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March 21, 2017

Teachers' Retirement Board
California State Teachers' Retirement System

Re: **Defined Benefit Program Actuarial Valuation as of June 30, 2016**

Dear Members of the Board:

At your request, we have performed an actuarial valuation of the Defined Benefit (DB) Program of the State Teachers' Retirement Plan as of June 30, 2016. 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 DB Program as of June 30, 2016.

CalSTRS funding is based on complex legislation. This valuation contains analysis based on our understanding of the relevant law based on our experience working with CalSTRS and other large public retirement systems and has been augmented by consultation with CalSTRS staff.

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. The valuation results depend on the integrity of this information. If any of this information is inaccurate or incomplete our results may be different and 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.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an

amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. 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 2016 valuation. Note that the board adopted a 7.25% investment return assumption for the 2016 valuation, but a 7.00% assumption is scheduled to be used for the 2017 and future valuations.

Actuarial computations presented in this report are for purposes of assessing the funding levels of CalSTRS and calculating contribution rates under CalSTRS valuation policy. The calculations in the enclosed report have been made on a basis consistent with our understanding of CalSTRS funding structure. Determinations for other purposes, such as for financial reporting in accordance with GASB standards, may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

This valuation report is only an estimate of the System's financial condition as of a single date. It can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Milliman's work is prepared solely for the internal business use of CalSTRS. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

(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 and practices, including the relevant Actuarial Standards of Practice. 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.

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.

We respectfully submit the following report and we look forward to discussing it with you.

Sincerely,

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

Mark C. Olleman, FSA, EA, MAAA
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Section 1 Summary of the Findings

The primary purpose of the actuarial valuation is to calculate the contribution rates for members, employers, and the state and analyze the sufficiency of these future contributions to meet the current and future obligations of the 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.

Under the board's valuation policy, an increase to the state supplemental contribution rate beginning July 2017 has been calculated. For the employer contribution rate, adjustments will be effective with the 2020 valuation for the fiscal year beginning July 2021. Note that the contribution rates calculated in this report are based on the relevant provisions of the Education Code and the board's valuation policy and are not necessarily our opinion of what the funding level should be; however, we note that CalSTRS is projected to make progress, albeit slow progress in the short term, toward paying off the Unfunded Actuarial Obligation (UAO).

The key findings of this actuarial valuation are:

- The **Funded Ratio** decreased from 68.5% to 63.7% primarily due to the inclusion of more conservative assumptions recently adopted by the board. However, our projections show the System's Funded Ratio improving over the longer term assuming all actuarial assumptions are met.
- An increase in the **state supplemental contribution rate** of 0.500% of payroll to 4.811% of payroll has been calculated for the fiscal year beginning July 1, 2017 pursuant to the valuation policy. This increase is the maximum increment allowed under the Education Code. Current projections show increases in the state supplemental contribution rate will be needed for more than 10 years assuming all actuarial assumptions are met.
- The **employer supplemental contribution rate** for the fiscal year beginning July 1, 2017 increases to 6.18% of payroll (currently 4.33%) as required by the Education Code, which specifies a fixed schedule of contribution increases until 2021.
- Based on the 2016 valuation, no changes to the **member contribution rates** for the fiscal year beginning July 1, 2017 are required. However, an increase of 1.0% of creditable compensation for CalSTRS 2% at 62 members is projected starting July 1, 2018 due to the scheduled reduction in the investment return assumption that will be effective with the June 30, 2017 valuation.

Explanatory Note about Investment Return Assumption

The board adopted a 7.25% investment return assumption for the 2016 valuation: however, a 7.00% assumption is scheduled to be used for the 2017 and future valuations. Therefore, we have used 7.25% for "point-in-time" measurements as of June 30, 2016 and 7.00% for projections of future results. For charts and tables where the return assumption is not explicitly shown, we have added an arrow to indicate whether the measurement uses a 7.00% or 7.25% investment return assumption. Note that all 2015 valuation measurements are at the prior assumption of 7.50%.

Funding Sufficiency

As of June 30, 2016, the future revenues from contributions and appropriations for the DB Program are projected to be sufficient to finance its obligations, except for a small portion of the UAO attributable to New Benefits and Post-2014 service that is not actuarially funded. This finding reflects the scheduled contribution increases specified in the Education Code, assumes additional increases in the scheduled contribution rates allowed under the current law will be made, and is based on the valuation assumptions and the valuation policy adopted by the board, including a 7.00% investment return assumption.

A level contribution rate of 38.140% beginning on the valuation date is projected to be needed to amortize the UAO by June 30, 2046. This is compared to the current projected revenue equivalent to 34.467% of payroll. The revenue calculation assumes no changes in the contribution rates specified in the Education Code 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. These additional increases (limited to 0.5% per year for the state and 1.0% per year for the employers) are not included in the Equivalent Contribution Rate calculation shown below, as the purpose of this exhibit is to assess the approximate magnitude of the combined increases needed over and above those rates scheduled in the legislation.

The projected revenue level (assuming no action by the board to change the rates already scheduled in the Education Code) being less than the needed contribution rates indicates that future net increases in the ultimate contribution rates are expected; however, the changes in contribution rates will vary between the state and employers.

(Percent of Earned Salaries)	2016 Valuation (7.00%)	2015 Valuation (7.50%)
Additional Revenue Needed for 100% Funding by 2046		
Equivalent Normal Cost Rate[1]	19.316%	17.091%
Amortization Rate Needed[2]	18.824%	13.398%
Total Level Rate over the Amortization Period	38.140%	30.489%
Equivalent Contribution Rate[3]	34.467%	33.439%
Contribution Deficit / (Buffer)	3.673%	(2.950%)
Additional Revenue Needed	3.673%	None

1. Normal Cost Rate shown is the 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. It differs from the Normal Cost Rate as of the valuation date shown in Table 1.

2. Reflects market value of assets and 7.00% investment return assumption. The 2015 Valuation column has been changed from the prior report to reflect market value of assets.

3. Assumes no change in the contribution rate once the ultimate level is reached in 2016 for the state and 2020 for the employers. (See Section 8 for details of this calculation.)

Funding Sufficiency (continued)

As shown in the above table, there was an increase in the additional revenue needed as a percentage of payroll. The 3.673% deficit represents the contribution rate needed as a percent of the current payroll, in addition to the scheduled increases to the employer rate, to project to the UAO to be completely funded by June 30, 2046. This implies additional contribution increases, as specified in the Education Code and described below, will be calculated in future valuations. As shown in the "Looking Ahead" subsection of this report, the projected impact is expected to vary between the state and employers.

Contribution Rates

The 2014 legislation added three subsections to the Education Code which address contribution rates. EC §22955.1 specifies graded increases in the supplemental state contribution rates. Effective with this valuation, the board has the authority to adjust the state contribution rate effective July 1, 2017, so that it is sufficient to amortize the UAO attributable to the 1990 contribution and benefit structure. However, the maximum increase in a given year is limited to 0.5% of payroll.

EC §22950.5 specifies graded increases in the employer supplemental contribution rate. Effective July 1, 2021, the employer supplemental 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 2% at 60 member rates are fixed now that they have reached the ultimate rate of 10.25% and are not dependent on the DB Program's funded status. The 2% at 62 members can still vary depending on the calculated Normal Cost Rate as discussed later in this section.

State Supplemental Contribution Rate

For the 2016 valuation, an increase in the state supplemental contribution rate under EC §22955.1 has been calculated. The following table shows a numerical breakdown of each of the factors that caused the increase in the unconstrained (i.e., prior to the application of the minimum supplemental rate and the maximum increase) state supplemental contribution rate. The actual calculation is limited to a 0.5% increase over the prior year and cannot be less than 4.311% until the 1990 UAO has been fully paid off.

