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July, 2006

Teachers' Retirement Board  
California State Teachers' Retirement System

**Re: Defined Benefit Supplement Program  
Actuarial Valuation as of June 30, 2005**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Defined Benefit Supplement Program of the State Teachers' Retirement Plan as of June 30, 2005. Details about the actuarial valuation are contained in the following report.

I certify that the information included in this report is complete and accurate to the best of my knowledge and belief. All calculations have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the applicable Standards of Practice adopted by the American Academy of Actuaries.

Milliman's work product was prepared exclusively for CalSTRS. It is a complex, technical analysis that assumes a high level of knowledge concerning CalSTRS operations, and uses CalSTRS data, which Milliman has not audited. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely upon Milliman's work product, but should engage qualified professionals for advice appropriate to its own specific needs.

Milliman has been engaged by CalSTRS as an independent actuary. The undersigned is a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, and an Enrolled Actuary, and is experienced in performing actuarial valuations for large public employee retirement systems.

Any distribution of this report must be provided in its entirety including this cover letter, unless prior written consent is obtained from Milliman.

Respectfully submitted,

Mark O. Johnson, F.S.A., M.A.A.A., E.A.  
Principal and Consulting Actuary



# California State Teachers' Retirement System

## Defined Benefit Supplement Program - 2005 Actuarial Valuation

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**California State Teachers' Retirement System**  
**Defined Benefit Supplement Program - 2005 Actuarial Valuation**

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**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, 2001	428,741	428,741	\$ 213,168,807
June 30, 2002	442,208	474,980	711,439,790
June 30, 2003	447,620	476,262	1,358,634,402
June 30, 2004	444,315	488,213	2,025,399,713
June 30, 2005	449,773	506,007	2,722,431,556

The Actuarial Value of Assets for this valuation is the Fair Market Value as certified to us by CalSTRS. The actual return for the year, as measured assuming uniform cash flows throughout the year, was about 9.4% net of investment and administrative expenses.

<i>(\$Thousands)</i>	Year Ended June 30, 2005	Year Ended June 30, 2004
<b>Additions</b>		
Contributions	\$ 669,706	\$ 691,081
Earnings	<u>235,554</u>	<u>247,605</u>
Total Additions	\$ 905,260	\$ 938,686
<b>Deductions</b>		
Benefits	\$ 84,025	\$ 45,069
Expenses	<u>1,740</u>	<u>1,206</u>
Total Deductions	\$ 85,765	\$ 46,275
<b>Net Increase (Decrease)</b>	\$ 819,495	\$ 892,411
<b>Net Assets</b>		
Beginning of Year	\$2,203,682	\$1,311,269
Accounting Adjustments	0	2
Net Increase (Decrease)	<u>819,495</u>	<u>892,411</u>
End of Year	\$3,023,177	\$2,203,682
<b>Estimated Net Rate of Return</b>	9.4%	15.1%



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

The DBS Program continues to have an Actuarial Surplus. As of June 30, 2005 the Actuarial Value of Assets of the DBS Program exceeded the Actuarial Obligation by \$266,978,000. If the experience had emerged as assumed, the Actuarial Surplus was expected to grow from \$168,630,000 to \$182,121,000. The difference between the actual and expected Actuarial Surplus is the actuarial gain or loss for the year.

- There was an actuarial gain of \$34,092,000 due to the actual investment return being greater than the assumed long-term return of 8%, and
- There was an actuarial gain of \$50,765,000 due primarily to the current year interest credits being less than 8% during the year. The Minimum Interest Rate for 2004-05 was 5.0%.
- The net actuarial gain was \$84,857,000, which brought the Funded Ratio to 110%.

