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May 12, 2014

Teachers' Retirement Board
California State Teachers' Retirement System

**Re: Defined Benefit Supplement Program
Actuarial Valuation as of June 30, 2013**

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, 2013. This report reflects the Additional Credits adopted at the April 2014 Teachers' Retirement Board meeting. 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 DBS Program. The Board adopted the actuarial methods and assumptions used in the 2013 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 to express our appreciation to the CalSTRS staff who gave substantial assistance in supplying the data on which this report is based.

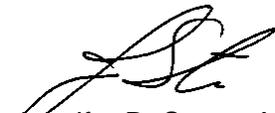
Respectfully submitted,

A handwritten signature in black ink, appearing to read "Nick Collier".

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

A handwritten signature in black ink, appearing to read "Mark C. Olleman".

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

A handwritten signature in black ink, appearing to read "Jennifer D. Senta".

Jennifer D. Senta, ASA, MAAA
Consulting Actuary

NJC/MCO/JDS/sat

California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table of Contents

	<i>Page</i>
Letter of Transmittal	
Section 1 Summary of the Findings	1
Section 2 Actuarial Certification	5
Section 3 Findings of the Actuarial Valuation	7
Table 1 Statement of Program Assets	11
Table 2 Statement of Change in Program Assets	12
Table 3 Actuarial Balance Sheet	13
Table 4 Actuarial Gains and Losses.....	14
Table 5 Gain and Loss Reserve	15
Table 6 Additional Credits Based on Board Policy	16
Table 7 History of Cash Flow	17
Table 8 Schedule of Funding Progress	18
Table 9 Schedule of Employer Contributions	19
Table 10 Reconciliation of Changes in Unfunded Actuarial Obligation	20
Table 11 Changes in Economic Assumptions	21
Table 12 Smoothing and Volatility Ratios.....	22
Appendix A Provisions of Governing Law.....	23
Appendix B Actuarial Methods and Assumptions	27
Table B.1 List of Major Valuation Assumptions	29
Table B.2 Mortality	30
Appendix C Valuation Data	31
Table C.1 Summary of Statistical Information.....	32
Table C.2 Age and Service Distribution All Active Members	33
Table C.3 Inactive Members	34
Table C.4 Annuitants	34
Appendix D Glossary	35



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California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 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, 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*
June 30, 2013	390,465	521,241	7,375,241,384*

* Includes 2006 and 2007 Additional Earnings Credits not previously reported. 2013 Additional Earnings Credits will be reported in the 2014 valuation.

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 13.6% net of investment and administrative expenses.

(\$ Thousands)	Year Ended June 30, 2013	Year Ended June 30, 2012
Additions		
Contributions	\$ 160,771	\$ 102,570
Earnings	<u>1,092,880</u>	<u>139,152</u>
Total Additions	\$ 1,253,651	\$ 241,722
Deductions		
Benefits	\$ 304,415	\$ 247,847
Expenses	<u>7,568</u>	<u>6,886</u>
Total Deductions	\$ 311,983	\$ 254,733
Net Increase (Decrease)	\$ 941,668	\$ (13,011)
Net Assets		
Beginning of Year	\$ 8,042,090	\$ 8,054,962
Accounting Adjustments	161	139
Net Increase (Decrease)	<u>941,668</u>	<u>(13,011)</u>
End of Year	\$ 8,983,919	\$ 8,042,090
Estimated Net Rate of Return	13.6%	1.7%

Summary of Findings (continued)

As of June 30, 2013 the Actuarial Value of Assets of the DBS Program exceeds the Actuarial Obligation by \$788,028,000. 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 would have increased from \$50,527,000 to \$54,316,000. The difference between the actual and expected Unfunded Actuarial Obligation is the actuarial gain or loss for the year.

- There was an actuarial gain of \$487,703,000 due to the actual investment return being greater than last year's assumed long-term return of 7.50%.
- There was an actuarial gain of \$246,009,000 due primarily to the current year's interest credits being less than 7.50% during the year. The Minimum Interest Rate for 2012-2013 was 3.75%.
- The net actuarial gain was \$733,712,000, which increased the Funded Ratio to 109.61%.
- The Actuarial Obligation increased by \$295,872,000 due to Additional Credits adopted effective June 30, 2013.

