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March 28, 2001

Retirement Board
California State Teachers' Retirement System

**RE: CASH BALANCE BENEFIT PROGRAM
ACTUARIAL VALUATION AS OF JUNE 30, 2000**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Cash Balance Benefit Program of the State Teachers' Retirement Plan as of June 30, 2000. 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 & Robertson 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.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark O. Johnson', with a large, stylized initial 'M'.

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

MOJ;j

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CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION

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CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION

SECTION 1
EXECUTIVE SUMMARY

The Cash Balance Benefit (CBB) Program was established on July 1, 1996 (as the CB Plan). The number of participants has steadily increased in the first few plan years, as shown in the following chart. This is the first year we have tracked active and inactive participants. Participants with contributions in 2000 are considered active in this report.

Date of Valuation	Number of Participants		Accumulated Account Balances
	Active	Total	
June 30, 1997	n/a	495	\$ 164,078
June 30, 1998	n/a	3,505	1,727,705
June 30, 1999	n/a	6,412	5,000,613
June 30, 2000	7,966	9,552	10,350,720

The actuarial value of assets for this valuation is the Fair Market Value as reported by CalSTRS.

(\$Thousands)	Year Ended June 30, 2000	Year Ended June 30, 1999
Additions		
Contributions	\$ 4,955	\$ 3,082
Earnings	752	380
Discharged Loan	<u>0</u>	<u>1,417</u>
Total Additions	\$ 5,707	\$ 4,879
Deductions		
Benefits	\$ 59	\$ 15
Expenses	<u>4</u>	<u>430</u>
Total Deductions	\$ 63	\$ 445
Net Increase (Decrease)	\$ 5,644	\$ 4,434
Net Assets (Deficit)		
Beginning of Year	\$ 5,224	\$ 790
End of Year	\$ 10,868	\$ 5,224

As of June 30, 2000, the Fair Market Value of Assets of the CBB Program exceeded the Actuarial Obligation by \$517,000. If the experience had emerged as assumed, the Surplus was expected to grow to \$241,000. There were actuarial gains of \$276,000 due to investment returns greater than 8%, and interest credits less than 8% during the year.

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(\$Thousands)	June 30, 2000	June 30, 1999
Actuarial Balance Sheet		
Actuarial Obligation	\$ 10,351	\$ 5,001
Actuarial Value of Assets	<u>10,868</u>	<u>5,224</u>
Unfunded Actuarial Obligation or (Actuarial Surplus)	\$ (517)	\$ (223)
Additional Earnings Credit	<u> *</u>	<u> 58</u>
Final Unfunded Actuarial Obligation or (Actuarial Surplus)	\$ (517)	\$ (165)
<i>* To be determined by the Teachers' Retirement Board after the actuarial valuation.</i>		

The following chart summarizes the activity in the Gain and Loss Reserve.

(\$Thousands)	June 30, 2000	June 30, 1999
Reserves		
Gain and Loss Reserve		
Beginning of Year	\$ 165	\$ 346
Additional Earnings Credit	<u> *</u>	<u> (58)</u>
Allocated to Funding	<u> *</u>	<u> (123)</u>
End of Year Gain and Loss Reserve	\$ 165	\$ 165
Unallocated Gains and (Losses)	<u> 352</u>	<u> 0</u>
Total Reserves	\$ 517	\$ 165
<i>* To be determined by the Teachers' Retirement Board after the actuarial valuation.</i>		

In a separate document, the Board will be provided information to decide how to distribute the Unallocated Gains and Losses. If no Additional Earnings Credit is adopted, the entire amount of \$352,000 would be distributed to the Gain and Loss Reserve, leaving an ending balance in the Gain and Loss Reserve of \$517,000.

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SECTION 2
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 CBB 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 which 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 CBB Program and represent our best estimate of future conditions affecting the Program. Nevertheless, the emerging costs of the System 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**.

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 Actuarial Obligation is equivalent to the current sum of the Participants' Account Balances. **TABLE 3** shows the Actuarial Obligation for this and the prior valuation.

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

Under normal conditions, the CBB Program should always have an Actuarial Surplus. In the first two years of operation, the CB Plan had an Unfunded Actuarial Obligation because the administrative start-up costs far exceeded the investment return. With the merger of the CB Plan with the DB Plan, specifically with the sharing of administrative expenses in proportion to invested assets, the future expenses allocated to the CBB Program should be minimal each year. Therefore, to retain the Actuarial Surplus, the investment returns over a long period of time must exceed the Minimum Interest Credit. We expect this to be the case.