(\$Thousands)	June 30, 2005	June 30, 2004
<b>Actuarial Balance Sheet</b>		
Actuarial Obligation	\$ 2,756,199	\$ 2,035,052
Actuarial Value of Assets	<u>3,023,177</u>	<u>2,203,682</u>
Unfunded Actuarial Obligation	\$ (266,978)	\$ (168,630)
Additional Earnings Credit	0 *	0
Additional Annuity Credit	<u>0 *</u>	<u>0</u>
Final Unfunded Actuarial Obligation	\$ (266,978)	\$ (168,630)
<b>Funded Ratio</b> (Assets ÷ Actuarial Obligation)	<b>110%</b>	<b>108%</b>
<b>Actuarial (Gain) or Loss</b>		
Investment Return on Assets	\$ (34,092)	\$ (115,659)
Interest Credits on Accounts	<u>(50,765)</u>	<u>(104,126)</u>
Actuarial (Gain) or Loss	\$ (84,857)	\$ (219,785)
Expected UAO at End of Year	<u>(182,121)</u>	<u>51,155</u>
Total Unfunded Actuarial Obligation	\$ (266,978)	\$ (168,630)
* Determined by the Teachers' Retirement Board on June 9, 2006.		

We recommended that no Additional Earnings Credit or Additional Annuity Credit be granted for the year ended June 30, 2005. The Minimum Interest Rate for 2004-05 was 5.00%.



# California State Teachers' Retirement System

## Defined Benefit Supplement Program - 2005 Actuarial Valuation

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### Section 2 Actuarial Certification

The major findings of the 2005 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, 2005.

In preparing the valuation, we relied without audit upon the financial and 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 our calculations. 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.

The findings have been determined according to actuarial assumptions and methods that were chosen on the basis of recent experience of the DBS Program and of current expectations concerning future economic conditions. In our opinion, the assumptions used in the actuarial valuation are appropriate for purposes of the valuation, are internally consistent, and reflect reasonable expectations. The assumptions represent our best estimate of future conditions affecting the DBS Program. Nevertheless, the emerging costs of the DBS Program will vary from those presented in this report to the extent that actual experience differs from that projected by the assumptions.

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 all of the actuarial methods and assumptions used in the 2005 valuation.

On the basis of the foregoing, I hereby certify that, to the best of my knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with principles prescribed by the Actuarial Standards Board and the code of Professional conduct and Qualification Standards for Public Statements of Actuarial Opinion of the American Academy of Actuaries. In addition, the assumptions and methods used meet the parameters set by Governmental Accounting Standards Board Statement No. 25 for financial statement disclosures.

This report was prepared exclusively for CalSTRS for a specific and limited purpose. It is a complex, technical analysis that assumes a high level of knowledge concerning CalSTRS operations. It is not for the use or benefit of any third party for any purpose. Any third party recipient of Milliman's work product who desires professional guidance should not rely on this report, but should engage qualified professionals for advice appropriate to its own specific needs.

The undersigned is an independent actuary, a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, an Enrolled Actuary, and experienced in performing valuations for large public employee retirement systems.

A handwritten signature in black ink, appearing to read "Mark O. Johnson", written over a horizontal line.

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Mark O. Johnson, F.S.A., M.A.A.A., E.A.  
Principal and Consulting Actuary



# California State Teachers' Retirement System

## Defined Benefit Supplement Program - 2005 Actuarial Valuation

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### 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 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 our best 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 2004-05 was calculated to be 9.4% 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 differs 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.

For the purpose of this valuation, the account information was provided to us by CalSTRS. We checked the information for reasonableness by reviewing the individual member records supplied to us. We independently calculated the value of the annuitized benefits.



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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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 generally 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, prior to this year, the investment performance has been below the long-term assumption. This is the second year that there has been an Actuarial Surplus.

### Actuarial Gains and Losses

The Minimum Interest Rate for the year ending on the valuation date was 5.0%. Since the assumed total earnings rate is 8% per year, the Actuarial Obligation was less than expected. The total actuarial gain on the Actuarial Obligation was \$50,765,000.

The assumed earnings rate on the invested assets is 8% per year. The actual return for the year was about 9.4% (net of investment and administrative expenses and assuming uniform cash flows though the year, which is slightly different than how interest is actually posted), which produced an investment gain of \$34,092,000.

The net actuarial gain due to all causes was \$84,857,000 as shown in **Table 4**.