Sources of Change	Theoretical Unconstrained State Supplemental Rate
June 30, 2015 Actuarial Valuation	**2.05%**
Expected Year-to-Year Change	-0.12%
Recognized Asset (Gain) / Loss	
• From Prior Years	-0.46%
• From Current Year	0.78%
Salary / Payroll Variation	
• Salary Increase > Assumed	0.21%
• Payroll Increase > Assumed	-0.08%
Assumption Changes	3.53%
All Other Sources	0.06%
Total Change	**3.92%**
June 30, 2016 Actuarial Valuation	**5.97%** (1)

1. Calculated rate is 4.811% due to application of maximum increase.

An **increase to the state supplemental contribution rate to 4.811%** effective July 1, 2017 has been calculated based on the board's valuation policy. For the current fiscal year, the state contribution rate is 4.311%, so this represents the maximum increase allowed of 0.5% of payroll. We have shown details of the calculation of the state supplemental contribution rate in Section 6 of this report. It is important to be aware that these calculations are based on the smoothed actuarial value of assets and the 7.25% return assumption. As shown later in this section (see "Looking Ahead"), if the deferred asset loss as of June 30, 2016 and the 7.00% investment return assumption are reflected in the projected contribution rates, a larger increase in the state supplemental contribution rate is projected.

Employer Supplemental Contribution Rate

Consistent with the Education Code, the 2016 valuation does not calculate changes in the employer supplemental contribution rate. Increases in this rate are fixed for the next few years. Effective with the 2020 valuation, we will calculate the change in the employer supplemental contribution rate starting July 1, 2021.

Employer Supplemental Contribution Rate (continued)

For illustrative purposes, we have shown details of how this calculation will look in Section 7 of this report. This hypothetical calculation shows that, based on the 2016 valuation and the board's current valuation policy, a very small increase would be needed in the ultimate employer contribution rate to maintain the 2046 full funding target for the actuarial obligation related to service prior to July 1, 2014. Note that this adjustment falls 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 and the 7.25% return assumption. As shown later in this section (see "Looking Ahead"), if the deferred asset loss as of June 30, 2016 and the 7.00% investment return assumption are reflected in the projected employer contribution rates, a small decrease in the employer rate is projected (from the ultimate employer rate of 19.10%). This result may seem counter-intuitive since reflecting deferred assets losses would increase the overall contribution rate the System needs. However, since the state's supplemental contribution rate is based on theoretical assets that are greater than the current CalSTRS assets, the impact on the state can be greater than the impact on the System as a whole. The employer supplemental contribution rate is effectively the balancing item in the equation, and can therefore be a decrease when there is an increase in the state supplemental contribution rate.

UAO for New Benefits, Post-2014 Service

The funding legislation included actuarial funding (within certain constraints) for most of the benefits provided by CalSTRS. The one exception is that there is no provision for the state, employers, or members to fund any UAO arising for New Benefits (i.e., those not included in the 1990 Benefit Structure) attributable to service after June 30, 2014. We will refer to this as the "Orphan UAO". Under the valuation policy, a portion of each year's total contributions, equal to the Normal Cost of the New Benefits, is allocated to fund these benefits. Since there is no contribution in excess of the Normal Cost Rate, the Orphan UAO will go up or go down based on future experience.

The following table shows how the Orphan UAO (based on assets at market value) has evolved over time. The two primary causes have been investment returns less than assumed since 2014 and the actuarial assumptions adopted based on the recent experience analysis which both increased the UAO. As of June 30, 2016, the Orphan UAO is small relative to the total UAO, as it only reflects service accrued for two years. However, as members continue to accrue benefits for service after June 30, 2014, there is the potential for the Orphan UAO to increase significantly if actual experience differs materially from that assumed or if further changes in assumptions occur.

($ Millions)	Orphan UAO[(1)]	UAO as % of Payroll
2014 Valuation	$ 0	0.0%
2015 Valuation	213	0.7%
2016 Valuation	639	2.0%

1. The Orphan UAO is calculated using the market value of assets. It is currently $484 million based on the actuarial value of assets.

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, 2017, for this valuation. Generally, the base member contribution rate is one-half of the Normal Cost Rate within certain parameters.

EC §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, 2016, the Normal Cost Rate for the CalSTRS 2% at 62 members is 16.723%. We recommend the board adopt this rate.

EC §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 creditable compensation since the last adjustment. This year the cumulative change is an increase in the Normal Cost Rate of 0.823%, from 15.900% (the time of the last adjustment) to 16.723% for this group. Therefore, **the current base member contribution rate remains at 8.00% for 2% at 62 members** based on the relevant section of the Education Code. It should be noted that there is a high probability that an increase (likely 1.00% of creditable compensation) in the 2% at 62 member contribution rate will be calculated in the 2017 valuation when the 7.00% investment return assumption is first reflected in the calculation.

Note that increases under EC §22901.7(b) are added to the base member rate. Therefore, effective July 1, 2017, the total member contribution rate should remain at 9.205% (8.00% plus the 1.205% additional contribution rate) for 2% at 62 members.

Funding Progress

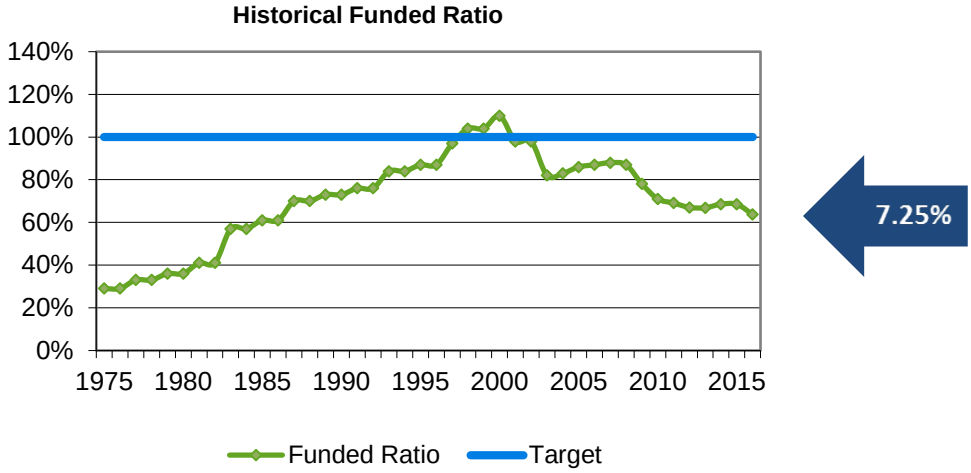
The UAO of a retirement plan is equal to the difference between its Actuarial Value of Assets and its Actuarial Obligation. The Funded Ratio is equal to the Actuarial Value of Assets divided by the Actuarial Obligation.

($ Millions)	2016 Valuation (7.25%)	2015 Valuation (7.50%)
Actuarial Obligation	$ 266,704	$ 241,753
Actuarial Value of Assets	169,976	165,553
Unfunded Actuarial Obligation	$ 96,728	$ 76,200
Funded Ratio	63.7%	68.5%

The $96.7 billion UAO compares to a projected June 30, 2016 value of $80.1 billion based on the prior valuation. The primary reason for the decrease in the funded ratio is the new assumptions that were adopted based on the recent experience analysis which caused an increase in the Actuarial Obligation. Additional discussion of the contributing factors in this change is discussed in Section 5 under Actuarial Gains and Losses.

Funding Progress (continued)

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.



The following table shows the factors that affected the DB Program's Funded Ratio since the last valuation. The increase in the actuarial obligation due to the new assumptions and the less-than-assumed return (Milliman estimate of 1.3% compared to the prior valuation assumption of 7.5%) in the most recent year were the most significant factors decreasing the Funded Ratio.

