TEACHERS' RETIREMENT BOARD

REGULAR MEETING Item Number: 14a

SUBJECT: Adoption of June 30, 2014, Actuarial Valuation and Analysis for the Defined Benefit Program

CONSENT: ___ ATTACHMENT(S): 2

ACTION: X MEETING DATE: April 2, 2015 / *30 mins.*

INFORMATION: ___ PRESENTER: Rick Reed / Nick Collier and Jennifer Senta, Milliman

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PURPOSE

The purpose of this item is to adopt the June 30, 2014 actuarial valuation of the Defined Benefit (DB) Program.

SUMMARY

Under board policy, an actuarial valuation of the DB Program of the State Teachers' Retirement Plan is completed every year. Therefore, CalSTRS Consulting Actuary has completed an actuarial valuation of the DB Program as of June 30, 2014.

An actuarial valuation identifies the extent to which the current and future assets of the program are sufficient to pay the benefits promised by law over a funding period. In addition to the Normal Cost Rate, which represents the cost of liabilities resulting from future service, the actuarial valuation identifies the Actuarial Obligation for benefits to current members and benefit recipients, which represents the cost of liabilities associated with service already performed. The Actuarial Obligation for benefits is then contrasted with the actuarial value of assets to assess the adequacy of past funding. If the actuarial value of assets is less than the Actuarial Obligation, an Unfunded Actuarial Obligation (UAO) exists. A UAO can arise from inadequate contribution rates, increases in benefits and/or actual experience that differs from expected experience, such as lower than anticipated investment earnings.

The attached actuarial valuation being presented to the board today was prepared by Milliman, CalSTRS consulting actuary. It is a snapshot of the fund's assets and liabilities and the Normal Cost of the DB Program as of June 30, 2014, based on assumptions adopted by the board at the February 2012 board meeting. The valuation also incorporates the new funding solution enacted in AB 1469—Bonta (Chapter 47, Statutes of 2014). The valuation indicates that the DB Program had:

- A UAO, on June 30, 2014, of $72.7 billion, a decrease in the UAO of $949 million from the June 30, 2013 valuation, but a decrease of $6.5 billion from what was anticipated as of June 30, 2013, when the prior valuation was adopted.
- A funding ratio of 68.5 percent, an increase of 1.6 percentage points from last year.
- A Normal Cost of 18.209 percent, a decrease of 0.050 percentage points from the 18.259

percent Normal Cost determined in the prior valuation.

- A UAO of $14.9 billion in the benefits associated with the plan in effect as of July 1, 1990, however an UAO on this benefit structure will not affect state contributions until the 2017-18 fiscal year. Due to AB 1469, supplemental State contributions were 1.437 percent in the 2014-15 fiscal year, with that rate increasing during the subsequent two fiscal years. Beginning in the 2017-18 fiscal year and each fiscal year thereafter, the percentage would be adjusted to an amount necessary to amortize the existing UAO associated with the plan in effect as of July 1, 1990.
- A UAO of $57.6 billion in the benefits associated with the pre-July 1, 2014 service other than for liabilities for the plan in effect as of July 1, 1990. This UAO on this benefit structure, however, will not affect employer contributions until fiscal year 2021-22. Under AB 1469, a supplemental employer contribution of 0.63 percent was required beginning July 1, 2014, and that rate will be increasing each year. Beginning for the fiscal year 2021-22 and each fiscal year thereafter, the percentage would be adjusted to an amount necessary to amortize the existing UAO associated with service credited to members prior to July 1, 2014.
- As a result of last year's investment returns, and assuming all future experience is consistent with the board's assumptions, the actual contribution rates imposed on the state and employers are projected to be less than the ultimate rates specified in AB 1469. The reduction in the state rate would first occur in 2017, while the reduction in the employer rate would first occur in 2021, although the initial reduction in the employer rate would be quite small and less certain than the reduction in the state contribution rate.
- A Normal Cost surplus of 15.087 percent after increasing the DB Program contribution rate by the equivalent rate through 2046 in graduated increases in state, employer and member contributions. This represents an increase of 13.849 percentage points in the Normal Cost surplus from the 1.238 percent Normal Cost surplus in last year's valuation; reflecting the enactment of AB 1469.
- Due to the new funding structure, there is no longer a projected depletion date. Instead the plan is expected to be fully funded by 2046.

The decrease in the UAO from the last valuation was very small, $949 million, but an increase of $6.5 billion in the UAO had been expected. Staff expects increases in the UAO will continue until the new funding structure is fully implemented. The small decrease in the UAO was mainly the result of three factors:

1. Continued unfunded status of the DB Program. The Actuarial Obligation is so much larger than the Actuarial Value of Assets that even if the assets make their assumed rate of return, the dollar amount of the investment earnings is not enough to pay for the interest on the Actuarial Obligation, and the UAO will continue to grow. Interest on the Actuarial Obligation was $16.428 billion whereas earnings on the Actuarial Value of Assets at the assumed rate of return of 7.50 percent were $10.908 billion. This means that even if all actuarial assumptions are met and there are no investment losses, the UAO would increase by $5.520 billion due to the fact the Actuarial Obligation is so much larger than the Actuarial Value of Assets.

2. An investment return of 18.6 percent on a market value basis during 2013-2014 (net of investment expenses and assuming a uniform cost flow), which is significantly above the assumed investment return of 7.50 percent. Since approximately one-third of the investment gains and losses are recognized this year, $5.7 billion of the approximately $17 billion investment gain was recognized this year. This added to approximately $4.0 billion recognized of last year's accumulated gains and was offset by the recognition of $4.7 billion of the accumulated losses from two years ago. If the actual investment return for the fiscal year ended June 30, 2014 had been 7.50 percent, the funding ratio would have been approximately 66 percent.
3. The decrease in the UAO of the DB Program was in a small part due to actuarial gains resulting from creditable earnings by DB Program members during 2013-14 being lower than expected. This resulted in an actuarial gain of $802 million this fiscal year.

The 18.6 percent investment return shown in the valuation report is different from the 18.7 percent investment return shown in the CalSTRS June 30, 2014 financial statements for the 2013-14 fiscal year due to the timing of cash flows. The actuarial valuation assumes that all cash flows occur evenly throughout the year, while the return shown in the financial statements is based on when the cash flows actually occurred. This method is used to simplify asset calculations for the valuation. In any one year the calculated actuarial investment gains and losses are expected to slightly differ under this method. This difference in the calculated investment gains and losses is only reflected in the determination the Actuarial Value of Assets and in any one year this difference is expected to be small. Over the long-term, these small differences are expected to offset one another and do not change the results of the actuarial valuation.

Milliman's analysis of the DB Program indicates that, given current assumptions and contribution rates, the $72.7 billion UAO can be amortized over a 32 year period ending 2046, the board's funding period. In order to be able to amortize the current UAO, Milliman indicates that over the next 32 years ending in 2046, which is the funding period adopted by the board under the new funding structure, a contribution rate of 31.106 percent of total membership salaries will be needed (assuming no population growth in the active membership). This is a decrease of 1.773 percentage points from what the June 30, 2013 valuation indicated was necessary over a thirty year period. The total contribution rate of the DB Program over the next 32 years is currently projected to be 32.228 percent of total membership salaries. As a result, the total contribution rate is currently 1.112 percent of total membership salaries greater than what is expected to be needed long-term at this time.

Under AB 340, the California Public Employees Pension Reform Act of 2013 (PEPRA), members first hired on or after January 1, 2013 (known as CalSTRS 2% at 62 members), must contribute at least one-half the Normal Cost of their pension plan. As of the valuation date, June 30, 2014, there were a small number of members subject to this provision. Based on the June 30, 2014 valuation, Milliman recommends that the board adopt a Normal Cost Rate of 15.672 percent of pay for CalSTRS 2% at 62 members.

The results of the valuation are based on the annual investment return assumption of 7.50 percent and annual inflation rate assumption of 3.00 percent and the other economic and demographic assumptions adopted by the board as a result of the June 30, 2010 Experience Study in February 2012. The attached valuation report graphically shows (on page 7 of the valuation) the impact of alternative investment assumptions, ranging from 5.7 percent to 9.10 percent, on the required total contribution rate to fully fund the program by 2046. Under those alternative assumptions, the total required contributions would range from about 21 percent (based on an 9.1 percent annual investment return) to just above 50 percent (based on a 5.7 percent annual investment return).

CalSTRS Consulting Actuaries, Nick Collier and Jennifer Senta of Milliman, will present a thorough discussion of the results of the Actuarial Valuation Report as of June 30, 2014 at the board meeting.

RECOMMENDATION

Staff recommends the board adopt the June 30, 2014 Actuarial Valuation Report for the DB Program, including the Normal Cost Rate of 15.672 percent of pay for CalSTRS 2% at 62 member.

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March 18, 2015

Teachers' Retirement Board
California State Teachers' Retirement System

Re: **Defined Benefit Program Actuarial Valuation as of June 30, 2014**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Defined Benefit Program of the State Teachers' Retirement Plan as of June 30, 2014. The major findings of the actuarial valuation are contained in the following report, which reflects the benefit provisions and contribution rates in effect as of the valuation date. This report satisfies all basic disclosure requirements under the Model Disclosure Elements for Actuarial Valuation Reports recommended by the California Actuarial Advisory Panel.

Actuarial Certification

To the best of our knowledge and belief, this report is complete and accurate and contains sufficient information to fully and fairly disclose the funded condition of the Defined Benefit Program as of June 30, 2014.

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

All costs, liabilities, rates of interest and other factors for CalSTRS have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of CalSTRS and reasonable expectations) and which, in combination, offer a reasonable estimate of anticipated experience affecting CalSTRS. Further, in our opinion, each actuarial assumption used is reasonably related to the experience of CalSTRS and to reasonable expectations which, in combination, represent a reasonable estimate of anticipated experience. The Teachers' Retirement Board has sole authority to determine the actuarial assumptions and methods used for the valuation of the DB Program. The Board adopted the actuarial methods and assumptions used in the 2014 valuation.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the

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economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements.

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

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(a) CalSTRS may provide a copy of Milliman's work, in its entirety, to CalSTRS' professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit CalSTRS.

(b) CalSTRS may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

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

The signing actuaries are independent of the plan sponsor. We are not aware of any relationship that would impair the objectivity of our work.

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

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

Respectfully submitted,

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

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

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Section 1 Summary of the Findings

The primary purpose of the actuarial valuation is to analyze the sufficiency of future contributions from members, employers and the State to meet the current and future obligations of the Defined Benefit (DB) Program. By using the actuarial methods and assumptions adopted by the Teachers' Retirement Board, this actuarial valuation provides a reasonable estimate of the long-term financing of the DB Program.

Additionally, effective with the 2016 valuation, adjustments will be recommended to the state contribution rate. For the employer contribution rate, adjustments will be effective with the 2020 valuation. New contribution rates will be effective in the fiscal year following the applicable valuation.

The key findings of this actuarial valuation are:

Funding Sufficiency

As of June 30, 2014, the future revenue from contributions and appropriations for the DB Program **is projected to be sufficient** to finance its obligations. This finding reflects the scheduled contribution increases specified in Assembly Bill 1469 (AB 1469) and is based on the valuation assumptions and the valuation policy adopted by the Board at their February, 2015 meeting.

A level contribution rate of 31.106% beginning on the valuation date is projected to be needed to amortize the Unfunded Actuarial Obligation (UAO) by June 30, 2046. This is compared to the current projected revenue equivalent to 32.228% of payroll. The revenue calculation assumes no changes in the contribution rates specified in AB 1469 once contribution rates grade to the ultimate rates. Note that in practice, the state and employer contribution rates will increase or decrease depending primarily on the relevant funded status.

The projected revenue level being greater than the needed contribution rates indicates that the overall contribution level is sufficient to amortize the UAO by 2046 and that future net decreases in the ultimate contribution rate are expected; however, the changes in contribution rates will vary between the state and employers. We have presented additional detail on that breakdown in this report.

(Percent of Earned Salaries)	2014 Valuation	2013 Valuation
Additional Revenue Needed for 100% Funding by 2046[(1)]		
Normal Cost Rate	18.209%	18.259%
Amortization Rate	12.897%	14.620%
Total Level Rate over the Amortization Period	31.106%	32.879%
Equivalent Contribution Rate[(2)]	32.228%	19.497%
Additional Revenue Needed	None	13.382%

(1) 2013 Valuation calculations based on 30-year funding.
(2) Assumes no change in contribution rate once ultimate level is reached (See Section 8).

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Funding Sufficiency (continued)

As shown in the previous chart, there was a significant decrease in the additional revenue needed. This change was primarily due to the scheduled increases in contribution rates under AB 1469, although several other factors had a lesser impact.

Aside from the legislation, the strong return on investments (18.6%, as reported by CalSTRS) for the fiscal year ending in 2014, was the biggest factor causing the decrease in the additional revenue needed.

The following chart shows a numerical breakdown of each of the factors that caused the change in the additional revenue needed.

Sources of Change	Additional Revenue Needed
June 30, 2013 Actuarial Valuation	**13.4%**
Due to Funding Legislation	-13.4%
Current Year Asset Gain	-1.2%
Salary / Payroll Variation	
• Salary Increase < Assumed	-0.2%
• Payroll Increase < Assumed	0.0%
Assumption Changes	0.0%
All Other Sources	0.3%
Total Change	**-14.5%**
June 30, 2014 Actuarial Valuation	**-1.1%**

Note that the negative value as of June 30, 2014 indicates that no additional revenue is needed, apart from the currently scheduled contribution rate increases, and that there is currently projected to be a reduction in the ultimate contributions needed. This projected decrease is on an aggregate basis; the changes in contribution rates will vary between the state and employers, and may be increases or decreases, as discussed later. This analysis is based on the actuarial value of assets, which is currently deferring a net gain. A projection showing the expected future impact of reflecting the currently deferred asset gain is shown later in this section (see "Looking Ahead").

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State and Employer Contribution Rates

AB 1469 added three subsections to the Education Code dealing with contribution rates. EC §22955.1 specifies graded increases in the state contribution rates. Effective July 1, 2017 the state contribution rate will be adjusted based on the contribution rate necessary to amortize the UAO attributable to the 1990 contribution and benefit structure. EC §22950.5 specifies graded increases in the employer contribution rates. Effective July 1, 2021 the employer contribution rate will be adjusted based on the contribution rate necessary to amortize the UAO attributable to service prior to July 1, 2014 that is not funded by the state as part of the 1990 Benefit Structure. Graded increases were also implemented for member contribution rates under EC §22901.7; however, the member rates are fixed once they reach the ultimate rate and are not dependent on the DB Program's funded status.

For the 2014 valuation, changes in the current schedules for the state and employer contribution rates do not apply. Effective with the 2016 valuation, we will calculate the recommended change in the state contribution rate starting July 1, 2017. Effective with the 2020 valuation, we will calculate the recommended change in the employer contribution rate starting July 1, 2021.