### 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.

On June 9, 2006, the Teachers' Retirement Board decided how to allocate the current Gain and Loss Reserve. The amount available is the sum of the previous Gain and Loss Reserve of \$168,630,000 (the Actuarial Surplus from 2004), assumed earnings on the Surplus of \$13,491,000 and the last year's actuarial gain of \$84,857,000. Since no Additional Earnings Credit or Additional Annuity Credit was adopted, the end of the year Gain and Loss Reserve is equal to \$266,978,000.

The following chart shows a history of prior Board actions.



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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<i>(\$Thousands)</i>	<b>Available Reserves and Unallocated Gains (Losses)</b>	<b>Adopted Additional Earnings Credit &amp; Annuity Credit</b>	<b>Final Gain and Loss Reserve</b>
<b>Valuation Date</b>			
June 30, 2001	\$ (6,253)	\$ 0	\$ (6,253)
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

### Accounting Disclosures

The Governmental Accounting Standards Board (GASB) has issued Statement No. 25 that describes the information to be disclosed in the System's financial reports. The required actuarial disclosures are shown in **Tables 6, 7, and 8**.



**California State Teachers' Retirement System**  
**Defined Benefit Supplement Program - 2005 Actuarial Valuation**

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**Table 1      Statement of Program Assets**

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<i>(\$Thousands)</i>	<b>June 30, 2005</b>	<b>June 30, 2004</b>
<b>Invested Assets</b>		
Short-term Investments	\$ 27,428	\$ 40,048
Pooled Domestic Securities	769,883	517,433
Pooled Domestic Equity	<u>2,012,065</u>	<u>1,433,867</u>
Total Investments	\$2,809,376	\$1,991,348
<b>Receivables</b>	215,579	213,373
<b>Liabilities</b>	<u>(1,778)</u>	<u>(1,039)</u>
<b>Fair Market Value of Net Assets</b>	\$3,023,177	\$2,203,682



**California State Teachers' Retirement System**  
**Defined Benefit Supplement Program - 2005 Actuarial Valuation**

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**Table 2      Statement of Change in Program Assets**

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<i>(\$Thousands)</i>	Year Ended June 30, 2005	Year Ended June 30, 2004
<b>Additions</b>		
Contributions		
Members	\$ 574,110	\$ 565,793
Employers	<u>95,596</u>	<u>125,288</u>
Total Contributions	669,706	691,081
Net Earnings	<u>235,554</u>	<u>247,605</u>
Total Additions	\$ 905,260	\$ 938,686
<b>Deductions</b>		
Benefit Payments		
Retirement, death, and survivor	\$ 75,426	\$ 41,991
Refunds of Member contributions	<u>8,599</u>	<u>3,078</u>
Total Benefits	84,025	45,069
Expenses	<u>1,740</u>	<u>1,206</u>
Total Deductions	\$ 85,765	\$ 46,275
<b>Net Increase (Decrease)</b>	\$ 819,495	\$ 892,411
<b>Fair Market Value of Net Assets</b>		
Beginning of Year	\$2,203,682	\$1,311,269
Accounting Adjustments	0	2
Net Increase (Decrease)	<u>819,495</u>	<u>892,411</u>
<b>End of Year</b>	\$3,023,177	\$2,203,682
<b>Estimated Net Rate of Return</b>	9.4%	15.1%
assuming uniform cash flow through the year net of investment and administrative expenses		



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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**Table 3 Actuarial Balance Sheet**

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<i>(\$Thousands)</i>	<b>June 30, 2005</b>	<b>June 30, 2004</b>
<b>Total Requirements</b>		
Actuarial Obligation		
Retirees and Beneficiaries	\$ 33,767	\$ 9,652
Inactive Members	67,353	37,437
Active Members	<u>2,655,079</u>	<u>1,987,963</u>
Total Requirements	\$2,756,199	\$2,035,052
<b>Total Resources</b>		
Actuarial Value of Assets	\$3,023,177	\$2,203,682
Unfunded Actuarial Obligation or (Actuarial Surplus)	<u>(266,978)</u>	<u>(168,630)</u>
Total Resources	\$2,756,199	\$2,035,052
<b>Funded Ratio</b>	110%	108%



