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March 17, 2000

Retirement Board
California State Teachers' Retirement System

**RE: DEFINED BENEFIT PROGRAM
ACTUARIAL VALUATION AS OF JUNE 30, 1999**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Defined Benefit (DB) Program of the State Teachers' Retirement Plan as of June 30, 1999. 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,

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

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CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

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**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**SECTION 1
EXECUTIVE SUMMARY**

An actuarial valuation is performed as of the last day of the Program's plan year of each odd-numbered year. A special valuation was performed as of June 30, 1998. The primary purpose of the valuation is to analyze the sufficiency of the statutory contributions to meet the current and future obligations of the Defined Benefit (DB) Program. By using the actuarial methods and assumptions adopted by the Retirement Board, this actuarial valuation provides the best estimate of the long-term financing of the System. We also describe recent changes in the Program's financial condition. Certain information in accordance with the Governmental Accounting Standards Board Statement No. 25 will be provided separately.

Our findings indicate that, overall, the DB Program is very well funded. However, the funding levels in the bifurcated portions of the program are extremely different. The revenue for the 1999 Benefits Increase is not sufficient, while the remainder of the DB Program is very well funded, as shown in the following chart.

| (\$Millions) | Benefits in Effect Prior to January 1, 1999 | Benefits Effective January 1, 1999 |
|--|---|--|
| Actuarial Obligation | \$ 78,889 | \$ 7,460 |
| Actuarial Value of Assets | <u>89,974</u> | <u>27</u> |
| Unfunded Actuarial Obligation (Actuarial Surplus) | \$(11,085) | \$ 7,433 |
| Cost Requirements | | |
| Normal Cost Rate | 13.747% | 1.917% |
| Amortization over 30 Years | <u>0.000</u> | <u>2.339</u> |
| Total Required over 30 Years | 13.747% | 4.256% |
| Source of Income | 16.000% | 3.260% |

The remainder of this report presents our findings in more detail.

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
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SECTION 2

FINDINGS OF THE ACTUARIAL VALUATION

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 DB 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.

DETERMINATION OF NORMAL COST

The **Normal Cost** represents the cost assigned to an average member for a given year such that it would meet the continuing costs of that particular benefit, if contributed each year starting with the date of membership. The Entry Age Actuarial Cost Method is designed to produce a Normal Cost that remains a level percentage of salaries, so it is best expressed as a rate.

The following chart shows the Normal Cost from the 1998 valuation compared to the Normal Cost in this valuation. **Table 1** provides more details on the Normal Cost. We have calculated the Normal Cost three times for the 1999 valuation: (1) based on the prior benefit structure and the prior actuarial assumptions, (2) based on the prior benefit structure and the revised actuarial assumptions, and (3) based on the new benefits that took effect on January 1, 1999, including the impact of the revised actuarial assumptions.

| | Amount (\$Millions) | Percent of Earned Salaries |
|--|--------------------------------|---------------------------------------|
| 1998 Actuarial Valuation | \$ 2,441 | 15.508% |
| 1999 Actuarial Valuation | | |
| Prior Benefits and Assumptions | \$ 2,742 | 15.917% |
| Prior Benefits and Revised Assumptions | \$ 2,363 | 13.747% |
| New Benefits and Assumptions | \$ 329 | 1.917% |

The Normal Cost Rate is expected to remain fairly stable as long as the benefits are not amended, experience emerges as assumed, and the demographic characteristics of the membership remain reasonably consistent.

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The total Normal Cost Rate in the 1998 and prior valuations also included a provision of 0.25% for administrative expenses. Administrative expenses are now assumed to be paid from investment earnings in excess of the assumed rate of return.

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

The next step in the valuation process is to calculate the **Actuarial Value of Assets** that will be used to determine the funding status of the System. As shown in **Table 2**, the market value of assets was reported as \$99,780 million as of June 30, 1999. Because the underlying calculations in the actuarial valuation are long-term in nature, it is advantageous to smooth out short-term fluctuations in the value of assets. The current asset smoothing method projects an Expected Value of Assets using the assumed rate of investment return, then one-third of the difference between the Expected Value and the Market Value is recognized in the Actuarial Value of Assets. The prior method recognized one-fourth of the difference.

The calculations for the 1998-99 plan year are shown in **Table 3** and summarized below.

| | (\$Millions) |
|--------------------------------------|--------------|
| Market Value on June 30, 1999 | \$ 99,780 |
| Prior Asset Method | |
| Based on Actual Earnings | \$ 87,604 |
| Less partial SBMA Reserve | <u>232</u> |
| Actuarial Value on June 30, 1999 | \$ 87,372 |
| Revised Asset Method | |
| Based on Actual Earnings | \$ 90,265 |
| Less full SBMA Reserve | <u>264</u> |
| Actuarial Value on June 30, 1999 | \$ 90,001 |

The method used in the last valuation subtracted an actuarial value for the SBMA Reserve. We have subtracted the full amount, because the full amount is set aside for SBMA benefits regardless of the investment performance of the fund.

The actuarial gain due to the change in the asset smoothing method is \$2,629 million. This is difference between the \$90,001 million on the revised method, and \$87,372 million on the prior method, as shown above.

Based on contributions started on October 1, 1998, additional benefits paid out due to the 1999 Benefits Increase, and earnings on the accumulated assets, we estimate the funds accumulated for the 1999 Benefits Increase to be \$27 million as of June 30, 1999. See **Table 4** for the details.

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DETERMINATION OF THE ACTUARIAL SURPLUS

The next step in the actuarial valuation process is to project all future benefit payments from the System for current members and retirees. The level of benefits currently being paid is known, but assumptions are needed to estimate how long they will be paid, and the amount and timing of the payment of future benefits for active and inactive members who are not currently receiving payments.