For illustrative purposes, we have shown details of how these calculations will look in Sections 7 and 8 of this report. These hypothetical calculations show that based on the 2014 valuation, an increase would be needed on the ultimate employer rate, and a fairly significant decrease in the state contribution rate is indicated to maintain the full funding target. Note that these adjustments fall within the parameters described in the funding legislation. It is important to be aware that these calculations are based on the smoothed actuarial value of assets. As shown later in this section (see "Looking Ahead"), if the deferred asset gain is reflected in the projected contribution rates, small decreases in the employer rate are expected (from the ultimate employer rate of 19.10%) and much larger decreases in the state rate.

Normal Cost Rate for CalSTRS 2% at 62 Members

As part of the annual valuation process, we determine the Normal Cost rate for CalSTRS 2% at 62 members, generally those first hired on or after January 1, 2013. The Normal Cost rate is used as the basis for setting the base member contribution rate for this group for the following fiscal year, the fiscal year beginning July 1, 2015, for this valuation. Generally, the base member contribution rate is one-half of the Normal Cost rate within certain parameters.

Education Code Section 22901(b)(1) requires the board to adopt the Normal Cost rate that is used to determine the 2% at 62 member contribution rate. As of June 30, 2014, the Normal Cost rate for the CalSTRS 2% at 62 members is 15.672%. We recommend the Board adopt this rate.

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Normal Cost Rate for CalSTRS 2% at 62 Members (continued)

Education Code Section 22901(b)(1) specifies that the CalSTRS 2% at 62 base member contribution rate does not change if the increase or decrease in the Normal Cost rate for members is less than 1% of pay since the last adjustment. This year the cumulative change is a decrease in the Normal Cost rate of 0.228%, from 15.900% (the time of last adjustment) to 15.672% for this group. Therefore, we recommend the Board retain the current base member contribution rate of 8.00% for these members. Note that increases under EC 22901.7(b) are added to the base member rate. Therefore, effective July 1, 2015, the total member contribution rate should be 8.56% (8.00% plus the 0.56% increase) for 2% at 62 members.

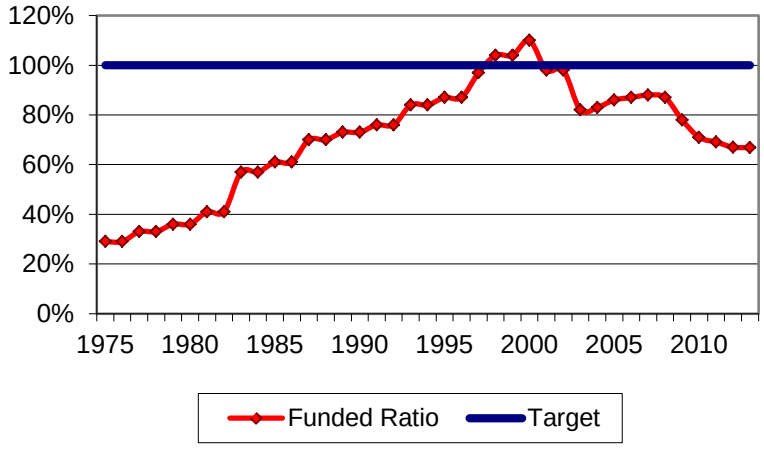
Funding Progress

The Funded Status of a retirement plan is equal to the difference between its Actuarial Value of Assets and its Actuarial Obligation. The Funded Ratio is equal to the Actuarial Value of Assets divided by the Actuarial Obligation.

($ Millions)	2014 Valuation	2013 Valuation
Actuarial Obligation	$ 231,213	$ 222,281
Actuarial Value of Assets	158,495	148,614
Unfunded Actuarial Obligation	$ 72,718	$ 73,667
Funded Ratio	68.5%	66.9%

Overall, the DB Program is in a better funded status as of June 30, 2014 than projected based on last year's valuation. The partial recognition of the current year asset gain had the most significant effect. The UAO of $72.7 billion compares to a projected June 30, 2014 UAO of $79.2 billion based on the prior valuation, and a 68.5% Funded Ratio compared to a projected Funded Ratio of 65.8% based on last year's valuation. The following graph shows a historical perspective of CalSTRS' funding. It shows the significant funding progress CalSTRS achieved from 1975 to 2000, and also the negative impact of the economic environment since then.

Historical Funded Ratio



Funding Progress (continued)

The following chart shows the factors that affected the DB Program's Funded Ratio since the last valuation. The recognition of the current year asset gain was the most significant factor in the increase.

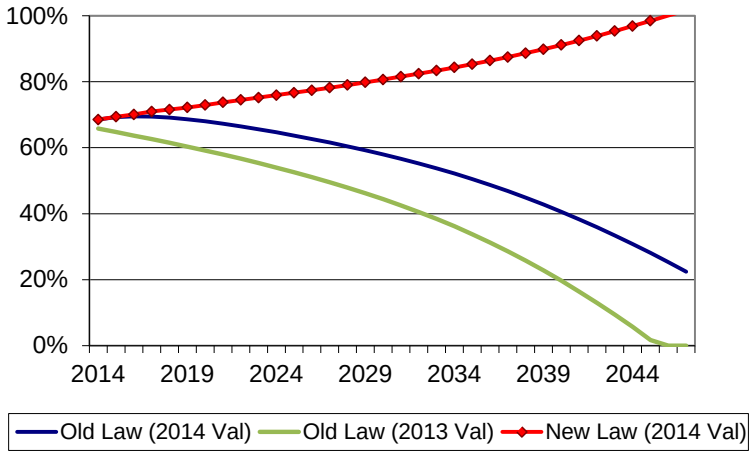
Sources of Change	Funded Ratio
June 30, 2013 Actuarial Valuation	**66.9%**
Expected Year-to-Year Change (due to underfunding*)	-1.0%
Recognized Asset (Gain)/Loss	
• From Prior Years	-0.1%
• From Current Year	2.7%
Salary Variation	0.2%
Assumption Changes	0.0%
All Other Sources	-0.2%
Total Change	**1.6%**
June 30, 2014 Actuarial Valuation	**68.5%**

**Although the utlimate contribution rates are projected to be sufficient to fund the DB Program, contributions paid in the prior year were not enough to improve the funded ratio.*

Looking Ahead

As previously noted, the recent legislation provides for contribution increases that are projected to be sufficient to amortize the UAO. The following projection shows the Funded Ratio if the DB Program earns 7.50% in each future year and all other assumptions are met. As shown in the graph, the DB Program is projected to reach 100% funding by 2046 under the recently passed funding legislation (red line). See the end of this subsection for a summary of the assumptions that this projection is based on.

Projected Funded Ratio



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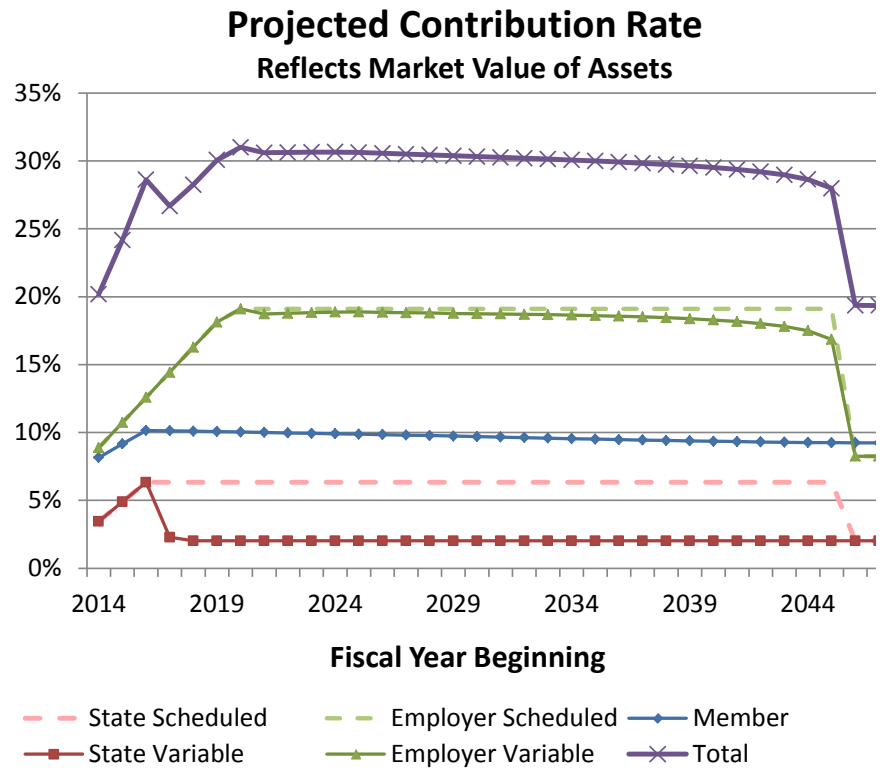
Looking Ahead (continued)

Asset gains and losses will generally have the largest year-to-year impact on the total contribution rate needed. However, under the legislation, as reflected in the valuation policy, the impact of asset gains and losses will tend to have a much more significant impact on the state contribution rate than the employer contribution rate. Therefore, the state contribution rate will tend to be more volatile than the employer rate. The following graph shows the projected contribution rates for each of the stakeholder groups and in total. Note that the actual contribution rates paid in the future will vary based on experience after the valuation date.



NOTE: Dashed lines indicate contribution rates prior to adjustments for funded status.

The projection calculations are based on the following assumptions:

- All experience subsequent to the valuation date is consistent with the valuation assumptions, as described in Appendix B.
- Future changes in the state and employer contribution rates, after the ultimate rates are reached, will be consistent with the recently adopted valuation policy.
- Current deferred asset gains and losses (currently a net gain) are reflected as they are expected to be recognized in the asset smoothing method.
- The emerging Normal Cost rate will decrease over time due to the lower benefits provided for 2% at 62 members.

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Investment Return Assumption

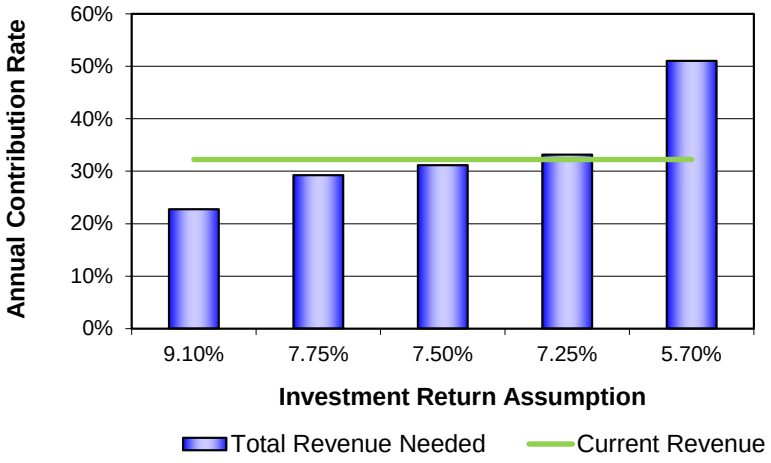
Future investment returns will have a material impact on the contributions ultimately needed to fund the DB Program. To illustrate the sensitivity to future investment returns, we have performed an analysis of the impact of various investment return assumptions. We have shown the revenue needed under the valuation investment return assumption of 7.50%, as well as assumed returns that are 0.25% higher and lower. For comparison, we have shown the projected revenue under the current scheduled contribution rates.

We have also presented the revenue needed at 9.10% and 5.70% investment return assumptions. The expected returns are the 25th and 75th percentiles respectively for a 30-year period net of both administrative and investment expenses and are based on analysis provided to us by Pension Consulting Alliance (PCA) using their 2015 capital market assumptions. It should be noted that this is PCA's preliminary analysis and they may incorporate future refinements, although they do not expect the results to change materially.

These percentile returns indicate the likelihood that actual future returns will deviate significantly from the current 7.50% assumption. Specifically, based on these assumptions, there is a 25% chance the net average annual return will be greater than 9.10%, but also a 25% chance the net average annual return will be less than 5.70% over a 30-year period.

PCA's capital market assumptions are based on a 10-year time horizon, with adjustments to certain asset classes for years 11-30 to better reflect longer-term expectations.

Total Revenue Needed Under Alternate Assumptions



Changes Since the 2014 Valuation

There were no additional changes that materially impacted the 2014 valuation outside of the funding legislation and the usual year-to-year asset, liability and payroll experience.

Further Information

Details of our findings are included in later sections of this report. The appendices include supporting documentation on the benefit and eligibility provisions used to project future benefits, the actuarial methods and assumptions used to value the projected benefits, and the underlying census data provided by CalSTRS for this valuation.

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Summary of Key Valuation Results

	2014 Valuation	2013 Valuation	Percent Change
1. Total Membership			
A. Active Members	420,887	416,643	1.0 %
B. Inactive Members	182,815	182,576	0.1 %
C. Retired Members and Beneficiaries	275,627	269,274	2.4 %
D. Total Membership	879,329	868,493	1.2 %
2. Earned Salaries as of Valuation Date (All Members)			
A. Annual Total *($Millions)*	$ 26,470	$ 25,479	3.9 %
B. Annual Average per Active Member	$ 62,891	$ 61,153	2.8 %
3. Average Annual Allowance Payable			
A. Service Retirement	$ 44,328	$ 43,308	2.4 %
4. Actuarial Obligation *($Millions)*			
A. Active Members	$ 99,935	$ 95,506	4.6 %
B. Inactive Members	4,702	4,641	1.3 %
C. Retired Members and Beneficiaries	126,235	121,714	3.7 %
D. Existing MPPP Unfunded Obligation	341	420	(18.8) %
E. Total	$ 231,213	$ 222,281	4.0 %
5. Value of System Assets *($Millions)*			
A. Fair Market Value	$ 179,749	$ 157,176	14.4 %
B. Deferred Investment (Gains) or Losses	(10,911)	707	
C. Actuarial Value	$ 168,838	$ 157,883	6.9 %
D. Ratio of Actuarial Value to Fair Value	94%	100%	
E. Less SBMA Reserve	(10,343)	(9,269)	11.6 %
F. Net Actuarial Value	$ 158,495	$ 148,614	6.6 %
6. Funded Status -- Actuarial Value Basis			
A. Unfunded Actuarial Obligation *($Millions)*	72,718	73,667	(1.3) %
B. Funded Ratio *(5F ÷ 4E)*	68.5%	66.9%	
7. Normal Cost Rates *(percent of salaries)*			
A. CalSTRS 2% at 60 Members	18.258%	18.263%	(0.0) %
B. CalSTRS 2% at 62 Members	15.672%	16.059%	(2.4) %
C. All Members	18.209%	18.259%	(0.3) %
8. Contribution Rates *(percent of salaries)*			
A. Projected Revenue (through 2046)	32.228%	19.497%	65.3 %
B. Projected Level Funding Rate (through 2046)	31.106%	32.879%	(5.4) %
C. Projected Shortfall *(8B – 8A)*	None	13.382%	NA %
9. Funded Status -- Market Value Basis			
A. Unfunded Actuarial Obligation *($Millions) (4E - (5A + 5E)*	61,807	74,374	(16.9) %
B. Alternate Funded Ratio (Based on Market Value of Assets)	73.3%	66.5%	

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Section 2 Scope of the Report

This report presents the actuarial valuation of the Defined Benefit Program of the State Teachers' Retirement Plan as of June 30, 2014. A summary of the key results of this valuation is presented in the previous section. The remainder of this report is arranged as follows:

Section 3 describes the benefit obligations of CalSTRS, including the development of the Normal Cost and the Actuarial Obligation.