The valuation results are based on the June 30, 2013 fair market value of assets.

(\$ Thousands)	June 30, 2013	June 30, 2012
Actuarial Balance Sheet		
Actuarial Obligation (before Add'l Credits)	\$ 8,195,891	\$ 7,991,563
Actuarial Value of Assets	<u>8,983,919</u>	<u>8,042,090</u>
Unfunded Actuarial Obligation / (Actuarial Surplus)	\$ (788,028)	\$ (50,527)
Additional Earnings Credit	266,247	0
Additional Annuity Credit	<u>29,625</u>	<u>0</u>
Final Unfunded Actuarial Obligation / (Actuarial Surplus)	\$ 492,156	\$ (50,527)
Funded Ratio		
Before Add'l Credits	109.61%	100.63%
After Add'l Credits	105.80%	100.63%
(Assets ÷ Actuarial Obligation)		
Actuarial (Gain) or Loss		
Investment Return on Assets	\$ (487,703)	\$ 466,269
Interest Credits on Accounts	<u>(246,009)</u>	<u>(214,512)</u>
Actuarial (Gain) or Loss	\$ (733,712)	\$ 251,757
Expected UAO at End of Year	<u>(54,316)</u>	<u>(302,284)</u>
Total Unfunded Actuarial Obligation / (Actuarial Surplus) Before Add'l Credits	\$ (788,028)	\$ (50,527)

**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. At the April 2014 meeting, the Board granted an Additional Earnings Credit of \$266,247,000 and an Additional Annuity Credit of \$29,625,000 as of June 30, 2013, pursuant to the Board Policy.

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
Valuation Date			
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
June 30, 2013	788,028	295,872	492,156

Future Funding

The DBS Program has an Actuarial Surplus (negative UAO), since the value of assets is greater than the current value of the Actuarial Obligation. If all assumptions are met, the funding surplus will slowly grow in the future. If future experience is worse than assumed, a UAO may develop. There is currently no provision in the Education Code to increase contributions to make up this shortfall, if it were to occur. However, the assumed return on investments exceeds the expected interest crediting rate. To the extent that the assets earn more than the accounts are credited in the future, this may be sufficient to make up any potential shortfall.

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.

Conclusion

Granting the Additional Credit of 3.61% is consistent with the Board's Policy. The estimated value of the Additional Earnings Credits is \$266,247,000 and for the Additional Annuity Credits it is \$29,625,000.

Like any policy, the Board's Policy on Additional Credits should be reviewed from time to time. Granting Additional Credits is currently triggered by an Actuarial Surplus exceeding two times the Minimum Interest Rate (MIR). When the Board Policy was established, the MIR was higher (5.00%), and therefore more Actuarial Surplus (a Funded Ratio above 110% instead of the current threshold of 106%) was required before Additional Credits were granted. We recommend the Policy on Additional Credits be reviewed before the next valuation in light of the changing economic environment.

California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 Actuarial Valuation

Section 2 Actuarial Certification

The major findings of the 2013 Actuarial Valuation are contained in this report. This report reflects the benefit provisions and contribution rates in effect as of the valuation date and the Additional Credits adopted at the April 2014 Teachers' Retirement Board meeting. 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, 2013.

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 2013 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
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California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 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 additional disclosure information.

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 2012-2013 was calculated to be 13.6% 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 3.75%. 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 \$246,009,000.

Last year, the assumed earnings rate on the invested assets was 7.50% per year. The actual return for the year was about 13.6% (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 gain of \$487,703,000.

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

The total actuarial gain due to all causes was \$733,712,000 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 \$160,771,000 were made up of \$82,480,000 in employee contributions and \$78,291,000 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.

The Teachers' Retirement Board allocated any unallocated gain or loss to funding, after the Additional Earnings Credits and Additional Annuity Credits were adopted.

Additional Credits Based on Board Policy

Based on the Board's Policy, an Additional Earnings Credit of \$266,247,000 and an Additional Annuity Credit of \$29,625,000 was granted as of June 30, 2013.

