



1301 Fifth Avenue
Suite 3800
Seattle, WA 98101-2605
USA

Tel +1 206 624 7940
Fax +1 206 623 3485

milliman.com

March 26, 2013

Teachers' Retirement Board
California State Teachers' Retirement System

**Re: Defined Benefit Supplement Program
Actuarial Valuation as of June 30, 2012**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Defined Benefit Supplement (DBS) Program of the State Teachers' Retirement Plan as of June 30, 2012. Details about the actuarial valuation are contained in the following report.

We certify that the information included in this report is complete and accurate to the best of our knowledge and belief. Please refer to Section 2 of this report for our full actuarial certification statement.

All costs, liabilities, rates of interest and other factors for CalSTRS have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of CalSTRS and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting CalSTRS. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of CalSTRS and to reasonable expectations which, in combination, represent a reasonable estimate of anticipated experience. The Teachers' Retirement Board has sole authority to determine the actuarial assumptions and methods used for the valuation of the CBB Program. The Board adopted the actuarial methods and assumptions used in the 2012 valuation.

Actuarial computations presented in this report are for purposes of assessing the funding of the DBS Program. The calculations in the enclosed report have been made on a basis consistent with our understanding of the DBS Program funding. Determinations for other purposes may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

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The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

We would like express our appreciation to the CalSTRS staff who gave substantial assistance in supplying the data on which this report is based.

Respectfully submitted,



Nick J. Collier, ASA, EA, MAAA
Consulting Actuary
NJC/MCO/nlo



Mark C. Olleman, FSA, EA, MAAA
Consulting Actuary

California State Teachers' Retirement System

Defined Benefit Supplement Program - 2012 Actuarial Valuation

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California State Teachers' Retirement System

Defined Benefit Supplement Program - 2012 Actuarial Valuation

Section 1 Summary of the Findings



The Defined Benefit Supplement (DBS) Program was established on January 1, 2001. All contributing members of the Defined Benefit Program participate in the DBS Program.

Date of Valuation	Number of Non-Retired Participants		Accumulated Account Balances
	Active	Total	
June 30, 2007	455,453	535,524	\$4,308,179,023
June 30, 2008	460,395	549,596	5,434,170,775
June 30, 2009	458,243	557,897	6,316,153,745
June 30, 2010	440,824	553,380	6,552,302,589
June 30, 2011	417,262	538,915	7,196,652,386*
June 30, 2012	403,117	530,880	7,280,976,741*

* Includes 2006 & 2007 Additional Earnings Credits not previously reported.

The Actuarial Value of Assets for this valuation is the Fair Market Value as provided to us by CalSTRS. The actual return for the year, as measured using uniform cash flow throughout the year, was about 1.7% net of investment and administrative expenses.

(\$ Thousands)	Year Ended June 30, 2012	Year Ended June 30, 2011
Additions		
Contributions*	\$ 102,570	\$ 410,820
Earnings	<u>139,152</u>	<u>1,514,007</u>
Total Additions	\$ 241,722	\$ 1,924,827
Deductions		
Benefits	\$ 247,847	\$ 275,905
Expenses	<u>6,886</u>	<u>6,140</u>
Total Deductions	\$ 254,733	\$ 282,045
Net Increase (Decrease)	\$ (13,011)	\$ 1,642,782
Net Assets		
Beginning of Year	\$ 8,054,962	\$ 6,412,180
Accounting Adjustments	139	0
Net Increase (Decrease)	<u>(13,011)</u>	<u>1,642,782</u>
End of Year	\$ 8,042,090	\$ 8,054,962
Estimated Net Rate of Return	1.7%	23.3%

*As of December 31, 2010, one-quarter of the member's DB Program contributions are no longer redirected to the DBS Program.

**Summary of Findings
(continued)**

As of June 30, 2012 the Actuarial Value of Assets of the DBS Program exceeds the Actuarial Obligation by \$50,527,000. This number is the negative Unfunded Actuarial Obligation (UAO), sometimes referred to as an Actuarial Surplus. If the experience had emerged as assumed, the Actuarial Surplus was expected to grow from \$281,195,000 to \$302,284,000. The difference between the actual and expected Unfunded Actuarial Obligation is the actuarial gain or loss for the year.

- There was an actuarial loss of \$466,269,000 due to the actual investment return being less than last year's assumed long-term return of 7.50%.
- There was an actuarial gain of \$214,512,000 due primarily to the current year interest credits being less than 7.50% during the year. The Minimum Interest Rate for 2011-12 was 4.25%.
- The net actuarial loss was \$251,757,000, which reduced the Funded Ratio to 100.63%.

The valuation results are based on the June 30, 2012 fair market value of assets.