Section 4 outlines the Fair Market Value of Assets of the DB Program and the determination of the Actuarial Value of Assets as of June 30, 2014. All of the assets of the Program are available to finance future DB Program benefits and expenses, except those allocated for the Supplemental Benefit Maintenance Account (SBMA) and for future payments from the Medicare Premium Payment Program (MPPP).

Section 5 shows the relationship between the Actuarial Value of Assets and the Actuarial Obligation, also called the Funded Ratio.

Section 6 discusses the calculations used to determine the supplemental contribution rate required from the state in accordance with EC §22955.1(b). The key elements of this calculation pertain to an evaluation of the assets and obligations associated with the benefits in effect in 1990. Note that the state supplemental rate is currently based on a fixed schedule of increases. No adjustments to the scheduled rates will be recommended until the 2016 valuation.

Section 7 discusses the calculations used to determine the supplemental contribution rate required from the employers in accordance with EC §22950.5. The key elements of this calculation are parallel to the funding valuation, except the assets and obligations are those associated with the benefits earned prior to July 1, 2014. Note that the employer supplemental rate is currently based on a fixed schedule of increases. No adjustments to the scheduled rates will be recommended until the 2020 valuation.

The funding sufficiency of the current projected revenue stream for the DB Program is tested in Section 8.

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Scope of the Report (continued)

This report includes several appendices:

Appendix A — A summary of the current benefit structure, as determined by the provisions of governing law on June 30, 2014.

Appendix B — A summary of the actuarial methods and assumptions used to estimate actuarial obligations and the funding sufficiency.

In our opinion, the assumptions used in the valuation are reasonably related to the past experience of the DB Program, are internally consistent, and represent a reasonable estimate of future conditions affecting the DB Program. Nevertheless, the emerging costs of the DB Program will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions.

Appendix C — Schedules of valuation data classified by various categories of plan members. We relied upon the membership and beneficiary data supplied by CalSTRS. We compared the data for this and the prior valuation and tested for reasonableness. Based on these tests, we believe the data to be sufficient for the purposes of our calculations.

Appendix D — A glossary of actuarial terms used in this report.

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Section 3 Actuarial Obligation

In this section, the discussion will focus on the commitments of CalSTRS for retirement benefits, which are referred to as its actuarial obligation.

In an active system with new entrants, the actuarial obligation, or liabilities, will generally exceed the actuarial value of assets. This deficiency has to be provided by future contributions, net actuarial gains due to experience more favorable than assumed or, to some extent, net growth in the number of active members. An actuarial valuation method sets out a schedule of future contributions and determines whether they will amortize any deficiency in an orderly fashion.

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 a 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 Earned Salaries, so it is best expressed as a rate. Normal Cost contributions are assumed to be contributed uniformly throughout the year.

The following chart shows that the total DB Program Normal Cost Rate has decreased from 18.259% to 18.209% since the last valuation. **Table 1** provides more details on the calculation of the Normal Cost and Normal Cost Rates.

($ Millions)	Annualized Earned Salaries	Normal Cost	Normal Cost Rate
June 30, 2013	$25,759	$4,703	18.259%
June 30, 2014	$26,778	$4,876	18.209%

In general, the Normal Cost Rate is expected to remain fairly stable as a percentage of Earned Salaries as long as the benefit provisions are not amended, the assumptions are not changed, membership experience emerges as assumed, and the demographic characteristics of the membership remain reasonably consistent.

The Normal Cost Rate decreased slightly since last year due mainly to the increasing membership of CalSTRS 2% at 62 members who have a lower overall Normal Cost Rate. We expect this trend to continue in the future.

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Normal Cost Rate for CalSTRS 2% at 62 Members

As part of the annual valuation process, we determine the Normal Cost rate for CalSTRS 2% at 62 members, generally those first hired on or after January 1, 2013. The Normal Cost rate is used as the basis for setting the base member contribution rate for this group for the following fiscal year, the fiscal year beginning July 1, 2015, for this valuation. Generally, the base member contribution rate is one-half of the Normal Cost rate within certain parameters.

Education Code Section 22901(b)(1) requires the board to adopt the Normal Cost rate that is used to determine the 2% at 62 member contribution rate. As of June 30, 2014, the Normal Cost rate for the 2% at 62 members is 15.672%. We recommend the Board adopt this rate.

Education Code Section 22901(b)(2) specifies that CalSTRS 2% at 62 base member contribution rates do not change if the increase or decrease in the Normal Cost rate for members is less than 1% of pay since the last adjustment. This year the cumulative change is a decrease in the Normal Cost rate of 0.228% from 15.900% (the time of last adjustment) to 15.672% for this group. Therefore, we recommend the Board retain the current base member contribution rate of 8.00% for these members. Note that increases under EC 22901.7(b) are added to the base member rate. Therefore, effective July 1, 2015, the total member contribution rate should be 8.56% (8.00% plus the 0.56% increase) for 2% at 62 members.

Actuarial Obligation

The next step in the actuarial valuation process is to project all future DB Program benefit payments 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 2** and summarized below.

($ Millions)	2014 Valuation	2013 Valuation
Benefits Being Paid	$ 126,235	$ 121,714
Inactive Deferred Benefits	4,702	4,641
Active Member Benefits	156,718	150,534
Existing MPPP Unfunded Obligation	341	420
Present Value of Projected Benefits	$ 287,996	$ 277,309
Present Value of Future Normal Costs	56,783	55,028
Actuarial Obligation	$ 231,213	$ 222,281

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Actuarial Obligation (continued)

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 Obligation** is the difference between the Actuarial Present Value of Projected Benefits and the Actuarial Present Value of Future Normal Costs. The Actuarial Obligation is equal to the assets that would exist if the current Normal Cost Rate had been paid for all members since entry into the Program, and if all experience had emerged as assumed.

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Table 1
Normal Cost

($Millions)	2014	2013
Estimated Annual Earned Salaries (1)	$26,778	$25,759
Present Value of Future Normal Costs for Current Active Members	$56,783	$55,028
Present Value of Future Earned Salaries for Current Active Members	$311,839	$301,373
Normal Cost		
Retirement	$4,489	$4,332
Disability	194	188
Death	48	46
Refund	145	137
Total Normal Cost	$4,876	$4,703
Normal Cost Rate Percent of Earned Salaries		
Retirement	16.765 %	16.818 %
Disability	0.724	0.730
Death	0.179	0.179
Refund	0.541	0.532
Total Normal Cost	**18.209** %	**18.259** %

(1) Annual rate of Earned Salaries for active members on the valuation date, excluding active members over age 75 on the valuation date who are assumed to retire immediately and therefore do not generate a Normal Cost. Earned salaries for new entrants who have only worked a partial year have been annualized.

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Table 2
Actuarial Obligation

($ Millions)	2014	2013
Present Value of Projected Benefits to All Current Members		
Benefits Currently Being Paid		
Service Retirement	$ 117,222	$ 113,152
Disability	3,120	2,977
Survivors	5,893	5,585
Total	$ 126,235	$ 121,714
Benefits to Inactive Members	4,702	4,641
Benefits to Active Members		
Retirement	$ 151,216	$ 145,299
Disability	3,857	3,699
Death	1,120	1,074
Refund	525	462
Total	$ 156,718	$ 150,534
Existing MPPP Unfunded Obligation	341	420
Total Present Value of Projected Benefits	$ 287,996	$ 277,309
Present Value of Future Normal Costs	56,783	55,028
Actuarial Obligation	**$ 231,213**	**$ 222,281**

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Section 4 Valuation Assets

In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date, which for this valuation is June 30, 2014. On that date, the assets available for the payment of retirement benefits are appraised.

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 Program. As shown in **Table 3**, the Fair Market Value of assets was reported as $179,749 million as of June 30, 2014, up from $157,176 million as of June 30, 2013. **Table 4** shows the asset changes for the period.

Valuation Assets

Because the underlying calculations in the actuarial valuation are long-term in nature, it may be advantageous to use an asset smoothing method to lessen the impact of short-term fluctuations in the value of assets. This is particularly true given that the supplemental state and employer contribution rates will soon be determined based on the applicable funded status.

The asset smoothing method utilized in the valuation uses a projection of the expected Actuarial Value of Assets from the Actuarial Value of Assets as of the previous year based on the assumed rate of investment return. The projection then recognizes one-third of the difference between the expected value and the Fair Market Value to arrive at the Actuarial Value of Assets. The calculation of the Actuarial Value of Assets is shown in **Table 5** and the result is shown below.

($ Millions)	2014 Valuation	2013 Valuation
Fair Market Value	$ 179,749	$ 157,176
Actuarial Value of Assets	168,838	157,883
Deferred Investment Gains or (Losses)	$ 10,911	$ (707)
Ratio of AVA to FMV	94%	100%

Due to the asset smoothing method, there are investment gains of $10,911 million that have not yet been recognized (the difference between the Actuarial and Fair Market Value of Assets). Absent investment returns in future years less than the assumed rate to offset the deferred investment gains, the current deferred gains will gradually be reflected in the Actuarial Value of Assets.

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Valuation Assets (continued)

If the future returns on the Fair Market Value of Assets are 7.50% each year, then as the current deferred gains flow through the smoothing method and are recognized, future valuations will show an actuarial gain. The result will be a gradual increase in the DB Program's funded status, ultimately decreasing the Unfunded Actuarial Obligation by the $10,911 million of currently deferred investment losses.

Table 6 shows a history of the Actuarial Value of Assets compared to the Fair Market Value of Assets.

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Table 3
Statement of Program Assets

($ Millions)	June 30, 2014	June 30, 2013
Invested Assets		
Cash	$ 500	*
Debt Securities	34,442	*
Equity Securities	96,217	*
Alternative Investments	50,416	*
Derivative Instruments	14	*
Total Investments	$ 181,589	$ 158,655
Receivables	3,226	3,167
Liabilities Net of Securities Lending Collateral	(5,066)	(4,646)
Fair Market Value of Net Assets	**$ 179,749**	**$ 157,176**

**Asset classes redefined by CalSTRS for tracking purposes in 2014. Detailed investment information for new asset classes not available as of 2013.*

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Table 4
Statement of Changes in Program Assets

($ Millions)	June 30, 2014	June 30, 2013
Contributions		
Members	$ 2,177	$ 2,247
Employers	2,178	2,192
State of California	1,384	1,328
Total Contributions	5,739	5,767
Benefits and Expenses		
Retirement, Death and Survivors	(11,414)	(10,844)
Refunds of Member Contributions	(82)	(78)
Purchasing Power Benefits	(202)	(222)
Administrative & Other Expenses	(154)	(133)
Total Benefits and Expenses	(11,852)	(11,277)
Net Cash Flow	**$ (6,113)**	**$ (5,510)**
Investment Income		
Realized Income	$ 4,508	$ 4,690
Net Appreciation	24,381	15,110
Net Securities Lending Income	91	100
Investment Expenses	(289)	(333)
Other (Expense) Income	(5)	1
Net Investment Return	28,686	19,568
Net Increase (Decrease)	**$ 22,573**	**$ 14,058**
Fair Market Value of Net Assets		
Beginning of Year	157,176	143,118
End of Year	**$ 179,749**	**$ 157,176**
Estimated Net Rate of Return [(1)]	18.6%	7.3%

(1) Estimated return on a Fair Market Value basis, net of all investment expenses and assuming uniform cash flow throughout the year. This number will likely differ from the return reported by CalSTRS as it is a dollar-weighted value, whereas CalSTRS reports time-weighted values.

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Table 5
Actuarial Value of Assets

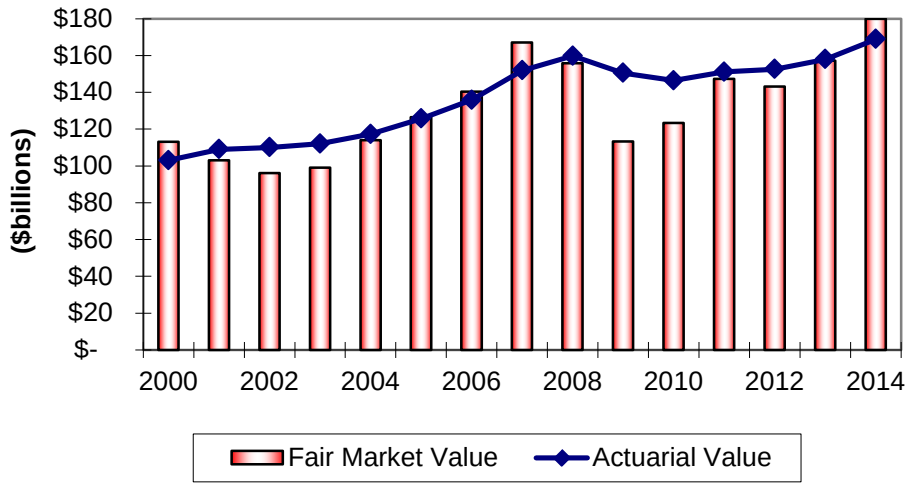
($ Millions)	June 30, 2014	June 30, 2013
Actuarial Value at Beginning of Year	$ 157,883	$ 152,515
Contributions	5,739	5,767
Benefits and Expenses	(11,852)	(11,277)
Expected Return at 7.50%	11,612	11,232
Expected Actuarial Value End of of Year	$ 163,382	$ 158,237
Fair Market Value	179,749	157,176
Difference between Fair Market Value and Expected Actuarial Value	$ 16,367	$ (1,061)
Recognition Factor	One-third	One-third
Recognized Gain or Loss	$ 5,456	$ (354)
Actuarial Value at End of of Year	**$ 168,838**	**$ 157,883**
Deferred Investment Gains or (Losses)	$ 10,911	$ (707)
Ratio of Actuarial Value of Assets to Fair Market Value of Assets	93.930%	100.450%
Estimated Net Rate of Return [1]	11.0%	7.3%

(1) Estimated return on an Actuarial Value basis, net of all investment expenses and assuming uniform cash flow throughout the year.