7.50%

Sources of Change	Funded Ratio
June 30, 2015 Actuarial Valuation	**68.5%**
Expected Year-to-Year Change (due to underfunding[(1)])	-0.2%
Recognized Asset Gain/(Loss)	
• From Prior Years	0.5%
• From Current Year	-1.4%
Salary Variation	-0.3%
Assumption Changes	-3.3%
All Other Sources	-0.1%
Total Change	**-4.8%**
June 30, 2016 Actuarial Valuation	**63.7%**

7.25%

1. The contributions paid in the prior year were not enough to improve the funded ratio. Future projected contribution increases are expected to increase the funded ratio as shown in the graph on the following page.

Impact of 7.00% Investment Return Assumption on 2016 Valuation Results

The 2016 valuation calculates results as of June 30, 2016 based on a 7.25% investment return assumption. For projections of future results, we have reflected the decrease in the investment return assumption to 7.00% that is scheduled to be reflected in the 2017 valuation. The following table shows a comparison of some of the key 2016 valuation results at both 7.00% and 7.25%. The 7.00% provides a rough idea of what the impact of the lower investment return assumption will be on the 2017 valuation results.

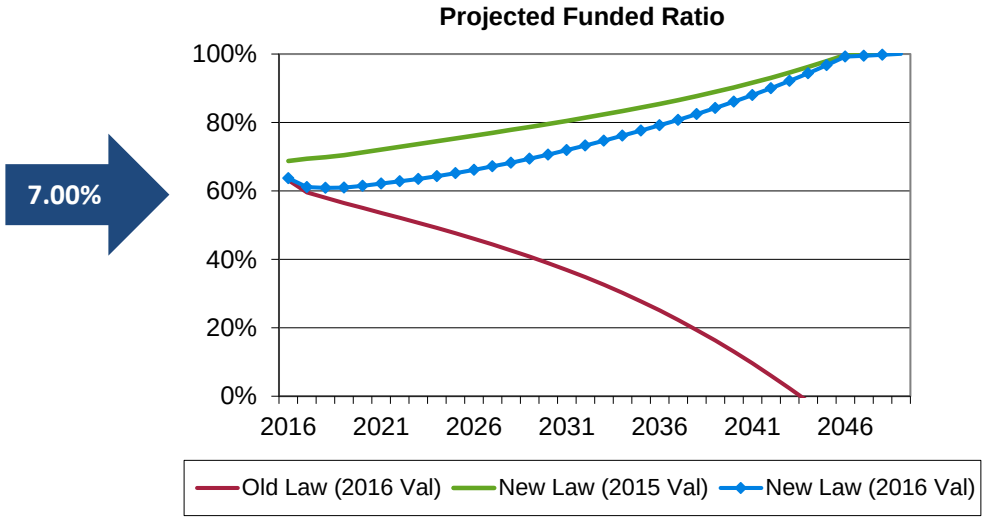
Additional information on the impact the 7.00% investment return assumption is projected to have in the future is shown on the following pages ("Looking Ahead")

($ Millions)	2016 Valuation Results	
	7.00%	7.25%
2% at 60 Normal Cost Rate	20.859%	19.297%
2% at 60 Member Rate	10.250%	10.250%
2% at 62 Normal Cost Rate	17.830%	16.723%
2% at 62 Member Rate[(1)]	10.205%	9.205%
Unfunded Actuarial Obligation	$ 105,075	$ 96,728
Funded Ratio	61.8%	63.7%

1. Includes additional contribution rate of 1.205% under EC §22901.7(b).

Looking Ahead

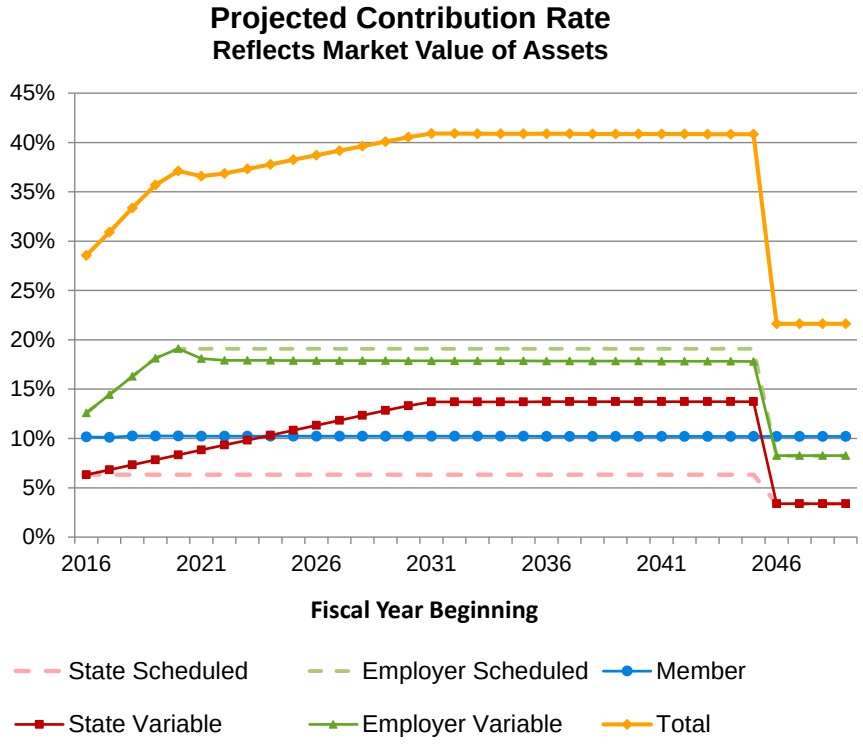
The following projection shows the Funded Ratio if the DB Program earns 7.00% in each future year and all other assumptions are met. As shown in the graph, the DB Program is projected to reach approximately 100% funding by 2046 based on the 2016 valuation (blue line) but reflecting the scheduled reduction in the investment return assumption. The funded ratio is lower than the 2015 valuation projection, primarily due to the FYE2016 return which was less than assumed and the lower projected future returns (7.50% was assumed in the prior valuation). Note that we have also shown a hypothetical projection of the funded status without the funding legislation. See the end of this subsection for a summary of the assumptions on which these projections are based.



Looking Ahead (continued)

Asset gains and losses will generally have the largest year-to-year impact on the total contribution rate needed, although assumption changes can cause a significant change in years when they occur. 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. The contribution rates shown include both the base and supplemental contribution rates, but do not reflect the state contribution to the Supplemental Benefit Maintenance Account (SBMA).

7.00%



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

The projection calculations are based on the following assumptions:

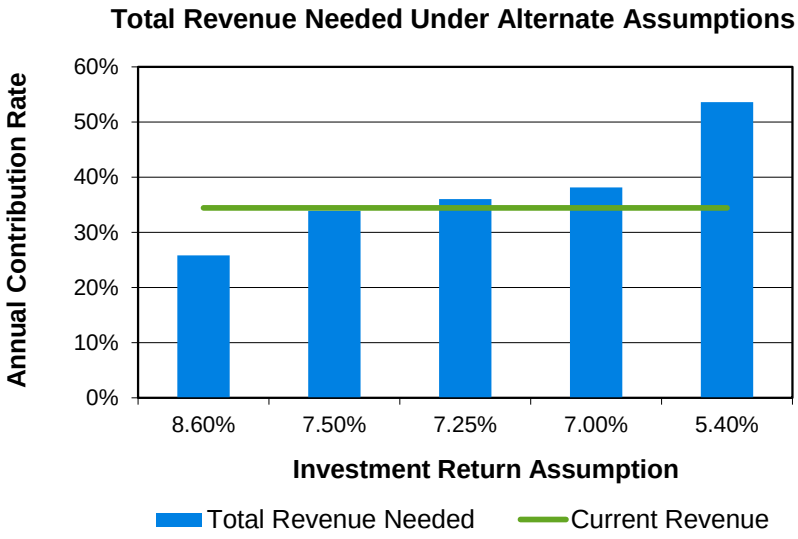
- All experience subsequent to the valuation date is consistent with the valuation assumptions, as described in Appendix B, with the exception that a 7.00% return will apply in the 2017 and later valuations.
- Future changes in the state and employer supplemental contribution rates, after the ultimate rates are reached, will be consistent with the board's valuation policy. In particular, the state rate is based on funding the UAO by 2046, a year which is not defined in statute.
- Current deferred asset gains and losses (currently a net deferred loss) are reflected as they are expected to be recognized in the asset smoothing method.
- The projection assumes new members will have the same Normal Cost Rate as the current 2% at 62 members. The emerging Normal Cost Rate will decrease over time due to the lower benefits provided for 2% at 62 members.