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 following 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>3.75</u>
Maximum Available in First Allocation (1)	3.75%
Actuarial Surplus	9.61%
First Threshold (2013-2014 MIR x 2)	<u>6.00</u>
Actuarial Surplus in excess of First Threshold (2)	3.61%
First Allocation [lesser of (1) and (2)]	3.61%

The second step in the process allocates 50% of the remaining Actuarial Surplus over three times the Minimum Interest Rate in the year following the valuation date.

Second Allocation

Remaining Actuarial Surplus	6.00%
Second Threshold (2013-2014 MIR x 3)	<u>9.00</u>
Actuarial Surplus in excess of Second Threshold	0.00%
Less 50%	<u>(0.00)</u>
Available for Second Allocation	0.00%

The total available is the sum of the two steps, or 3.61% of the Actuarial Obligation as of June 30, 2013.

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 - 2013 Actuarial Valuation

Table 1
Statement of Program Assets

<i>(\$ Thousands)</i>	June 30, 2013	June 30, 2012
Invested Assets		
Short-term Investments	\$ 145,213	\$ 143,039
Debt Securities	1,498,632	1,462,040
Global Equity	4,783,115	3,981,291
Inflation Sensitive	38,308	1,198,192
Real Estate	1,208,830	1,077,464
Private Equity	1,178,808	16,693
Overlay	<u>55,858</u>	<u>32,754</u>
Total Investments	\$ 8,908,764	\$ 7,911,473
Receivables	114,015	143,897
Liabilities	<u>(38,860)</u>	<u>(13,280)</u>
Fair Market Value of Net Assets	\$ 8,983,919	\$ 8,042,090

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 2
Statement of Change in Program Assets

(\$ Thousands)	Year Ended June 30, 2013	Year Ended June 30, 2012
Additions		
Contributions		
Members	\$ 82,480	\$ 44,875
Employers	<u>78,291</u>	<u>57,695</u>
Total Contributions	160,771	102,570
Net Earnings	<u>1,092,880</u>	<u>139,152</u>
Total Additions	\$ 1,253,651	\$ 241,722
Deductions		
Benefit Payments		
Retirement, Death and Survivor	\$ 279,284	\$ 223,411
Refunds of Member Contributions	<u>25,131</u>	<u>24,436</u>
Total Benefits	304,415	247,847
Expenses	<u>7,568</u>	<u>6,886</u>
Total Deductions	\$ 311,983	\$ 254,733
Net Increase (Decrease)	\$ 941,668	\$ (13,011)
Fair Market Value of Net Assets		
Beginning of Year	\$ 8,042,090	\$ 8,054,962
Accounting Adjustments	161	139
Net Increase (Decrease)	<u>941,668</u>	<u>(13,011)</u>
End of Year	\$ 8,983,919	\$ 8,042,090
Estimated Net Rate of Return	13.6%	1.7%
- assuming uniform cash flow through the year		
- net of investment and administrative expenses		

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 3
Actuarial Balance Sheet

<i>(\$ Thousands)</i>	<u>June 30, 2013</u>		<u>June 30, 2012</u>
	Without Additional Credits	After Additional Credits Adopted	
Total Requirements			
Actuarial Obligation			
Retirees and Beneficiaries	\$ 820,650	\$ 850,275	\$ 710,586
Inactive Members	465,214	482,008	423,212
Active Members	<u>6,910,027</u>	<u>7,159,480</u>	<u>6,857,765</u>
Total Requirements	\$ 8,195,891	\$ 8,491,763	\$ 7,991,563
Total Resources			
Actuarial Value of Assets	\$ 8,983,919	\$ 8,983,919	\$ 8,042,090
Unfunded Actuarial Obligation or (Actuarial Surplus)	<u>(788,028)</u>	<u>(492,156)</u>	<u>(50,527)</u>
Total Resources	\$ 8,195,891	\$ 8,491,763	\$ 7,991,563
Funded Ratio	109.61%	105.79%	100.63%

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 4
Actuarial Gains and Losses*

