambitious Scenario	Increase in Number from Baseline to Ambitious Scenario	Number Awarded at Private Colleges	Total Number Awarded at CSU and UC	Number Awarded at UC and CSU due to Higher Completion Rates	Number Awarded at UC and CSU due to Transfers from CCC	Number Awarded at UC and CSU due to Increased college-going
2008	158,961	163,921	4,960	763	4,197	3,848	349	-
2009	166,939	177,439	10,500	1,616	8,885	6,804	2,081	-
2010	168,391	184,406	16,015	2,464	13,551	7,301	6,250	-
2011	174,750	197,088	22,338	3,437	18,901	7,790	6,367	4,744
2012	172,591	200,391	27,800	4,277	23,523	9,684	7,942	5,897
2013	177,389	211,953	34,564	5,317	29,247	12,198	9,621	7,428
2014	189,491	232,917	43,425	6,681	36,744	15,725	11,443	9,576
2015	188,369	238,105	49,736	7,651	42,084	18,072	13,008	11,005
2016	187,132	243,170	56,038	8,621	47,417	20,582	14,301	12,534
2017	186,846	249,524	62,678	9,642	53,034	23,167	15,758	14,109
2018	187,101	256,706	69,605	10,709	58,896	25,894	17,234	15,769
2019	185,801	261,824	76,024	11,696	64,328	28,445	18,560	17,323
2020	183,735	265,848	82,114	12,633	69,481	30,601	20,245	18,635
2021	181,180	269,101	87,921	13,526	74,394	32,699	21,783	19,912
2022	181,377	276,460	95,083	14,629	80,455	35,767	22,907	21,781
2023	181,011	283,068	102,057	15,701	86,356	38,449	24,492	23,415
2024	181,040	290,396	109,356	16,824	92,532	41,234	26,186	25,111
2025	179,860	295,853	115,993	17,845	98,148	43,930	27,466	26,752
2008-2025	3,231,964	4,298,170	1,066,207	164,032	902,173	402,188	265,995	233,990

Appendix C

Community College Peer Groups and Transfers

Table C.1. Number of transfers to CSU and UC per 1,000 four-year previous FTE, by college and race/ethnicity, 2007–08

College	Peer Group	**All Transfers**	Asian, Pacific Islander, Filipino Transfers	Black Transfers	Latino Transfers	White Transfers
Las Positas College	A1	**11.7**	10.6	5.1	12.2	10.5
Skyline College	A1	**9.3**	9.1	4.7	8.4	8.2
Crafton Hills College	A1	**8.9**	9.1	8.0	7.0	8.6
Cuesta College	A1	**10.4**	13.2	8.7	10.8	9.8
Santiago Canyon College	A1	**7.3**	10.1	7.6	3.5	8.8
Golden West College	A1	**9.6**	10.7	6.9	7.2	9.2
Glendale Community College	A1	**11.6**	12.2	5.3	8.5	9.2
Ventura College	A1	**10.5**	15.1	6.7	8.6	10.7
Butte Community College	A1	**8.5**	7.0	6.5	7.8	8.0
Sierra College	A1	**10.9**	15.6	6.7	9.3	9.9
Cuyamaca College	A1	**8.8**	9.4	9.0	6.3	8.1
Santa Barbara City College	A1	**10.3**	13.4	7.7	6.3	10.8
Evergreen Valley College	A1	**10.8**	12.8	9.7	6.8	9.3
Moorpark College	A1	**13.9**	15.3	10.6	12.3	14.5
Los Medanos College	A1	**7.4**	5.9	4.1	7.4	7.1
Orange Coast College	A1	**11.5**	13.6	9.4	8.6	10.8
Citrus College	A1	**8.1**	11.6	6.0	6.1	8.4
Cypress College	A1	**8.8**	11.0	5.9	7.1	7.4
Palomar College	A1	**9.1**	11.1	6.2	7.1	8.9
College of the Canyons	A1	**9.3**	13.7	8.6	8.8	9.4
Los Angeles Valley College	A1	**8.3**	6.9	6.0	6.8	9.0
Fullerton College	A1	**10.8**	12.5	8.3	9.2	9.7
San Diego City College	A1	**6.0**	6.4	3.2	6.6	6.4
Cosumnes River College	A1	**6.8**	8.2	4.1	6.2	5.7
Solano Community College	A1	**7.4**	9.3	3.9	5.6	6.6
Pierce College	A1	**11.7**	11.9	7.2	8.6	13.0
San Jose City College	A1	**7.1**	6.3	11.4	5.8	7.1
De Anza College	A1	**10.6**	13.7	6.3	7.3	9.1
Grossmont College	A1	**11.3**	11.6	9.1	10.1	11.2
San Diego Mesa College	A1	**9.9**	10.1	6.7	9.2	9.8
Los Angeles Harbor College	A1	**8.1**	6.7	7.6	6.8	9.6