(\$ Thousands)	June 30, 2012	June 30, 2011
Actuarial Balance Sheet		
Actuarial Obligation (before Add'l Credits)	\$ 7,991,563	\$ 7,773,767
Actuarial Value of Assets	<u>8,042,090</u>	<u>8,054,962</u>
Unfunded Actuarial Obligation	\$ (50,527)	\$ (281,195)
Additional Earnings Credit	0	0
Additional Annuity Credit	<u>0</u>	<u>0</u>
Final Unfunded Actuarial Obligation	\$ (50,527)	\$ (281,195)
Funded Ratio		
Before Add'l Credits	100.63%	103.62%
After Add'l Credits	100.63%	103.62%
(Assets ÷ Actuarial Obligation)		
Actuarial (Gain) or Loss		
Investment Return on Assets	\$ 466,269	\$ (1,038,093)
Interest Credits on Accounts	<u>(214,512)</u>	<u>(363,073)</u>
Actuarial (Gain) or Loss	\$ 251,757	\$ (1,401,166)
Expected UAO at End of Year	<u>(302,284)</u>	<u>1,119,971</u>
Total Unfunded Actuarial Obligation	\$ (50,527)	\$ (281,195)

**Summary of Findings
(continued)**

The Board established a Policy on June 9, 2006 that was effective for the Additional Earnings Credit and Additional Annuity Credit decisions beginning in 2006.

The Board's Policy calls for a two-step determination of the allocation as shown in detail in this report. Based on the Board's Policy, we recommend that no Additional Earnings Credit or Additional Annuity Credit be granted as of June 30, 2012. This report assumes that the Board will adopt this recommendation.

The following chart shows a history of prior Board actions.

<i>(\$ Thousands)</i>	Available Reserves and Unallocated Gains (Losses)	Additional Credits Adopted	Final Gain and Loss Reserve
June 30, 2002	\$ (51,292)	\$ 0	\$ (51,292)
June 30, 2003	(47,366)	0	(47,366)
June 30, 2004	168,630	0	168,630
June 30, 2005	266,978	0	266,978
June 30, 2006	423,269	88,201	335,068
June 30, 2007	954,762	195,223	759,539
June 30, 2008	8,769	0	8,769
June 30, 2009	(1,453,334)	0	(1,453,334)
June 30, 2010	(1,044,262)	0	(1,044,262)
June 30, 2011	281,195	0	281,195
June 30, 2012	50,527	0	50,527

Future Funding

As noted, the DBS Program has a slightly negative UAO, since the value of assets is greater than the current value of the Actuarial Obligation. Under the current structure, the only contributions to the DBS Program go directly to the members' accounts. Beginning with the 2011 actuarial valuation, it is assumed that the Program assets will earn 7.50% (previously, 7.25% was assumed); whereas, accounts are currently being credited a much lower interest rate. To the extent that these assets earn more than the accounts are credited in the future, the funding surplus will continue to grow. Therefore, the actuarially determined contribution in accordance with the funding policy is equal to the actual contributions that will be required to be made to the DBS Program according to the California Education Code. The funding situation should be monitored closely going forward.

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California State Teachers' Retirement System

Defined Benefit Supplement Program - 2012 Actuarial Valuation

Section 2 Actuarial Certification

The major findings of the 2012 Actuarial Valuation are contained in this report. This report reflects the benefit provisions and contribution rates in effect as of the valuation date. To the best of our knowledge and belief, this report is complete and accurate and contains sufficient information to fully and fairly disclose the funded condition of the Defined Benefit Supplement Program as of June 30, 2012.

In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by CalSTRS' staff. This information includes, but is not limited to, statutory provisions, employee data and financial information. In our examination of these data, we have found them to be reasonably consistent and comparable with data used for other purposes. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

All costs, liabilities, rates of interest and other factors for CalSTRS have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of CalSTRS and reasonable expectations); and which, in combination, offer a reasonable estimate of anticipated experience affecting CalSTRS. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of CalSTRS and to reasonable expectations which, in combination, represent a reasonable estimate of anticipated experience. The Teachers' Retirement Board has sole authority to determine the actuarial assumptions and methods used for the valuation of the DBS Program. The Board adopted the actuarial methods and assumptions used in the 2012 valuation.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles. We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



Nick J. Collier, ASA, EA, MAAA
Consulting Actuary



Mark C. Olleman, FSA, MAAA
Consulting Actuary

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California State Teachers' Retirement System

Defined Benefit Supplement Program - 2012 Actuarial Valuation

Section 3 Findings of the Actuarial Valuation



An actuarial valuation is performed as of June 30 of each year, the last day of the Program's plan year. The primary purpose of the valuation is to determine the financial condition of the DBS Program through the measurement of the Gain and Loss Reserve. We also describe recent changes in the Program's financial condition and provide certain disclosure information in accordance with the Governmental Accounting Standards Board (GASB) Statement No. 25.