The summation of the discounted values of all of the projected benefit payments for all current members, at the assumed rate of return, is called the **Actuarial Present Value of Projected Benefits**. Details are shown in **Table 5** and summarized below.

| (\$Millions) | Benefits: Assumptions: | Actuarial Valuation as of June 30, 1999 | | | 1998 |
|---|---------------------------|---|------------------|----------------|------------------------|
| | | New Revised | Prior Revised | Prior Prior | Actuarial Valuation |
| Benefits Currently Being Paid | | \$ 248 | \$ 32,771 | \$ 32,741 | \$ 31,158 |
| Inactive Members' Deferred Benefits | | 13 | 1,388 | 1,388 | 1,046 |
| Active Members' Future Benefits | | <u>11,665</u> | <u>72,508</u> | <u>81,480</u> | <u>72,796</u> |
| Total Present Value of Projected Benefits to All Current Members | | \$ 11,926 | \$106,667 | \$115,609 | \$105,000 |

The **Actuarial Present Value of Future Normal Costs** is the value of all remaining Normal Costs expected to be received over the future working lifetime of current active members. The Actuarial Present Value of Future Normal Costs is subtracted from the Actuarial Present Value of Projected Benefits to arrive at the **Actuarial Obligation**, the assets that would exist if the current Normal Cost Rate had been paid for all members since entry into the System, and if all actuarial assumptions had been realized. The following is a summary from **Table 6**.

| (\$Millions) | Benefits: Assumptions: | Actuarial Valuation as of June 30, 1999 | | | 1998 |
|--|---------------------------|---|------------------|----------------|------------------------|
| | | New Revised | Prior Revised | Prior Prior | Actuarial Valuation |
| Value of Projected Benefits | | \$ 11,926 | \$106,667 | \$115,609 | \$105,000 |
| Value of Future Normal Costs | | <u>4,466</u> | <u>27,778</u> | <u>33,533</u> | <u>30,766</u> |
| Actuarial Obligation | | \$ 7,460 | \$ 78,889 | \$ 82,076 | \$ 74,234 |
| Actuarial Value of Assets | | <u>27</u> | <u>89,974</u> | <u>87,345</u> | <u>77,290</u> |
| Unfunded Actuarial Obligation (Actuarial Surplus) | | \$ 7,433 | \$(11,085) | \$ (5,269) | \$ (3,056) |

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The Unfunded Actuarial Obligation is the excess of the Actuarial Obligation over the Actuarial Value of Assets, which represents a liability that must be funded over time. Contributions in excess of the Normal Cost are used to amortize the Unfunded Actuarial Obligation.

An Actuarial Surplus exists if the Actuarial Value of Assets exceeds the Actuarial Obligation.

ACTUARIAL GAINS AND LOSSES

Comparing the Unfunded Actuarial Obligation as of two valuation dates does not provide enough information to determine if there were actuarial gains or losses. The correct comparison is between the Unfunded Actuarial Obligation on the valuation date and the Expected Unfunded Actuarial Obligation projected from the prior valuation date using the actuarial assumptions in effect for the two-year period.

Table 7 shows the Actuarial Obligation as of June 30, 1998, and the elements to project that figure forward to June 30, 1999: the Normal Cost, less benefits paid, plus a charge for interest at the assumed rate. The actuarial gains and losses for the 1998-99 year are as follows:

| | (\$Millions) |
|-------------------------------------|--------------|
| Actuarial (Gains) and Losses | |
| Gain from Investments | \$ (1,195) |
| Net Loss from Non-investment | |
| Experience and Change in Actuary | 2,616 |
| Change in Asset Method | (2,629) |
| Change in Actuarial Assumptions | (3,187) |
| 1999 Benefits Increase | <u>7,460</u> |
| Net from All Sources | \$ 3,065 |

As calculated in Table 3, the expected market value as of June 30, 1999, assuming the fund had earned 8% for the year, was \$95,030 million. After smoothing with the prior method, the actuarial value would have been \$86,177 million. The difference between this figure and \$87,372 million represents the gain in the Actuarial Value of Assets due to the partial recognition of the 1998-99 investment gains, or \$1,195 million.

The net loss due to non-investment experience includes certain uncalculated changes due to the different procedures and proprietary software used between different actuarial firms. We have not audited the results of the 1998 actuarial valuation.

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SOURCES OF INCOME

The statutory **Sources of Income** include contributions from members at the rate of 8.00% of Earned Salaries, and the School Districts contribute at the rate of 8.25% of Earned Salaries. Contributions from the State, as shown below, are used to fund the difference between the Normal Cost and the member and employer contributions, and to finance the Unfunded Actuarial Obligation, if any.

Table 8 is shown below.

| Sources of Income | | 1999 | 1998 |
|-------------------------------------|--|-----------------------------|-----------------------------|
| Normal Cost Funding | | | |
| EC 22901 | Members - permanent contribution | 8.000% | 8.000% |
| EC 22950 | Employers - permanent contribution | 8.000 | 8.000 |
| EC 22955 | State – Normal Cost Deficit ⁽¹⁾ | <u>0.000</u> | <u>0.000</u> |
| Total for Normal Cost | | 16.000% | 16.000% |
| Additional Funding | | | |
| EC 22951 | Employers – Unused Sick Leave | 0.250% | 0.250% |
| EC22952 | State - Ad hoc retiree increase | 0.000 | 0.307 |
| EC22955 | State – Supplemental Funding | <u>3.010</u> ⁽²⁾ | <u>3.786</u> ⁽³⁾ |
| Total for Additional Funding | | 3.260% | 4.343% |
| Total Contribution Rate | | 19.260% | 20.343% |

Notes:

- (1) Only used if Normal Cost Rate is greater than 16.000% of salaries for benefits in place on July 1, 1990.
- (2) Equivalent to 3.102% paid quarterly based on prior calendar year salaries.
- (3) Equivalent to 4.050% paid quarterly based on prior calendar year salaries.

The 16% from the members and employers is used to fund the benefits in place on July 1, 1990. If needed, some additional funding is available from the State per EC 22955 for these benefits. For purposes of the 1999 valuation, only 16% is available to fund the benefits in place in 1990.

The remaining 3.260% of Earned Salaries (0.250% plus 3.102% adjusted from prior calendar year salaries) is available to fund the 1999 Benefits Increase.

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FUNDED STATUS OF THE DB PROGRAM

The 1999 Benefits Increase was passed with a specified source of revenue, as described above, at a rate equivalent to 3.260% of Earned Salaries. In order to test the sufficiency of this revenue, it is necessary to perform separate funding calculations for the benefits in place prior to 1999, compared to the 1999 Benefits Increase which was effective on January 1, 1999. Note that all benefits enacted with effective dates between July 1, 1990 and December 31, 1998 are presumed to be cost-neutral.

Table 9 shows the key findings of the valuation bifurcated between the two benefit structures.

| (\$Millions) | Benefits in Effect Prior to January 1, 1999 | Benefits Effective January 1, 1999 |
|--|---|--|
| Actuarial Obligation | \$ 78,889 | \$ 7,460 |
| Actuarial Value of Assets | <u>89,974</u> | <u>27</u> |
| Unfunded Actuarial Obligation (Actuarial Surplus) | \$ (11,085) | \$ 7,433 |
| Cost Requirements | | |
| Normal Cost Rate | 13.747% | 1.917% |
| Amortization over 30 Years | <u>0.000</u> | <u>2.339</u> |
| Total Required over 30 Years | 13.747% | 4.256% |
| Total Contribution Rate | 16.000% | 3.260% |

It is apparent that the benefits of the DB Program that were in effect prior to 1999 are extremely well funded. The revenue is 16% of Earned Salaries and the Normal Cost is only 13.747%. In addition, there is an Actuarial Surplus of \$11,085 million.