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ACTUARIAL GAINS AND LOSSES

The assumed earnings rate on the invested assets is 8% per year. The actual return for the year was about 9.75% which produced an investment gain of \$134,000.

The combination of the Minimum Interest Credit and the Additional Earnings Credit for the year was slightly over 6%. Since the assumed total interest credit is 8% per year, the Actuarial Obligation was less than expected by about \$142,000.

The total gains due to these causes was \$276,000 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.

- The 1997 actuarial valuation determined the CB Plan had an Unfunded Actuarial Obligation of \$557,000. The Board did not adopt an Additional Earnings Credit after the 1997 valuation, so the Gain and Loss Reserve stood at \$(557,000).
- The 1998 actuarial valuation determined that the CB Plan had an Unfunded Actuarial Obligation of \$938,000. However, the Unfunded Actuarial Obligation was reduced by \$1,293,000 as of June 30, 1998, to reflect the value of the loan from the DB Plan which would be discharged due to the merger on January 1, 1999. Therefore, with an adjustment to reflect the merger, the CBB Program had an Actuarial Surplus of \$355,000. After the 1998 actuarial valuation was adopted, the Board allocated \$8,916 as Additional Earnings Credit, with the remainder of the Surplus remaining in the Gain and Loss Reserve.
- The 1999 actuarial valuation determined the Actuarial Surplus to be \$223,000 as of June 30, 1999. Therefore, with a Gain and Loss Reserve of \$346,000 there was an unallocated actuarial loss for the year of \$123,000. One reason for the change in the funding status of the CBB Program was the method used to charge expenses to the CB Plan. The level of expenses in the CB Plan during 1998-99 reflected a method of allocating administrative expenses that will no longer be applied. As a result, a principal cause of the 1998-99 actuarial loss will not occur in the future.

After the 1999 actuarial valuation, the Board allocated \$58,000 as Additional Earnings Credit, with the remainder of the Surplus remaining in the Gain and Loss Reserve.

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- After the adoption of the 2000 actuarial valuation, the Board will decide how to allocate this actuarial gain. If all of it is allocated to the Gain and Loss Reserve, with no Additional Earnings Credit, the end of the year Gain and Loss Reserve will be equal to \$517,000.

ACCOUNTING DISCLOSURES

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

REMAINDER OF THE REPORT

The remainder of this report includes a summary of the benefit and eligibility provisions of the CBB Program in **SECTION 3**, the Outline of the Provisions of Governing Law.

A description of the actuarial methods and assumptions is included in **SECTION 4**. The assumptions are intended to estimate the future experience of the Participants of the CBB Program and of the System itself in areas which 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.

A summary of the participant data is shown in **SECTION 5**. The membership data for this actuarial valuation was supplied by CalSTRS and accepted without audit. We believe the membership data to be sufficient for the purposes of this valuation.

And finally, **SECTION 6** is the Glossary of Actuarial Terminology.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION**

**TABLE 1
STATEMENT OF PROGRAM ASSETS**

(\$Thousands)	June 30, 2000	June 30, 1999
Invested Assets		
Pooled Domestic Securities	\$ 4,007	\$ 1,818
Pooled Domestic Equity	<u>6,588</u>	<u>2,939</u>
Total Investments	\$ 10,595	\$ 4,757
Receivables	273	144
Liabilities	0	(1)
Expense Adjustment ⁽¹⁾	<u>0</u>	<u>324</u>
Fair Market Value of Net Assets	\$ 10,868	\$ 5,224

Notes:

⁽¹⁾ Reduction in expenses previously reported

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TABLE 2
STATEMENT OF CHANGE IN PROGRAM ASSETS

(\$Thousands)	Year Ended June 30, 2000	Year Ended June 30, 1999
Additions		
Contributions		
Participants	\$ 2,590	\$ 1,520
Employers	<u>2,365</u>	<u>1,562</u>
Total Contributions	4,955	3,082
Net Earnings	752	380
Loan write-off from DB Program	<u>0</u>	<u>1,417</u>
Total Additions	\$ 5,707	\$ 4,879
Deductions		
Benefit Payments		
Retirement, death, and survivor	\$ 0	\$ 0
Refunds of Participant contributions	<u>59</u>	<u>15</u>
Total Benefits	59	15
Expenses		
Administrative	4	388
Interest Expense	<u>0</u>	<u>42</u>
Total Expenses	4	430
Total Deductions	\$ 63	\$ 445
Net Increase (Decrease)	\$ 5,644	\$ 4,434
Net Assets (Deficit)		
Beginning of the Year	\$ 5,224	\$ 790
End of the Year	\$ 10,868	\$ 5,224

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
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**TABLE 3
ACTUARIAL BALANCE SHEET**

(\$Thousands)	June 30, 2000	June 30, 1999
Total Requirements		
Actuarial Obligation		
Retirees and Beneficiaries	\$ 0	\$ 0
Inactive Participants	1,064	n/a
Active Participants	<u>9,287</u>	<u>n/a</u>
Total Requirements	\$ 10,351	\$ 5,001
Total Resources		
Actuarial Value of Assets	\$ 10,868	\$ 5,224
Unfunded Actuarial Obligation (Surplus)	<u>(517)</u>	<u>(223)</u>
Total Resources	\$ 10,351	\$ 5,001

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
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**TABLE 4
ACTUARIAL GAINS AND LOSSES**

(\$Thousands)	Actuarial Obligation	Actuarial Value of Assets	(Actuarial Surplus)
Balance at June 30, 1999	\$ 5,001	\$ 5,224	\$ (223)
Expected Changes			
Actual Contributions	\$ 4,955	\$ 4,955	\$ 0
Actual Benefits Paid	(59)	(59)	0
Expected Earnings / Credits	<u>596</u>	<u>614</u>	<u>(18)</u>
Expected Balance at June 30, 2000	\$ 10,493	\$ 10,734	\$ (241)
Actuarial Gains or Losses	<u>(142)</u>	<u>134</u>	<u>(276)</u>
Actual Balance at June 30, 2000	\$ 10,351	\$ 10,868	\$ (517)

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**TABLE 5
GAIN AND LOSS RESERVE**

(\$Thousands)	June 30, 2000	June 30, 1999
Unfunded Actuarial Obligation	\$ (517)	\$ (223)
Gain and loss Reserve		
Beginning of Year	\$ 165	\$ 346
Additional Earnings Credit	(1)	(58)
Allocated to Funding	<u>(1)</u>	<u>(123)</u>
End of Year Gain and Loss Reserve	\$ 165	\$ 165
Unallocated Gains and (Losses)	\$ 352	\$ 0

Notes:

(1) To be determined by the Teachers' Retirement Board after the adoption of this Actuarial Valuation.

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**TABLE 6
HISTORY OF CASH FLOW**

(\$Thousands)		Expenditures During the Year					External Cash Flow	Market Value of Net Assets
Year End	Contributions for the Year	Benefit Payments	Contribution Refunds	Expenses	Total			
1997	\$ 148	\$ 0	\$ 0	\$ 428	\$ 428	\$ (280)	\$ (393)	
1998	1,544	0	0	466	466	1,078	790	
1999	3,082	0	15	430	445	2,637 ⁽¹⁾	5,224	
2000	4,955	0	59	4	63	4,892	10,868	

⁽¹⁾ Excludes write-off of loan from the DB Plan of \$1,417,000 as of January 1, 1999.

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**TABLE 7
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
1997	\$ (393)	\$ 164	\$ 557	(240)%	\$ 4,504	12%
1998	790	1,728	938	46%	18,838	5%
1999	5,224	5,001	(223)	104%	50,426	0%
2000	10,868	10,351	(517)	105%	70,605	(1)%

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**TABLE 8
SCHEDULE OF EMPLOYER CONTRIBUTIONS**

(\$Thousands)					
Year End	Annual Required Contribution	Contributed by Employers	Contributed by the State	Total Contributed	Percentage Contributed
1997	\$ 74	\$ 74	\$ 0	\$ 74	100%
1998	772	772	0	772	100%
1999	1,562	1,562	0	1,562	100%
2000	2,365	2,365	0	2,365	100%

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SECTION 3
OUTLINE OF THE PROVISIONS OF GOVERNING LAW

All of the actuarial calculations contained in this report are based upon our understanding of the Cash Balance Benefit (CBB) Program of the State Teachers' Retirement Plan as contained in Part 14 of the California Education Code. The provisions used in this valuation are summarized below for reference purposes.