Table 6
History of Actuarial Value of Assets

($ Millions) June 30	Fair Market Value	Estimated Return [(1)]	Actuarial Value	Ratio of Actuarial to Market
2001	$ 102,915	(9.1) %	$ 108,571	105%
2002	96,028	(6.1)	109,755	114
2003	99,031	3.8	111,604	113
2004	113,815	16.6	117,206	103
2005	126,447	12.3	125,665	99
2006	140,192	12.5	135,832	97
2007	166,903	20.9	151,827	91
2008	155,763	(5.5)	159,785	103
2009	113,192	(25.4)	150,445	133
2010	123,242	12.9	146,404	119
2011	147,140	23.6	151,030	103
2012	143,118	0.6	152,515	107
2013	157,176	13.9	157,883	100
2014	179,479	18.6	168,838	94

(1) Estimated return on a Fair Market Value basis, net of all investment expenses and assuming uniform cash flow throughout the year. This number will likely differ from the return reported by CalSTRS as it is a dollar-weighted value, whereas CalSTRS reports time-weighted values.



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Section 5 Funded Status

The **Unfunded Actuarial Obligation** (UAO) 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 UAO. An **Actuarial Surplus** exists if the Actuarial Value of Assets exceeds the Actuarial Obligation.

The **Funded Ratio** is equal to the Actuarial Value of Assets divided by the Actuarial Obligation. A Funded Ratio of 100% means the Value of Assets equals the Actuarial Obligation, and the DB Program could be financed by contributions equal to the Normal Cost, if all future experience emerges as assumed. The Funded Ratio is shown below and in **Table 7**.

($ Millions)	2014 Valuation	2013 Valuation
Actuarial Obligation	$ 231,213	$ 222,281
Actuarial Value of Assets (AVA)		
From Table 5	$ 168,838	$ 157,883
Less SBMA Reserve	(10,343)	(9,269)
Net for Funding	158,495	148,614
Unfunded Actuarial Obligation	$ 72,718	$ 73,667
Funded Ratio (on AVA)	**68.5%**	**66.9%**
Alternate Funded Ratio (based on Fair Market Value)	*73.3%*	*66.5%*

Overall, the DB Program is in better financial condition than it was one year ago as measured by the Funded Ratio. The Alternate Funded Ratio using the Fair Market Value of assets has increased since the last valuation, due to the investment gain for the 2013-14 year.

Future benefits provided through the Supplemental Benefits Maintenance Account (SBMA) are not part of the projected benefits included in this valuation. Therefore, the SBMA Reserve is subtracted from the DB Program assets to arrive at the value available to support the benefits included in this valuation.

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Funded Status (continued)

In addition, the Teachers' Retirement Board has established a policy of allocating funds for future costs associated with the Teachers' Health Benefits Fund (THBF). This policy was revised in April of 2009 to make a one-time credit to the THBF and "true up" the future MPPP obligations (payable from the THBF) in the funding of the DB Program. As of June 30, 2014, only a relatively small amount of less than $1 million resides in the THBF, while the remaining unfunded amount of $359 million is added to the DB Program obligation.

The following table shows a history of the Funded Status of the DB Program.

($ Millions) Year	Actuarial Obligation	Actuarial Value of Assets	Unfunded Actuarial Obligation	Funded Ratio
1975	**$ 12,834**	**$ 3,775**	**$ 9,059**	**29%**
1977	15,203	5,019	10,184	33%
1979	17,971	6,488	11,483	36%
1981	22,545	9,345	13,200	41%
1983	26,553	15,023	11,530	57%
1985	**28,401**	**17,457**	**10,944**	**61%**
1987	34,637	24,401	10,236	70%
1989	40,266	29,327	10,939	73%
1991	47,100	36,001	11,099	76%
1993	53,581	45,212	8,369	84%
1995	**63,391**	**55,207**	**8,184**	**87%**
1997	69,852	67,980	1,872	97%
1998	74,234	77,290	(3,056)	104%
1999	86,349	90,001	(3,652)	104%
2000	93,124	102,225	(9,101)	110%
2001	109,881	107,654	2,227	98%
2003	131,777	108,667	23,110	82%
2004	138,254	114,094	24,160	83%
2005	**142,193**	**121,882**	**20,311**	**86%**
2006	150,872	131,237	19,635	87%
2007	167,129	146,419	20,710	88%
2008	177,734	155,215	22,519	87%
2009	185,683	145,142	40,541	78%
2010	196,315	140,291	56,024	71%
2011	208,405	143,930	64,475	69%
2012	215,189	144,232	70,957	67%
2013	222,281	148,614	73,667	67%
2014	231,213	158,495	72,718	69%

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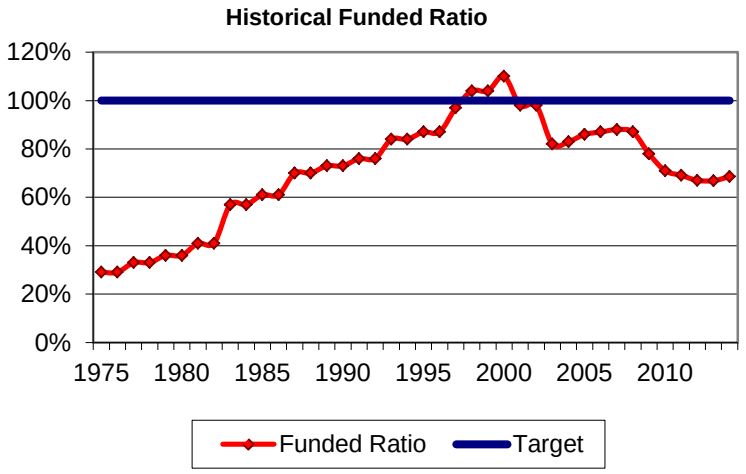
Funded Status (continued)

The historical Funded Ratios are plotted in the following graph. In years in which a valuation was not performed, the Funded Ratio from the previous year is used.



Actuarial Gains and Losses

Comparing the UAO as of two valuation dates does not provide enough information to determine whether there were actuarial gains or losses. The correct comparison is between the UAO on the valuation date and the Expected UAO projected from the prior valuation date using the actuarial assumptions in effect since the previous valuation.

The actuarial gains and losses since the last report are summarized in the following tables and shown in **Table 8**.

($ Millions)	Expected Results	Actual Results	(Gain) or Loss
Actuarial Obligation	$232,110	$231,213	$ (897)
Act. Value of Assets	153,183	158,495	(5,312)
Unfunded Act. Oblig.	$ 78,927	$ 72,718	$ (6,209)
Actuarial (Gains) or Losses by Source			
Change in actuarial assumptions			$ 0
Salaries increased less than assumed			(802)
All other non-investment sources			(95)
(Gain) or Loss on the Actuarial Obligation			(897)
Investment Return on Actuarial Value of Assets			(5,320)
Contributions (in excess of) or less than assumed			8
(Gain) or Loss on the Actuarial Value of Assets			(5,312)
Total Actuarial (Gain) or Loss			$ (6,209)

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Actuarial Gains and Losses (continued)

($ Millions) Actuarial (Gains) or Losses on the Actuarial Obligation	(Gain) or Loss	Percent of Act. Oblig.
Change in actuarial assumptions	$ 0	0.0%
Salaries increased less than assumed	(802)	(0.4)
All other non-investment sources	(95)	0.0
(Gain) or Loss on the Actuarial Obligation	$ (897)	(0.4)%

Actuarial (Gains) or Losses on the Actuarial Value of Assets	(Gain) or Loss	Percent of AVA
Return on Actuarial Value of Assets	$ (5,320)	(3.4)%
Contributions greater than assumed	8	0.0
(Gain) or Loss on the Actuarial Value of Assets	$ (5,312)	(3.4)%

These net gains and losses are within a reasonable range for variances in a single year.

Based on the 2013 Actuarial Valuation, the UAO was expected to increase to $78,927 million. The actual UAO of $72,718 million represents a net actuarial gain of $6,209 million.

- Salaries increased less than predicted by the current actuarial assumptions, causing the Actuarial Obligation to decrease by $802 million from the expected amount. Smaller-than-expected salary increases have been common among public agencies in recent years, although we have observed a modest rise in salary increases recently. We expect to continue to see salary increase fluctuations from year to year.
- All other non-investment experience represents only a relatively small portion of the expected Actuarial Obligation. These relatively minor net gains and losses indicate that the census is consistent from the prior period, and the actual experience tracked closely overall with the actuarial assumptions (exclusive of the asset return and the salary increase).
- On the asset side, there was an asset gain, as the investment return on the Fair Market Value of Assets was greater than the 7.50% assumption. The return on market value was estimated at 18.6%, while the return on the Actuarial Value of Assets was less (estimated at 11.0%) due to the smoothing of the current year gain, and the recognition of a portion of prior deferred investment losses.

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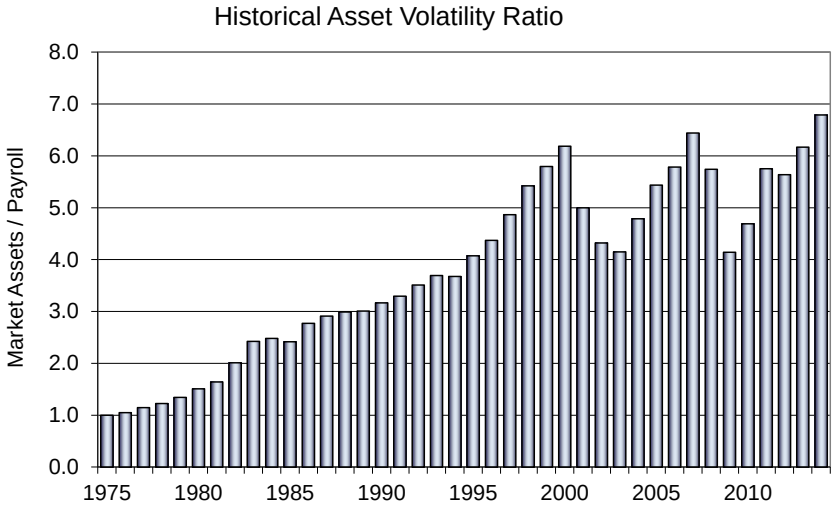
Volatility Ratios

As a retirement system becomes more mature (i.e., a greater percentage of the obligation is attributable to benefits already earned), it tends to be subject to increased volatility in the contributions needed. Specifically, for CalSTRS, there may be significant swings in the Additional Revenue Needed from year to year due to the actual investment return.

One indicator of this potential volatility is the Asset Volatility Ratio (AVR) which is equal to the Fair Market Value of Assets divided by total payroll. Plans with a high Asset Volatility Ratio will be subject to a greater level of contribution volatility. The AVR is a current measure since it is based on the current level of assets and will vary from year to year.

For CalSTRS, the current AVR is equal to 6.8, which is typical for a mature system. This means that for each 1% asset loss (in relation to the assumed investment return), there will need to be an increase in contributions equivalent to 6.8% of one-year's payroll. Since CalSTRS is currently targeting a funding period of 31 years (the years from the next valuation date to June 30, 2046), the increase (or decrease) in the Additional Revenue Needed will be spread out over 31 years, resulting in approximately a 0.36% of payroll increase (decrease) in the Additional Revenue Needed for each 1% asset loss (gain).

The following graph shows how the System matured during the last 25 years of the 20th Century, as represented by the increasing AVR. Over the last decade and a half, increases in the AVR have somewhat leveled off although there continues to be year-to-year variance.



Volatility Ratios (continued)

Another measure of a system's maturity is the Liability Volatility Ratio (LVR), which is equal to the Actuarial Obligation divided by the total payroll. This ratio provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. In addition, this ratio provides an indication of the potential contribution volatility due to liability experience (gains and losses) and liability re-measurements (assumption changes). For CalSTRS the current LVR is 8.7. Ultimately, the LVR and AVR should be equal if CalSTRS achieves 100% funding in the future.

The following graph shows the historical LVR. It is a similar pattern to the Asset Volatility Ratio except the increase is more gradual and the year-to-year variance is significantly less.

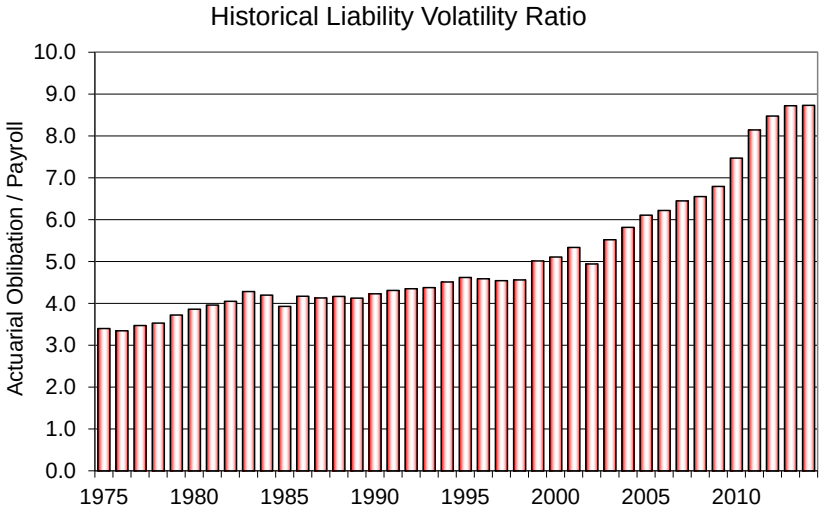


Table 7
Funded Status

($ Millions)	2014	2013
Actuarial Obligation *(Table 2)*	$231,213	$222,281
Actuarial Value of Assets		
Calculated *(Table 5)*	$ 168,838	$ 157,883
Less SBMA Reserve	(10,343)	(9,269)
Program Assets	$ 158,495	$ 148,614
Unfunded Actuarial Obligation	**$ 72,718**	**$ 73,667**
Funded Ratio	**68.5%**	**66.9%**

Table 8
Actuarial Gains and Losses

($ Millions)	Expected	Actual	(Gain) / Loss
Actuarial Obligation			
Actuarial Obligation June 30, 2013	$222,281		
Normal Cost for 2013-14	4,897		
Benefits Paid (Excludes Purchasing Power)	(11,496)		
Expected Interest at 7.50%	16,428		
Actuarial Obligation June 30, 2014	**$232,110**	**$231,213**	**$ (897)**
By Source:			
Change in actuarial assumptions			*0*
Retiree Mortality			*(92)*
Active Member Mortality			*(5)*
Service Retirements			*(95)*
Terminations			*90*
Disability Retirement			*84*
Salary increases less than assumed			*(802)*
All Other Non-investment Sources			*(77)*
Total (Gain) Loss on the Actuarial Obligation			*$ (897)*
Actuarial Value of Assets			
Actuarial Value of Assets June 30, 2013	$148,614		
Expected Contributions for 2013-14	5,157		
Benefits Paid (Excludes Purchasing Power)	(11,496)		
Expected Interest at 7.50% on AVA	10,908		
Actuarial Value of Assets June 30, 2014	**$153,183**	**$158,495**	**$ (5,312)**
By Source: Investment Return on Actuarial Value of Assets (including the recognition of prior deferred investment gains and losses)			*$ (5,320)*
Contributions (in excess of) or less than assumed (including service purchases)			*8*
Total (Gain) Loss on the Actuarial Value of Assets			*$ (5,312)*
Unfunded Actuarial Obligation	**$ 78,927**	**$ 72,718**	**$ (6,209)**

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Section 6 State Supplemental Contribution Rate

Under EC §22955.1(b), increases in the state contribution rate are required, reaching an ultimate increase of 4.311% of payroll as of July 1, 2016. We will refer to this contribution as the state supplemental contribution. Note that for the state, the payroll is the second prior fiscal year salaries, so contributions made in fiscal year 2016-17 will be based on the covered member compensation for fiscal year 2014-15. The state supplemental rate is in addition to the base state contribution under EC §22955.1(a) of 2.017% of payroll.