**California State Teachers' Retirement System**  
**Defined Benefit Supplement Program - 2005 Actuarial Valuation**

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**Table 4 Actuarial Gains and Losses**

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<i>(\$Thousands)</i>	<b>Actuarial Obligation</b>	<b>Actuarial Value of Assets</b>	<b>Unfunded Actuarial Obligation</b>
<b>Balance at June 30, 2004</b>	\$2,035,052	\$2,203,682	\$(168,630)
<b>Expected Changes</b>			
Actual Contributions	669,706	669,706	0
Actual Benefits Paid	(84,025)	(84,025)	0
Expected Earnings / Credits	<u>186,231</u>	<u>199,722</u>	<u>(13,491)</u>
<b>Expected Balance at June 30, 2005</b>	\$2,806,964	\$2,989,085	\$(182,121)
<b>Actuarial Gains or Losses</b>			
(Gain) on Actuarial Obligation	(50,765)		
(Gain) on Assets	<u>          </u>	<u>(34,092)</u>	
Net (Gain) or Loss	(50,765)	(34,092)	(84,857)
<b>Actual Balance at June 30, 2005</b>	\$2,756,199	\$3,023,177	\$(266,978)



**California State Teachers' Retirement System**  
**Defined Benefit Supplement Program - 2005 Actuarial Valuation**

**Table 5      Gain and Loss Reserve**

<i>(\$Thousands)</i>	<b>June 30, 2005</b>	<b>June 30, 2004</b>
<b>Unfunded Actuarial Obligation</b>	\$(266,978)	\$(168,630)
<b>Gain and Loss Reserve</b>		
Beginning of Year	\$ 168,630	\$ (47,366)
Additional Earnings Credit	0 *	0
Additional Annuity Credit	0 *	0
Allocated to Funding	<u>98,348</u> *	<u>215,996</u>
End of Year Gain and Loss Reserve	\$ 266,978	\$ 168,630
<b>Unallocated Gains and (Losses)</b>	<b>\$ 0</b>	<b>\$ 0</b>

<i>(\$Thousands)</i>	<b>Available Reserves and Unallocated Gains (Losses)</b>	<b>Adopted Additional Earnings Credit &amp; Annuity Credit</b>	<b>Final Gain and Loss Reserve</b>
<b>Valuation Date</b>			
June 30, 2001	\$ (6,253)	\$ 0	\$ (6,253)
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

Notes:

\* Determined by the Teachers' Retirement Board on June 9, 2006.



**California State Teachers' Retirement System**  
**Defined Benefit Supplement Program - 2005 Actuarial Valuation**

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**Table 6 History of Cash Flow**

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<i>(\$Thousands)</i>	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



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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**Table 7      Schedule of Funding Progress**

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*(\$Thousands)*

<b>Year End</b>	<b>Actuarial Value of Assets</b>	<b>Actuarial Accrued Liability</b>	<b>Unfunded Actuarial Accrued Liability</b>	<b>Funded Ratio  Assets/AAL</b>	<b>Estimated Covered Payroll</b>	<b>Coverage Ratio  UAAL/Pay</b>
2001	\$206,916	\$ 213,169	\$ 6,253	97%	\$ 20,494,152	0%
2002	660,148	711,440	51,292	93%	21,731,775	0%
2003	1,311,269	1,358,635	47,366	97%	23,865,497	0%
2004	2,203,682	2,035,052	(168,630)	108%	23,762,587	(1)%
2005	3,023,177	2,756,199	(266,978)	110%	23,262,586	(1)%



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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**Table 8**      **Schedule of Employer Contributions**

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*(\$Thousands)*

<b>Year End</b>	<b>Annual Required Contribution</b>	<b>Contributed by Employers</b>	<b>Contributed by the State</b>	<b>Total Contributed</b>	<b>Percentage Contributed</b>
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%



# California State Teachers' Retirement System

## Defined Benefit Supplement Program - 2005 Actuarial Valuation

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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, have a DBS Account.
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, and Additional Earnings Credits.
Contributions:	One-quarter (2% of compensation) of the DB Program Member contributions on creditable compensation is 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 Minimum Interest Rate is equal to the average of the yields on 30-year Treasuries for the twelve months ending in



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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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 Minimum Interest Rate 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 Minimum Interest Rate 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.