The findings have been determined according to actuarial assumptions that were adopted on the basis of recent experience and current expectations of future experience. In our opinion, the assumptions used in the valuation are reasonably related to the past experience of the DBS Program and represent a reasonable estimate of future conditions affecting the Program. Nevertheless, the emerging costs of the Program will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions.

Actuarial Value of Assets

The Actuarial Value of Assets for this valuation is the Fair Market Value as reported by CalSTRS. A Statement of Program Assets for the last two plan years is shown in **Table 1**, and the Statement of Change in Program Assets is shown in **Table 2**.

The investment return for 2011-12 was calculated to be 1.7% net of all investment and administrative expenses, and assuming uniform cash flow throughout the year. This is an estimate only for the purpose of comparing investment experience from one year to the next and will likely differ from information provided by your investment advisors.

Actuarial Balance Sheet

Under the Traditional Unit Credit Actuarial Cost Method, when the assumed investment return is equal to the assumed interest crediting rate, the Normal Cost is equal to the contributions made during the year and the Actuarial Obligation is equivalent to the current sum of the Members' Account Balances plus a reserve for current annuity payments. **Table 3** shows the Actuarial Obligation for this and the prior valuation.

Actuarial Balance Sheet (continued)

For the purpose of this valuation, the account information was provided to us by CalSTRS, including Additional Earnings Credits granted for 2006 and 2007. We checked the information for reasonableness by reviewing the individual member records supplied to us. We independently calculated the value of the annuitized benefits.

The excess of the Actuarial Obligation over the Actuarial Value of Assets is called the Unfunded Actuarial Obligation. If the Actuarial Value of Assets exceeds the Actuarial Obligation, the difference is called the Actuarial Surplus.

If all experience emerged as assumed every year, the DBS Program would have an Actuarial Surplus at the end of each year before any Additional Earnings Credit or Additional Annuity Credit. This is because the Minimum Interest Rate is less than the assumed earnings rate. In order to retain an Actuarial Surplus, the investment returns over a long period of time must exceed the combination of the Minimum Interest Rates, the Additional Earnings Credits and the Additional Annuity Credits.

Although we expect this to be the case, investment performance for several prior years was below the long-term assumption.

Actuarial Gains and Losses

The Minimum Interest Rate for the year ending on the valuation date was 4.25%. Since the assumed total earnings rate last year was 7.50% per year, the increase in the Actuarial Obligation was less than expected. The total actuarial gain on the Actuarial Obligation was \$214,512,000.

Last year, the assumed earnings rate on the invested assets was 7.50% per year. The actual return for the year was about 1.7% (net of investment and administrative expenses and assuming uniform cash flow though the year, which is slightly different than how interest is actually posted), which produced an investment loss of \$466,269,000.

The assumed earnings rate for future years will be 7.50%, as adopted by the Board in February 2012.

The total actuarial loss due to all causes was \$251,757,000 as shown in **Table 4**.

Contributions and Normal Costs

As shown in Table 4, the Normal Costs of the Defined Benefit Supplement Program are equal to the actual contributions. They are shown as the actual dollar amount of contributions. The timing in Table 4 is therefore consistent with the fact that contributions are spread over the entire year and correspond to payroll timing. The total contributions of \$102,570,000 were made up of \$44,875,000 in employee contributions, and \$57,695,000 in employer contributions.

Gain and Loss Reserve

Table 5 shows the derivation of the Gain and Loss Reserve. After each actuarial valuation, the Teachers' Retirement Board decides on the adjustment to the prior year's Gain and Loss Reserve and the Additional Earnings Credit, if any.

This report assumes the Teachers' Retirement Board will allocate the unallocated loss to funding and that none of the current Gain and Loss Reserve will be used for Additional Earnings Credits or Additional Annuity Credits.

Additional Credits Based on Board Policy

Based on the Board's Policy, we recommended that no Additional Earnings Credit or Additional Annuity Credit be granted as of June 30, 2012.

The Board's Policy calls for a two-step determination of the allocation.

- The first step in the process allocates the excess of the Actuarial Surplus over twice the Minimum Interest Rate in the year after the valuation date, but limited by the long-term assumed rate of earnings.

First Allocation

Long-term Net Investment Return	7.50%
Minimum Interest Rate (year prior to valuation)	<u>4.25</u>
Maximum Available in First Allocation (1)	3.25%
Actuarial Surplus	0.63%
First Threshold (2012-13 MIR x 2)	<u>7.50</u>
Actuarial Surplus in excess of First Threshold (2)	0.00%
First Allocation [lesser of (1) and (2)]	0.00%

- The second step is not necessary this year.

Details of the calculation are shown in **Table 6**.

Accounting Disclosures

GASB has issued statements that describe the information to be disclosed in the System's financial reports. The required actuarial disclosures are shown in **Tables 7, 8 and 9**.

Supplemental Information

Supplemental information that is recommended to be disclosed by the California Actuarial Advisory Panel is shown in **Tables 10, 11 and 12**.