On the other hand, the revenue intended for the 1999 Benefits Increase is not sufficient to fund the benefits. The Normal Cost Rate is 1.917% and the remaining available 1.350% of Earned Salaries will not amortize the Unfunded Actuarial Obligation of \$7,433 million. Therefore, additional resources will be needed for the current contributions associated with the 1999 Benefits Increase to be sufficient to fund those benefits over the 30-year funding period. An allocation of \$3,165 million from the \$11,085 million Actuarial Surplus associated with benefits in effect prior to 1999 could be applied to fund the 1999 Benefits Increase, or a portion of the difference between the 16% contribution and the 13.747% Normal Cost for prior benefits could be allocated to the 1999 Benefits Increase. A combination of the two approaches could be used as well. No funds have been allocated in this manner at this time.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 1
NORMAL COST**

| (\$Millions) | Actuarial Valuation as of June 30, 1999 | | | 1998 |
|---|---|------------------|----------------|------------------------|
| Benefits: Assumptions: | New Revised | Prior Revised | Prior Prior | Actuarial Valuation |
| Estimated Annual Earned Salaries | \$ 17,185 | \$ 17,185 | \$ 17,228 | \$ 15,741 |
| Present Value of Future Normal Costs for Current Active Members | \$ 4,466 | \$ 27,778 | \$ 33,533 | \$ 30,766 |
| Present Value of Future Earned Salaries for Current Active Members | \$205,899 | \$202,018 | \$210,632 | \$198,388 |
| Annual Normal Cost | | | | |
| Retirement | \$ 324 | \$ 2,092 | \$ 2,427 | \$ 2,115 |
| Disability | 1 | 115 | 124 | 101 |
| Death | 4 | 45 | 43 | 79 |
| Withdrawal | <u>0</u> | <u>111</u> | <u>148</u> | <u>146</u> |
| Total Normal Cost | \$ 329 | \$ 2,363 | \$ 2,742 | \$ 2,441 |
| Normal Cost Rate (Percent of Earned Salaries) | | | | |
| Benefits | 1.917% | 13.747% | 15.917% | 15.508% |
| Administrative Expenses | <u>0.000</u> | <u>0.000</u> | <u>0.250</u> | <u>0.250</u> |
| Total Normal Cost | 1.917% | 13.747% | 16.167% | 15.758% |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 2
STATEMENT OF PROGRAM ASSETS**

| (\$Millions) | June 30, 1999 | June 30, 1998 |
|--|----------------|----------------|
| Invested Assets | | |
| Short-term | \$ 1,019 | \$ 1,725 |
| Debt Securities | 25,119 | 26,886 |
| Equity | 68,668 | 55,257 |
| Alternative | 2,582 | 1,983 |
| Real Estate | <u>2,170</u> | <u>2,061</u> |
| Total Investments ⁽¹⁾ | \$ 99,558 | \$ 87,912 |
| Cash and Cash Equivalents | 2 | 4 |
| Receivables | 2,853 | 3,339 |
| Liabilities ⁽¹⁾ | <u>(2,633)</u> | <u>(3,057)</u> |
| Fair Market Value of Net Assets | \$ 99,780 | \$ 88,198 |

Notes:

⁽¹⁾ Excludes offsetting entries from Securities Lending Collateral and Obligation

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**TABLE 3
ACTUARIAL VALUE OF ASSETS**

| (\$Millions) | <u>As of June 30, 1999</u> | | <u>Expected Values</u> | |
|--|----------------------------|------------------|------------------------|------------------|
| | Revised Method | Prior Method | Prior Method | Market Value |
| Value June 30, 1998 ⁽¹⁾ | \$ 79,381 | \$ 77,565 | \$ 77,565 | \$ 88,198 |
| Contributions | 3,247 | 3,247 | 3,247 | 3,247 |
| Benefits and Expenses | (3,462) | (3,462) | (3,462) | (3,462) |
| Expected Return at 8% | <u>6,342</u> | <u>6,196</u> | <u>6,196</u> | <u>7,047</u> |
| Expected Value at June 30, 1999 | \$ 85,508 | \$ 83,546 | \$ 83,546 | \$ 95,030 |
| Market Value | \$ 99,780 | \$ 99,780 | \$ 95,030 | |
| Difference between Market Value and Expected Value | \$ 14,272 | \$ 16,234 | \$ 11,484 | |
| Recognition Factor | One-third | One-fourth | One-fourth | |
| Recognized Gain or Loss | \$ 4,757 | \$ 4,058 | \$ 2,871 | |
| Actuarial Value at June 30, 1999 (Expected Value plus Recognized Gain or Loss) | \$ 90,265 | \$ 87,604 | \$ 86,417 | |
| SBMA Reserve | \$ 264 | \$ 264 | \$ 264 | |
| Adjusted SBMA Reserve ⁽²⁾ | \$ 264 | \$ 232 | \$ 240 | |
| Actuarial Value at June 30, 1999 (After SBMA Adjustment) | \$ 90,001 | \$ 87,372 | \$ 86,177 | |

Notes:

⁽¹⁾ Accumulated at prior method and revised method from fresh start on July 1, 1993.

⁽²⁾ Full amount of the SBMA Reserve is set aside in the 1999 valuation.

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DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 4
BIFURCATED ASSETS**

| | (\$Thousands) |
|---|------------------|
| Assets Allocated to 1999 Benefits Increase | |
| Market Value at July 1, 1998 | \$ 0 |
| Contributions | |
| EC 22951 at 0.250% of salaries (effective 10/1/98) | 31,890 |
| EC 22955 at 3.102% of prior calendar year salaries (effective 7/1/99) | 0 |
| Benefits Paid | |
| Increased Multiplier | (2,154) |
| Career Bonus | (955) |
| Unused Sick Leave | (87) |
| Total Increase in Benefits for 1998-99 | (3,196) |
| Investment Return at annualized rate of 13.39% ⁽¹⁾ | |
| Beginning Balance (12 months) | 0 |
| Contributions (9 months) | 1,601 |
| Benefits Paid (1.93 months ⁽²⁾) | (34) |
| Total Earnings Allocated | 1,567 |
| Market Value at June 30, 1999 | \$ 30,261 |
| Ratio of Actuarial Value to Market Value at June 30, 1999 ⁽³⁾ | 90.464% |
| Actuarial Value of Assets for 1999 Benefits Increase at June 30, 1999 | \$ 27,375 |