Diablo Valley College	A1	**17.4**	22.7	9.6	15.4	16.2
Pasadena City College	A1	**10.7**	14.8	6.1	7.8	9.6
Mt. San Antonio College	A1	**9.0**	12.1	6.5	6.7	7.0
Sacramento City College	A1	**7.4**	8.2	3.9	6.3	7.8
Contra Costa College	A1	**8.4**	9.6	7.6	7.7	7.6
Long Beach City College	A1	**9.9**	10.8	7.6	9.5	9.4
Santa Monica College	A1	**13.0**	20.4	9.2	10.0	14.5
El Camino College	A1	**11.0**	14.9	6.9	9.9	11.7
Copper Mountain College	A2	**3.9**	3.9	2.6	3.4	3.8
Gavilan College	A2	**7.2**	9.1	3.5	6.2	5.9
College of the Redwoods	A2	**7.8**	6.1	5.0	9.7	7.1
Imperial Valley College	A2	**8.5**	11.1	5.8	8.2	8.5
College of the Desert	A2	**10.3**	16.0	11.1	8.8	11.0
Southwestern College	A2	**7.0**	7.8	6.2	6.6	6.2
Chabot College	A2	**9.1**	10.5	4.7	6.0	7.9
Lake Tahoe Community College	A3	**6.4**	2.2	0.0	3.5	6.9
Cerro Coso Community College	A3	**2.9**	6.4	0.7	3.4	2.6
Columbia College	A3	**8.4**	11.0	5.4	9.7	7.5
Feather River College	A3	**5.4**	7.2	1.1	8.1	4.1
College of the Siskiyous	A3	**3.8**	6.1	2.7	5.7	3.5
Folsom Lake College	A3	**7.1**	7.3	3.4	8.3	6.3
Coastline Community College	A3	**4.6**	6.0	1.2	5.6	4.2
Hartnell College	A3	**7.1**	10.2	2.1	6.8	8.7
Mendocino College	A3	**5.4**	6.6	5.6	5.1	4.9
Palo Verde College	A3	**1.5**	0.0	1.8	1.8	1.2
Taft College	A3	**8.4**	2.2	9.9	5.7	7.9
Barstow College	A3	**5.6**	16.2	4.1	6.5	3.9
Allan Hancock College	A3	**6.7**	5.6	6.3	6.0	6.7
Napa Valley College	A3	**8.6**	6.4	6.6	7.8	9.0
Santa Rosa Junior College	A3	**8.6**	10.3	5.7	6.2	8.0
Monterey Peninsula College	A3	**8.2**	10.4	8.6	7.4	8.1
American River College	A3	**7.4**	8.2	3.8	6.1	7.2
Merritt College	A3	**4.3**	3.9	4.7	3.5	2.3
West Los Angeles College	A3	**4.9**	4.7	4.7	4.7	4.2
Lassen Community College	A4	**3.0**	11.2	1.5	1.8	2.5
Cañada College	A4	**6.7**	5.8	5.9	4.4	7.0
Rio Hondo College	A4	**6.6**	10.8	5.2	6.3	4.7
Santa Ana College	A4	**7.3**	9.3	4.2	5.7	6.5
Mission College	A4	**6.5**	7.3	5.6	5.4	4.4
Merced College	A4	**17.5**	16.6	8.6	15.7	18.1
Los Angeles City College	A4	**5.8**	6.8	4.6	5.4	4.0
Compton Community College	A4	**4.5**	6.6	4.4	4.7	10.7
Los Angeles Trade-Technical College	A4	**3.6**	3.1	3.2	3.7	2.0