MEMBERSHIP

- Eligibility Requirement: Membership if employed at less than 50% of a full-time position for a California school district, community college district, or county office of education which has elected to offer the CBB Program.
- Participant: 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 Participant. Accounts are credited with Contributions, Minimum Interest Rate, and Additional Earnings Credits.
- Contributions: Generally, Participant Contributions are 4% of salary, and Employer Contributions are 4% of salary.
- Rules for Contribution rates may differ for Participants covered by a collective bargaining agreement, but the sum of the Participant and Employer contributions must equal or exceed 8% of salary, and in no event can the Employer contribution rate be less than 4% of salary.
- The Retirement Board may adjust Employer Contributions for a fixed number of years, but the adjustment shall not exceed 0.25% of salaries in any plan year.
- 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

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on 30-year Treasuries for the twelve 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 Minimum Interest Rate and provide any additions to the Gain and Loss Reserve deemed warranted by the Board.

NORMAL RETIREMENT

Eligibility Requirement: Age 60.

Benefit: The Account Balance at the retirement date subject to limits imposed under Internal Revenue Code (IRC) Section 415.

Form of Payment: The normal form of payment is a lump sum distribution. Annuity options are available if the sum of the employer and employee accounts equal or exceed \$3,500.

EARLY RETIREMENT

Eligibility Requirement: Age 55.

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.

DEFERRED RETIREMENT

Benefit: A Participant may cease active service, leave the accumulated Account Balance on deposit, and later retire upon attaining the minimum age requirement.

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DISABILITY BENEFIT

Eligibility Requirement:	Determination by the Retirement Board that the Participant has a total and permanent disability.
Benefit:	The Account Balance at the date of disability. An annuity benefit is discontinued if the Participant is re-employed before age 60, and performs service creditable under the Program.
Form of Payment:	Same as Normal Retirement.

DEATH BEFORE RETIREMENT

Eligibility Requirement:	Deceased Participant has an Account Balance.
Benefit:	The 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 Participant was receiving an annuity.
Benefit:	According to the terms of the annuity elected by the Participant.

TERMINATION FROM THE PROGRAM

Eligibility Requirement:	More than five years has elapsed since the most recent termination benefit, if any, has been paid.
Benefit:	Lump sum distribution of the Account Balance as of the date of distribution. The benefit is payable one year from the termination of credited service.

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SECTION 4
ACTUARIAL METHODS AND ASSUMPTIONS

This section of the report describes the actuarial methods and assumptions used in this valuation. These procedures and assumptions have been chosen by the Teachers' Retirement Board based on our recommendations. The Board has the sole authority to select the methods and assumptions used in this actuarial valuation.

In our opinion, the current actuarial methods and actuarial assumptions are reasonable and appropriate for the CBB Program. The economic assumptions have been developed in accordance with the Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. Furthermore, because the CBB Program is relatively new and significant data was not available to develop demographic assumptions, the demographic assumptions adopted for this program were developed from the experience of the DB Program.

The assumptions are intended to estimate the future experience of the Participants of the CBB Program and of the System itself in areas which 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 illustrated at selected ages and duration combinations in Tables 10 through 14.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION**

**TABLE 9
OUTLINE OF METHODS AND ASSUMPTIONS**

I. Actuarial Methods

- | | | |
|----|------------------------|-------------------------|
| A. | Cost Method | Traditional Unit Credit |
| B. | Asset Valuation Method | Fair Market Value |

II. Economic Assumptions

- | | | |
|----|--|-------|
| A. | Investment Return
(net of investment and administrative expenses) | 8.00% |
| B. | Interest on Participant Accounts | 8.00% |
| C. | Wage Growth | 4.25% |
| D. | Inflation | 3.50% |