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 2016 valuation investment return assumption of 7.25%, 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 8.6% and 5.4% investment return assumptions. These expected returns are the 25th and 75th percentiles respectively for a 30-year period net of both administrative and investment expenses. They are based on CalSTRS current capital market assumptions after reflecting the board's expectation that median long-term returns will be 7.00% instead of the approximate 7.50% initially derived from the current CalSTRS capital market assumptions.

These percentile returns indicate the likelihood that actual future returns will deviate significantly from the current assumption. Specifically, based on these assumptions, there is a 25% chance the net average annual return will be greater than 8.6%, but also a 25% chance the net average annual return will be less than 5.4% over a 30-year period.



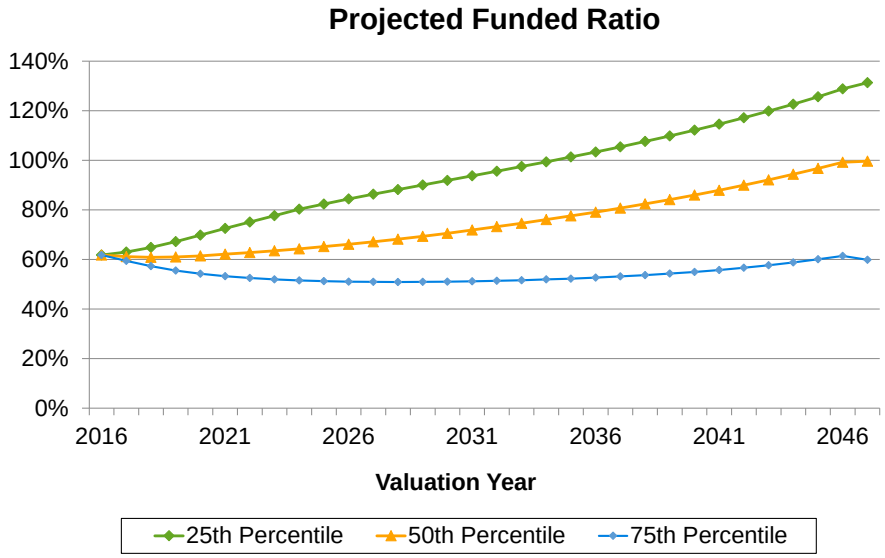
Projections Under Alternate Return Scenarios

Actuarial valuations are based on a certain set of assumptions. The reality is that these assumptions will not be exactly met and that this will affect future valuation results. As noted in the previous section, investment returns will likely have the biggest impact on the future funding of CalSTRS. In the following graphs, we show some simple examples of the future variation that may occur on key funding metrics. This is not intended to be a comprehensive analysis of the potential risks to CalSTRS funding, but it will give the board some idea of the sensitivity of funding levels and contribution rates caused by returns that are above or below the assumption.

It should be noted that last fall CalSTRS internal actuarial staff, in consultation with Milliman, completed a more comprehensive analysis of potential risks ("2016 Review of Funding Level and Risks"). Our understanding is that this analysis will be performed again in 2017.

To show potential variability of future returns, we have assumed CalSTRS earns the 25th, 50th, and 75th percentile returns over the next 30 years. This assumes a median (50th percentile) geometric return of 7.00% and a standard deviation of 13.00%. The average 30-year returns shown for the 30-year period are 8.6% for the 25th percentile and 5.4% for the 75th percentile.

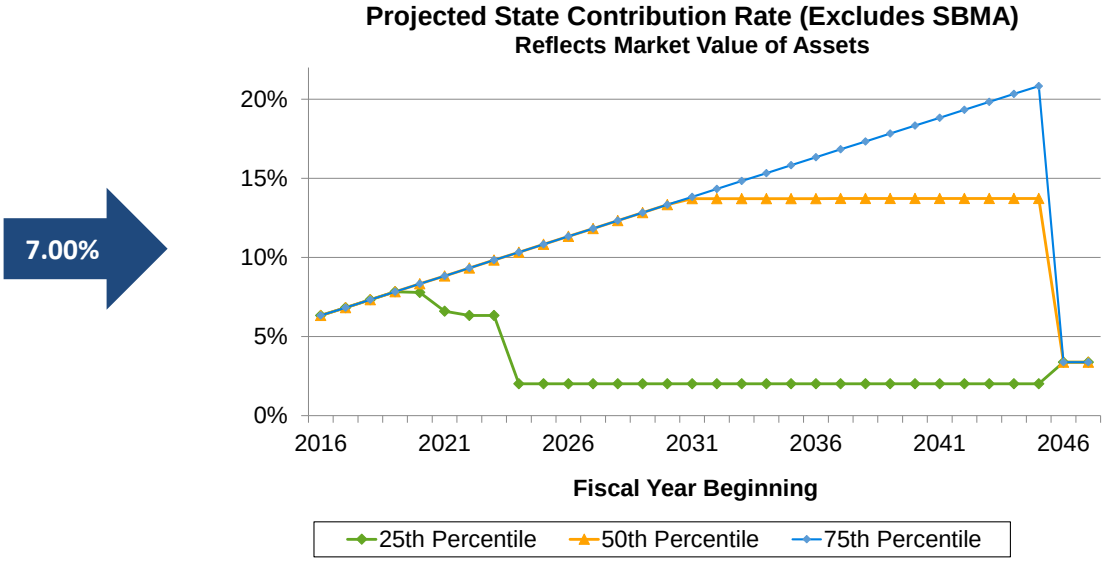
The following graph shows the potential impact of alternate returns on CalSTRS funded ratio. The caps on contribution rate increases restrict CalSTRS ability to make significant progress toward its funding goal when the funded ratio is low.



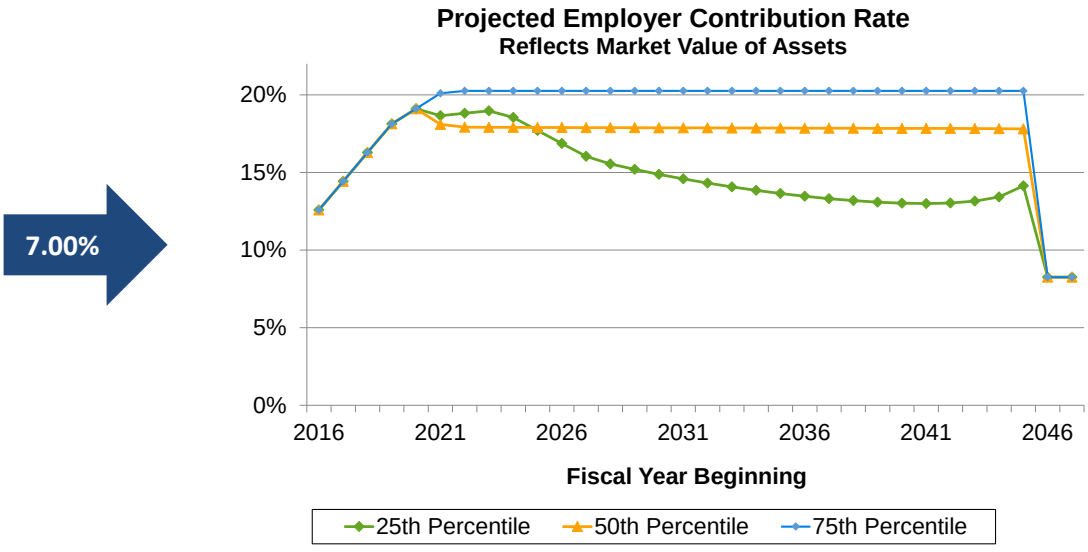
As previously mentioned, future investment returns are likely to have the largest impact on the future funded status of CalSTRS; however, other factors, such as variance in payroll and life expectancies, could also have a material impact. Additionally, the timing of future returns could influence future results. For example, good returns followed by poor returns may have a materially different result than poor returns followed by good returns, even if the average return over the period is the same.