San Bernardino Valley College	A4	**6.6**	6.6	5.2	6.5	7.0
Los Angeles Southwest College	A4	**6.3**	0.0	5.9	6.2	0.0
College of Marin	A5	**6.0**	7.6	2.3	4.8	5.6
Irvine Valley College	A5	**11.4**	11.3	6.9	10.4	11.2
MiraCosta College	A5	**10.9**	11.6	4.4	8.8	10.4
Cabrillo College	A5	**8.1**	8.8	8.5	5.6	7.7
San Diego Miramar College	A5	**7.2**	9.8	5.6	4.3	6.2
Ohlone College	A5	**11.6**	11.8	6.3	12.0	10.4
College of San Mateo	A5	**9.1**	10.3	6.2	6.9	8.4
Foothill College	A5	**6.6**	8.8	3.9	4.9	6.6
Saddleback College	A5	**10.9**	13.5	8.9	9.6	10.3
West Valley College	A5	**10.8**	10.8	11.7	9.7	10.5
Berkeley City College	A5	**8.4**	5.6	6.7	7.5	11.0
College of Alameda	A5	**7.2**	7.4	5.7	6.5	6.8
City College of San Francisco	A5	**9.4**	10.3	5.9	6.1	8.3
Laney College	A5	**6.4**	7.4	4.5	4.2	7.8
Porterville College	A6	**5.2**	5.6	1.9	5.1	3.9
Shasta College	A6	**7.0**	9.5	4.8	9.0	7.7
East Los Angeles College	A6	**7.5**	10.9	2.5	6.1	5.5
Oxnard College	A6	**6.0**	8.1	3.4	6.2	3.8
West Hills College Coalinga (and Lemoore)	A6	**8.1**	14.6	3.7	6.0	8.9
Yuba College	A6	**7.4**	10.5	2.9	6.3	6.6
Reedley College	A6	**11.1**	19.9	6.6	10.0	11.9
College of the Sequoias	A6	**8.4**	9.1	4.3	7.3	9.0
Los Angeles Mission College	A6	**6.7**	6.4	5.7	6.3	4.6
Modesto Junior College	A6	**9.0**	11.1	5.6	7.4	9.2
Victor Valley College	A6	**10.5**	18.8	6.2	13.1	8.3
Mt. San Jacinto College	A6	**7.5**	11.9	6.1	6.3	7.3
Bakersfield College	A6	**8.3**	9.5	5.2	6.7	8.3
San Joaquin Delta College	A6	**8.5**	10.8	5.1	6.9	7.9
Fresno City College	A6	**14.0**	23.8	8.9	10.3	16.9
Chaffey Community College	A6	**7.9**	11.5	4.9	6.4	8.3
Antelope Valley College	A6	**10.1**	14.7	6.4	9.1	9.6
Cerritos College	A6	**7.7**	12.8	7.1	7.3	7.8
Riverside City College	A6	**7.8**	10.2	6.9	6.7	7.6

Appendix D
UC, CSU, and CCC Expenditures per FTE

In this report, we briefly address the fiscal costs of educating students in the UC, CSU, and CCC systems. To discuss per pupil expenditures, we use the CPEC 2008 Fiscal Profiles.[2] We focus on expenditures related directly to students, using Displays 31, 33, and 35, which show general purpose expenditures in program categories for UC, CSU, and CCC, respectively. For both UC and CSU, we include categories for instruction, academic support, student services, institutional support, and provisions for allocation expenditure but we exclude the organized research and public service categories. We do not make exclusions for the CCC expenditures.