Effective July 1, 2017, the board shall increase or decrease the state supplemental contribution rate to reflect the contribution required to eliminate the remaining UAO associated with the 1990 benefit and contribution rate structure. This will be referred to as the 1990 UAO. State supplemental contributions are included as part of the 1990 UAO. Although not specified in the law, the Board's valuation policy calls for the state supplemental contribution rate to be calculated to amortize the UAO by June 30, 2046.

Changes in the state supplemental contribution are determined annually beginning with the 2016 valuation and subject to the following conditions:

- The state supplemental contribution rate cannot increase by more than 0.5% of payroll over the prior year supplemental rate. There is no limit on decreases.
- In any year when there is no UAO for the 1990 Benefit Structure, the supplemental contribution shall be reduced to zero.

1990 Unfunded Actuarial Obligation

The 1990 Actuarial Obligation for the DB Program is calculated using the benefit provisions in place during 1990. CalSTRS provides us with supplementary information on the census data for this determination. The process has limitations since we do not know, for example, whether members who retired would have done so if the post-1990 benefit enhancements had not been enacted. However, we believe we are using a reasonable process to estimate what the Actuarial Obligation would be if only the 1990 benefits were currently in place.

There were no benefit improvements enacted between 1990 and 1998 that had a material cost. All benefit enhancements enacted with effective dates from July 1, 1990 to December 31, 1998 have been presumed to be cost-neutral. Due to the enhanced retirement benefits enacted since 1990, we are using a separate set of retirement probabilities to evaluate the 1990 Benefit Structure.

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1990 Unfunded Actuarial Obligation (continued)

The Actuarial Obligation related to the 1990 Benefit Structure is $188.3 billion. This compares to the Actuarial Obligation for the DB Program of $231.2 billion.

($ Millions)	2014 Valuation	2013 Valuation
Actuarial Obligation -- 1990 Benefit Structure		
Value of Projected Benefits	$ 236,726	$ 227,919
Value of Future Normal Costs	48,383	46,805
Actuarial Obligation	$ 188,343	$ 181,114

The current Actuarial Value of Assets for the DB Program needs to be adjusted to reflect the contributions started on October 1, 1998 (excluding the state supplemental contributions under 22955.1(b)), and an estimate of the additional benefits paid out through the valuation date due to the post-1990 benefit increases. This task also has some limitations since we do not have precise data regarding the portion or the timing of benefit payments that would be attributable to only the 1990 benefits.

The most significant adjustments to the assets are:

- Eliminating contributions in excess of 16.00% (except for the state supplemental contributions),
- Adding back the member contributions that were directed to the DBS Program,
- Adding back the post-1990 benefit enhancements that have been paid, and
- Adjusting for actual investment return.

See **Table 9** for the details of the asset adjustment.

($ Millions)	2014 Valuation	2013 Valuation
Asset Adjustment -- 1990 Benefit Structure		
Actuarial Value for DB Program	$ 158,495	$ 148,614
Adjustments per Table 9	14,932	12,568
Actuarial Value of Assets	$ 173,427	$ 161,182

For purposes of testing the funding sufficiency of the 1990 Benefit Structure, note that we did not reserve the Board's allocation of assets for future THBF costs because it was established subsequent to 1990.

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1990 Unfunded Actuarial Obligation (continued)

The following table summarizes the Funded Status of the 1990 Benefit Structure as detailed in **Table 10**. The 1990 Benefit Structure has an actuarial deficit equal to the UAO of $14.9 billion.

($ Millions)	2014 Valuation	2013 Valuation
Funded Status -- 1990 Benefit Structure		
Actuarial Obligation	$ 188,343	$ 181,114
Actuarial Value of Assets	173,427	161,182
Unfunded Actuarial Obligation	$ 14,916	$ 19,932
Funded Ratio	92.1%	89.0%

Supplemental State Contributions

The statute calls for an adjustment to the supplemental state contribution to amortize the 1990 UAO effective with the 2016 actuarial valuation. Therefore, no adjustment to the scheduled state supplemental contribution rate is needed effective July 1, 2015.

For illustrative purposes, we have shown the adjustment to the state supplemental contribution rate that would have been recommended if this were the 2016 valuation. As shown in **Table 10**, a supplemental contribution rate of 2.706% of pay would be needed to amortize the 1990 UAO by June 30, 2046, a decrease of about 1.6% of pay from the ultimate supplemental rate of 4.311%. Note this is based on the Actuarial Value of Assets, so it does not reflect the future recognition of currently deferred asset gains and losses, and therefore differs from the projection shown in the Looking Ahead subsection of Section 1.

The funded status of the 1990 Benefit Structure in future years is difficult to predict with certainty because the Actuarial Value of Assets for the 1990 Benefit Structure includes adjustments for contributions and benefits paid in excess of those in place in 1990. The benefits paid may vary considerably depending on demographic experience. In addition, the Actuarial Obligation can only be assessed accurately when current census data is evaluated along with current asset information.

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Table 9
Asset Adjustment for 1990 Benefit Structure

($ Millions)	2014	2013
Assets Adjustment due for 1990 Structure Changes		
Allocated Market Value at Beginning of Year	$12,512	$10,119
Contributions During the Year		
EC §22901.7 at 0.000% / 0.000% of Earned Salaries	0	0
EC §22951 at 0.250% of Earned Salaries	(66)	(66)
EC §22955 at 2.017% of second preceding fiscal year Earned Salaries	(527)	(531)
EC §22955b at 1.024% / 0.774% of second preceding fiscal year Earned Salaries	(268)	(203)
THBF costs reallocated to DB Program	33	35
Total Adjustment to Contributions[(1)]	(828)	(765)
Benefits Paid During the Year		
Post-1990 Benefits Paid During the Year	1,826	1,714
Prior 2% DBS redirection contributions refunded	(16)	(19)
Total Adjustment to Benefits Paid [(1)]	1,810	1,695
Estimated Investment Earnings for the Year [(2)]	2,403	1,463
Total Allocated Market Value at End of Year	**$15,897**	**$12,512**
Ratio of Actuarial Value to Market Value [(3)]	93.930%	100.450%
Actuarial Value of Assets of Asset Adjustment	**$14,932**	**$12,568**

(1) May not add exactly, due to rounding.

(2) Based on Fair Market Value and uniform cash flow for contributions, benefits and expenses. The rates of return used in these calculations were 13.94% for 2012-13 and 18.61% for 2013-14.

(3) Developed from Table 5.

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Table 10
Funded Status and Supplemental Contribution Rate for 1990 Benefit Structure

($ Millions)	2014	2013	
Actuarial Obligation			
Present Value of Projected Benefits			
Benefits Currently Being Paid	$ 104,718	$ 101,128	
Benefits to Inactive Members	4,578	4,510	
Benefits to Active Members	127,430	122,281	
Total	$ 236,726	$ 227,919	
Present Value of Future Normal Costs	(48,383)	(46,805)	
Actuarial Obligation	$ 188,343	$ 181,114	
Actuarial Value of Assets			
Actuarial Value of Assets *(Table 7)*	$ 158,495	$ 148,614	
Plus, 1990 Asset Adjustment (Table 9)	14,932	12,568	
Theoretical AVA for 1990 Benefits	$173,427	$161,182	
Funded Status			
Actuarial Obligation	$ 188,343	$ 181,114	
Actuarial Value of Assets	173,427	161,182	
Unfunded Actuarial Obligation (Surplus)	$14,916	$19,932	
Funded Ratio	92.1%	89.0%	
Amortization Sufficiency Under Current Contribution Schedule			
Revenue for 1990 Benefits	16.000%	16.000%	
Normal Cost Rate for 1990 Benefits	(15.348)	(15.393)	
Level Equivalent Additional Revenue Under EC 22955.1(b)	4.097	1.367	(1)
Revenue Available for Amortization	4.749%	1.974%	
Revenue Needed for Amortization	3.144	na	(2)
Revenue Surplus / (Deficit)	1.605%		
Amortization Status under current contribution rate schedule and no changes in ultimate rate	Projected to Fund 1990 UAO by 2046	na	(2)
Contribution Rate for Amortization of 1990 UAO			
[Illustrative Purposes Only. Not Applicable for 2014 Valuation]			
Current EC 22955.1(b) Contribution Rate	4.311%	na	(2)
Increase / (Decrease) in State Contribution Rate for Next Fiscal Year	(1.605)	na	(2)
EC 22955.1(b) Contribution Rate for FYB 2017	**2.706%**	**na**	(2)

(1) 2013 Additional Revenue based on EC 22955(b).
(2) Not calculated in 2013.

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Section 7 Employer Supplemental Contribution Rate

Under EC §22950.5, increases in the employer contribution rate are required, reaching an ultimate increase of 10.85% of payroll as of July 1, 2020. We will refer to this contribution as the employer supplemental contribution. The employer supplemental rate is in addition to the base employer contribution under EC §22950 and 22951 of 8.25% of payroll.

Effective July 1, 2021, the board shall increase or decrease the employer supplemental contribution rate to reflect the contribution required to eliminate the remaining UAO associated with service earned prior to July 1, 2014. This will be referred to as the pre-2014 UAO.

There is an additional complexity in that the pre-2014 UAO that the employer is responsible for funding overlaps with the 1990 UAO that the state is responsible for funding. Under the Board's valuation policy, the pre-2014 UAO is split into two separate pieces: 1) the pre-2014 UAO for the 1990 Benefit Structure; and 2) the pre-2014 UAO for "new" benefits (i.e., those adopted after 1990). The employers are responsible for funding the New Benefit UAO.

Changes in the employer supplemental contribution are determined annually beginning with the 2020 valuation and are subject to the following conditions:

- The employer supplemental contribution rate cannot increase or decrease by more than 1.0% of payroll over the prior year supplemental rate.
- The employer supplemental contribution rate cannot exceed 12.00%.

To determine the pre-2014 UAO for New Benefits, we must determine the total UAO for pre-2014 service and subtract the 1990 UAO for pre-2014 service.

Pre-2014 Unfunded Actuarial Obligation

The pre-2014 Actuarial Obligation for the DB Program is calculated using service through June 30, 2014 and projected salaries. Since there are no future service accruals for this portion of the Actuarial Obligation, the Projected Unit Credit actuarial cost method is used, per the Board's valuation policy.

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Pre-2014 Unfunded Actuarial Obligation (continued)

The current Actuarial Value of Assets for the DB Program needs to be adjusted to reflect the contributions and assets not allocated to funding the pre-2014 UAO. The supplemental contribution rates specified in the legislation were designed to fund the pre-2014 UAO based on the Entry Age Normal cost method, which assumes future service accruals. However, since the funding legislation fixed the service at June 30, 2014, the Actuarial Obligation was recalculated using the Projected Unit Credit cost method, as specified in the valuation policy, which resulted in a reduction in the Actuarial Obligation. Therefore, a corresponding reduction in the assets is made to match the original targeted UAO as of June 30, 2014. The value of the asset adjustment is allocated to funding post-2014 benefit accruals.

To determine the pre-2014 assets to be used in the 2014 valuation, the only modification to the total assets is the one-time adjustment for the change in actuarial cost method. In future valuations, a theoretical pre-2014 asset value will be maintained based on the prior year value adjusted as follows:

- Add total contributions (excluding SBMA),
- Subtract total Normal Costs for prior year,
- Subtract benefit payments attributable to pre-2014 service, and
- Adjust for actual investment return.

See **Table 11** for the details of the asset adjustment.

Pre-2014 Unfunded Actuarial Obligation for 1990 Benefit Structure

A second calculation is done to isolate the portion of the pre-2014 UAO that is allocated to the 1990 Benefit Structure and therefore is subject to state funding. The Actuarial Obligation for this portion is calculated using the 1990 Benefit Structure, service through June 30, 2014 and projected salaries. Since there are no future service accruals, the Projected Unit Credit actuarial cost method is used.

The Actuarial Value of Assets needs to be adjusted to reflect the contributions and assets not allocated to funding the 1990 UAO for pre-2014 service. Similar to the total pre-2014 UAO, the 1990 Actuarial Obligation for pre-2014 service was recalculated using the Projected Unit Credit cost method, which resulted in a reduction in the Actuarial Obligation. Therefore, a corresponding reduction in the assets is made to match the original targeted UAO as of June 30, 2014.

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Pre-2014 Unfunded Actuarial Obligation (continued)

To determine the pre-2014 assets allocated to the 1990 Structure that are to be used in the 2014 valuation, the only modification to the total assets is the one-time adjustment for the change in actuarial cost method. In future valuations, a theoretical pre-2014 asset value for the 1990 Structure will be maintained based on the prior year value adjusted as follows:

- Add contributions equal to 16.00% of prior year payroll,
- Add state supplemental contributions,
- Subtract total Normal Costs for prior year attributable to 1990 Benefit Structure,
- Subtract benefit payments attributable to pre-2014 service and the 1990 Benefit Structure, and
- Adjust for actual investment return.

See **Table 12** for the details of the asset adjustment.

Pre-2014 Unfunded Actuarial Obligation for New Benefits

The following table shows the calculation of the UAO for Pre-2014 Service attributable to New Benefits.

($ Millions)	Pre-2014 Service		
	Total	1990 Benefits	New Benefits
Funded Status -- Pre-2014 Service			
Actuarial Obligation	$ 220,632	$ 181,697	$ 38,935
Actuarial Value of Assets	148,556	167,184	(18,628)
Unfunded Actuarial Obligation	$ 72,076	$ 14,513	**$ 57,563**

Supplemental Employer Contributions

The statute calls for an adjustment to the supplemental employer contribution to amortize the pre-2014 UAO effective with the 2020 actuarial valuation. Therefore, no adjustment to the scheduled employer supplemental contribution is needed effective July 1, 2015.

For illustrative purposes, we have shown the adjustment to the employer supplemental contribution rate that would have been recommended if this were the 2020 valuation. As shown in **Table 13**, an increase in the supplemental contribution rate of about 0.9% of pay would be needed to amortize the pre-2014 UAO for New Benefits by June 30, 2046. Note this is based on the Actuarial Value of Assets, so it does not reflect the future recognition of currently deferred asset gains and losses, and therefore differs from the projection shown in the Looking Ahead subsection of Section 1.