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 1
Statement of Program Assets

<i>(\$ Thousands)</i>	June 30, 2012	June 30, 2011
Invested Assets		
Short-term Investments	\$ 143,039	\$ 75,355
Pooled Domestic Securities	1,462,040	1,897,669
Pooled Domestic Equity	3,981,291	5,706,837
Private Equity	1,198,192	0
Real Estate	1,077,464	0
Absolute Return	16,693	195,703
Overlay	<u>32,754</u>	<u>0</u>
Total Investments	\$ 7,911,473	\$ 7,875,564
Receivables	143,897	208,761
Liabilities	<u>(13,280)</u>	<u>(29,363)</u>
Fair Market Value of Net Assets	\$ 8,042,090	\$ 8,054,962

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 2
Statement of Change in Program Assets

(\$ Thousands)	Year Ended June 30, 2012	Year Ended June 30, 2011
Additions		
Contributions		
Members	\$ 44,875	\$ 341,919
Employers	<u>57,695</u>	<u>68,901</u>
Total Contributions	102,570	410,820
Net Earnings	<u>139,152</u>	<u>1,514,007</u>
Total Additions	\$ 241,722	\$ 1,924,827
Deductions		
Benefit Payments		
Retirement, Death and Survivor	\$ 223,411	\$ 249,949
Refunds of Member Contributions	<u>24,436</u>	<u>25,956</u>
Total Benefits	247,847	275,905
Expenses	<u>6,886</u>	<u>6,140</u>
Total Deductions	\$ 254,733	\$ 282,045
Net Increase (Decrease)	\$ (13,011)	\$ 1,642,782
Fair Market Value of Net Assets		
Beginning of Year	\$ 8,054,962	\$ 6,412,180
Accounting Adjustments	139	0
Net Increase (Decrease)	<u>(13,011)</u>	<u>1,642,782</u>
End of Year	\$ 8,042,090	\$ 8,054,962
Estimated Net Rate of Return	1.7%	23.3%
- assuming uniform cash flow through the year		
- net of investment and administrative expenses		

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 3
Actuarial Balance Sheet

<i>(\$ Thousands)</i>	June 30, 2012	June 30, 2011
Total Requirements		
Actuarial Obligation		
Retirees and Beneficiaries	\$ 710,586	\$ 577,115
Inactive Members	423,212	375,115
Active Members	<u>6,857,765</u>	<u>6,821,537</u>
Total Requirements	\$ 7,991,563	\$ 7,773,767
Total Resources		
Actuarial Value of Assets	\$ 8,042,090	\$ 8,054,962
Unfunded Actuarial Obligation or (Actuarial Surplus)	<u>(50,527)</u>	<u>(281,195)</u>
Total Resources	\$ 7,991,563	\$ 7,773,767
Funded Ratio	100.63%	103.62%

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 4
Actuarial Gains and Losses

<i>(\$ Thousands)</i>	Actuarial Obligation	Actuarial Value of Assets	Unfunded Actuarial Obligation
Balance at June 30, 2011	\$ 7,773,767	\$ 8,054,962	\$ (281,195)
Expected Changes			
Actual Contributions/Normal Cost	102,570	102,570	0
Actual Benefits Paid	(247,847)	(247,847)	0
Expected Earnings / Credits	<u>577,585</u>	<u>598,674</u>	<u>(21,089)</u>
Expected Balance at June 30, 2012	\$ 8,206,075	\$ 8,508,359	\$ (302,284)
Actuarial Gains or Losses			
(Gain)/Loss on Actuarial Obligation	(214,512)		
Gain/(Loss) on Assets		(466,269)	
Net (Gain) or Loss on UAO	<u> </u>	<u> </u>	<u>251,757</u>
Actual Balance at June 30, 2012	\$ 7,991,563	\$ 8,042,090	\$ (50,527)

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 5
Gain and Loss Reserve

<i>(\$ Thousands)</i>	June 30, 2012	June 30, 2011
Unfunded Actuarial Obligation	\$ (50,527)	\$ (281,195)
Gain and Loss Reserve		
Beginning of Year	\$ 281,195	\$(1,044,262)
Additional Earnings Credit	0	0
Additional Annuity Credit	0	0
Allocated to Funding	<u>(230,668)</u>	<u>1,325,457</u>
End of Year Gain and Loss Reserve	\$ 50,527	\$ 281,195
Unallocated Gains and (Losses)	\$ 0	\$ 0

<i>(\$ Thousands)</i>	Available Reserves and Unallocated Gains (Losses)	Additional Earnings Credit Adopted	Final Gain and Loss Reserve
Valuation Date			
June 30, 2002	\$ (51,292)	\$ 0	\$ (51,292)
June 30, 2003	(47,366)	0	(47,366)
June 30, 2004	168,630	0	168,630
June 30, 2005	266,978	0	266,978
June 30, 2006	423,269	88,201	335,068
June 30, 2007	954,762	195,223	759,539
June 30, 2008	8,769	0	8,769
June 30, 2009	(1,453,334)	0	(1,453,334)
June 30, 2010	(1,044,262)	0	(1,044,262)
June 30, 2011	281,195	0	281,195
June 30, 2012	50,527	0	50,527