Notes:

- ⁽¹⁾ Based on Market Value of Assets and uniform cash flow for contributions, benefits, and expenses.
- ⁽²⁾ Based on data supplied by CalSTRS staff
- ⁽³⁾ From Table 3: (\$90,265 divided by \$99,780)

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
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**TABLE 5
ACTUARIAL PRESENT VALUE OF PROJECTED BENEFITS**

| (\$Millions) | Benefits: Assumptions: | Actuarial Valuation as of June 30, 1999 | | | 1998 Actuarial Valuation |
|---|---------------------------|---|------------------|----------------|--------------------------------|
| | | New Revised | Prior Revised | Prior Prior | |
| Benefits Currently Being Paid | | | | | |
| Retirement | | \$ 248 | \$ 30,033 | \$ 30,038 | \$ 28,564 |
| Disability | | 0 | 1,068 | 1,026 | 1,009 |
| Survivors and Contingent Survivors | | <u>0</u> | <u>1,670</u> | <u>1,677</u> | <u>1,585</u> |
| Total | | \$ 248 | \$ 32,771 | \$ 32,741 | \$ 31,158 |
| Benefits to Inactive Members | | | | | |
| Total Deferred Vested Benefits | | \$ 13 | \$ 1,388 | \$ 1,388 | \$ 1,046 |
| Benefits to Active Members | | | | | |
| Retirement | | \$ 11,548 | \$ 69,245 | \$ 77,778 | \$ 68,100 |
| Disability | | 42 | 1,890 | 1,941 | 1,980 |
| Death | | 75 | 828 | 854 | 1,438 |
| Withdrawal | | <u>0</u> | <u>545</u> | <u>907</u> | <u>1,278</u> |
| Total for Active Members | | \$ 11,665 | \$ 72,508 | \$ 81,480 | \$ 72,796 |
| Total Present Value of Projected Benefits to All Current Members | | \$ 11,926 | \$106,667 | \$115,609 | \$105,000 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 6
UNFUNDED ACTUARIAL OBLIGATION / ACTUARIAL SURPLUS**

| (\$Millions) | Benefits: Assumptions: | Actuarial Valuation as of June 30, 1999 | | | 1998 Actuarial Valuation |
|--|--|---|------------------|----------------|--------------------------------|
| | | New Revised | Prior Revised | Prior Prior | |
| Present Value of Projected Benefits | | | | | |
| | Benefits Currently Being Paid | \$ 248 | \$ 32,771 | \$ 32,741 | \$ 31,158 |
| | Inactive Members | 13 | 1,388 | 1,388 | 1,046 |
| | Active Members | <u>11,665</u> | <u>72,508</u> | <u>81,480</u> | <u>72,796</u> |
| | Total | \$ 11,926 | \$106,667 | \$115,609 | \$105,000 |
| | Present Value of Future Normal Costs | <u>4,466</u> | <u>27,778</u> | <u>33,533</u> | <u>30,766</u> |
| | Actuarial Obligation | \$ 7,460 | \$ 78,889 | \$ 82,076 | \$ 74,234 |
| Actuarial Value of Assets | | | | | |
| | Program Assets | | 90,001 | 87,372 | 77,290 |
| | Allocated to 1999 Benefits Increase | <u>27</u> | <u>(27)</u> | <u>(27)</u> | <u>(0)</u> |
| | Net Assets Available | 27 | 89,974 | 87,345 | 77,290 |
| | Unfunded Actuarial Obligation (Actuarial Surplus) | \$ 7,433 | \$(11,085) | \$ (5,269) | \$ (3,056) |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
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**TABLE 7
ACTUARIAL GAINS AND LOSSES**

| (\$Millions) | Expected | Actual ⁽¹⁾ | (Gain) Loss |
|---|-------------------|-----------------------|-------------------------------|
| Actuarial Obligation June 30, 1998 | \$ 74,234 | | |
| Normal Cost for 1998-99 | 2,441 | | |
| Benefits Paid | (3,220) | | |
| Expected Interest at 8% | <u>6,005</u> | | |
| Expected Actuarial Obligation | \$ 79,460 | \$ 82,076 | \$ 2,616 ⁽²⁾ |
| Actuarial Value of Assets | <u>86,150</u> | <u>87,345</u> | <u>(1,195) ⁽³⁾</u> |
| Unfunded Actuarial Obligation (Actuarial Surplus) before changes in assumptions and benefits | \$ (6,690) | \$ (5,269) | \$ 1,421 |
| Changes in Asset Method | | | (2,629) |
| Changes in Actuarial Assumptions | | | (3,187) |
| 1999 Benefits Increase | | | <u>7,460</u> |
| Total Actuarial (Gain) or Loss | | | \$ 3,065 |

Notes:

- (1) Actual values before changes in methods, assumptions, and benefits.
- (2) Net actuarial loss due to demographic and census changes.
- (3) Actuarial gain due to investment performance.
Assets exclude net available for 1999 Benefits Increase.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
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**TABLE 8
SOURCES OF INCOME**

| | | 1999 | 1998 |
|-------------------------------------|--|-----------------------------|-----------------------------|
| Normal Cost Funding | | | |
| EC 22901 | Members - permanent contribution | 8.000% | 8.000% |
| EC 22950 | Employers - permanent contribution | 8.000 | 8.000 |
| EC 22955 | State – Normal Cost Deficit ⁽¹⁾ | <u>0.000</u> | <u>0.000</u> |
| Total for Normal Cost | | 16.000% | 16.000% |
| Additional Funding | | | |
| EC 22951 | Employers – Unused Sick Leave | 0.250% | 0.250% |
| EC 22952 | State - Ad hoc retiree increase | 0.000 | 0.307 |
| EC 22955 | State – Supplemental Funding | <u>3.010</u> ⁽²⁾ | <u>3.786</u> ⁽³⁾ |
| Total for Additional Funding | | 3.260% | 4.343% |
| Total Contribution Rate | | 19.260% | 20.343% |

Notes:

- ⁽¹⁾ Only used if Normal Cost Rate is greater than 16.000% of salaries.
- ⁽²⁾ Equivalent to 3.102% paid quarterly based on prior calendar year salaries.
- ⁽³⁾ Equivalent to 4.050% paid quarterly based on prior calendar year salaries.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 9
FUNDED STATUS**

| (\$Millions) | Benefits in Effect Prior to January 1, 1999 | Benefits Effective January 1, 1999 |
|--|---|--|
| Actuarial Obligation | \$ 78,889 | \$ 7,460 |
| Actuarial Value of Assets | <u>89,974</u> | <u>27</u> |
| Unfunded Actuarial Obligation (Actuarial Surplus) | \$ (11,085) | \$ 7,433 |
| Cost Requirements | | |
| Normal Cost Rate | 13.747% | 1.917% |
| Amortization over 30 Years | <u>0.000</u> | <u>2.339</u> |
| Total Required over 30 Years | 13.747% | 4.256% |
| Total Contribution Rate | 16.000% | 3.260% |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

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 Defined Benefit (DB) 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. Certain provisions are identified as part of the 1999 Benefit Increase package, and are financed with separately designated contributions.