<i>(\$ Thousands)</i>	Actuarial Obligation	Actuarial Value of Assets	Unfunded Actuarial Obligation
Balance at June 30, 2012	\$ 7,991,563	\$ 8,042,090	\$ (50,527)
Expected Changes			
Actual Contributions/Normal Cost	160,771	160,771	0
Actual Benefits Paid	(304,415)	(304,415)	0
Expected Earnings / Credits	<u>593,981</u>	<u>597,770</u>	<u>(3,789)</u>
Expected Balance at June 30, 2013	\$ 8,441,900	\$ 8,496,216	\$ (54,316)
Actuarial Gains or Losses			
(Gain)/Loss on Actuarial Obligation	(246,009)		
Gain/(Loss) on Assets		487,703	
Net (Gain) or Loss on UAO	<u> </u>	<u> </u>	<u>(733,712)</u>
Actual Balance at June 30, 2013	\$ 8,195,891	\$ 8,983,919	\$ (788,028)

* Prior to Additional Credits.

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 5
Gain and Loss Reserve

(\$ Thousands)	June 30, 2013		June 30, 2012
	Without Additional Credits	After Additional Credits Adopted	
Unfunded Actuarial Obligation or (Actuarial Surplus) (prior to any additional earnings)	\$ (788,028)	\$ (788,028)	\$ (50,527)
Additional Earnings Credit	0	266,247	0
Additional Annuity Credit	<u>0</u>	<u>29,625</u>	<u>0</u>
Unfunded Actuarial Obligation or (Actuarial Surplus) (prior to any additional earnings)	\$ (788,028)	\$ (492,156)	\$ (50,527)
Gain and Loss Reserve			
Beginning of Year	\$ 50,527	\$ 50,527	\$ 281,195
Allocated to Funding	<u>737,501</u>	<u>441,629</u>	<u>(230,668)</u>
End of Year Gain and Loss Reserve	\$ 788,028	\$ 492,156	\$ 50,527
Unallocated Gains and (Losses)	\$ 0	\$ 0	\$ 0

(\$ Thousands)	Available Reserves and Unallocated Gains (Losses)	Additional Credits Adopted	Final Gain and Loss Reserve
Valuation Date			
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
June 30, 2013	788,028	295,872	492,156

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 6
Additional Credits Based on Board Policy

	June 30, 2013	June 30, 2012
Funded Ratio before Additional Credits	109.61%	100.63%
Actuarial Surplus	9.61%	0.63%
Minimum Interest Rate (year following valuation date)	3.00%	3.75%
First Threshold	6.00%	7.50%
Second Threshold	9.00%	11.25%
First Allocation		
Long-term Net Investment Return	7.50%	7.50%
Minimum Interest Rate (MIR) (year prior to valuation)	<u>3.75</u>	<u>4.25</u>
Maximum Available in First Allocation (1)	3.75%	3.25%
Actuarial Surplus	9.61%	0.63%
First Threshold (2 x MIR for year following valuation date)	<u>6.00</u>	<u>7.50</u>
Actuarial Surplus in excess of First Threshold (2)	3.61%	0.00%
First Allocation [lesser of (1) and (2)]	3.61%	0.00%
Second Allocation		
Remaining Actuarial Surplus	6.00%	0.00%
Second Threshold (3 x MIR for year following valuation date)	<u>9.00</u>	<u>11.25</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	3.61%	0.00%
As a dollar amount (\$ Thousands)	\$ 295,872	\$ 0

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 7
History of Cash Flow

(\$ Thousands)

Year End	Contributions for the Year	Expenditures During the Year				External Cash Flow	Fair Market Value of Assets
		Benefit Payments	Contribution Refunds	Expenses	Total		
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
2013	160,771	279,284	25,131	7,568	311,983	(151,212)	8,983,919

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 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
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)%
2013*	8,983,919	8,491,763	(492,156)	106%	24,994,000	(2)%

* Results include Additional Credits adopted at the April 2014 Teachers' Retirement Board meeting.