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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### 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.



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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### 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 Defined Benefit 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.

Please refer to the 2003 Actuarial Experience Analysis for further information on the revisions made to the actuarial assumptions in 2003. There were no changes in assumptions or methods in this valuation.

#### 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.



## California State Teachers' Retirement System Defined Benefit Supplement Program - 2005 Actuarial Valuation

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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.

The demographic assumptions are listed in **Table B.1** and illustrated at selected ages and duration combinations in Tables **B.2 – B.6**.



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**Table B.1 List of Major Valuation Assumptions**

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**I. Economic Assumptions**

A.	Investment Return (net of investment and administrative expenses)	8.00%
B.	Interest on Member Accounts	8.00%
C.	Wage Growth	4.25%
D.	Inflation	3.25%

**II. Demographic Assumptions**

A.	Mortality		
	(1) Active	- Male	1999 CalSTRS Retired – M (-2 years)
		- Female	1999 CalSTRS Retired – F (-2 years)
			Table B.2
	(2) Retired *	- Male	1999 CalSTRS Retired – M
		- Female	1999 CalSTRS Retired – F
			Table B.2
	(3) Beneficiary *	- Male	1999 CalSTRS Beneficiary – M
		- Female	1999 CalSTRS Beneficiary – F
			Table B.2
	(4) Disabled *	- Male	1994 GAM-M (minimum 2.5% with select rates in first three years)
		- Female	1994 GAM-F (minimum 2.2% with select rates in first three years)
			Table B.2

\* *Future retirees and beneficiaries are valued with a 2-year age setback*

B.	Service Retirement	Experience Tables	Table B.3
C.	Disability Retirement	Experience Tables	Table B.4
D.	Withdrawal	Experience Tables	Table B.5
E.	Merit Salary Increases	Experience Tables	Table B.6



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**Table B.2      Mortality**

							<u>Active Members</u>		
							<u>Age</u>	<u>Male</u>	<u>Female</u>
							25	0.051%	0.029%
							30	0.066	0.029
							35	0.080	0.037
							40	0.085	0.051
							45	0.107	0.077
							50	0.158	0.103
							55	0.258	0.157
							60	0.443	0.256
							65	0.798	0.509
<u>Age</u>	<u>Retired Members *</u>		<u>Beneficiaries *</u>		<u>Disabled (After Year 3) *</u>				
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>			
50	0.190%	0.121%	0.233%	0.121%	2.500%	2.200%			
55	0.321	0.191	0.398	0.191	2.500	2.200			
60	0.558	0.336	0.709	0.336	2.500	2.200			
65	1.015	0.668	1.294	0.668	2.500	2.200			
70	1.803	1.176	2.173	1.176	2.500	2.200			
75	2.848	1.834	3.405	1.834	3.721	2.269			
80	5.021	3.778	5.586	3.778	6.203	3.940			
85	9.419	6.503	8.961	6.503	9.724	6.774			
90	14.754	11.627	14.754	11.627	15.293	11.627			
95	23.361	18.621	23.361	18.621	23.361	18.621			
<b>Select rates for disability:</b>									
First year of disablement					11.4%	6.0%			
Second year of disablement					7.7	3.8			
Third year of disablement					6.2	3.0			

\* Future retirees and beneficiaries are valued with a 2-year age setback



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**Table B.3 Service Retirement**