III. Demographic Assumptions

- | | | | |
|----|------------------------|-------------------|---|
| A. | Mortality | | |
| | (1) Active | - Male | 1999 CalSTRS Retired – M (-2 years) Table 10 |
| | | - Female | 1999 CalSTRS Retired – F (-2 years) Table 10 |
| | (2) Retired | - Male | 1999 CalSTRS Retired – M Table 10 |
| | | - Female | 1999 CalSTRS Retired – F Table 10 |
| | (3) Beneficiary | - Male | 1999 CalSTRS Beneficiary – M Table 10 |
| | | - Female | 1999 CalSTRS Beneficiary – F Table 10 |
| | (4) Disabled | - Male | 1994 GAM-M (minimum 2.5% with select rates in first three years) Table 10 |
| | | - Female | 1994 GAM-F (minimum 2.2% with select rates in first three years) Table 10 |
| B. | Service Retirement | Experience Tables | Table 11 |
| C. | Disability Retirement | Experience Tables | Table 12 |
| D. | Withdrawal | Experience Tables | Table 13 |
| E. | Merit Salary Increases | Experience Tables | Table 14 |

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**TABLE 10
MORTALITY RATES**

<u>Active Participants</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 Participants</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%	0.258%	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	2.200
70	1.803	1.176	2.173	1.176	0	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
Select rates for disability:						
First year of disablement					11.4%	6.0%
Second year of disablement					7.7	3.8
Third year of disablement					6.2	3.0

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**TABLE 11
SERVICE RETIREMENT**

<u>Age</u>	<u>Male</u>	<u>Female</u>
54	1.5%	1.5%
55	5.0	6.0
56	3.5	4.0
57	4.0	4.0
58	6.0	6.0
59	15.0	9.0
60	20.0	12.0
61	14.0	13.0
62	14.0	17.0
63	25.0	25.0
64	25.0	25.0
65	20.0	19.0
66	16.0	16.0
67	16.0	16.0
68	16.0	16.0
69	16.0	16.0
70	100.0	100.0

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**TABLE 12
DISABILITY RETIREMENT**

<u>Age</u>	<u>Entry Ages - Male</u>		<u>Entry Ages - Female</u>	
	<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	0.196%	0.141	0.231%
50	0.195	0.288	0.231	0.360
55	0.270	0.390	0.318	0.459
60	0.330	0.529	0.390	0.588
65	0.380	0.852	0.459	0.915

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION**

**TABLE 13
WITHDRAWAL**

Entry Ages - Male					
<u>Year</u>	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 and Up</u>
1	12.5%	12.5%	12.5%	12.5%	12.5%
2	9.5	9.5	9.2	9.2	9.5
3	7.7	6.8	6.8	6.8	7.2
4	5.8	5.8	5.8	5.8	6.2
5	5.0	4.2	4.2	4.2	4.2
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	0.3				
35	0.3				
40	0.3				
Entry Ages - Female					
<u>Year</u>	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 and Up</u>
1	10.0%	10.0%	10.0%	10.0%	10.0%
2	8.3	8.3	8.3	7.5	6.8
3	7.7	7.3	6.5	5.5	5.3
4	7.1	7.1	5.6	4.5	4.0
5	5.5	5.8	4.2	3.5	3.0
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	0.3				
35	0.3				
40	0.3				

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION**

**TABLE 14
MERIT SALARY INCREASES**

Yr.	<u>Entry Age - Annual Increase in Salaries Due to Merit</u>					
	<u>Under 25</u>	<u>25 - 29</u>	<u>30 - 34</u>	<u>35 - 39</u>	<u>40 - 44</u>	<u>45 & up</u>
1	6.1%	5.8%	5.5%	5.4%	5.4%	4.0%
2	5.6	5.1	4.9	4.7	4.7	3.3
3	5.5	5.0	4.7	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	1.2	1.1	1.1	0.7	0.7	0.5
25	1.1	1.0	0.9	0.5	0.6	
30	0.9	0.7	0.6	0.4		
35	0.7	0.7	0.5			
40	0.8	0.7				
45	0.8					

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION**

**SECTION 5
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.

We believe the membership data to be sufficient for the purposes of this valuation.

Tables 15 and 16 summarize the census data used in this valuation.