Projections Under Alternate Return Scenarios (continued)

The following graph shows the potential impact of alternate returns on the state contribution rate (excluding the SBMA). The state's contribution rate is quite sensitive to future returns, although the 0.5% cap on increases prevents large year-over-year increases. However, minimizing the year-over-year increases defers these costs and ultimately results in a higher ultimate contribution level than if the full increase needed was immediate.



The following graph shows the potential impact of varying returns on the employer contribution rate. The employer contribution rate is not as sensitive to future returns as the state contribution rate, although returns can still have a significant impact. Note that the blue line reflects the employers' 12.00% cap on their supplemental contribution rate (20.25% total).



Note that member rates are not affected by future returns; however, the 2% at 62 member contributions may be affected by changes in the investment return assumption or other assumption changes.

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.

Summary of Key Valuation Results

	2016 Valuation (7.25%)	2015 Valuation (7.50%)	Percent Change
1. Total Membership			
A. Active Members	438,537	429,460	2.1 %
B. Inactive Members	187,722	184,396	1.8 %
C. Retired Members and Beneficiaries	288,195	282,100	2.2 %
D. Total Membership	914,454	895,956	2.1 %
2. Payroll as of Valuation Date (All Members)			
A. Annual Total *($Millions)*	$ 29,826	$ 28,013	6.5 %
B. Annual Average Earned Salary per Active Member	$ 68,013	$ 65,229	4.3 %
3. Average Annual Allowance Payable			
A. Service Retirement	$ 46,608	$ 45,432	2.6 %
4. Actuarial Obligation *($Millions)*			
A. Active Members	$ 116,273	$ 105,535	10.2 %
B. Inactive Members	5,323	4,767	11.7 %
C. Retired Members and Beneficiaries	144,793	131,115	10.4 %
D. Existing MPPP Unfunded Obligation	315	336	(6.3) %
E. Total	$ 266,704	$ 241,753	10.3 %
5. Value of System Assets *($Millions)*			
A. Fair Market Value	$ 177,914	$ 180,633	(1.5) %
B. Deferred Investment (Gains) or Losses	4,858	(3,574)	
C. Actuarial Value	$ 182,772	$ 177,059	3.2 %
D. Ratio of Actuarial Value to Fair Value	103%	98%	
E. Less SBMA Reserve	(12,796)	(11,506)	11.2 %
F. Net Actuarial Value	$ 169,976	$ 165,553	2.7 %
6. Funded Status -- Actuarial Value Basis			
A. Unfunded Actuarial Obligation *($Millions)*	$ 96,728	$ 76,200	26.9 %
B. Funded Ratio *(5F ÷ 4E)*	63.7%	68.5%	
7. Normal Cost Rates *(percent of salaries)*			
A. CalSTRS 2% at 60 Members	19.297%	18.224%	5.9 %
B. CalSTRS 2% at 62 Members	16.723%	15.614%	7.1 %
C. All Members	19.100%	18.110%	5.5 %
8. Next Fiscal Year Contribution Rates (percent of salaries)			
A. 2% at 60 Members	10.250%	10.250%	- %
B. 2% at 62 Members	9.205%	9.205%	- %
C. State Supplemental Rate	4.811%	4.311%	11.6 %
D. Employer Supplemental Rate	6.180%	4.330%	42.7 %
9. Funded Status -- Market Value Basis			
A. Unfunded Actuarial Obligation *($Millions) [4E - (5A + 5E)]*	$ 101,586	$ 72,626	39.9 %
B. Alternate Funded Ratio (Based on Market Value of Assets)	61.9%	70.0%	

Section 2 Scope of the Report

This report presents the actuarial valuation of the DB Program of the State Teachers' Retirement Plan as of June 30, 2016. 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, 2016. 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).

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 state supplemental contribution rate 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. An adjustment to the state supplemental rate is calculated based on this valuation and effective with the fiscal year beginning July 1, 2017.

Section 7 discusses the calculations used to determine the employer supplemental contribution rate 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 calculated until the 2020 valuation.

Section 8 tests the funding sufficiency of the current projected revenue stream for the DB Program.

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, 2016.

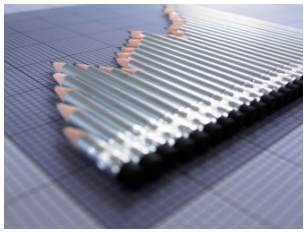
Appendix B — A summary of the actuarial methods and assumptions used to estimate actuarial obligations and the funding sufficiency.

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.

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.

The actuarial obligation, or liabilities, are compared with the actuarial value of assets. If there is a deficiency, it 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 payroll (payroll is calculated as the sum of the expected creditable compensation for the active members), so it is best expressed as a rate. Normal Cost contributions are assumed to be contributed uniformly throughout the year.

The following table shows that the total DB Program Normal Cost Rate has increased from 18.110% to 19.100% since the last valuation. This rate represents a blended average of the Normal Cost Rates for the 2% at 60 and 2% at 62 members. **Table 1** provides more details on the calculation of the Normal Cost and Normal Cost Rate.

7.50%

7.25%

($ Millions)	Projected Payroll	Normal Cost	Normal Cost Rate
FYB July 1, 2015	$29,418	$5,328	18.110%
FYB July 1, 2016	$31,303	$5,979	19.100%

NOTE: The July 1, 2016 results shown above are based on a 7.25% investment return assumption. At a 7.00% assumption, the annual Normal Cost would be $6,739 million and the Normal Cost Rate would be 20.378%.

In general, the Normal Cost Rate is expected to remain fairly stable as a percentage of payroll 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. CalSTRS can expect modest decreases in the Normal Cost Rate over time due to the change in benefit levels for most members hired in 2013 or later. However, next year the Normal Cost Rate is expected to increase due to the reflection of the lower investment return assumption (7.00%).

The adoption of the new actuarial assumptions at the February 2017 board meeting caused an increase in the Normal Cost Rate between the 2015 and 2016 actuarial valuations.

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, 2017, for this valuation. Generally, the base member contribution rate is one-half of the Normal Cost Rate within certain parameters.

EC §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, 2016, the Normal Cost Rate for the CalSTRS 2% at 62 members is 16.723%. We recommend the board adopt this rate.

EC §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 creditable compensation since the last adjustment. This year the cumulative change is an increase in the Normal Cost Rate of 0.823%, from 15.900% (the time of the last adjustment) to 16.723% for this group. Therefore, the current base member contribution rate remains at 8.00% for 2% at 62 members based on the relevant section of the Education Code. It should be noted that there is a high probability that we will calculate an increase (likely 1.00% of creditable compensation) in the 2% at 62 member contribution rate with the 2017 valuation when the 7.00% investment return assumption is first effective.