The rest of this appendix describes the rationale behind the components of per pupil expenditures that were chosen for this report. These calculations were done by Patrick Murphy, associate professor of politics at the University of San Francisco and an adjunct fellow at PPIC. In general, the decisions regarding the use of particular data were made in an effort to produce a stable model, whose component parts are recognizable to, and replicable by, others in the policy community. In this manner, others can explore the effect on the capacity of the higher education system of policy choices that are not discussed in this report.

Enrollment

The first decision made with regard to enrollment is whether to use head counts or full-time equivalents. Although head counts reflect the total number of individuals participating in higher education, full-time equivalents better represent the cost of providing education services to students. For that reason, this project will base its projections on full-time equivalents.

CPEC already collects enrollment data and provides a relatively comparable presentation. There is a slight difference in the way enrollment figures are calculated across the three systems, but in general, the measures used to estimate the number of full-time equivalent students

[2] The "Fiscal Profiles" report is available at www.cpec.ca.gov/completereports/2008reports/FiscalProfiles2008.asp.

appear to be a sensible measure of current capacity. The specific differences in how these measures calculate these variables are as follows:

- FTES: The CCC system reports fulltime equivalent enrollment in terms of *full-time equivalent students* (FTES) which is a calculation based on contact hours. As with many metrics in the system, this measure of enrollment reflects the CCC system's K–12 roots. The CCC calculates how many contact hours (seat time) for all students systemwide and divides that total by 525 to determine FTES. The number 525 is based on the assumption that a full-time student will spend on average three hours per day in class on each of the 175 instructional days per year.
- FTE: The UC and CSU systems calculate *full-time equivalents* as a function of credit hour enrollments. For UC schools operating on a semester system, total undergraduate credit hours are divided by 30; graduate credits are divided by 24. For UC campuses operating on a quarter system, the denominators are 45 and 36. CSUs do not distinguish between graduate and undergraduate units and simply divide total credit hours from semester-based campuses by 30 and from quarter-based campuses by 45.[3]

Although these enrollment measures are not 100 percent comparable, they do approximate the level of "work" being carried out on the various campuses annually. They also are rational measures of the expectations for the completion of a degree. For example, the minimum number of units required for a bachelor's degree at a UC campus operating under a quarter system is 180 units. A full-time student, completing 45 units per year, would graduate in four years, assuming appropriate course selection. Finally, and perhaps most important, the FTE/FTES numbers are familiar to those in the higher education policy community and have been used for some time for similar analyses.

Instruction-Related Expenditures

Data on the costs associated with teaching and guiding students toward higher education degrees are compiled by both the U.S. Department of Education's NCES and by CPEC. For the purposes of this report, the CPEC figures are used. The NCES's methodology and figures appear to be reasonably reliable for recent years and are useful when making comparisons

[3] This information can be found in the Appendix B of the CPEC *Fiscal Profiles Report 2006*. See footnote 2.

across states.[4] However, the expenditure figures reported by CPEC are compiled using a methodology developed in consultation with the California Department of Finance, the Legislative Analyst's Office, and the three systems.[5] The CPEC expenditure figures also provide a longer time series of stable, historical estimates. Reflecting the total investment being made in California higher education, these instruction-related expenditures include resources from multiple sources, which include the state general fund, property taxes (in the case of the CCC), school funds, lottery funds, and student fees. The relative share that each source contributes to the total cost of educating a student is based on the data for the base year. Obviously, this mix is a function of policy decisions and can be altered, as is discussed elsewhere in this report.