NORMAL RETIREMENT

| | |
|----------------------------|--|
| Eligibility Requirement: | Age 60 with five years of credited California Service. |
| Allowance: | Two percent of final compensation for each year of credited service. |
| Credited Service: | For each year of membership, credited service is granted based on the ratio of salary earned to full-time salary earnable for one position. |
| Final Compensation: | Average salary earnable for the highest three consecutive years of credited California service for one position. |
| IRC Section 415: | Benefits are subject to limits imposed under Internal Revenue Code (IRC) Section 415, except for benefits based on plan provisions in effect as of October 14, 1987, payable to members with membership dates prior to 1990. |
| Sick Leave Service Credit: | Service is granted for unused sick leave at the time of retirement under certain circumstances. New members on and after July 1, 1980, or any members who refund and return to membership, will receive credit for sick leave as part of the 1999 Benefits Increase . |
| Career Bonus: | If a member has thirty years of credited service, the age factor is increased by 0.2%. However, the maximum age factor is 2.4%. The career bonus is part of the 1999 Benefits Increase . |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

EARLY RETIREMENT

Eligibility Requirement: Age 55 with five years of credited California service, or age 50 with 30 years of credited California service.

Benefit Reduction: A 1/2% reduction in the normal retirement allowance for each full month or partial month the member is younger than age 60, plus a reduction of 1/4% for each full month or partial month the member is younger than age 55.

LATE RETIREMENT

Allowance: Members continue to earn additional service credit after age 60. As part of the **1999 Benefits Increase**, the 2% age factor increases by 0.033% for each quarter year of age that the member is over age 60, up to a maximum of 2.4%.

DEFERRED RETIREMENT

Allowance: Any time after satisfying the minimum service requirement, a member may cease active service, leave the accumulated contributions on deposit, and later retire upon attaining the minimum age requirement.

POST-RETIREMENT BENEFIT ADJUSTMENT

Benefit Improvement Factor: Two percent simple increase on September 1 following the first anniversary of the effective date of the allowance, applied to all continuing allowances.

DISABILITY ALLOWANCE - COVERAGE A

Eligibility Requirement: Member has five years of Credited California service and has not attained age 60.

Allowance: Fifty percent of final compensation

or

5% of final compensation for each year of service credit if over age 45 with less than 10 years of service credit.

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

| | |
|---------------------|---|
| Children's Benefit: | 10% for each eligible dependent child, up to a maximum of 40% of final compensation. The increment for each eligible child continues until the child marries or attains age 22. Beginning in 2002, children not registered as full-time students will retain eligibility only up to age 18. |
| Offsets: | Allowance, including children's increment, is reduced by disability benefits payable under Social Security, Workers' Compensation and district-paid income protection plan. |

DISABILITY ALLOWANCE - COVERAGE B

| | |
|--------------------------|---|
| Eligibility Requirement: | Member has five years of Credited California service. |
| Allowance: | Fifty percent of final compensation, regardless of age and service credit. |
| Children's Benefit: | 10% for each eligible child up to four children, for a maximum of 40% of final compensation. The increment for each child continues until the child attains age 21, regardless of student, marital, or employment status. |
| Offsets: | The member's allowance is reduced by disability benefits payable under Workers' Compensation. |

DEATH BEFORE RETIREMENT - COVERAGE A

| | |
|--------------------------|--|
| Eligibility Requirement: | One or more years of service credit for active members or members receiving a disability allowance. |
| Lump Sum Payment: | \$5,493 lump sum to the designated beneficiary. If there is no surviving spouse or eligible children, the contributions and interest are paid to the designated beneficiary. |
| Allowance: | <p>The surviving spouse with eligible children will receive a family benefit of 40% of final compensation for as long as there is at least one eligible child. An additional 10% of final compensation is payable for each eligible child up to a maximum benefit of 90%.</p> <p>If there is no surviving spouse, an allowance of 10% of final compensation is payable to eligible child up to a maximum benefit of 50%.</p> |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

When there are no eligible children, the spouse may elect to receive one half of a 50% joint and survivor allowance projected to age 60, or take a lump sum payment of the remaining contributions and interest.

DEATH BEFORE RETIREMENT - COVERAGE B

| | |
|-------------------|--|
| Eligibility: | One or more years of service credit for active members. |
| Lump Sum Payment: | \$21,974 lump sum to the designated beneficiary. If there is no surviving spouse, the contributions and interest are paid to the designated beneficiary. |
| Allowance: | A lump sum payment of the contributions and interest. or One half of a 50% joint and survivor allowance, beginning on the member's 60th birthday, or immediately with a reduction based on the member and spouse's age at the time the benefit begins. If the surviving spouse elects a monthly allowance, each eligible child would receive 10% of the member's final compensation, with a maximum benefit of 50%. |

DEATH AFTER RETIREMENT

| | |
|-------------------|--|
| Lump Sum Payment: | \$5,493 lump sum to the designated beneficiary. |
| Annuity Form: | If the retirant had elected one of the joint and survivor options, the retirement allowance would be modified in accordance with the option selected. If no option had been elected, payment of the unpaid contributions and interest, if any, remaining in the retirant's account. |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

TERMINATION FROM SYSTEM

- | | |
|------------------------|--|
| Refund: | Refund of contributions with interest as credited to the member's account to date of withdrawal. A refund terminates membership and all rights to future benefits from the System. |
| Re-entry After Refund: | Former Members who re-enter the System, may redeposit all amounts previously refunded plus regular interest. The member must earn one year of credited service after re-entry before becoming eligible for benefits from the System. |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

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 DB 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*. The demographic assumptions adopted for this program were developed from recent experience and expectations of future trends.