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Table 11
Total Assets Allocated for Pre-2014 Service

($ Millions)	2014	2013
Asset Value for Pre-2014 Service		
Allocated Market Value at Beginning of Year	na	na
Contributions During the Year		
Total Contributions	na	na
Less Normal Costs for Year	na	na
Total Adjustment to Contributions[1]	na	na
Benefits for Pre-2014 Service Paid During the Year	na	na
Estimated Investment Earnings for the Year [2]	na	na
Preliminary Market Value at End of Year	**$179,749**	**na**
One-Time Adjustment due to Shift in AO		
2014 Actuarial Obligation Under Projected Unit Credit	220,632	na
2014 Actuarial Obligation Under Entry Age Normal	231,213	na
One-Time Adjustment Value	(10,581)	na
Total Allocated Market Value at End of Year	**$169,168**	**na**
Ratio of Actuarial Value to Market Value [3]	93.930%	na
Gross Actuarial Value of Assets for Pre-2014 Service	**$158,900**	**na**
Less Supplemental Benefits Maintenance Account	(10,343)	na
Actuarial Value of Assets for Pre-2014 Service	**$148,557**	**na**

(1) May not add exactly, due to rounding.

(2) Based on Fair Market Value and uniform cash flow for contributions, benefits and expenses. The rates of return used in these calculations were 13.94% for 2012-13 and 18.61% for 2013-14.

(3) Developed from Table 5.

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Table 12
1990 Assets Allocated for Pre-2014 Service

($ Millions)	2014	2013
1990 Asset Value for Pre-2014 Service		
Allocated Market Value at Beginning of Year	na	na
Contributions During the Year		
1990 Employer Contributions (8.00%)	na	na
1990 Member Contributions (8.00%)	na	na
State Contributions under EC §22955.1b (0.000% / 0.000%)	na	na
Less 1990 Normal Costs for Year	na	na
Total Adjustment to Contributions[1]	na	na
1990 Benefits for Pre-2014 Service Paid During the Year	na	na
Estimated Investment Earnings for the Year [2]	na	na
Preliminary Market Value at End of Year[4]	**$195,646**	**na**
One-Time Adjustment due to Shift in AO		
2014 Actuarial Obligation Under Projected Unit Credit	181,697	na
2014 Actuarial Obligation Under Entry Age Normal	188,343	na
One-Time Adjustment Value	(6,646)	na
Total Allocated Market Value at End of Year	**$189,000**	**na**
Ratio of Actuarial Value to Market Value [3]	93.930%	na
Gross Actuarial Value of 1990 Assets for Pre-2014 Service	**$177,528**	**na**
Less Supplemental Benefits Maintenance Account	(10,343)	na
Actuarial Value of Assets for Pre-2014 Service	**$167,185**	**na**

(1) May not add exactly, due to rounding.

(2) Based on Fair Market Value and uniform cash flow for contributions, benefits and expenses. The rates of return used in these calculations were 13.94% for 2012-13 and 18.61% for 2013-14.

(3) Developed from Table 5.

(4) $195,645 million is equal to the $179,749 million fair market value of the DB Program plus the $15,896 million asset adjustment for the 1990 Benefit Structure from Table 9.

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Table 13
Funded Status and Employer Supplemental Contribution Rate for Pre-2014 Service

($ Millions)	2014	2013[1]
Funded Status		
Total Unfunded Actuarial Obligation (Pre-2014 Service)		
Total Actuarial Obligation for Pre-2014 Service	$220,632	na
Total AVA for Pre-2014 Service	148,557	na
Total UAO (pre-2014 Service)	$72,075	na
1990 Unfunded Actuarial Obligation (Pre-2014 Service)		
Total Actuarial Obligation for Pre-2014 Service	$181,697	na
1990 Actuarial Obligation for Pre-2014 Service	167,185	na
1990 UAO (pre-2014 Service)	$14,512	na
Post-1990 UAO (Pre-2014 Service)	$57,563	na
Amortization Sufficiency Under Current Contribution Schedule		
Revenue from Member Contributions[2]	9.654%	na
Revenue from Employer Contributions (22950 & 22951)[2	8.250	na
Revenue from State Contributions EC 22955(a)[2]	1.868	na
Equivalent Normal Cost Rate for Total Benefits	(17.141)	na
Normal Cost Rate Surplus for 1990 Benefits	(0.652)	na
Additional Revenue Under EC 22950.5[2]	8.662	na
Revenue Available for Amortization	10.641%	na
Revenue Needed for Amortization	11.502	na
Revenue Surplus / (Deficit)	(0.861%)	
Amortization Status under current contribution rate schedule and no changes in ultimate rate	Contribution Increase Needed	na
Contribution Rate for Amortization of UAO for pre-2014 Service and New Benefits		
[Illustrative Purposes Only. Not Applicable for 2014 Valuation]		
Current EC 22950.5 Contribution Rate	10.850%	na
Increase / (Decrease) in State Contribution Rate for Next Fiscal Year [3]	0.861	na
EC 22955.1(b) Contribution Rate for FYB 2021[3]	**11.711%**	**na**

(1) Not calculated in 2013.
(2) Equivalent level contribution rate payable through June 30, 2046 as detailed in Tables 14 and 15.
(3) Hypothetical value based on the Actuarial Value of Assets. Current projections indicate a decrease in the ultimate employer contribution rate when reflecting the future recognition of currently deferred asset gains and losses. See Looking Ahead subsection of Section 1.

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Section 8 Funding Sufficiency

The contributions to fund the DB Program include those listed below and described in **Table 14,** including reference to the appropriate section of the California Education Code. Since each contribution is not paid uniformly over time as a percentage of Earned Salaries, we have calculated an equivalent rate over a period ending June 30, 2046, the target period defined in the Education Code to fully fund the UAO.

Source of Revenue	FYB2014 Rate	Equivalent Rate
Members	8.150 %	9.654 %
Districts – Base Rate	8.000	8.000
Districts – Sick Leave	0.250	0.250
Districts – Supplemental Rate	0.630	8.662
State – Base Rate	2.017	1.868
State – Supplemental Rate	1.437	3.794
Equivalent Level Contribution Rate through 2046 (assuming no changes in scheduled rates)		**32.228 %**

The basic state contribution rate will be 2.017% of the second preceding fiscal year Earned Salaries, which is equivalent to a lesser percentage of current Earned Salaries. For example, the state contribution for the 2014-15 year will be equal to 2.017% of the 2012-13 Earned Salaries. Based on two years of known future contributions and projections for the other years, the equivalent rate for the full period is 1.868% of current Earned Salaries.

The calculation of the equivalent rates in **Table 15** results in a combined equivalent contribution of 32.228% of Earned Salaries over the period ending June 30, 2046.

Table 16 shows the amortization of the Unfunded Actuarial Obligation for the total DB Program on a year-by-year basis. Based on the current Actuarial Value of Assets, if the graded contribution rate increases with no additional changes and all future experience emerges as assumed, the UAO will be amortized by June 30, 2046.

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Funding Sufficiency (continued)

Table 17 summarizes these findings. Note that the scheduled increases under the funding legislation are reflected with no future changes once the rates reach the ultimate amount. In practice, the state and employer supplemental contribution rates are designed to adjust to the funded status of the plan. Given that there is now projected to be a small revenue surplus, we would expect the overall DB Program contribution rate to decrease from the ultimate rates and effectively use up this projected surplus.

(Percent of Earned Salaries)	2014 Valuation	2013 Valuation
Additional Revenue Needed for 100% Funding by 2046[1]		
Normal Cost Rate	18.209%	18.259%
Amortization Rate	12.897%	14.620%
Total Level Rate over the Amortization Period	31.106%	32.879%
Equivalent Contribution Rate[2]	32.228%	19.497%
Additional Revenue Needed	None	13.382%

(1) 2013 Valuation calculations based on 30-year funding.
(2) Assumes no change in contribution rate once ultimate level is reached.

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Table 14
Contributions

		FY2014-15 Rate	Ultimate Rate	Equivalent Rate(1)
EC 22901 & 22901.7	Members	8.15% / 8.15%	10.25% / 9.205%	9.654%
EC 22950 & 22951	Employers	8.25%	8.25%	8.250%
EC 22950.5(a)	Employers – Supplemental(2)	0.63%	10.85%	8.662%
EC 22950(c)	Employers for THBF(3)	0.00%	*as needed*	0.000%
EC 22955.1(a)	State(4)	2.017%	2.017%	1.868%
EC 22955.1(b)	State – Supplemental	1.437%	4.311%	3.794%
	Equivalent Level Contribution Rate through June 30, 2046			**32.228%**

(1) Equivalent level contribution rate payable through June 30, 2046. See Table 15 for details.

(2) Graded increases per schedule defined in the Education Code. The ultimate contribution will vary depending on the funded status. For purposes of this exhibit, it is assumed the ultimate rate specified in the graded schedule will not change in the future.

(3) The Teachers' Health Benefit Fund is financed by a redirection of employer contributions. The Teachers' Retirement Board has set aside DB Program assets to finance these future costs. This is reflected in the valuation by adding the unfunded obligation for future THBF benefits to the Actuarial Obligation of the DB Program. See Table 2.

(4) The State's contribution of 2.017% is paid quarterly based on second prior fiscal year salaries.

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Table 15
Projection of Contributions through June 30, 2046[3]

($Millions)		Member	Employer				
	Projected	*22901 &*	*22950 &*	Employer	State	State	Total
FYE	Salaries	*22901.7*	*22951*	*22950.5*	*22955(a)*	*22955.1(b)*	Contrib.
2015	$27,825	$2,268	$2,296	$175	$513	$366	$5,618
2016	28,858	2,643	2,381	715	509	726	6,974
2017	29,933	3,039	2,469	1,297	561	1,200	8,566
2018	31,049	3,143	2,562	1,918	582	1,244	9,449
2019	32,206	3,250	2,657	2,586	604	1,290	10,387
2020	33,407	3,362	2,756	3,301	626	1,339	11,384
2021	34,652	3,476	2,859	3,494	650	1,388	11,867
2022	35,943	3,595	2,965	3,625	674	1,440	12,299
2023	37,282	3,717	3,076	3,760	699	1,494	12,746
2024	38,671	3,843	3,190	3,900	725	1,550	13,208
2025	40,112	3,974	3,309	4,045	752	1,607	13,687
2026	41,606	4,108	3,432	4,196	780	1,667	14,183
2027	43,156	4,247	3,560	4,352	809	1,729	14,697
2028	44,763	4,390	3,693	4,514	839	1,794	15,230
2029	46,430	4,537	3,830	4,682	870	1,860	15,779
2030	48,158	4,689	3,973	4,857	903	1,930	16,352
2031	49,950	4,844	4,121	5,038	936	2,002	16,941
2032	51,808	5,004	4,274	5,225	971	2,076	17,550
2033	53,736	5,170	4,433	5,420	1,007	2,153	18,183
2034	55,735	5,341	4,598	5,621	1,045	2,233	18,838
2035	57,810	5,519	4,769	5,830	1,084	2,317	19,519
2036	59,961	5,702	4,947	6,047	1,124	2,403	20,223
2037	62,194	5,893	5,131	6,272	1,166	2,492	20,954
2038	64,510	6,091	5,322	6,506	1,209	2,585	21,713
2039	66,913	6,296	5,520	6,748	1,254	2,681	22,499
2040	69,407	6,510	5,726	6,999	1,301	2,781	23,317
2041	71,995	6,733	5,940	7,260	1,350	2,885	24,168
2042	74,681	6,966	6,161	7,531	1,400	2,992	25,050
2043	77,468	7,208	6,391	7,811	1,452	3,104	25,966
2044	80,360	7,460	6,630	8,103	1,506	3,219	26,918
2045	83,362	7,724	6,877	8,405	1,563	3,340	27,909
2046	86,478	8,000	7,134	8,719	1,621	3,464	28,938
PV [1]	$520,727	$50,271	$42,960	$45,104	$9,725	$19,757	$167,816
Level Rate [2]		**9.654%**	**8.250%**	**8.662%**	**1.868%**	**3.794%**	**32.228%**

(1) Present Value, as of the valuation date, of projected contributions through June 30, 2046.

(2) Equivalent level rate payable over the period ending June 30, 2046.

(3) Assumes no changes in the state and employer contribution rates once the ultimate rates have been reached.

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Table 16
Amortization of Unfunded Actuarial Obligation[1]
(Reflecting Currently Scheduled Contributions Increases)[2]

($Millions)		Beginning	Amortization Payment			Interest	Ending
		Unfunded	Total	Normal	Available	Charge	Unfunded
Year	FYE	Act. Oblig.	Contrib.	Cost	Amtzn.	at 7.50%	Act. Oblig.
1	2015	$72,718	$5,618	$5,050	$568	$5,433	$77,583
2	2016	77,583	6,975	5,215	1,760	5,754	81,577
3	2017	81,577	8,565	5,387	3,178	6,001	84,400
4	2018	84,400	9,449	5,565	3,884	6,187	86,703
5	2019	86,703	10,388	5,748	4,640	6,332	88,395
6	2020	88,395	11,383	5,937	5,446	6,429	89,378
7	2021	89,378	12,133	6,132	6,001	6,482	89,859
8	2022	89,859	12,574	6,333	6,241	6,510	90,128
9	2023	90,128	13,031	6,539	6,492	6,521	90,157
10	2024	90,157	13,504	6,752	6,752	6,513	89,918
11	2025	89,918	13,995	6,972	7,023	6,485	89,380
12	2026	89,380	14,502	7,198	7,304	6,435	88,511
13	2027	88,511	15,028	7,430	7,598	6,359	87,272
14	2028	87,272	15,573	7,668	7,905	6,254	85,621
15	2029	85,621	16,136	7,913	8,223	6,119	83,517
16	2030	83,517	16,719	8,163	8,556	5,949	80,910
17	2031	80,910	17,323	8,419	8,904	5,740	77,746
18	2032	77,746	17,947	8,682	9,265	5,490	73,971
19	2033	73,971	18,594	8,953	9,641	5,193	69,523
20	2034	69,523	19,265	9,234	10,031	4,845	64,337
21	2035	64,337	19,961	9,524	10,437	4,441	58,341
22	2036	58,341	20,682	9,824	10,858	3,976	51,459
23	2037	51,459	21,430	10,135	11,295	3,444	43,608
24	2038	43,608	22,207	10,458	11,749	2,838	34,697
25	2039	34,697	23,012	10,794	12,218	2,152	24,631
26	2040	24,631	23,849	11,144	12,705	1,380	13,306
27	2041	13,306	24,718	11,510	13,208	512	610
28	2042	610	25,622	11,892	13,730	(460)	(13,580)
29	2043	(13,580)	26,560	12,291	14,269	(1,544)	(29,393)
30	2044	(29,393)	27,534	12,708	14,826	(2,750)	(46,969)
31	2045	(46,969)	28,548	13,145	15,403	(4,090)	(66,462)
32	2046	(66,462)	29,602	13,604	15,998	(5,574)	(88,034)

(1) Based on the actuarial value of assets with no projected recognition of deferred known asset gains and losses.

(2) Contribution rates based on no change in ultimate supplemental rates. Actual contributions will vary based on funded status.