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<u>Age</u>	<u>Under 30 Years</u>		<u>30 or More Years</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
50	0.0%	0.0%	1.5%	1.5%
51	0.0	0.0	1.5	1.5
52	0.0	0.0	1.5	1.5
53	0.0	0.0	2.0	1.5
54	0.0	0.0	2.0	2.0
55	3.0	5.0	6.0	8.0
56	2.0	3.5	6.0	8.0
57	2.0	3.5	8.0	10.0
58	3.0	4.5	12.0	15.0
59	5.0	6.0	16.0	18.0
60	7.0	10.0	25.0	30.0
61	7.0	10.0	40.0	35.0
62	9.0	12.0	35.0	32.0
63	13.0	18.0	27.0	30.0
64	12.0	15.0	27.0	27.0
65	14.0	16.0	27.0	27.0
66	10.0	15.0	27.0	27.0
67	10.0	15.0	27.0	27.0
68	10.0	15.0	27.0	27.0
69	10.0	15.0	27.0	27.0
70	100.0	100.0	100.0	100.0



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**Table B.4      Disability Retirement**

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<u>Age</u>	<b>Entry Ages - Male</b>		<b>Entry Ages - Female</b>	
	<u>Under 40</u>	<u>40 and Up</u>	<u>Under 40</u>	<u>40 and Up</u>
25	0.021%		0.030%	
30	0.030		0.030	
35	0.051		0.051	
40	0.120		0.090	
45	0.150	0.118%	0.141	0.139%
50	0.195	0.202	0.231	0.252
55	0.270	0.312	0.318	0.367
60	0.195	0.477	0.243	0.530
65	0.120	0.853	0.168	0.916



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**Table B.5      Withdrawal**

<u>Year</u>	<u>Entry Ages - Male</u>					
	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 - 44</u>	<u>45 &amp; Up</u>
0	15.3%	15.3%	15.3%	15.3%	15.3%	15.3%
1	12.5	12.5	12.5	12.5	12.5	13.5
2	7.7	7.7	7.7	7.7	7.7	8.6
3	6.3	5.4	5.4	5.4	5.4	6.3
4	4.4	4.4	4.4	4.4	4.4	4.4
5	3.9	3.0	3.0	3.0	3.0	3.6
10	2.0	2.0	2.0	2.0	2.4	
15	1.1	1.1	1.1	1.2		
20	0.6	0.6	0.6			
25	0.5	0.5				
30	0.0					

  

<u>Year</u>	<u>Entry Ages - Female</u>					
	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 - 44</u>	<u>45 &amp; Up</u>
0	15.3%	15.3%	15.3%	15.3%	15.3%	15.3%
1	10.0	10.0	10.0	10.0	10.0	10.0
2	7.2	7.2	7.2	7.2	7.2	7.2
3	6.3	6.3	5.8	5.3	4.9	4.9
4	5.8	5.8	5.4	4.9	3.9	3.0
5	5.5	5.8	4.2	2.9	2.5	2.5
10	2.3	2.0	1.7	1.4	1.6	
15	1.1	0.9	1.0	0.9		
20	0.6	0.7	0.9			
25	0.6	0.6				
30	0.0					



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**Table B.6 Merit Salary Increases**

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Yr.	Entry Age - Annual Increase in Salaries Due to Merit					
	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 - 44</u>	<u>45 &amp; up</u>
1	5.6%	5.3%	5.1%	4.8%	4.8%	3.5%
2	5.6	5.1	4.9	4.7	4.7	3.3
3	5.6	5.0	4.8	4.6	4.6	3.0
4	5.5	4.8	4.6	4.4	4.4	2.9
5	5.5	4.8	4.5	3.8	3.8	2.6
10	3.2	3.0	2.7	2.3	2.2	1.6
15	1.5	1.5	1.4	1.1	1.1	0.8
20	1.3	1.1	1.1	0.8	0.8	0.6
25	1.1	0.9	0.8	0.5	0.5	
30	0.9	0.7	0.6	0.5		
35	0.8	0.7	0.6			
40	0.8	0.6				
45	0.8					



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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** and **C.2** summarize the census data used in this valuation.