Note that increases under EC §22901.7(b) are added to the base member rate. Therefore, effective July 1, 2017, the total member contribution rate should remain at 9.205% (8.00% plus the 1.205% additional contribution rate) 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)	2016 Valuation (7.25%)	2015 Valuation (7.50%)
Benefits Being Paid	$ 144,793	$ 131,115
Inactive Deferred Benefits	5,323	4,767
Active Member Benefits	182,901	165,101
Existing MPPP Unfunded Obligation	315	336
Present Value of Projected Benefits	$ 333,332	$ 301,319
Present Value of Future Normal Costs	66,628	59,566
Actuarial Obligation	$ 266,704	$ 241,753

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.

Table 1
Normal Cost

($Millions)	2016 (7.25%)	2015 (7.50%)
Estimated Annual Earned Salaries [1]	$30,189	$28,354
Present Value of Future Normal Costs for Current Active Members	$66,628	$59,566
Present Value of Future Earned Salaries for Current Active Members	$352,348	$330,671
Normal Cost		
Retirement	$5,326	$4,728
Disability	241	203
Death	46	50
Refund	153	154
Total Normal Cost	$5,766	$5,135
Normal Cost Rate Percent of Payroll		
Retirement	17.643 %	16.675 %
Disability	0.798	0.716
Death	0.152	0.176
Refund	0.507	0.543
Total Normal Cost	**19.100** %	**18.110** %

1. Annual rate of payroll 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. Creditable compensation for new entrants who have only worked a partial year have been annualized.

Table 2
Actuarial Obligation

($ Millions)	2016 (7.25%)	2015 (7.50%)
Present Value of Projected Benefits to All Current Members		
Benefits Currently Being Paid		
Service Retirement	$ 134,249	$ 121,599
Disability	3,617	3,264
Survivors	6,927	6,252
Total	$ 144,793	$ 131,115
Benefits to Inactive Members	5,323	4,767
Benefits to Active Members		
Retirement	$ 176,300	$ 159,269
Disability	4,801	4,090
Death	1,036	1,166
Refund	764	576
Total	$ 182,901	$ 165,101
Existing MPPP Unfunded Obligation	315	336
Total Present Value of Projected Benefits	$ 333,332	$ 301,319
Present Value of Future Normal Costs	66,628	59,566
Actuarial Obligation	**$ 266,704**	**$ 241,753**

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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, 2016. 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 $177,914 million as of June 30, 2016, down from $180,633 million as of June 30, 2015. **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)	2016 Valuation	2015 Valuation
Fair Market Value	$ 177,914	$ 180,633
Actuarial Value of Assets	182,772	177,059
Deferred Investment Gains or (Losses)	$ (4,858)	$ 3,574
Ratio of AVA to FMV	103%	98%

Due to the asset smoothing method, there are investment losses of $4,858 million that have not yet been recognized (the difference between the Actuarial and Fair Market Value of Assets). Absent investment returns in future years greater than the assumed rate to offset the deferred investment losses, the current deferred losses will gradually be reflected in the Actuarial Value of Assets.

If the future returns on the Fair Market Value of Assets are 7.25% (or 7.00%) each year, then as the current deferred losses flow through the smoothing method and are recognized, future valuations will show an actuarial loss. Absent contribution rate increases, the result will be a gradual decrease in the DB Program's funded status, ultimately increasing the UAO by the $4,858 million of currently deferred investment losses. However, this recognition of asset losses should trigger increases in contribution rates to help pay off the additional UAO.

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

Table 3
Statement of Program Assets

($ Millions)	June 30, 2016	June 30, 2015
Invested Assets		
Cash	$ 384	$ 563
Debt Securities	37,487	34,119
Equity Securities	93,805	98,340
Alternative Investments	47,177	50,128
Derivative Instruments	1	8
Total Investments	$ 178,854	$ 183,158
Receivables	4,101	4,072
Liabilities Net of Securities Lending Collateral	(5,049)	(6,587)
Net Deferred (Inflows) and Outflows	8	(10)
Fair Market Value of Net Assets	**$ 177,914**	**$ 180,633**

Table 4
Statement of Changes in Program Assets

($ Millions)	June 30, 2016	June 30, 2015
Contributions		
Members	$ 2,824	$ 2,394
Employers	3,248	2,554
State of California	1,940	1,426
Total Contributions	8,012	6,374
Benefits and Expenses		
Retirement, Death and Survivors	(12,546)	(11,972)
Refunds of Member Contributions	(62)	(66)
Purchasing Power Benefits	(172)	(193)
Administrative & Other Expenses	(183)	(146)
Total Benefits and Expenses	(12,963)	(12,377)
Net Cash Flow	**$ (4,951)**	**$ (6,003)**
Investment Income		
Realized Income	$ 4,649	$ 4,675
Net Appreciation	(2,253)	2,646
Net Securities Lending Income	89	94
Investment Expenses	(294)	(287)
Other (Expense) Income	41	4
Net Investment Return	2,232	7,132
Net Increase (Decrease)	**$ (2,719)**	**$ 1,129**
Fair Market Value of Net Assets		
Beginning of Year	180,633	179,749
Acounting Adjustments (GASB 68)	-	(153)
Prior Year Fair Value Accrual Adjustment	-	(92)
End of Year	**$ 177,914**	**$ 180,633**
Estimated Net Rate of Return [1]	1.3%	3.9%

1. Estimated return on a Fair Market Value basis, net of all investment expenses, gross of administrative expenses, and assuming uniform cash flow throughout the year. This number may differ from the money-weighted return reported by CalSTRS.

Table 5
Actuarial Value of Assets

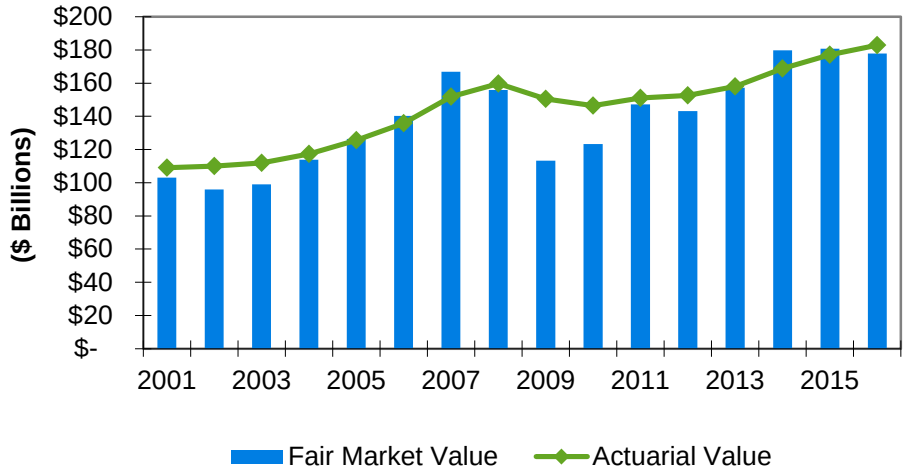
($ Millions)	June 30, 2016	June 30, 2015
Actuarial Value at Beginning of Year	$ 177,059	$ 168,838
Contributions	8,012	6,374
Benefits and Expenses	(12,963)	(12,377)
Expected Return at 7.50%	13,093	12,437
Expected Actuarial Value End of of Year	$ 185,201	$ 175,272
Fair Market Value	177,914	180,633
Difference between Fair Market Value and Expected Actuarial Value	$ (7,287)	$ 5,361
Recognition Factor	One-third	One-third
Recognized Gain or Loss	$ (2,429)	$ 1,787
Actuarial Value at End of of Year	**$ 182,772**	**$ 177,059**
Deferred Investment Gains or (Losses)	$ (4,858)	$ 3,574
Ratio of Actuarial Value of Assets to Fair Market Value of Assets	102.731%	98.022%
Estimated Net Rate of Return [(1)]	6.1%	8.6%

1. Estimated return on an Actuarial Value basis, net of all investment expenses, gross of administrative 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
2015	180,633	3.9	177,059	98
2016	177,914	1.3	182,772	103

1. Estimated return on a Fair Market Value basis, net of all investment expenses, gross of administrative expenses, and assuming uniform cash flow throughout the year, reported on a dollar-weighted basis.