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION

TABLE 15
SUMMARY OF STATISTICAL INFORMATION

	June 30, 2000	June 30, 1999
Number of Participants		
Active Participants	7,966	n/a
Inactive Participants	1,586	n/a
Retirees and Beneficiaries	<u>0</u>	<u>0</u>
Total Number of Participants	9,552	6,412
Active Participant Statistics		
Annualized Salaries	\$70.6 million	\$50.4 million
Average Salary	\$ 8,863	\$ 7,864
Average Age	46.7 years	45.8 years
Average Service	1.5 years	1.1 years
Accumulated Account Balances		
Participant Contributions	\$ 5,250,345	\$ 2,473,015
Employer Contributions	<u>5,100,375</u>	<u>2,527,598</u>
	\$10,350,720	\$ 5,000,613

TABLE 16
ACTIVE PARTICIPANTS BY AGE GROUP AND YEARS OF SERVICE

Age Group	June 30, 2000	Years	June 30, 2000
Under 25	84	Under 1	3,264
25 – 29	421	1 – 2	2,409
30 – 34	807	2 and Over	<u>2,293</u>
35 – 39	986	Total	7,966
40 – 44	1,129		
45 – 49	1,392		
50 – 54	1,360		
55 – 59	881		
60 – 64	494		
65 and Over	373		
Unknown	<u>39</u>		
Total	7,966		

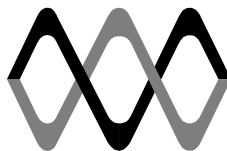
CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION

SECTION 6
GLOSSARY OF ACTUARIAL TERMINOLOGY

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, 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.
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 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.

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM - 2000 ACTUARIAL VALUATION

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.
Actuarial Equivalent:	Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.
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 Participant 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, 2000.



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April 17, 2001

Retirement Board
California State Teachers' Retirement System

**RE: CASH BALANCE BENEFIT PROGRAM AS OF JUNE 30, 2000
DECISION ON GAIN AND LOSS RESERVE AND ADDITIONAL EARNINGS CREDIT**

Dear Members of the Board:

The calculations have been completed for the actuarial valuation of the Cash Balance Benefit (CBB) Program as of June 30, 2000. The purpose of this letter is to outline the alternatives available to distribute the Unallocated Actuarial Gains and Losses to the Gain and Loss Reserve and/or for an Additional Earnings Credit as of June 30, 2000.

UNFUNDED ACTUARIAL OBLIGATION (ACTUARIAL SURPLUS)

Based on the findings of the actuarial valuation as of June 30, 2000, the CBB Program has an Actuarial Surplus of \$517,000. The following chart shows a comparison with the prior year.

(\$Thousands)	June 30, 2000	June 30, 1999
Actuarial Obligation	\$ 10,351	\$ 5,001
Actuarial Value of Assets	<u>10,868</u>	<u>5,224</u>
Unfunded Actuarial Obligation or (Actuarial Surplus)	\$ (517)	\$ (223)

The Actuarial Surplus is allocated by the Teachers' Retirement Board each year between the Gain and Loss Reserve and an Additional Earnings Credit, if any.

GAIN AND LOSS RESERVE

The purpose of the Gain and Loss Reserve is to provide funds to credit interest when the investment earnings of the Program are not sufficient to credit the Minimum Interest Rate. The Board has a goal of maintaining the Gain and Loss Reserve at 160% of the amount anticipated to fund the Minimum Interest Rate for the coming plan year.

The following chart shows the Gain and Loss Reserve calculations for the last three years.

(\$Thousands)	June 30, 2000	June 30, 1999	June 30, 1998
Gain and Loss Reserve			
Beginning of Year	\$ 165	\$ 346	\$ (557)
Adjustment for Plan Merger	0	0	1,293
Additional Earnings Credit	*	(58)	(9)
Gain and Loss Reserve Adjustment	<u> *</u>	<u> (123)</u>	<u> (381)</u>
End of Year Gain and Loss Reserve	\$ 165	\$ 165	\$ 346
Unallocated Gains and (Losses)	\$ 352	\$ 0	0
<i>* To be determined by the Teachers' Retirement Board prior to June 30, 2001</i>			

After each actuarial valuation, the Teachers' Retirement Board decides how to allocate the Unallocated Gains and Losses. In the past, this allocation included an adjustment to the prior year's Gain and Loss Reserve and a declaration of the Additional Earnings Credit, if any.

After the Additional Earnings Credit is declared, the remaining Unallocated Gains (or Losses) strengthen (or reduce) the Gain and Loss Reserve. Therefore, the ending balance of the Gain and Loss Reserve will equal the Actuarial Surplus as determined in the actuarial valuation, less the Additional Earnings Credit granted for the year.