Undergraduate Versus Graduate Student Cost

The estimates of cost do not distinguish between undergraduates and graduates. Clearly, the costs of educating a graduate student are different (and typically higher) than the average costs of educating an undergraduate. Making such a distinction would imply that it is possible to both systematically identify the difference and assign those costs appropriately. The higher education systems do not report figures that would facilitate such an assignment, however. It is also possible to make an argument that distinguishing between undergraduate and graduate students for the purposes of assigning costs may not be the most important differentiation. Such a division overlooks the fact that there are differences in the costs associated with different undergraduate programs as well. For example, the costs associated with completing an undergraduate nursing or biology degree would be expected to be more than the resources required to study history or philosophy. Indeed, these annual costs may even exceed those required to instruct a student in the humanities at the graduate level. Given the difficulty of making such distinctions, as well as the myriad of issues raised once one begins to try to differentiate costs associated with various programs, it seems prudent to treat all of the full-time equivalents the same for the purposes of constructing projections from the base year.

[4] The NCES data collection effort, IPEDS, was developed to collect data on all public and private higher education institutions across the United States. The methods by which data are collected have been evolving and the system was completely redesigned in 2000–01. It is now Web-based with institutions entering their data directly. Although all three California higher education systems participate in IPEDS, it is only in the most recent years that all of the campuses have taken part. Since the IPEDS system is a "bottom-up" reporting system, there is no systemwide check at the state level.

[5] CPEC, *Fiscal Profiles*, Appendix B. See footnote 2.

Student Aid

The issue of how much the state spends on student aid is a reflection of the state's commitment to making higher education more accessible. Education grants and tuition aid, then, are a significant component of the costs associated with higher education from the perspective of the individual student, but not the system as a whole. In determining the costs incurred by the state in providing higher education services, the level of student aid is considered to be external to the question of calculating capacity. It is conceivable that the state could decide to increase spending on aid significantly in future years. As this model is conceived, however, such a decision would not affect the capacity of public higher educational opportunities in the state. Instead, it would simply reduce the cost of attendance for individual students and, possibly, would make higher education more accessible to lower-income students.

Capital Costs

The uneven nature of capital investment renders single-year treatment of these expenditures a poor fit for the purposes of this approach. Other PPIC publications have already noted that California's capital expenditures for higher education in recent years have lagged relative to its growth in enrollment and to these expenditures in other large states.[6] It is safe to assume that future increases in enrollment would necessitate some proportional increase in capital expenditures over time. Therefore, these annual projections understate the total costs associated with increasing the capacity of the state's higher education system. We report the three public system's estimates of their own capital cost requirements to 2013–14 in the main body of the report.

Other Costs

A number of other elements could have an effect on the state's capacity to graduate students but they are not included in the model. For example, there has been some discussion that all three systems would function more efficiently if the students they enrolled were, on average, better prepared. Although the proposition is an interesting one, it is clearly beyond the scope of

[6] See Gordon et al. (2007). That study found that, over the period 1992–2002, California invested approximately $66,000 dollars in capital expenditures for each additional full-time equivalent student. That figure was less half the national average.

this project. Therefore, the level of preparation of incoming students is essentially treated as a constant for the purposes of projections.

Two other factors treated as constants are the degree of advising and support offered to students as well as the composition of course offerings. Increasing the quantity or quality of student advising services may decrease the time it takes a student to complete the requirements for a degree. Similarly, changes in the sequencing of courses, the times they are offered, and the number of sections offered could reduce the total time for degree completion. It would be extremely difficult to incorporate these elements into a capacity model, however. Their inclusion would imply an understanding of both the costs associated with these elements, as well as their effect on student progress; such an understanding is unlikely to exist.

Bibliography

Arcidiacono, Peter, "Ability Sorting and the Returns to College Major," *Journal of Econometrics,* Vol. 121, No. 1-2, 2004, pp. 343–375.

Baldassare, Mark, Dean Bonner, Jennifer Paluch, and Sonja Petek, "Californians and Higher Education," *PPIC Statewide Survey,* Public Policy Institute of California, San Francisco, California, November 2008.

Bettinger, Eric, "How Financial Aid Affects Persistence, "Case Western Reserve University - Department of Economics; National Bureau of Economic Research, NBER Working Paper No. W10242, January 2004.

Brand, Jennie E., and Yu Xie, "Who Benefits Most from College? Evidence for Negative Selection in Heterogeneous Economic Returns to Higher Education," *California Center for Population Research Online Working Paper Series*, University of California, Los Angeles, California, 2007.