**California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation**

**Table 6
Additional Credits Based on Board Policy**

	June 30, 2012	June 30, 2011
Funded Ratio before Additional Credits	100.63%	103.62%
Actuarial Surplus	0.63%	3.62%
Minimum Interest Rate (year following valuation date)	3.75%	4.25%
First Threshold	7.50%	8.50%
Second Threshold	11.25%	12.75%
First Allocation		
Long-term Net Investment Return	7.50%	7.50%
Minimum Interest Rate (MIR) (year prior to valuation)	<u>4.25</u>	<u>4.50</u>
Maximum Available in First Allocation (1)	3.25%	3.00%
Actuarial Surplus	0.63%	3.62%
First Threshold (2 x MIR for year following valuation date)	<u>7.50</u>	<u>8.50</u>
Actuarial Surplus in excess of First Threshold (2)	0.00%	0.00%
First Allocation [lesser of (1) and (2)]	0.00%	0.00%
Second Allocation		
Remaining Actuarial Surplus	0.00%	0.00%
Second Threshold (3 x MIR for year following valuation date)	<u>11.25%</u>	<u>12.75%</u>
Actuarial Surplus in excess of Second Threshold	0.00%	0.00%
Less 50%	<u>(0.00)</u>	<u>(0.00)</u>
Available for Second Allocation	0.00%	0.00%
Recommended Additional Earnings Credit and Additional Annuity Credit based on Policy		
As a percentage of Actuarial Obligation as of the valuation date	0.00%	0.00%
As a dollar amount (\$ Thousands)	\$ 0	\$ 0

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 7
History of Cash Flow

Year End	Contributions for the Year	Expenditures During the Year				External Cash Flow	Fair Market Value of Assets
		Benefit Payments	Contribution Refunds	Expenses	Total		
2001	\$ 210,205	\$ 0	\$ 0	\$ 113	\$ 113	\$210,092	\$ 206,916
2002	487,185	0	4,982	255	5,237	481,948	660,148
2003	604,853	0	17,102	580	17,682	587,171	1,311,269
2004	691,081	41,991	3,078	1,206	46,275	644,806	2,203,682
2005	669,706	75,426	8,599	1,740	85,765	583,941	3,023,177
2006	703,104	97,997	14,032	1,952	113,981	589,123	3,951,327
2007	749,844	97,221	18,026	2,464	117,711	632,133	5,381,585
2008	802,380	139,435	17,716	2,903	160,054	642,326	5,636,113
2009	822,010	156,458	29,823	3,385	189,666	632,344	5,145,981
2010	796,743	223,733	13,673	6,113	243,519	553,224	6,412,180
2011	410,820	249,949	25,956	6,140	282,045	128,775	8,054,962
2012	102,570	223,411	24,436	6,886	254,733	(152,163)	8,042,090

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table 8
Schedule of Funding Progress

(\$ Thousands)

Year End	Actuarial Value of Assets	Actuarial Accrued Liability	Unfunded Actuarial Accrued Liability	Funded Ratio Assets/AAL	Estimated Covered Payroll	Coverage Ratio UAAL/Pay
2001	\$ 206,916	\$ 213,169	\$ 6,253	97%	\$ 20,494,000	0%
2002	660,148	711,440	51,292	93%	21,732,000	0%
2003	1,311,269	1,358,635	47,366	97%	22,654,000	0%
2004	2,203,682	2,035,052	(168,630)	108%	22,589,000	(1)%
2005	3,023,177	2,756,199	(266,978)	110%	23,257,000	(1)%
2006	3,951,327	3,616,259	(335,068)	109%	24,240,000	(1)%
2007	5,381,585	4,622,046	(759,539)	116%	25,906,000	(3)%
2008	5,636,113	5,627,344	(8,769)	100%	27,118,000	0%
2009	5,145,981	6,599,315	1,453,334	78%	27,327,000	5%
2010	6,412,180	7,456,442	1,044,262	86%	26,274,000	4%
2011	8,054,962	7,773,767	(281,195)	104%	25,536,000	(1)%
2012	8,042,090	7,991,563	(50,527)	100%	25,091,000	(0)%

California State Teachers' Retirement System
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Table 9
Schedule of Employer Contributions

(\$ Thousands)