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**Table C.1 Summary of Statistical Information**

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	June 30, 2005	June 30, 2004
<b>Number of Members</b>		
Active Members <sup>(1)</sup>	450,282	444,680
Inactive Members <sup>(1)</sup>	124,394	116,128
Retirees and Beneficiaries		
Service Retirants	176,008	169,022
Disabilitants	7,571	7,311
Survivors	<u>17,662</u>	<u>16,912</u>
Total	201,241	193,245
Total Membership in Valuation	775,917	754,053
<b>Active Member Statistics</b>		
Earned Salaries	\$23,257 million	\$22,589 million <sup>(2)</sup>
Average Salary	\$ 51,649	\$ 50,798 <sup>(2)</sup>
Average Age	44.5 years	44.5 years
Average Service	10.7 years	10.7 years

Note:

- <sup>(1)</sup> Some active members were reported with no Earnable Salaries, in which case their liabilities, if any, were included with inactive members
- <sup>(2)</sup> Restated due to incorrect data submitted for prior valuation.



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**Table C.2 Age and Service Distribution  
All Active Members**

<u>Age</u>	<u>Service in the DB Program</u>					
	<u>Under 1</u>	<u>1 - 5</u>	<u>6 - 10</u>	<u>11 - 15</u>	<u>16 - 20</u>	<u>21 - 25</u>
Under 25	2,219	3,387				
25 to 30	4,898	37,315	2,441			
30 to 35	2,741	30,560	27,232	676		
35 to 40	2,252	18,422	24,400	11,386	487	
40 to 45	2,022	14,550	14,310	11,847	8,513	299
45 to 50	1,892	13,717	12,885	9,668	10,502	6,218
50 to 55	1,701	12,620	12,881	10,405	11,039	8,642
55 to 60	1,230	9,346	9,581	8,886	10,433	7,460
60 to 65	530	4,196	3,821	3,398	4,234	3,255
65 to 70	241	1,478	1,003	750	865	684
70 & Up	127	814	377	230	235	192
Unknown	11	23				
<b>Total</b>	<b>19,864</b>	<b>146,428</b>	<b>108,931</b>	<b>57,246</b>	<b>46,308</b>	<b>26,750</b>

<u>Age</u>	<u>Service in the DB Program</u>					<u>Total</u>
	<u>26 - 30</u>	<u>31 - 35</u>	<u>36 - 40</u>	<u>41 - 45</u>	<u>Over 45</u>	
Under 25						5,606
25 to 30						44,654
30 to 35						61,209
35 to 40						56,947
40 to 45						51,541
45 to 50	446					55,328
50 to 55	9,261	801	1			67,351
55 to 60	10,065	11,544	1,190	2		69,737
60 to 65	3,313	3,314	2,512	74	2	28,649
65 to 70	637	457	323	204	18	6,660
70 & Up	190	162	107	65	67	2,566
Unknown						34
<b>Total</b>	<b>23,912</b>	<b>16,278</b>	<b>4,133</b>	<b>345</b>	<b>87</b>	<b>450,282</b>



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### Appendix D Glossary

<b>Account Balance:</b>	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.
<b>Actuarial Assumptions:</b>	Assumptions as to the occurrence of future events affecting pension costs, such as mortality, withdrawal, disablement, 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.
<b>Actuarial Cost Method:</b>	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.
<b>Actuarial Gain or Loss:</b>	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.
<b>Actuarial Obligation:</b>	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.
<b>Actuarial Present Value:</b>	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.
<b>Actuarial Surplus:</b>	The excess, if any, of the Actuarial Value of Assets over the Actuarial Obligation.



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<b>Actuarial Valuation:</b>	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.
<b>Actuarial Value of Assets:</b>	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.
<b>Actuarial Equivalent:</b>	Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
<b>Normal Cost:</b>	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.
<b>Traditional Unit Credit Actuarial Cost Method:</b>	A method under which the Actuarial Obligation is equal to the actuarial present value of benefits for service accrued to the valuation date.
<b>Unfunded Actuarial Obligation:</b>	The excess, if any, of the Actuarial Obligation over the Actuarial Value of Assets.
<b>Valuation Date:</b>	June 30, 2005