- After the 1998 actuarial valuation was adopted, the Board allocated \$9,000 as an Additional Earnings Credit, with the remaining Actuarial Surplus assigned to the Gain and Loss Reserve. The Additional Earnings Credit had the effect of crediting an average of 8.5% interest to Participant Accounts for the 1997-98 plan year.
- After the 1999 actuarial valuation was adopted, the Board allocated \$58,000 as an Additional Earnings Credit, with the remaining Actuarial Surplus assigned to the Gain and Loss Reserve. Again the Additional Earnings Credit had the effect of crediting an average of 8.5% interest to Participant Accounts for the 1998-99 plan year.

- The 2000 actuarial valuation determined the Actuarial Surplus to be \$517,000 as of June 30, 2000. Therefore, with a Gain and Loss Reserve of \$165,000, the unallocated actuarial gain for the year was \$352,000.

The Board must now decide how to allocate this actuarial gain. If all of it is allocated to the Gain and Loss Reserve, with no Additional Earnings Credit, the end of the year Gain and Loss Reserve will be equal to \$517,000 (equal to the Actuarial Surplus contained in the actuarial valuation). The Board may decide it is appropriate to allocate some of the Gain and Loss Reserve to an Additional Earnings Credit for 1999-00.

ADDITIONAL EARNINGS CREDIT

The attached exhibit includes information to assist the Board in deciding how much, if any, Additional Earnings Credit should be granted. We have developed a Decision Matrix which shows an ending balance in the Gain and Loss Reserve for effective interest rates ranging from the 5.50% Minimum Interest Rate for 1999-00 to over 12% if all of the Gain and Loss Reserve is used for an Additional Earnings Credit for 1999-00.

Data for Decision Matrix: The Minimum Interest Rate for 1999-00 was 5.50% and was equal to approximately \$410,000. The Minimum Interest Rate for the 2000-01 plan year is 6.25%. We have estimated the dollar amount of the Minimum Interest for 2000-01 to be \$834,000 based on Account Balances of \$10,350,720, and expected contributions in 2000-01 of \$6,000,000 (earning interest for six months, on average). The Board's goal for the Gain and Loss Reserve is 160% of the Minimum Interest Rate for the coming year, which we estimate to be \$1,335,000.

Decision Matrix: The enclosed Decision Matrix provides data on the effect of granting various levels of Additional Earnings credit on the Gain and Loss Reserve.

- (1) The Effective Interest Rate is the average rate that would apply for the 2000-01 plan year. Note that while this would be the earnings credit for all Participants as a whole, each Participant would receive a different effective rate because the Additional Earnings Credit is applied to the Account Balances as of the end of the plan year.
- (2) The Total Interest Allocated was \$410,000 for the Minimum Interest Rate. The total interest will increase proportionately to the Effective Interest Rate.
- (3) The dollar amount of Additional Earnings Credit is the increase in the total interest as calculated in column (2) from 5.50% to the applicable decision point. Note that the maximum Additional Earnings Credit is \$517,000, the current Actuarial Surplus.
- (4) The dollar amount of Additional Earnings Credit is expressed as a percentage of the sum of all Account Balances as of the end of the year. This is the percentage increase for the Additional Earnings Credit that will be applied to each Participant's Account

Balance as of June 30, 2000.

- (5) The Gain and Loss Reserve is currently \$165,000. This column shows the remaining balance of the reserve after the Board's decision on the Additional Earnings Credit. For example, if no Additional Earnings Credit is granted, the entire unallocated gain of \$352,000 will be added to the Gain and Loss Reserve, to arrive at an ending balance of \$517,000. On the other hand, if all of the Actuarial Surplus is used for the Additional Earnings Credit, the Gain and Loss Reserve will be depleted as of June 30, 2000. Note the sum of columns (3) and (5) is always equal to \$517,000.
- (6) The next column shows the remaining balance in the Gain and Loss Reserve as a percentage of the amount estimated to be needed to fund the Minimum Interest Rate projected for 2000-01 at each decision point.
- (7) Through February 28, 2001, the rate of return earned on program assets was - 4.1%. This column shows the rate of return needed for the current fiscal year, such that the return plus the remaining Gain and Loss Reserve together are sufficient to fund the Minimum Interest Rate of 6.25% for 2000-01.
- (8) The final column indicates the rate of return that would have to be earned over the last four months of 2000-01 to achieve the indicated return in column (7) for the entire fiscal year.