The assumptions are intended to estimate the future experience of the Participants of the DB 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 11 through 16.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 10
OUTLINE OF METHODS AND ASSUMPTIONS**

I. Actuarial Methods

- | | | |
|----|------------------------|---|
| A. | Cost Method | Entry Age Cost Method |
| B. | Asset Valuation Method | Expected Value with 1/3 rd Recognition |

II. Economic Assumptions

- | | | |
|----|--|-------|
| A. | Investment Return (net of investment and administrative expenses) | 8.00% |
| B. | Interest on Participant Accounts | 6.00% |
| C. | Wage Growth | 4.25% |

III. Demographic Assumptions

- | | | | |
|----|------------------------|-------------------|---|
| A. | Mortality | | |
| | (1) Active | - Male | 1999 CalSTRS Retired – M (-2 years) Table 11 |
| | | - Female | 1999 CalSTRS Retired – F (-2 years) Table 11 |
| | (2) Retired | - Male | 1999 CalSTRS Retired – M Table 11 |
| | | - Female | 1999 CalSTRS Retired – F Table 11 |
| | (3) Beneficiary | - Male | 1999 CalSTRS Beneficiary – M Table 11 |
| | | - Female | 1999 CalSTRS Beneficiary – F Table 11 |
| | (4) Pre-1972 | - Male | 1951 GA Table – M (-1 year) Table 11 |
| | Disabled | - Female | 1951 GA Table – M (-7 years) Table 11 |
| | (5) Disabled | - Male | 1994 GAM-M (minimum 2.5% with select rates in first three years) Table 11 |
| | | - Female | 1994 GAM-F (minimum 2.2% with select rates in first three years) Table 11 |
| B. | Service Retirement | Experience Tables | Table 12 |
| C. | Disability Retirement | Experience Tables | Table 13 |
| D. | Withdrawal | Experience Tables | Table 14 |
| | Probability of Refund | Experience Tables | Table 15 |
| E. | Merit Salary Increases | Experience Tables | Table 16 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 11
MORTALITY RATES**

| <u>Age</u> | <u>Active Participants</u> | | <u>Age</u> | <u>Retired Participants</u> | |
|------------|----------------------------|---------------|------------|-----------------------------|---------------|
| | <u>Male</u> | <u>Female</u> | | <u>Male</u> | <u>Female</u> |
| 25 | 0.051% | 0.029% | 50 | 0.190% | 0.121% |
| 30 | 0.066 | 0.029 | 55 | 0.321 | 0.191 |
| 35 | 0.080 | 0.037 | 60 | 0.558 | 0.336 |
| 40 | 0.085 | 0.051 | 65 | 1.015 | 0.668 |
| 45 | 0.107 | 0.077 | 70 | 1.803 | 1.176 |
| 50 | 0.158 | 0.103 | 75 | 2.848 | 1.834 |
| 55 | 0.258 | 0.157 | 80 | 5.021 | 3.778 |
| 60 | 0.443 | 0.256 | 85 | 9.419 | 6.503 |
| 65 | 0.798 | 0.509 | 90 | 14.754 | 11.627 |
| | | | 95 | 23.361 | 18.621 |

| <u>Age</u> | <u>Beneficiaries</u> | | <u>Pre-1972 Disabled</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 | 0.233% | 0.258% | 0.581% | 0.277% | 2.500% | 2.200% |
| 55 | 0.398 | 0.191 | 0.956 | 0.518 | 2.500 | 2.200 |
| 60 | 0.709 | 0.336 | 1.438 | 0.873 | 2.500 | 2.200 |
| 65 | 1.294 | 0.668 | 2.207 | 1.330 | 2.500 | 2.200 |
| 70 | 2.173 | 1.176 | 3.594 | 2.007 | 2.500 | 2.200 |
| 75 | 3.405 | 1.834 | 5.708 | 3.299 | 3.721 | 2.269 |
| 80 | 5.586 | 3.778 | 9.095 | 5.208 | 6.203 | 3.940 |
| 85 | 8.961 | 6.503 | 13.707 | 8.269 | 9.724 | 6.774 |
| 90 | 14.754 | 11.627 | 18.892 | 12.744 | 15.293 | 11.627 |
| 95 | 23.361 | 18.621 | 25.277 | 17.779 | 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 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 12
SERVICE RETIREMENT**

| <u>Age</u> | <u>For Prior Benefits</u> | | <u>For 1999 Benefits Increase</u> | |
|------------|---------------------------|---------------|-----------------------------------|---------------|
| | <u>Male</u> | <u>Female</u> | <u>Male</u> | <u>Female</u> |
| 54 | 1.5% | 1.5% | 1.5% | 1.5% |
| 55 | 5.8 | 7.0 | 5.0 | 6.0 |
| 56 | 3.9 | 4.5 | 3.5 | 4.0 |
| 57 | 4.9 | 4.5 | 4.0 | 4.0 |
| 58 | 6.8 | 7.0 | 6.0 | 6.0 |
| 59 | 17.5 | 14.0 | 15.0 | 9.0 |
| 60 | 25.0 | 22.0 | 20.0 | 12.0 |
| 61 | 16.5 | 15.0 | 14.0 | 13.0 |
| 62 | 16.5 | 15.0 | 14.0 | 17.0 |
| 63 | 15.0 | 15.0 | 25.0 | 25.0 |
| 64 | 17.5 | 18.0 | 25.0 | 25.0 |
| 65 | 20.0 | 18.0 | 20.0 | 19.0 |
| 66 | 16.0 | 18.0 | 16.0 | 16.0 |
| 67 | 16.0 | 18.0 | 16.0 | 16.0 |
| 68 | 16.0 | 16.0 | 16.0 | 16.0 |
| 69 | 16.0 | 16.0 | 16.0 | 16.0 |
| 70 | 100.0 | 100.0 | 100.0 | 100.0 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 13
DISABILITY RETIREMENT**

| <u>Age</u> | <u>Coverage A</u> | |
|------------|-------------------|---------------|
| | <u>Male</u> | <u>Female</u> |
| 25 | 0.021% | 0.021% |
| 30 | 0.030 | 0.030 |
| 35 | 0.051 | 0.060 |
| 40 | 0.081 | 0.090 |
| 45 | 0.111 | 0.111 |
| 50 | 0.159 | 0.219 |
| 55 | 0.210 | 0.279 |

| <u>Age</u> | <u>Coverage B</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
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 14
WITHDRAWAL**

| <u>Entry Ages - Male</u> | | | | | |
|----------------------------|-----------------|----------------|----------------|----------------|------------------|
| <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 | | | | |
| <u>Entry Ages - Female</u> | | | | | |
| <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
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 15
PROBABILITY OF REFUND**

| 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> |
| Under 5 | 100% | 100% | 100% | 100% | 100% |
| 10 | 50 | 40 | 40 | 45 | 40 |
| 15 | 40 | 40 | 35 | 35 | |
| 20 | 35 | 35 | 30 | | |
| 25 | 25 | 20 | | | |
| 30 | 20 | | | | |
| 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> |
| Under 5 | 100% | 100% | 100% | 100% | 100% |
| 10 | 25 | 25 | 30 | 30 | 25 |
| 15 | 20 | 20 | 30 | 20 | |
| 20 | 20 | 20 | 20 | | |
| 25 | 20 | 20 | | | |
| 30 | 15 | | | | |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 16
MERIT SALARY INCREASES**

| 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 & 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
DEFINED BENEFIT PROGRAM - 1999 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.