Year End	Annual Required Contribution	Contributed by Employers	Contributed by the State	Total Contributed	Percentage Contributed
2001	\$ 0	\$ 0	\$ 0	\$ 0	100%
2002	0	0	0	0	100%
2003	72,243	72,243	0	72,243	100%
2004	125,288	125,288	0	125,288	100%
2005	95,596	95,596	0	95,596	100%
2006	103,956	103,956	0	103,956	100%
2007	111,375	111,375	0	111,375	100%
2008	117,583	117,583	0	117,583	100%
2009	121,159	121,159	0	121,159	100%
2010	145,273	145,273	0	145,273	100%
2011	68,901	68,901	0	68,901	100%
2012	57,695	57,695	0	57,695	100%

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**Table 10
Reconciliation of Changes in Unfunded Actuarial Obligation**

(\$ Thousands)

Year End	Beginning of Year UAO	Expected Earnings/ Credits	(G)/L on Actuarial Obligation	(G)/L on Assets	End of Year UAO
2010	\$ 1,453,334	\$ 112,633	\$ (235,331)	\$ (286,374)	\$ 1,044,262
2011	\$ 1,044,262	\$ 75,709	\$ (363,073)	\$ (1,038,093)	(281,195)
2012	\$ (281,195)	\$ (21,089)	\$ (214,512)	\$ 466,269	(50,527)

**California State Teachers' Retirement System
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**Table 11
Changes in Economic Assumptions⁽¹⁾**

Year	Price Inflation	Wage Inflation	Investment Return
2010	3.00%	4.00%	7.25%
2011	3.00%	3.75%	7.50%
2012	3.00%	3.75%	7.50%

(1) *These changes in assumptions did not have a material financial impact since the active account balances are assumed to adjust to actual experience, and retired liabilities have been small. Rationales are provided in the corresponding Investigation of Experience reports.*

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**Table 12
Smoothing and Volatility Rates**

Year	Asset Smoothing Ratio AVA/MVA	Asset Volatility Ratio MVA/Payroll	Liability Volatility Ratio AAL/Payroll
2001	100%	1.0%	1.0%
2002	100%	3.0%	3.3%
2003	100%	5.8%	6.0%
2004	100%	9.8%	9.0%
2005	100%	13.0%	11.9%
2006	100%	16.3%	14.9%
2007	100%	20.8%	17.8%
2008	100%	20.8%	20.8%
2009	100%	18.8%	24.1%
2010	100%	24.4%	28.4%
2011	100%	31.5%	30.4%
2012	100%	32.1%	31.9%

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California State Teachers' Retirement System

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Appendix A Provisions of Governing Law



All of the actuarial calculations contained in this report are based upon our understanding of the Defined Benefit Supplement (DBS) Program of the State Teachers' Retirement Plan as contained in Part 13 of the California Education Code. The provisions used in this valuation are summarized below for reference purposes.

Membership

- Eligibility Requirement:** All members of the Defined Benefit Program who perform creditable service and earn creditable compensation after December 31, 2000.
- Member:** An eligible employee with creditable service subject to coverage, who has contributions credited in the Program or is receiving an annuity from the Program.

Account Balance

- Account Balance:** Nominal accounts established for the purpose of determining benefits payable to the Member. Accounts are credited with Contributions, a Minimum Interest Rate (MIR) and Additional Earnings Credits.
- Contributions:** One-quarter (2% of compensation) of the DB Program Member contributions on creditable compensation was allocated to the Member's DBS Account through December 31, 2010.
- In addition, member and employer contributions will be credited to the Member's DBS Account for service greater than one year (ESC) and compensation for Limited Term Enhancements and retirement incentives (LTE).
- Minimum Interest Rate:** Annual rate determined for the plan year by the Retirement Board in accordance with federal laws and regulations. The MIR is equal to the average of the yields on 30-year Treasuries for the 12 months ending in February preceding the beginning of the plan year, rounded to the next highest 0.25%.
- Additional Earnings Credit:** Annual rate determined for the plan year by the Retirement Board based on the actual earnings during the plan year, but only to the extent the earnings are sufficient to credit the MIR and provide any additions to the Gain and Loss Reserve deemed warranted by the Board.
- Additional Annuity Credit:** Annual rate determined for the plan year by the Retirement Board based on the actual earnings during the plan year, but only to the extent the earnings are sufficient to credit the MIR and provide any additions to the Gain and Loss Reserve deemed warranted by the Board.

Normal Retirement

Eligibility Requirement: Receipt of a corresponding benefit under the DB Program.

Benefit: The DBS Account Balance at the benefit effective date subject to limits imposed under Internal Revenue Code Section 415.

Form of Payment: The normal form of payment is a lump sum distribution. Annuity options are available if the DBS Account equals or exceeds \$3,500.

Early Retirement

Eligibility Requirement: Same as Normal Retirement.

Benefit and Form: Same as Normal Retirement.

Late Retirement

Benefit and Form: Same as Normal Retirement.

Contributions and earnings continue to be credited to the Account Balances until distributed.

Deferred Retirement

Benefit: A Member must receive a DBS benefit when the corresponding benefit is received under the DB Program.