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Table 17
Funding Sufficiency

($ Millions)	June, 2014	June, 2013
Funded Status *(Table 7)*		
Actuarial Obligation	$ 231,213	$ 222,281
Actuarial Value of Assets	158,495	148,614
Unfunded Actuarial Obligation	$ 72,718	$ 73,667
Funded Ratio	68.5%	66.9%
Level Contributions over 30 Years *(Table 14)*	32.228%	19.497%
Amortization Period based on Current Revenues[1]		
Total Level Rate over the Amortization Period	32.228%	19.497%
Equivalent Normal Cost Rate[2]	17.141	18.259
Amortization Rate	15.087%	1.238%
Amortization Period (Based on current revenue projections)	*Amortizes by 2046*	*Does not amortize*
Calculated Contribution Rate for Amortization by 2046[1]		
Equivalent Normal Cost Rate[2]	17.141%	17.244%
Amortization Rate	13.965	15.635
Total Level Rate over the Amortization Period	31.106%	32.879%
Estimated Additional Revenue Needed *(Based on current valuation assumptions)*	None	13.382%

(1) Prior year amortization revenue calculations based on 30-year funding.
(2) Normal Cost Rate shown is expected average Normal Cost Rate through June 30, 2046. It reflects the projected impact of the reduced Normal Cost Rate for future 2% at 62 members.

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Appendix A Provisions of Governing Law

The actuarial calculations contained in this report are based upon our understanding of the CalSTRS DB Program as contained in Part 13 of the California Education Code. The provisions used in this valuation are summarized below for reference purposes.

Member Contributions

Contribution Rate:

2% at 60 Members: 8.0% of creditable compensation. The employer can pay all or a portion of a member's contributions. 25% of this contribution was redirected to the member's Defined Benefit Supplement account from January 1, 2001 through December 31, 2010.

The redirection of member contributions does not apply to the 1990 Benefit Structure.

2% at 62 Members: Equal to one-half of the Normal Cost rate determined in the valuation rounded to the nearest quarter percent. Member rates only change when the Normal Cost rate changes by 1.0% of pay as compared to the initial Normal Cost rate (or at the time of the last adjustment). Currently, the member contribution rate is equal to 8.0% of creditable compensation.

Interest Rate:

Interest is credited at the end of each fiscal year based on rates adopted by the Teachers' Retirement Board. Currently, rates are approximately equal to two-year Treasury notes.

Normal Retirement

Eligibility Requirement:

2% at 60 Members: Age 60 with five years of credited service.

2% at 62 Members: Age 62 with five years of credited service.

Allowance:

Two percent of final compensation for each year of credited service.

Final Compensation:

2% at 60 Members: Average salary earnable for the highest three consecutive years of credited service for one position. For members with 25 years of service, the calculation is based on the highest average compensation earnable in a consecutive 12-month period.

12-month highest average compensation does not apply to the 1990 Benefit Structure.

2% at 62 Members: Final compensation is based on the highest three consecutive years of salary earnable. Compensation is limited to approximately 120% of the Social Security Wage Base. The limit for 2013 is $138,077 (after applying the 120% factor) and is adjusted annually based on changes to the Consumer Price Index for All Urban Consumers. The 2% at 62 members are not eligible for the one-year final compensation benefit enhancement.

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Normal Retirement (continued)

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.
Sick Leave Service Credit:	Credited service is granted for unused sick leave at the time of retirement. Sick Leave Service Credit up to 0.2 years of Credited Service may be used for eligibility for One-Year Final Compensation or to attain the Career Factor or the Longevity Bonus. Unused sick leave service credit does not apply to the 1990 Benefit Structure.
Career Factor:	If a member has 30 years of credited service, the age factor is increased by 0.2%. However, the maximum age factor is 2.4%. Career factor does not apply to 2% at 62 members or the 1990 Benefit Structure.
Longevity Bonus:	For members attaining 30 years of service by January 1, 2011, a longevity bonus of $200 per month is added to the unmodified allowance. The bonus is increased to $300 per month with 31 years of service, and $400 per month with 32 or more years of service. Longevity Bonus does not apply to 2% at 62 members or the 1990 Benefit Structure.
IRC Section 415:	Benefits are subject to limits imposed under Internal Revenue Code (IRC) Section 415. However, no limits are imposed in the valuation of the DB Program until they actually occur, in order to address the potential pay-as-you-go funding needs of the Teachers' Replacement Benefits Program Fund.
IRC Section 401(a)(17):	Compensation is limited under IRC Section 401(a)(17) and assumed to increase at the rate of inflation for valuation purposes. Current 401(a)(17) limits do not apply to members hired before July 1, 1993.

Early Retirement

Eligibility Requirement:	2% at 60 Members: Age 55 with five years of credited service, or age 50 with 30 years of credited service. 2% at 62 Members: Age 55 with five years of credited service.
Benefit Reduction:	2% at 60 Members: 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. 2% at 62 Members: A 1/2% reduction in the normal retirement allowance for each full month or partial month the member is younger than age 62

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Late Retirement

Allowance:	2% at 60 Members: Members continue to earn additional service credit after age 60. 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%. 2% at 62 Members: Members continue to earn additional service credit after age 62. The 2% age factor increases by 0.033% for each quarter year of age that the member is over age 62, up to a maximum of 2.4%. The late retirement adjustment does not apply to the 1990 Benefit Structure.

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:	2% 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:*	50% 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.
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.
Offsets:	Allowance, including children's increment, is reduced by disability benefits payable under Social Security, Workers' Compensation and employer-paid income protection plan.

**Note that, for valuation purposes, the greater of the service retirement allowance and the disability allowance is valued if the member is eligible for service retirement.*

Disability Allowance - Coverage B (including 2% at 62 members)

Eligibility Requirement:	Member has five years of credited California service.
Allowance:*	50% 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.

**Note that, for valuation purposes, the greater of the service retirement allowance and the disability allowance is valued if the member is eligible for service retirement.*

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:	$6,163 lump sum to the designated beneficiary. If there is no surviving spouse, domestic partner or eligible children, the contributions and interest are paid to the designated beneficiary.
Allowance:	The surviving spouse or domestic partner 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%. If there is no surviving spouse or domestic partner, an allowance of 10% of final compensation is payable to eligible children up to a maximum benefit of 50%. When there are no eligible children, the spouse or domestic partner 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.

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Death Before Retirement - Coverage B (including 2% at 62 members)

Eligibility:	One or more years of service credit for active members.
Lump Sum Payment:	$24,652 lump sum to the designated beneficiary. If there is no surviving spouse or domestic partner, 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's and spouse's (or domestic partner's) ages at the time the benefit begins. If the surviving spouse or domestic partner 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:	$6,163 lump sum to the designated beneficiary.
Annuity Form:	If the retiree 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 retiree's account.

Termination from the Program

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 System benefits.

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Appendix B Actuarial Methods and Assumptions

This section of the report discloses the actuarial methods and assumptions used in this actuarial valuation. These methods and assumptions have been chosen on the basis of recent experience of the DB Program and on current expectations as to future economic conditions. The assumptions are intended to estimate the future experience of the members of the DB Program and of the DB Program itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in estimated costs of the DB Program's benefits.

Actuarial Cost Method

The accruing costs of all benefits with future accruals are measured by the Entry Age Normal Actuarial Cost Method. For measurements where no future service is earned (i.e., those with service fixed as of June 30, 2014), the actuarial obligation uses the Projected Unit Credit Actuarial Cost Method.

The projected revenue in excess of the Normal Cost is tested for sufficiency to amortize the Unfunded Actuarial Obligation created by this method. Amortization is calculated on a level percentage of salary including general wage inflation but no increase or decrease in the number of active members.

Entry Age Normal Cost Method:

The actuarial present value of projected benefits for each individual member included in the 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. For 2% at 60 members, the Normal Cost is based on the Coverage B benefit structure. For 2% at 62 members, the Normal Cost is based on their benefit structure. 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. The excess of the Actuarial Obligation over the Actuarial Value of Assets is called the Unfunded Actuarial Obligation. If the Actuarial Value of Assets exceeds the Actuarial Obligation, the difference is called the Actuarial Surplus.

Entry Age:

The ages at entry of future active members are assumed to average the same as the entry ages of the present active members they replace. If the number of active members should increase (or decrease), it is further assumed that the average entry age of the larger (or smaller) group will be the same, from an actuarial standpoint, as that of the present active group. Under these assumptions, the Normal Cost Rate will not vary significantly due to the termination of the present active membership, or with an expansion or contraction of the active membership.

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Projected Unit Cost Method:	The actuarial present value of projected benefits for each individual member included in the valuation is determined based on the current service and salary projected to the age the member leaves active employment. The Normal Cost is $0, since no benefits are being earned.
Asset Valuation Method	The assets are valued using a method that delays recognition of investment gains or losses. The expected actuarial value is the prior year's actuarial value increased with net cash flow of funds, and all increased with interest during the past year at the expected investment return assumption. One-third of the difference between the expected actuarial value of assets and the Fair Market Value of assets is added to the expected actuarial value of assets to arrive at the Actuarial Value of Assets. The asset smoothing method was adopted for the 1999 Actuarial Valuation and is effective for the investment experience beginning in July of 1993.
Actuarial Assumptions	The Actuarial Standards Board has adopted Actuarial Standard of Practice No. 27, *Selection of Economic Assumptions for Measuring Pension Obligations*. This Standard provides guidance on selecting economic assumptions under defined benefit retirement programs such as the System. In our opinion, the economic assumptions have been developed in accordance with the Standard. The Actuarial Standards Board has adopted Actuarial Standard of Practice No. 35, *Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations*. This Standard provides guidance on selecting demographic assumptions under defined benefit retirement programs such as the System. In our opinion, the demographic assumptions have been developed in accordance with the Standard. The assumptions are intended to estimate the future experience of the members of the DB Program and of the System itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in estimated costs of the Program's benefits. The demographic assumptions are listed in **Table B.1** and illustrated at selected ages and duration combinations in **Tables B.2** – **B.7**.

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Payroll Growth Assumption

The wage growth assumption is equal to 3.75%, and the active population is assumed to be stable. Additionally, the Earned Salaries applicable to the DB Program for members hired after December 31, 2012 are assumed to be 99.23% of a similar CalSTRS 2%-at-60 member. Thus, the DB Program payroll is assumed to increase at a rate slightly less than 3.75% each year depending on the expected number of new members.

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Table B.1
List of Major Valuation Assumptions

I. Economic Assumptions

A.	Investment Return (net of investment and administrative expenses)	7.50%
B.	Interest on Member Accounts	4.50%
C.	Wage Growth	3.75%
D.	Inflation	3.00%

II. Demographic Assumptions

A. Mortality*

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

**The mortality assumptions specified contain a margin for expected future mortality improvement. Refer to the 2011 Experience Analysis Report for details. See Table B.9 of this report for a key to the custom mortality tables used for CalSTRS.*

***Future retirees and beneficiaries are valued with a two-year age setback.*

B.	Service Retirement	Experience Tables	Table B.3
C.	Disability Retirement	Experience Tables	Table B.4
D.	Withdrawal	Experience Tables	Table B.5
	Probability of Refund	Experience Tables	Table B.6
E.	Merit Salary Increases	Experience Tables	Table B.7
F.	Supplemental Assumptions		Table B.8

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Table B.2
Mortality

Active Members

Age	Male	Female
25	0.023%	0.013%
30	0.033	0.014
35	0.034	0.018
40	0.057	0.034
45	0.076	0.041
50	0.103	0.063
55	0.143	0.093
60	0.238	0.179
65	0.435	0.368

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

Select rates for disability:		
First year of disablement	6.0%	3.5%
Second year of disablement	4.8	3.0
Third year of disablement	3.5	2.5

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

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Table B.3
Service Retirement

	Only for the 1990 Benefit Structure		For the DB Program			
			Under 30 Years*		30 or More Years	
Age	Male	Female	Male	Female	Male	Female
50	0.0%	0.0%	0.0%	0.0%	1.5%	2.5%
51	0.0	0.0	0.0	0.0	1.5	2.5
52	0.0	0.0	0.0	0.0	1.5	2.5
53	0.0	0.0	0.0	0.0	2.0	2.5
54	1.5	1.5	0.0	0.0	2.0	3.0
55	5.8	7.0	2.7	4.5	8.0	9.0
56	3.9	4.5	1.8	3.2	8.0	9.0
57	4.9	4.5	1.8	3.2	10.0	11.0
58	6.8	7.0	2.7	4.1	14.0	16.0
59	17.5	14.0	4.5	5.4	18.0	19.0
60	25.0	22.0	6.3	9.0	27.0	31.0
61	16.5	15.0	6.3	9.0	47.5	47.5
62	16.5	15.0	10.8	10.8	42.5	45.0
63	15.0	15.0	11.7	16.2	35.0	40.0
64	17.5	18.0	10.8	13.5	30.0	35.0
65	20.0	18.0	13.5	14.4	32.5	37.5
66	16.0	18.0	10.8	13.5	30.0	32.0
67	16.0	18.0	10.8	13.5	30.0	32.0
68	16.0	16.0	10.8	13.5	30.0	32.0
69	16.0	16.0	10.8	13.5	30.0	32.0
70	100.0	100.0	10.8	13.5	30.0	35.0
71			10.8	13.5	30.0	35.0
72			10.8	13.5	30.0	35.0
73			10.8	13.5	30.0	35.0
74			10.8	13.5	30.0	35.0
75			100.0	100.0	100.0	100.0

**If service is equal to or greater than 25 but less than 28 years, the assumed retirement rates shown above for members with less than 25 years of service are increased by 100%. For example, a 60-year old female member with 26 years of service would have an 18.0% probability of retirement (twice the rate for service less than 25 years of 9.0%). For members with 28 but less than 30 years of service, the assumed retirement rates shown above for members with less than 25 years of service apply.*

The assumptions shown above are for retirement from active status. We assume that all vested terminated members retire at age 60.

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Table B.4
Disability Retirement

Coverage A

Age	Male	Female
25	0.018%	0.018%
30	0.027	0.027
35	0.045	0.054
40	0.072	0.081
45	0.099	0.099
50	0.144	0.198
55	0.189	0.252

Coverage B

Age	Male	Female
25	0.010%	0.020%
30	0.020	0.020
35	0.030	0.040
40	0.060	0.070
45	0.100	0.110
50	0.140	0.185
55	0.245	0.300
60	0.365	0.380
65	0.400	0.400
70	0.400	0.400

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Table B.5
Withdrawal

Year	Male	Female
0	16.0%	15.0%
1	13.0	12.0
2	9.0	8.5
3	6.4	6.4
4	4.6	4.6
5	3.9	3.9
10	1.8	1.8
15	0.9	0.9
20	0.5	0.5
25	0.3	0.3
30	0.2	0.2

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Table B.6
Probability of Refund

	Entry Ages - Male				
Year	**Under 25**	**25 - 29**	**30 - 34**	**35 - 39**	**40 and Up**
Under 5	100%	100%	100%	100%	100%
10	46	46	38	36	36
15	38	38	31	21	
20	28	31	15		
25	15	15			
30	10				

	Entry Ages - Female				
Year	**Under 25**	**25 - 29**	**30 - 34**	**35 - 39**	**40 and Up**
Under 5	100%	100%	100%	100%	100%
10	34	32	32	29	29
15	27	24	24	24	
20	19	14	14		
25	10	10			
30	10				

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Table B.7
Merit Salary Increases

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

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Table B.8
Supplemental Assumptions

PEPRA Coverage

All members hired on or after the valuation date are assumed to be subject to the provisions of PEPRA.