Table 17 summarizes the census data used in this valuation.

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 17
SUMMARY OF STATISTICAL INFORMATION**

| | June 30, 1999 | June 30, 1998 |
|-----------------------------------|------------------|------------------|
| Number of Members | | |
| Active Members | 402,220 | 385,530 |
| Inactive Members | 69,112 | 61,848 |
| Retirees and Beneficiaries | | |
| Service Retirants | 142,309 | 139,193 |
| Disabilitants | 5,822 | 5,758 |
| Survivors | <u>13,326</u> | <u>12,796</u> |
| Total | 161,457 | 157,747 |
| Total Membership in Valuation | 632,789 | 605,125 |
| Active Member Statistics | | |
| Annualized Salaries | \$17,185 million | \$15,741 million |
| Average Salary | \$ 42,733 | \$ 40,830 |
| Average Age | 44.2 years | 44.3 years |
| Average Service | 10.8 years | 11.0 years |
| Average Annual Allowances | | |
| Service Retirants | \$ 20,748 | \$ 19,656 |
| Disabilitants | 17,296 | 16,596 |
| Survivors | <u>13,248</u> | <u>12,036</u> |
| All Benefit Recipients | \$ 20,153 | \$ 18,924 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 17.1
DISTRIBUTION OF ACTIVE MEMBERS BY AGE GROUP**

| AGE GROUP | MALE | FEMALE | TOTAL |
|------------------|-------------|---------------|--------------|
| Under 25 | 1,090 | 4,916 | 6,006 |
| 25 – 29 | 10,778 | 33,656 | 44,434 |
| 30 – 34 | 13,261 | 32,682 | 45,943 |
| 35 – 39 | 13,036 | 29,882 | 42,918 |
| 40 – 44 | 14,100 | 34,260 | 48,360 |
| 45 – 49 | 18,695 | 45,699 | 64,394 |
| 50 – 54 | 23,301 | 50,647 | 73,948 |
| 55 – 59 | 16,895 | 32,764 | 49,659 |
| 60 – 64 | 6,833 | 11,949 | 18,782 |
| 65 – 70 | 2,010 | 3,392 | 5,402 |
| 70 and Up | 764 | 1,214 | 1,978 |
| Unknown | 7 | 389 | 396 |
| Total | 120,770 | 281,450 | 402,220 |
| Percent of Total | 30.0% | 70.0% | 100.0% |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 17.2
ACTIVE MALE MEMBERS**

| <u>AGE</u> | <u>SERVICE</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 | 351 | 739 | | | | |
| 25 to 30 | 1,400 | 9,207 | 171 | | | |
| 30 to 35 | 1,046 | 8,869 | 3,280 | 66 | | |
| 35 to 40 | 923 | 5,581 | 4,168 | 2,309 | 55 | |
| 40 to 45 | 826 | 4,641 | 3,196 | 3,416 | 1,905 | 116 |
| 45 to 50 | 812 | 4,556 | 3,038 | 3,267 | 2,944 | 3,745 |
| 50 to 55 | 766 | 3,936 | 2,615 | 2,647 | 2,287 | 4,255 |
| 55 to 60 | 458 | 2,180 | 1,353 | 1,359 | 1,072 | 1,529 |
| 60 to 65 | 237 | 1,099 | 573 | 616 | 409 | 453 |
| 65 to 70 | 131 | 474 | 207 | 169 | 138 | 140 |
| 70 & Up | 66 | 285 | 89 | 60 | 43 | 28 |
| Unknown | | 7 | | | | |
| Total | 7,016 | 41,574 | 18,690 | 13,909 | 8,853 | 10,266 |

| <u>AGE</u> | <u>SERVICE</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 | | | | | | 1,090 |
| 25 to 30 | | | | | | 10,778 |
| 30 to 35 | | | | | | 13,261 |
| 35 to 40 | | | | | | 13,036 |
| 40 to 45 | | | | | | 14,100 |
| 45 to 50 | 333 | | | | | 18,695 |
| 50 to 55 | 6,229 | 566 | | | | 23,301 |
| 55 to 60 | 4,021 | 4,589 | 334 | | | 16,895 |
| 60 to 65 | 963 | 1,455 | 990 | 38 | | 6,833 |
| 65 to 70 | 160 | 233 | 249 | 109 | | 2,010 |
| 70 & Up | 48 | 57 | 25 | 41 | 22 | 764 |
| Unknown | | | | | | 7 |
| Total | 11,754 | 6,900 | 1,598 | 188 | 22 | 120,770 |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

TABLE 17.3
ACTIVE FEMALE MEMBERS

| <u>AGE</u> | <u>SERVICE</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 | 1,363 | 3,553 | | | | |
| 25 to 30 | 2,992 | 29,810 | 854 | | | |
| 30 to 35 | 1,696 | 20,013 | 10,485 | 488 | | |
| 35 to 40 | 1,431 | 11,834 | 9,456 | 6,918 | 243 | |
| 40 to 45 | 1,715 | 12,022 | 7,834 | 7,556 | 4,856 | 277 |
| 45 to 50 | 1,573 | 12,474 | 9,260 | 8,480 | 6,714 | 6,595 |
| 50 to 55 | 1,152 | 9,314 | 8,278 | 8,935 | 5,997 | 6,650 |
| 55 to 60 | 584 | 4,263 | 3,806 | 5,009 | 4,169 | 3,939 |
| 60 to 65 | 233 | 1,491 | 1,214 | 1,673 | 1,620 | 1,669 |
| 65 to 70 | 94 | 520 | 340 | 460 | 422 | 464 |
| 70 & Up | 59 | 328 | 126 | 126 | 122 | 104 |
| Unknown | 41 | 348 | | | | |
| Total | 12,933 | 105,970 | 51,653 | 39,645 | 24,143 | 19,698 |