California Community College Chancellor's Office, *California Community Colleges Government Relations Division 2007-08 Legislative Bill Analysis, SB 946*, 2008, available at http://www.cccco.edu/Portals/4/Executive/Board/2008_agendas/july/attach_3_1_sb_946.pdf.

California Department of Finance, *California Public Postsecondary Enrollment Projections, 2006 Series,* Sacramento, California, December 2006.

California Postsecondary Education Commission, *University Eligibility Study for the Class of 2003*, May 2004, available at www.cpec.ca.gov/completereports/2004reports/04-05.pdf.

California Postsecondary Education Commission, *California Higher Education Accountability: Goal – Student Success: Measure: First-Year Persistence Rates,* December 2006.

California Postsecondary Education Commission, *California Higher Education Accountability: Goal – Student Success, Measure: California Community College Students' Degrees and Certificates Awarded and Successful Transfers*, March 2007a, available at www.cpec.ca.gov/completereports/2007reports/07-06.pdf.

California Postsecondary Education Commission, *College-Going Rates: A Performance Measure in California's Higher Education Accountability Framework*, Commission Report 07-04, March 2007b, available at www.cpec.ca.gov/completereports/2007reports/07-04.pdf.

California Postsecondary Education Commission, *Who Can Afford It? How Rising Costs Are Making College Unaffordable for Working Families,* Sacramento, California, June 2008.

California State University, *California State University, University of California and Gov. Schwarzenegger Reach Agreement on Long-term Funding Plan for 2005/06 to 2010/11,* May 2004, available at www.calstate.edu/PA/news/2004/compact.shtml.

California State University, *Cost Saving Measures and Budget Update,* 2009, available at www.calstate.edu/executive/communications/090109.shtml.

Campaign for College Opportunity, *Practices with Promise 2008: A Collection of Working Solutions for College Opportunity and Student Success,* November 2008, available at www.collegecampaign.org/assets/docs/pwp/pwp-full-report-2008-11-19.pdf.

Driscoll, Anne K., "Beyond Access: How the First Semester Matters for Community College Students' Aspirations and Persistence," *Policy Analysis for California Education,* Policy Brief 07-2, Berkeley, California, August 2007.

Dynarski, Susan, "Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion," *American Economic Review*, Vol. 93, No. 1, 2003, pp. 279–288.

Dynarski, Susan, "Building the Stock of College-Educated Labor," *National Bureau of Economic Research Working Paper 11604*, September 2005, available at www.nber.org/papers/w11604.

Gordon, Larry, "University of California Officials Urge 6% Cut in Freshmen for Fall," *Los Angeles Times,* January 10, 2009, available at www.latimes.com/news/local/la-me-ucfreshmen10-2009jan10,0,3862072.story.

Gordon, Tracy M., Jaime Calleja Alderete, Patrick J. Murphy, Jon Sonstelie, and Ping Zhang, *Fiscal Realities: Budget Tradeoffs in California Government,* Public Policy Institute of California, San Francisco, California, 2007.

Hanak, Ellen, and Mark Baldassare, eds., *California 2025: Taking on the Future,* Public Policy Institute of California, San Francisco, California, 2005.

Hanushek, Eric, and Ludger Wößmann,"The Role of Education Quality in Economic Growth," World Bank Policy Research Working Paper 4122, February 2007, available at http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2007/01/29/000016406_20070129113447/Rendered/PDF/wps4122.pdf.

Hill, Elizabeth G., *Back to Basics: Improving College Readiness of Community College Students*, Legislative Analyst's Office, Sacramento, California, 2008.

Horn, Laura, and Stephen Lew, "California Community College Transfer Rates: Who Is Counted Makes a Difference," MPR Associates, Inc., Berkeley, California, 2007.

Johnson, Hans, and Deborah Reed, "Can California Import Enough College Graduates to Meet Workforce Needs?" *California Counts,* Vol. 8, No. 4, Public Policy Institute of California, San Francisco, California, May 2007.