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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 emerged as assumed. The Funded Ratio is shown below and in **Table 7**.

($ Millions)	2016 Valuation (7.25%)	2015 Valuation (7.50%)
Actuarial Obligation	$ 266,704	$ 241,753
Actuarial Value of Assets (AVA)		
From Table 5	$ 182,772	$ 177,059
Less SBMA Reserve	(12,796)	(11,506)
Net for Funding	169,976	165,553
Unfunded Actuarial Obligation	$ 96,728	$ 76,200
Funded Ratio (on AVA)	**63.7%**	**68.5%**
Alternate Funded Ratio (based on Fair Market Value)	*61.9%*	*70.0%*

The Funded Ratio decreased by 4.8% during the past year and has decreased by 23% over the past 10 years. The Alternate Funded Ratio using the Fair Market Value of assets has also decreased since the last valuation. Increases in the Actuarial Obligation due to the assumption changes recently adopted was the primary cause of the decrease in the funded ratio from last year on both measures. The longer-term decrease has been primarily due to returns over the last 10 years that been less than the actuarial assumption.

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.

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, 2016, only a relatively small amount of less than $0.1 million resides in the THBF, while the remaining unfunded amount of $315 million is added to the DB Program obligation.

Funded Status (continued)

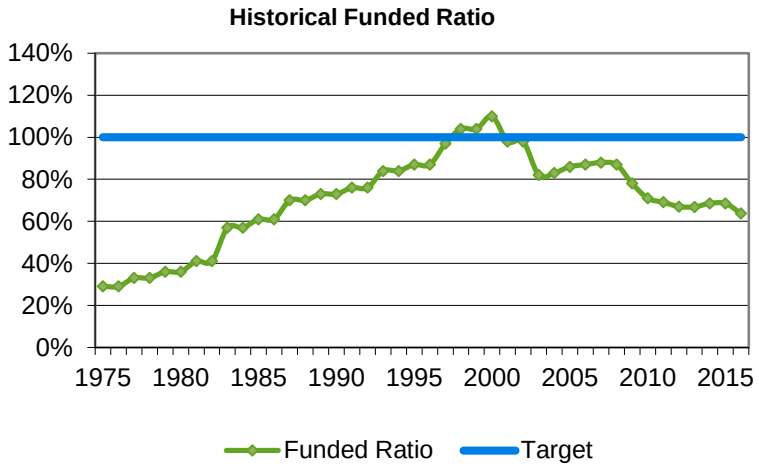
The following table shows a history of the Funded Status of the DB Program.

($ 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%
2015	**241,753**	**165,553**	**76,200**	**69%**
2016	266,704	169,976	96,728	64%

7.25%

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**.

7.25%

($ Millions)	Expected Results	Actual Results	(Gain) or Loss
Actuarial Obligation	$ 252,477	$ 266,704	$ 14,227
Act. Value of Assets	172,251	169,976	2,275
Unfunded Act. Oblig.	$ 80,226	$ 96,728	$ 16,502
Actuarial (Gains) or Losses by Source			
Change in actuarial assumptions			$ 13,227
Salaries increased greater than assumed			1,020
All other non-investment sources			(20)
Loss on the Actuarial Obligation			$ 14,227
Investment Return on Actuarial Value of Assets			2,590
Contributions (in excess of) or less than assumed			(315)
Loss on the Actuarial Value of Assets			$ 2,275
Total Actuarial Loss			$ 16,502

Actuarial Gains and Losses (continued)

7.25%

($ Millions)

Actuarial (Gains) or Losses on the Actuarial Obligation	(Gain) or Loss	Percent of Actuarial Obligation
Change in actuarial assumptions	$13,227	5.0%
Salaries increased greater than assumed	1,020	0.4
All other non-investment sources	(20)	0.0
(Gain) or Loss on the Actuarial Obligation	$14,227	5.3%

7.25%

Actuarial (Gains) or Losses on the Actuarial Value of Assets	(Gain) or Loss	Percent of AVA
Return on Actuarial Value of Assets	$ 2,590	1.5%
Contributions (greater)/less than assumed	(315)	(0.2)
(Gain) or Loss on the Actuarial Value of Assets	$ 2,275	1.3%

These net gains and losses are within a reasonable range for variances in a single year given the newly adopted actuarial assumptions.

Based on the 2015 Actuarial Valuation, the UAO was expected to increase to $80,226 million. The actual UAO of $96,728 million represents a net actuarial loss of $16,502 million.

- The change in the actuarial valuation assumptions based on the most recent Experience Analysis caused the Actuarial Obligation to increase by $13,227 million.
- Salaries increased more than predicted by the current actuarial assumptions, causing the Actuarial Obligation to increase by $1,020 million from the expected amount. 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 loss based on the actuarial value of assets as well as an asset loss based on the Market Value of Assets, as the investment return on the Fair Market Value of Assets was less than the prior valuation's 7.50% assumption. The return on market value was estimated at 1.3%, while the return on the Actuarial Value of Assets was greater (estimated at 6.1%) due to the smoothing of the current year loss and the recognition of a portion of prior deferred investment gains.

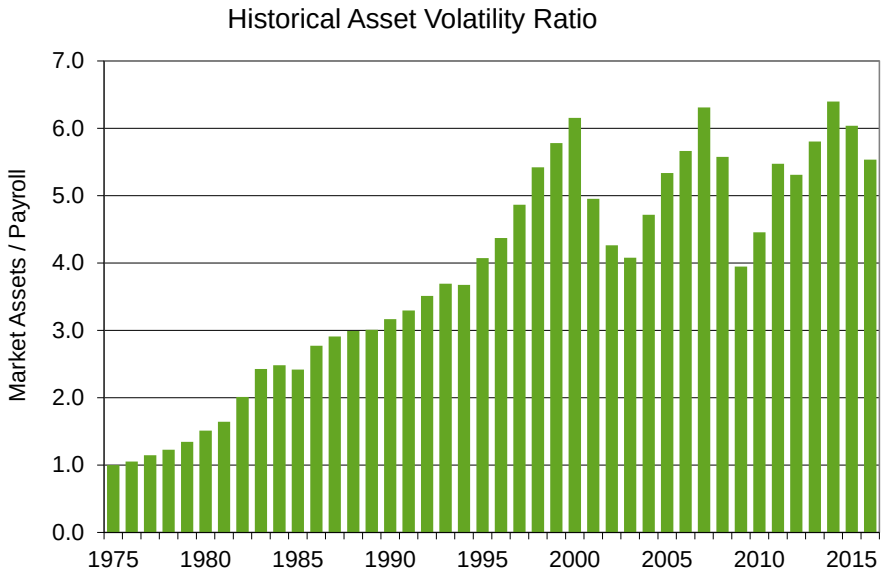
Volatility Ratios

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 fluctuations in the state and employer contribution rates 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 5.5, 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 5.5% of one-year's payroll. Since CalSTRS is currently targeting a funding period of 29 years (the years from the next valuation date to June 30, 2046), the increase (or decrease) in the state and employer contribution rates will be spread out over 29 years, resulting in approximately a 0.31% of payroll increase (decrease) in the total contribution rate needed for each 1% asset loss (gain). An asset loss (or gain) will primarily cause a contribution rate increase (or decrease) for the state and have a much smaller impact on the employer contribution rate.