For example, in order to grant an Additional Earnings Credit of 8.50% through June 30, 2001, earnings of \$224,000 would come out of the current Reserve, lowering the level to from \$517,000 to \$293,000. Our estimate of the Minimum Interest Rate for 2000-01 is \$834,000. In order for the program to have sufficient funds available to pay the Minimum Interest Rate of 6.25% for 2000-01, the earnings for the year would need to be 4.05% (7.06% for the last four months, since the return for the first eight months was - 4.10%). The Gain and Loss Reserve would, however, be depleted as of June 30, 2001. If such an Additional Earnings Credit is paid for 1999-00 and the rate of return for 2000-01 is less than 4.05%, the Gain and Loss Reserve will become negative.

Comments:

For the previous two plan years (ending in 1998 and 1999), the Board adopted an Additional Earnings Credit that produced an average effective rate of return of 8.5%. To do so again for the year ended in 2000 would require a very optimistic projection of investment returns over the next several months.

- With losses of 4.1% for the plan year through February, the Program will need to earn 9.03% for the last four months of the year to be able to credit the 6.25% Minimum

Interest Rate without using the Gain and Loss Reserve.

- In order for the Gain and Loss Reserve to be sufficient to fund the 6.25% Minimum Interest Rate for 2000-01, the Program will need a return of 2.38% for the year, and 5.55% for the last four months to meet this standard.

Note that if the return for the plan year is less than 2.38%, the Gain and Loss Reserve will not be sufficient to fund the 6.25% Minimum Interest Rate for 2000-01. In this event, the Gain and Loss Reserve will become negative and the Program will have an Unfunded Actuarial Obligation instead of an Actuarial Surplus. If the Program does incur an Unfunded Actuarial Obligation, we would expect it to be eliminated by future investment returns in excess of the Minimum Interest Rate. Based on the actuarial assumptions used in the valuation of the Program, this is a reasonable approach, and there should be no immediate cause for concern.

If you have any questions, please let us know.

Sincerely,

A handwritten signature in black ink, appearing to read "Mark O. Johnson". The signature is fluid and cursive, with a large initial "M" and "J".

Mark O. Johnson, F.S.A.
Consulting Actuary

MOJ;j
Encls.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
CASH BALANCE BENEFIT PROGRAM**

**ADDITIONAL EARNINGS CREDIT - JUNE 30, 2000
DECISION MATRIX**

DATA FOR DECISION MATRIX

Minimum Interest in 1999-00 (at 5.50%) <i>estimated</i>	\$ 410,000
Account Balances at June 30, 2000	\$ 10,350,720
Expected Contributions for 2000-01	\$ 6,000,000
Minimum Interest Rate in 2000-01	6.25%
Projected Minimum Interest for 2000-01	\$ 834,000
Estimated Return through February, 2001	- 4.10%

DECISION MATRIX (DOLLARS IN \$000)

Effective Interest Rate (1)	Total Interest Allocated (2)	Add'l Earnings Credit		Gain and Loss Reserve		Return for 00-01 MIR	
		Dollar Amount (3)	Percent of Accounts (4)	Remaining Balance (5)	Percent of 00-01 MIR (6)	Yr (7)	4Qtr (8)
5.50%	\$ 410	\$ 0	0.00%	\$ 517	62%	2.38%	5.55%
6.00	448	37	0.36	480	57	2.66	5.80
6.50	485	75	0.72	442	53	2.94	6.05
7.00	522	112	1.08	405	49	3.22	6.30
7.50	560	149	1.44	368	44	3.50	6.55
8.00	597	187	1.80	330	40	3.77	6.81
8.50	634	224	2.16	293	35	4.05	7.06
9.00	671	261	2.52	256	31	4.33	7.31
9.50	709	298	2.88	219	26	4.61	7.56
10.00	746	336	3.24	181	22	4.89	7.81
10.50	783	373	3.60	144	17	5.17	8.06
11.00	821	410	3.96	107	13	5.45	8.31
11.50	858	448	4.32	69	8	5.73	8.57
12.00	895	485	4.69	32	4	6.01	8.82
12.43	927	517	4.99	0	0	6.25	9.03