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 9
Schedule of Employer Contributions

(\$ Thousands)

Year End	Annual Required Contribution	Contributed by Employers	Contributed by the State	Total Contributed	Percentage Contributed
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%
2013	78,291	78,291	0	78,291	100%

**California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation**

**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	Additional Credits	End of Year UAO
2011	\$ 1,044,262	\$ 75,709	\$ (363,073)	\$ (1,038,093)	\$ 0	(281,195)
2012	(281,195)	(21,089)	(214,512)	466,269	0	(50,527)
2013*	(50,527)	(3,789)	(246,009)	(487,703)	295,872	(492,156)

* Results include Additional Credits adopted at the April 2014 Teachers' Retirement Board meeting.

California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table 11
Changes in Economic Assumptions⁽¹⁾

Year	Price Inflation	Wage Inflation	Investment Return
2011	3.00%	3.75%	7.50%
2012	3.00%	3.75%	7.50%
2013	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.*

**California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation**

**Table 12
Smoothing and Volatility Ratios**

Year	Asset Smoothing Ratio AVA/MVA	Asset Volatility Ratio MVA/Payroll	Liability Volatility Ratio AAL/Payroll
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%
2013*	100%	35.9%	34.0%

* Results include Additional Credits adopted at the April 2014 Teachers' Retirement Board meeting.

California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 Actuarial Valuation

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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California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 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

Defined Benefit Supplement Program - 2013 Actuarial Valuation

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	2011 CalSTRS Retired – M	Table B.2
		- Female	2011 CalSTRS Retired – F	Table B.2
	Disabled	- Male	2011 CalSTRS Disabled – M	Table B.2
		- Female	2011 CalSTRS Disabled – F	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.*

**California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation**

**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

California State Teachers' Retirement System

Defined Benefit Supplement Program - 2013 Actuarial Valuation

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
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table C.1
Summary of Statistical Information

	June 30, 2013	June 30, 2012
Number of Members		
Active Members*	416,643	421,499
Inactive Members	130,776	127,763
Annuitants	<u>46,927</u>	<u>41,991</u>
Total Membership in Valuation	594,346	591,253
Active Member Statistics*		
Earned Salaries (\$ millions)	\$ 24,994	\$ 25,091
Average Salary	\$ 59,989	\$ 59,528
Average Age	45.6 years	45.5 years
Average Service	12.2 years	11.9 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.

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table C.2
Age and Service Distribution
All Active Members

Age	Total				
	Years of Service				
	0-5	5-10	10-15	15-20	20-25
Less than 25	4,469	1	-	-	-
25 to 30	23,747	4,453	1	-	-
30 to 35	18,880	27,860	4,317	2	-
35 to 40	11,623	19,743	26,031	3,432	5
40 to 45	9,626	12,875	20,900	19,781	1,296
45 to 50	7,748	8,854	12,402	14,235	9,857
50 to 55	6,578	7,567	10,331	10,702	9,916
55 to 60	4,990	6,035	8,729	9,380	8,421
60 to 65	3,275	3,701	5,740	6,404	5,582
65 to 70	1,585	1,490	1,865	1,716	1,459
70 and over	717	588	477	389	318
Age Unknown	-	-	-	-	-
Total	93,238	93,167	90,793	66,041	36,854

Age	Years of Service					Total
	25-30	30-35	35-40	40-45	Over 45	
Less than 25	-	-	-	-	-	4,470
25 to 30	-	-	-	-	-	28,201
30 to 35	-	-	-	-	-	51,059
35 to 40	-	-	-	-	-	60,834
40 to 45	5	-	-	-	-	64,483
45 to 50	1,012	5	-	-	-	54,113
50 to 55	8,155	713	7	-	-	53,969
55 to 60	7,876	6,290	893	8	-	52,622
60 to 65	4,252	2,690	1,898	103	1	33,646
65 to 70	1,007	469	312	202	19	10,124
70 and over	239	137	98	85	74	3,122
Age Unknown	-	-	-	-	-	-
Total	22,546	10,304	3,208	398	94	416,643

California State Teachers' Retirement System
Defined Benefit Supplement Program - 2013 Actuarial Valuation

Table C.3
Inactive Members

Fiscal Year Ending June 30	Number	Account Balances*
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
2013	130,776	444,279,000

** Does not include Additional Earnings Credits.*

Table C.4
Annuitants

Fiscal Year Ending June 30	Number	Accounts at Retirement
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
2013	46,927	926,192,000

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, 2013