| <u>AGE</u> | <u>SERVICE</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 | | | | | | 4,916 |
| 25 to 30 | | | | | | 33,656 |
| 30 to 35 | | | | | | 32,682 |
| 35 to 40 | | | | | | 29,882 |
| 40 to 45 | | | | | | 34,260 |
| 45 to 50 | 603 | | | | | 45,699 |
| 50 to 55 | 9,256 | 1,065 | | | | 50,647 |
| 55 to 60 | 4,841 | 5,610 | 543 | | | 32,764 |
| 60 to 65 | 1,525 | 1,525 | 949 | 50 | | 11,949 |
| 65 to 70 | 421 | 390 | 170 | 104 | 7 | 3,392 |
| 70 & Up | 110 | 112 | 61 | 40 | 26 | 1,214 |
| Unknown | | | | | | 389 |
| Total | 16,756 | 8,702 | 1,723 | 194 | 33 | 281,450 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 17.4
INACTIVE MEMBERS**

| <u>FISCAL YEAR ENDING JUNE 30</u> | <u>TOTAL</u> | <u>MALE % OF TOTAL</u> | <u>FEMALE % OF TOTAL</u> |
|---------------------------------------|--------------|----------------------------|------------------------------|
| 1990 | 47,063 | 28.7 | 71.3 |
| 1991 | 49,396 | 28.5 | 71.5 |
| 1992 | 50,898 | 28.0 | 72.0 |
| 1993 | 51,094 | 27.3 | 72.7 |
| 1994 | 53,222 | 27.2 | 72.8 |
| 1995 | 54,159 | 26.7 | 73.3 |
| 1996 | 56,424 | 26.8 | 73.2 |
| 1997 | 59,385 | 27.2 | 72.8 |
| 1998 | 61,848 | 27.4 | 72.6 |
| 1999 | 69,112 | 27.7 | 72.3 |

| <u>FISCAL YEAR ENDING JUNE 30</u> | <u>AVERAGE ACCOUNT ON DEPOSIT</u> | <u>AVERAGE AGE</u> | <u>AVERAGE SERVICE CREDIT</u> | <u>AVERAGE YEARS INACTIVE</u> |
|---|---|------------------------|---------------------------------------|---------------------------------------|
| 1990 | 7,456 | 48.2 | 3.6 | 7.4 |
| 1991 | 7,900 | 48.4 | 3.6 | 7.8 |
| 1992 | 8,312 | 48.3 | 3.5 | 8.0 |
| 1993 | 9,078 | 48.1 | 3.6 | 8.1 |
| 1994 | 9,607 | 47.9 | 3.5 | 8.2 |
| 1995 | 10,282 | 47.4 | 3.6 | 8.0 |
| 1996 | 10,931 | 47.2 | 3.5 | 8.0 |
| 1997 | 11,431 | 47.3 | 3.5 | 8.2 |
| 1998 | 11,731 | 47.5 | 3.4 | 8.3 |
| 1999 | 12,105 | 47.1 | 3.3 | 8.0 |

**CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION**

**TABLE 17.5
SERVICE RETIREMENTS**

| <u>FISCAL YEAR ENDING JUNE 30</u> | <u>TOTAL</u> | <u>MALE % OF TOTAL</u> | <u>FEMALE % OF TOTAL</u> |
|---------------------------------------|--------------|----------------------------|------------------------------|
| 1990 | 110,465 | 35.9 | 64.1 |
| 1991 | 115,010 | 36.6 | 63.4 |
| 1992 | 118,963 | 37.1 | 62.9 |
| 1993 | 122,762 | 37.6 | 62.4 |
| 1994 | 126,476 | 37.9 | 62.1 |
| 1995 | 130,576 | 38.1 | 61.9 |
| 1996 | 133,764 | 38.2 | 61.8 |
| 1997 | 135,809 | 38.3 | 61.7 |
| 1998 | 139,193 | 38.3 | 61.7 |
| 1999 | 142,309 | 38.3 | 61.7 |

| <u>FISCAL YEAR ENDING JUNE 30</u> | <u>AVERAGE AGE AT RETIREMENT</u> | <u>AVERAGE YEARS OF SERVICE CREDIT</u> | <u>FINAL AVERAGE COMPENSATION</u> | <u>AVERAGE CURRENT ALLOWANCE PAYABLE</u> |
|---|--|--|---|--|
| 1990 | 60.6 | 23.6 | 2,025 | 1,040 |
| 1991 | 60.9 | 23.8 | 2,160 | 1,115 |
| 1992 | 60.8 | 24.2 | 2,285 | 1,217 |
| 1993 | 60.9 | 24.3 | 2,414 | 1,297 |
| 1994 | 60.9 | 24.5 | 2,532 | 1,369 |
| 1995 | 60.9 | 24.6 | 2,637 | 1,434 |
| 1996 | 60.9 | 24.7 | 2,743 | 1,502 |
| 1997 | 60.8 | 24.8 | 2,837 | 1,566 |
| 1998 | 60.8 | 24.7 | 2,945 | 1,638 |
| 1999 | 60.7 | 24.8 | 3,057 | 1,729 |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

SECTION 6

GLOSSARY OF ACTUARIAL TERMINOLOGY

| | |
|---------------------------------|--|
| 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. |
| 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. |

CALIFORNIA STATE TEACHERS' RETIREMENT SYSTEM
DEFINED BENEFIT PROGRAM - 1999 ACTUARIAL VALUATION

| | |
|---------------------------------------|---|
| 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. |
| Entry Age Cost Method: | An actuarial cost method under which the Actuarial Present Value of Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Obligation. |
| Normal Cost: | The portion of the Actuarial Present Value of Projected Benefits which is allocated to a valuation year by the Actuarial Cost Method. |
| Unfunded Actuarial Obligation: | The excess, if any, of the Actuarial Obligation over the Actuarial Value of Assets. |
| Valuation Date: | June 30, 1999. |

PROPOSED
RESOLUTION
OF THE
TEACHERS' RETIREMENT BOARD

SUBJECT: Adoption of the June 30, 1999
Defined Benefit Program Actuarial Valuation Report

RESOLUTION NO. _____

WHEREAS, Section 22311 of the Education Code requires a periodic actuarial valuation of the System's assets and liabilities; and

WHEREAS, Milliman & Robertson, Inc. has performed the necessary actuarial calculations using the June 30, 1999 data provided by the System; and

WHEREAS, the Board has reviewed the June 30, 1999 Actuarial Valuation Report presented by Milliman & Robertson, Inc.; therefore, be it

RESOLVED that the Board adopt the accompanying Actuarial Valuation Report from Milliman & Robertson, Inc.

Adopted by:
Teachers' Retirement Board

on April 6, 2000

James D. Mosman
Chief Executive Officer