Disability Benefit

Eligibility Requirement: Receipt of a corresponding benefit under the DB Program.

Benefit: The DBS Account Balance at the date the disability benefit becomes payable. An annuity benefit is discontinued upon the termination of the corresponding DB Program benefit.

Form of Payment: Same as Normal Retirement.

Death Before Retirement

Eligibility Requirement: Deceased Member has a DBS Account Balance.

Benefit: The DBS Account Balance at the date of death payable to the designated beneficiary.

Form of Payment: Same as Normal Retirement.

Death After Retirement

Eligibility Requirement: The deceased Member was receiving an annuity.
Benefit: According to the terms of the annuity elected by the Member.

**Termination from
the Program**

Eligibility Requirement: Termination of all CalSTRS-covered employment.
Benefit: Lump-sum distribution of the DBS Account Balance as of the date of distribution. The benefit is payable one year from the termination of creditable service.

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Defined Benefit Supplement Program - 2012 Actuarial Valuation

Appendix B Actuarial Methods and Assumptions



This section of the report discloses the actuarial methods and assumptions used in this Actuarial Valuation. These methods and assumptions have been chosen on the basis of recent experience of the DBS Program and on current expectations as to future economic conditions.

The assumptions are intended to estimate the future experience of the members of the DBS Program and of the DBS Program itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in estimated costs of the DBS Program's benefits.

Actuarial Cost Method

The accruing costs of all benefits are measured by the Traditional Unit Credit Actuarial Cost Method. Under this method, the projected benefits of each individual member are allocated by a consistent formula to valuation years. The actuarial present value of future projected benefits allocated to the current year is called the Normal Cost. The actuarial present value of future projected benefits allocated to periods prior to the valuation year is called the Actuarial Obligation.

The Actuarial Obligation is equal to the accumulated account balances and the Normal Cost is equal to the total annual contribution.

Asset Valuation Method

The assets are valued at Fair Market Value.

Actuarial Assumptions

The Actuarial Standards Board has adopted Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. This Standard provides guidance on selecting economic assumptions under defined benefit retirement programs such as the System. In our opinion, the economic assumptions have been developed in accordance with the Standard.

The Actuarial Standards Board has adopted Actuarial Standard of Practice No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This Standard provides guidance on selecting demographic assumptions under defined benefit retirement programs such as the System. In our opinion, the demographic assumptions have been developed in accordance with the Standard.

**Actuarial
Assumptions
(continued)**

The assumptions are intended to estimate the future experience of the members of the DBS Program and of the System itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in estimated costs of the Program's benefits.

The demographic assumptions are listed in **Table B.1** and illustrated at selected ages and duration combinations in **Table B.2**.

California State Teachers' Retirement System

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Table B.1
List of Major Valuation Assumptions

I. Economic Assumptions

A.	Investment Return (net of investment and administrative expenses)	7.50%
B.	Interest on Member Accounts	7.50%
C.	Wage Growth	3.75%
D.	Inflation	3.00%

II. Demographic Assumptions

A.	Mortality*			
	Retired & Beneficiary	- Male - Female	2011 CalSTRS Retired – M 2011 CalSTRS Retired – F	Table B.2 Table B.2
	Disabled	- Male - Female	2011 CalSTRS Disabled – M 2011 CalSTRS Disabled – F	Table B.2 Table B.2
			(select rates in first three years for both Males and Females)	

** Assumptions for active members do not apply to the DBS Program valuation, as each active and inactive member's liabilities are equal to their account balance. Mortality rates shown include a margin for anticipated future mortality improvement.*

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**Table B.2
Mortality**

Age	Retired Members and Beneficiaries		Disabled Members (After Year 3)	
	Male	Female	Male	Female
50	0.114%	0.073%	2.400%	1.750%
55	0.164	0.118	2.600	1.875
60	0.300	0.254	2.800	2.000
65	0.596	0.468	3.000	2.125
70	1.095	0.864	3.054	2.331
75	1.886	1.451	4.972	3.334
80	3.772	2.759	7.285	4.477
85	7.619	5.596	9.797	8.367
90	14.212	11.702	17.639	14.007
95	22.860	17.780	27.005	20.992
Select rates for disability:				
	First year of disability		6.0%	3.5%
	Second year of disability		4.8	3.0
	Third year of disability		3.5	2.5

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Appendix C Valuation Data



The membership data for this actuarial valuation was supplied by CalSTRS and accepted without audit. We have examined the data for reasonableness and consistency with prior valuations and periodic reports from the CalSTRS staff to the Teachers' Retirement Board.

In preparing this report, we relied upon the membership data furnished by CalSTRS. Although we did not audit this data, we compared the data for this and the prior valuation and tested for reasonableness. Based on these tests, we believe the data to be sufficiently accurate for the purposes of this valuation. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

Tables C.1 through **C.4** summarize the census data used in this valuation.