Kane, Thomas J., "College Entry by Blacks since 1970: The Role of College Costs, Family Background, and the Returns to Education," *The Journal of Political Economy,* Vol. 102, No. 5, 1994, pp. 878–911.

Kane, Thomas J., "A Quasi-Experimental Estimate of the Impact of Financial Aid on College-Going," *National Bureau of Economic Research Working Paper 9703*, 2003, available at www.nber.org/papers/w9703.pdf.

Kelly, Patrick J., *As America Becomes More Diverse: The Impact of State Higher Education Inequality,* National Center for Higher Education Management Systems, November 2005, available at www.nchems.org/pubs/docs/Inequality%20Paper%20Jan2006.pdf.

Larsen, Eric, and Steve Lipscomb, "Education Facilities," *Just the Facts*, Public Policy Institute of California, San Francisco, California, September 2008.

Mortenson, Thomas G., ed., *Postsecondary Education Opportunity,* no date, available at http://www.postsecondary.org (subscription required).

Murray, Charles, "Should the Obama Generation Drop Out?" *New York Times,* December 28, 2008.

National Center for Education Statistics, "The Condition of Education 2005," U.S. Department of Education, NCES Paper 2005-094, Washington, D.C., 2005.

National Center for Education Statistics, Computation by DAS-T Online Version 5.0, "institution type by state, 2004 undergrads Variance estimation method: BRR," June 3, 2008.

National Center for Public Policy and Higher Education, *Measuring Up 2008: The National Report Card on Higher Education*, San Jose, California, 2008.

Organisation for Economic Co-operation and Development, "Education at a Glance," 2006, available at http://www.oecd.org/document/52/3343,en_2649_39263238_37328564_1_1_1_1,00.html.

Puente Project,"About Puente," 2008, available at www.puente.net/about/.

Reed, Deborah, *California's Future Workforce: Will There Be Enough College Graduates?* Public Policy Institute of California, San Francisco, California, 2008.

Robst, John, "Education and Job Match: The Relatedness of College Major and Work," *Economics of Education Review,* Vol. 26, No. 4, 2007, pp. 397–407.

Rose, Heather, "The Effects of Affirmative Action Programs: Evidence from the University of California at San Diego," *Education Evaluation and Policy Analysis,* Vol. 27, No. 3, Fall 2005, pp. 263–289.

Sengupta, Ria, and Christopher Jepsen, "California's Community College Students," *California Counts,* Vol. 8, No. 2, Public Policy Institute of California, San Francisco, California, November 2006.

Serban, Andreea, "An Analysis of Seven Case Studies Featuring Colleges with Consistently Higher-Than-Expected Transfer Rates," 2008, http://www.rpgroup.org/documents/TLC_Cross_Case_Analysis.pdf.

Shulock, Nancy, and Colleen Moore, *Rules of the Game: How State Policy Creates Barriers to Degree Completion and Impedes Student Success in the California Community Colleges,* Institute for Higher Education Leadership and Policy, Sacramento, California, 2007.

St. John, Edward P., Glenda Droogsma Musoba, Ada B. Simmons, and Choong-Geun Chung, *Meeting the Access Challenge: Indiana's Twenty-First Century Scholars Program,* Lumina Foundation for Education, Indianapolis, Indiana, 2002.

University of California, "UC Systemwide Enrollment Projections: Undergraduate & Graduate Enrollment Through 2020–21 Phase I Report 2008," Paper 5, 2008, available at repository.ucop.edu/enrllmt_projections_reports/5.

University of California Office of the President, "UC President to Bring Proposal to Board of Regents Providing Minimum Gift Aid for Lower-Income Students," January 22, 2009, available at www.universityofcalifornia.edu/news/article/19341.

Zau, Andrew C., and Julian R. Betts, Predicting Success, Preventing Failure: An Investigation of the California High School Exit Exam, Public Policy Institute of California, San Francisco, California, 2008.