Unused Sick Leave

Credited Service is increased by 2.0%.

Optional Forms

Active and Inactive: Based on single life annuity assumed.
Retirees and Beneficiaries: Based on optional form in data.

Probability of Marriage

Male: 90%
Female: 70%

Male spouses are assumed to be three years older than female spouses.

Number of Children

Married members are assumed to have the following number of children:

Member's Gender	Assumed Number of Children
Male	0.65
Female	0.50

Assumed Offsets

The following offsets, expressed as a percentage of Final Compensation, are assumed to cease at age 60:

	Coverage A		Coverage B (including 2% @ 62)	
	Male	Female	Male	Female
Death	2.0%	1.0%	0.0%	0.0%
Disability	2.0%	1.0%	1.0%	1.0%

Valuation of Inactive Members

Reliable salary and benefit information is not available for inactive members. Therefore, the Actuarial Obligation for inactive members is valued using individual contribution account balances as follows:

1) Projected account balances at assumed retirement age of 60 are multiplied by 275%. Note this factor is based on a study of the relationship between individual accumulated contribution balances for inactive members and the Actuarial Obligation at actual retirement.
2) An additional load of 10% is applied to account for the potential redeposit of member contributions.
3) A reduction of 17% is applied to non-vested inactives.

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Table B.9
Custom Mortality Table Key

Healthy (Service) Retirees and Beneficiaries -- Males*	
Expected:	RP2000 Healthy Male -5 to age 70 smoothed to -2 at age 95
Proposed:	RP2000 Healthy Male White Collar -2 Projected to 2025 to age 70 smoothed to -1 at age 90
Healthy (Service) Retirees and Beneficiaries -- Females*	
Expected:	RP2000 Healthy Female -5/-1 adj from 75 to 90
Proposed:	RP2000 Healthy Female White Collar -4 Projected to 2025 to age 75 smoothed to -0 at age 90
Disabled Retirees -- Males*	
Expected:	RP2000 Male (minimum 2.5% with select rates in first three years)
Proposed:	Age < 70: 2% at age 40 & under, graded to 3.2% at age 70 Age > 70: RP2000 Male White Collar +7 Projected to 2025 at age 70 smoothed to +1 age 85 (select rates in first three years, regardless of age)
Disabled Retirees -- Females*	
Expected:	RP2000 Female (minimum 2.0% with select rates in first three years)
Proposed:	Age < 70: 1.5% at age 40 & Less graded to 2.25% at age 70 Age > 70: RP2000 Female White Collar +6 Projected to 2025 at age 70 smoothed to +2 at age 80 (select rates in first three years, regardless of age)

** Tables shown are for current retirees as of the valuation date. Future retirees and beneficiaries are valued with a two-year setback.*

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Appendix C Valuation Data

The membership data for this actuarial valuation was supplied by CalSTRS. Although we did not audit this data, we compared the data for this and the prior valuation and tested for reasonableness, as well as for consistency with prior periodic reports from the CalSTRS staff. Based on these tests, we believe the data to be sufficiently accurate for the purposes of this valuation. Since the valuation results are dependent on the integrity of the data supplied, the results can be expected to differ if the underlying data is incomplete or missing. It should be noted that if any data or other information is inaccurate or incomplete, our calculations may need to be revised.

Tables C.1-C.6 summarize the census data used in this valuation.

Table C.1
Summary of Statistical Information

	June 30, 2014	June 30, 2013
Number of Members		
Active Members [1]	420,887	416,643
Inactive Members [1]	182,815	182,576
Retirees and Beneficiaries		
Service Retirees	241,920	236,487
Disabled Retirees	9,604	9,374
Survivors	24,103	23,413
Total Benefit Recipients	275,627	269,274
Total Membership in Valuation	879,329	868,493
Active Member Statistics		
Earned Salaries	$ 26,470 million	$ 25,479 million
Average Salary	$ 62,891	$ 61,153
Average Age	45.6 years	45.6 years
Average Service	12.3 years	12.2 years

(1) Some active members were reported with no Earnable Salaries, in which case their liabilities, if any, were included with inactive members

Retired Member Statistics[2]	June 30, 2014	June 30, 2013
Average Age		
Service Retiree	72.8	72.6
Disabled Retiree	65.2	65.0
Survivors	77.1	76.9
All Benefit Recipients	72.9	72.6
Average Monthly Benefit		
Service Retirees	$ 3,694	$ 3,609
Disabled Retirees	2,563	2,491
Survivors	2,259	2,172
All Benefit Recipients	$ 3,547	$ 3,464

(2) Average retiree ages shown here are current ages; average retiree ages shown elsewhere in this Appendix are age at retirement.

Inactive Member Statistics	June 30, 2014	June 30, 2013
Average Age	48.1	47.6
Average Account Balance	$ 11,815	$ 11,771

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Table C.2
Age and Service Distribution – Active Male Members

Male

	Years of Service				
Age	**Under 5**	**5-9**	**10-14**	**15-19**	**20-24**
Less than 25	1,062				
25 to 30	5,825	574			
30 to 35	5,813	5,568	881	2	
35 to 40	3,831	5,102	6,376	1,034	3
40 to 45	2,930	3,327	6,114	6,770	454
45 to 50	2,326	2,209	3,695	5,453	3,290
50 to 55	1,932	1,726	2,635	3,435	3,245
55 to 60	1,637	1,494	2,082	2,573	2,235
60 to 65	1,248	1,168	1,576	1,732	1,409
65 to 70	758	619	685	634	454
70 and over	378	305	207	190	121
Age Unknown					
Total	27,740	22,092	24,251	21,823	11,211

	Years of Service					
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45 & Over**	**Total**
Less than 25						1,062
25 to 30						6,399
30 to 35						12,264
35 to 40						16,346
40 to 45	3					19,598
45 to 50	255	3				17,231
50 to 55	2,551	195				15,719
55 to 60	2,746	1,811	273	1		14,852
60 to 65	1,430	872	734	39		10,208
65 to 70	383	186	153	106	7	3,985
70 and over	102	58	33	46	38	1,478
Age Unknown						
Total	7,470	3,125	1,193	192	45	119,142

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Table C.3
Age and Service Distribution – Active Female Members

Female

	Years of Service				
Age	**Under 5**	**5-9**	**10-14**	**15-19**	**20-24**
Less than 25	4,108	1			
25 to 30	19,546	2,748			
30 to 35	14,486	19,768	3,321	4	
35 to 40	8,751	13,900	19,076	2,753	4
40 to 45	7,056	8,883	14,197	15,023	1,053
45 to 50	5,798	6,338	8,712	10,667	7,036
50 to 55	4,665	5,280	7,129	7,935	6,771
55 to 60	3,503	4,026	6,037	7,220	5,712
60 to 65	2,060	2,345	3,754	5,013	4,049
65 to 70	938	859	1,199	1,403	1,101
70 and over	361	311	266	277	212
Age Unknown					
Total	71,272	64,459	63,691	50,295	25,938

	Years of Service					
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45 & Over**	**Total**
Less than 25						4,109
25 to 30						22,294
30 to 35						37,579
35 to 40						44,484
40 to 45	2					46,214
45 to 50	856	4				39,411
50 to 55	6,090	574	4			38,448
55 to 60	5,598	4,119	501	6		36,722
60 to 65	3,256	1,830	1,230	76		23,613
65 to 70	826	338	193	131	15	7,003
70 and over	180	92	77	45	47	1,868
Age Unknown						
Total	16,808	6,957	2,005	258	62	301,745

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Table C.4
Age and Service Distribution – All Active Members

Total

	Years of Service				
Age	**Under 5**	**5-9**	**10-14**	**15-19**	**20-24**
Less than 25	5,170	1			
25 to 30	25,371	3,322			
30 to 35	20,299	25,336	4,202	6	
35 to 40	12,582	19,002	25,452	3,787	7
40 to 45	9,986	12,210	20,311	21,793	1,507
45 to 50	8,124	8,547	12,407	16,120	10,326
50 to 55	6,597	7,006	9,764	11,370	10,016
55 to 60	5,140	5,520	8,119	9,793	7,947
60 to 65	3,308	3,513	5,330	6,745	5,458
65 to 70	1,696	1,478	1,884	2,037	1,555
70 and over	739	616	473	467	333
Age Unknown					
Total	99,012	86,551	87,942	72,118	37,149

	Years of Service					
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45 & Over**	**Total**
Less than 25						5,171
25 to 30						28,693
30 to 35						49,843
35 to 40						60,830
40 to 45	5					65,812
45 to 50	1,111	7				56,642
50 to 55	8,641	769	4			54,167
55 to 60	8,344	5,930	774	7		51,574
60 to 65	4,686	2,702	1,964	115		33,821
65 to 70	1,209	524	346	237	22	10,988
70 and over	282	150	110	91	85	3,346
Age Unknown						
Total	24,278	10,082	3,198	450	107	420,887

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Table C.5
Inactive Members

Fiscal Year Ending June 30	Number Vested	Total Number	Male % of Total	Female % of Total
2002	19,703	96,159	28.0%	72.0%
2003	20,627	104,617	28.3	71.7
2004	22,511	116,128	28.7	71.3
2005	24,113	124,394	28.8	71.2
2006	26,733	133,601	28.8	71.2
2007	28,922	141,450	28.9	71.1
2008	30,370	147,997	29.0	71.0
2009	31,661	156,207	29.0	71.0
2010	33,036	166,976	29.2	70.8
2011	33,976	173,719	29.1	70.9
2012	34,848	178,655	29.1	70.9
2013	35,883	182,576	29.1	70.9
2014	36,344	182,815	29.2	70.8

Fiscal Year Ending June 30	Average Account on Deposit	Average Age	Average Service Credit	Average Years Inactive
2002	$12,997	46.0	3.1	7.3
2003	12,691	46.0	3.0	7.4
2004	12,418	45.8	2.9	7.3
2005	12,177	45.9	2.9	7.4
2006	12,282	45.9	2.9	7.5
2007	12,440	46.0	3.0	7.7
2008	12,698	46.3	2.9	8.0
2009	12,717	46.5	2.9	8.2
2010	12,334	46.7	2.8	8.3
2011	12,035	46.8	2.8	8.6
2012	11,818	47.2	2.8	8.9
2013	11,771	47.6	2.8	9.4
2014	11,815	48.1	2.8	9.9

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Table C.6
Members Retired for Service

Fiscal Year Ending June 30	Total	Male % of Total	Female % of Total
2002	154,884	37.8%	62.2%
2003	159,172	37.6	62.4
2004	169,022	37.2	62.8
2005	176,008	36.9	63.1
2006	181,833	36.5	63.5
2007	188,659	36.1	63.9
2008	195,960	35.7	64.3
2009	203,649	35.3	64.7
2010	213,952	34.9	65.1
2011	222,222	34.4	65.6
2012	230,278	34.0	66.0
2013	236,487	33.6	66.4
2014	241,920	33.1	66.9

Fiscal Year Ending June 30	Average Age at Retirement	Average Years of Service Credit	Final Average Compensation	Average Current Allowance Payable
2002	60.7	25.7	$3,539	$2,183
2003	60.7	25.9	3,735	2,339
2004	60.7	26.0	3,931	2,488
2005	60.8	26.1	4,103	2,617
2006	60.8	26.2	4,264	2,741
2007	60.8	26.3	4,437	2,878
2008	60.8	26.3	4,620	3,021
2009	60.8	26.4	4,798	3,164
2010	60.9	26.3	4,983	3,302
2011	61.0	26.3	5,138	3,417
2012	61.1	26.2	5,271	3,517
2013	61.1	26.1	5,385	3,609
2014	61.2	26.0	5,487	3,694

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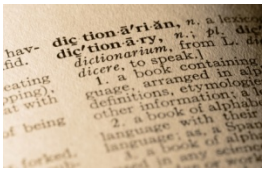
Appendix D Glossary


dic·tion·ā'ri·ăn, n. a lexico
dic'tion·ā·ry, n.; pl. dic
dictionarium, from L. dic
dicere, to speak.]
1. a book containing
guage, arranged in alp
definitions, etymologies
other information; a l
2. a book of alphabe
language with their
language; as, a Spani
3. a book of alpha
in any scienc

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

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, and procedures used to determine other relevant items.

Actuarial Cost Method — A procedure for determining the Actuarial Present Value of pension plan benefits and expenses and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Normal Cost and an Actuarial Obligation.

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

Actuarial Gain or Loss — A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions during the period between two actuarial valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Actuarial Obligation — That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Actuarial Present Value — The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Surplus — The excess, if any, of the Actuarial Value of Assets over the Actuarial Obligation.

Actuarial Valuation — The determination, as of a Valuation Date, of the Normal Cost, Actuarial Obligation, Actuarial Value of Assets and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets — The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an actuarial valuation.

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Entry Age Cost Method	An Actuarial Cost Method under which the Actuarial Present Value of Projected Benefits of each individual included in the 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.
Projected Unit Credit Cost Method	An Actuarial Cost Method under which the Actuarial Obligation is equal to the portion of the Actuarial Present Value of Projected Benefits of each individual included in the actuarial valuation is attributable to service credit that has been earned to date (past service). Since this cost method is only used in this valuation for cases where the service is fixed as of June 30, 2014, the Actuarial Obligation is equal to the portion of the Actuarial Present Value of Projected Benefits for the DB Program, and there is no Normal Cost.
Unfunded Actuarial Obligation	The excess, if any, of the Actuarial Obligation over the Actuarial Value of Assets.
Valuation Date	June 30, 2014.

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PROPOSED
RESOLUTION
OF THE
TEACHERS' RETIREMENT BOARD

SUBJECT: Adoption of June 30, 2014, Actuarial Valuation for the Defined Benefit Program

RESOLUTION NO. _____

WHEREAS, section 22311 of the Education Code requires a periodic actuarial valuation of the California State Teachers' Retirement System's assets and liabilities; and

WHEREAS, Milliman has performed the necessary actuarial calculations using the June 30, 2014 data provided by the California State Teachers' Retirement System; and

WHEREAS, the Teachers' Retirement Board has reviewed the June 30, 2014 Actuarial Valuation Report presented by Milliman; therefore, be it

RESOLVED that the Teachers' Retirement Board adopts the accompanying Actuarial Valuation Report from Milliman, including the Normal Cost Rate of 15.672 percent of pay for CalSTRS 2% at 62 members.

Adopted by:
Teachers' Retirement Board
on April 2, 2015

_____
JACK EHNES
Chief Executive Officer

Reviewed by:

_____
Brian J. Bartow
General Counsel