California State Teachers' Retirement System
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Table C.1
Summary of Statistical Information

	June 30, 2012	June 30, 2011
Number of Members		
Active Members*	421,499	429,600
Inactive Members	127,763	121,653
Annuitants	<u>41,991</u>	<u>36,066</u>
Total Membership in Valuation	591,253	587,319
Active Member Statistics*		
Earned Salaries (\$ millions)	\$ 25,091	\$ 25,576
Average Salary	\$ 59,528	\$ 59,534
Average Age	45.5 years	45.3 years
Average Service	11.9 years	11.6 years

* Active member statistics include all active members in the DB Program, as they are eligible to participate in the DBS Program. The count differs from page 1 of this report, which only includes active members with non-zero accounts in the DBS Program.

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Table C.2
Age and Service Distribution
All Active Members

Age	Years of Service					
	Less than 1	1-5	6-10	11-15	16-20	21-25
Less than 25	1,443	1,601				
25 to 30	3,925	21,758	1,963			
30 to 35	2,293	22,062	25,781	1,742		
35 to 40	1,573	12,644	22,229	23,459	983	2
40 to 45	1,396	10,161	14,166	23,632	13,925	473
45 to 50	1,136	7,968	9,709	13,665	12,655	8,148
50 to 55	958	6,988	8,430	11,261	9,623	10,166
55 to 60	714	5,577	6,858	10,008	8,774	8,781
60 to 65	438	3,615	4,397	6,760	6,086	6,092
65 to 70	205	1,795	1,694	2,104	1,719	1,553
70 and over	89	850	589	513	355	352
Age Unknown		1	2	1		
Total	14,170	95,020	95,818	93,145	54,120	35,567

Age	Years of Service					Total
	26-30	31-35	36-40	41-45	Over 45	
Less than 25						3,044
25 to 30						27,646
30 to 35						51,878
35 to 40						60,890
40 to 45						63,753
45 to 50	434	1				53,716
50 to 55	6,472	329	2			54,229
55 to 60	7,698	6,201	391	4		55,006
60 to 65	4,099	3,378	1,989	39	2	36,895
65 to 70	954	511	346	202	5	11,088
70 and over	199	153	98	72	80	3,350
Age Unknown						4
Total	19,856	10,573	2,826	317	87	421,499

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2012 Actuarial Valuation

Table C.3
Inactive Members

Fiscal Year Ending June 30	Number	Account Balances*
2005	56,234	\$ 67,353,000
2006	68,799	109,084,000
2007	80,071	158,169,000
2008	89,201	200,750,000
2009	99,654	249,838,000
2010	112,556	303,047,000
2011	121,653	356,289,000
2012	127,763	403,271,000

** Does not include Additional Earnings Credits.*

Table C.4
Annuitants

Fiscal Year Ending June 30	Number	Accounts at Retirement
2005	5,445	\$ 37,239,000
2006	9,302	76,888,000
2007	13,561	133,216,000
2008	17,897	206,275,000
2009	23,002	312,732,000
2010	30,028	472,547,000
2011	36,066	627,629,000
2012	41,991	783,543,000

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Defined Benefit Supplement Program - 2012 Actuarial Valuation

Appendix D Glossary



The following definitions are largely excerpts from a list adopted by the major actuarial organizations in the United States. In some cases, the definitions have been modified for specific applicability to the CalSTRS DBS Program. Defined terms are capitalized throughout this Appendix.

Account Balance	The nominal account amount of an individual's benefit as of a specific date, determined in accordance with the terms of the Plan. The Account Balance is accumulated with contributions and interest.
Actuarial Assumptions	Assumptions as to the occurrence of future events affecting pension costs, such as mortality, withdrawal, disability and retirement, changes in compensation, rates of investment earnings and asset appreciation or depreciation, procedures used to determine the Actuarial Value of Assets and other relevant items.
Actuarial Cost Method	A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Obligation.
Actuarial Equivalent	Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
Actuarial Gain or Loss	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.
Actuarial Obligation	That portion, as determined by a particular Actuarial Cost method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.
Actuarial Present Value	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.
Actuarial Surplus	The excess, if any, of the Actuarial Value of Assets over the Actuarial Obligation.
Actuarial Valuation	The determination, as of a Valuation Date, of the Normal Cost, Actuarial Obligation, Actuarial Value of Assets and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets	The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.
Normal Cost	The Actuarial Present Value of benefits expected to accrue in the plan year subsequent to the valuation date. The Normal Cost is equivalent to the expected Member and Employer contributions for the next year.
Traditional Unit Credit Actuarial Cost Method	A method under which the Actuarial Obligation is equal to the Actuarial Present Value of benefits for service accrued to the valuation date.
Unfunded Actuarial Obligation	The excess, if any, of the Actuarial Obligation over the Actuarial Value of Assets.
Valuation Date	June 30, 2012