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 8.9%. 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.

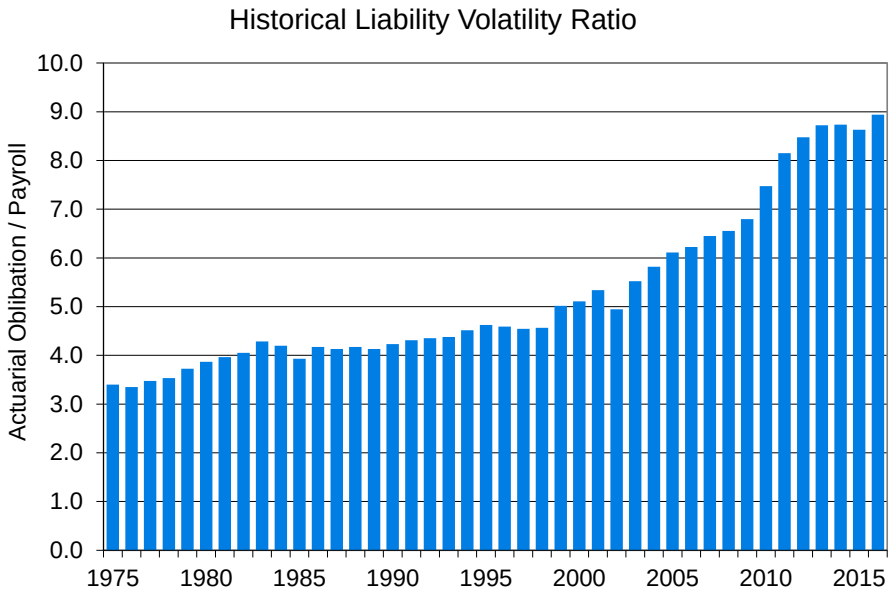


Table 7
Funded Status

($ Millions)	2016 (7.25%)	2015 (7.50%)
Actuarial Obligation *(Table 2)*	$266,704	$241,753
Actuarial Value of Assets		
Calculated *(Table 5)*	$ 182,772	$ 177,059
Less SBMA Reserve	(12,796)	(11,506)
Program Assets	$ 169,976	$ 165,553
Unfunded Actuarial Obligation	**$ 96,728**	**$ 76,200**
Funded Ratio	**63.7%**	**68.5%**

Table 8
Actuarial Gains and Losses

($ Millions)	Expected	Actual	(Gain) / Loss
Actuarial Obligation			
Actuarial Obligation June 30, 2015	$241,753		
Normal Cost for 2015-2016	5,463		
Benefits Paid (Excludes Purchasing Power)	(12,608)		
Expected Interest at 7.50%	17,869		
Actuarial Obligation June 30, 2016	**$252,477**	**$266,704**	**$ 14,227**
By Source:			
Change in actuarial assumptions			*13,227*
Retiree Mortality			*(53)*
Active Member Mortality			*(14)*
Service Retirements			*(164)*
Disability Retirement			*60*
Other Terminations of Employment			*90*
Salary increases more / (less) than assumed			*1,020*
All Other Non-investment Sources			*61*
Total (Gain) Loss on the Actuarial Obligation			*$ 14,227*
Actuarial Value of Assets			
Actuarial Value of Assets June 30, 2015	$165,553		
Expected Contributions for 2015-2016	7,096		
Benefits Paid (Excludes Purchasing Power)	(12,608)		
Expected Interest at 7.50% on AVA	12,210		
Actuarial Value of Assets June 30, 2016	**$172,251**	**$169,976**	**$ 2,275**
By Source: *Investment Return on Actuarial Value of Assets (including the recognition of prior deferred investment gains and losses)*			*$ 2,590*
Contributions (in excess of) or less than assumed (including service purchases)			*(315)*
Total (Gain) Loss on the Actuarial Value of Assets			*$ 2,275*
Unfunded Actuarial Obligation	**$ 80,226**	**$ 96,728**	**$ 16,502**

Section 6 State Supplemental Contribution Rate

Under EC §22955.1(b), scheduled increases in the state contribution rate were 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. Additional increases are needed effective July 1, 2017, as described below. Note that for the state, the payroll is the second prior fiscal year payroll, so contributions made in fiscal year 2017-2018 will be based on the covered member compensation for fiscal year 2015-2016. The state supplemental rate is in addition to the base state contribution under EC §22955.1(a) of 2.017% of payroll and contributions to fund the SBMA under EC §22954.

Effective July 1, 2017, the board shall increase or decrease the state supplemental contribution rate (within certain parameters) 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.
- The state supplemental contribution rate shall not be reduced below 4.311% if a UAO for the 1990 Benefit Structure exists.

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.

1990 Unfunded Actuarial Obligation (continued)

The Actuarial Obligation related to the 1990 Benefit Structure is $218.6 billion. This compares to the Actuarial Obligation for the DB Program of $266.7 billion.

($ Millions)	2016 Valuation (7.25%)	2015 Valuation (7.50%)
Actuarial Obligation -- 1990 Benefit Structure		
Value of Projected Benefits	$ 276,120	$ 247,920
Value of Future Normal Costs	58,082	51,114
Actuarial Obligation	$ 218,038	$ 196,806

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)	2016 Valuation (7.25%)	2015 Valuation (7.50%)
Asset Adjustment -- 1990 Benefit Structure		
Actuarial Value for DB Program	$ 169,976	$ 165,553
Adjustments per Table 9	18,730	17,314
Actuarial Value of Assets	$ 188,706	$ 182,867

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.

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 $29.9 billion.

($ Millions)	2016 Valuation (7.25%)	2015 Valuation (7.50%)
Funded Status -- 1990 Benefit Structure		
Actuarial Obligation	$ 218,038	$ 196,806
Actuarial Value of Assets	188,706	182,867
Unfunded Actuarial Obligation	$ 29,332	$ 13,939
Funded Ratio	86.5%	92.9%

State Supplemental Contributions

The statute calls for an adjustment to the state supplemental contribution to amortize the 1990 UAO effective with the 2016 actuarial valuation. An increase in the state supplemental contribution rate is needed effective July 1, 2017.

As shown in **Table 10**, a supplemental contribution rate of 5.970% of payroll is needed to amortize the 1990 UAO by June 30, 2046 based on the board's current valuation policy. This is based on an unconstrained increase of about 1.7% of payroll from the current supplemental rate of 4.311%. However, increases in the state contribution rate are limited to 0.5%. Therefore, the state supplemental contribution rate for the fiscal year beginning July 1, 2017 should be 4.811% under EC §22955.1(b). Note that the 5.970% 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. Additionally, this calculation is based on the 7.25% investment return assumption; whereas, the projections reflect the scheduled reduction to 7.00% for future valuations.

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 also 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.

Actuarial Gains and Losses

Similar to the total DB Program, we perform a comparison for the 1990 Benefit Structure 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 for the 1990 Benefit Structure are summarized in the following table. A technical refinement in the calculation of the 1990 Normal Cost Rate to better align it with the projected payroll used in the calculation of the 1990 Actuarial Obligation caused a gain from "All other non-investment sources." Note that projected payroll used in the 1990 Actuarial Obligation is fractionally different than in the calculation of the total Actuarial Obligation because the retirement assumption used in the calculations differ.

7.25%

($ Millions)	Expected Results	Actual Results	(Gain) or Loss
Actuarial Obligation	$ 205,307	$ 218,038	$ 12,731
Act. Value of Assets	191,288	188,706	2,582
Unfunded Act. Oblig.	$ 14,019	$ 29,332	$ 15,313
Actuarial (Gains) or Losses by Source			
Change in actuarial assumptions			$ 12,179
Salaries increased greater than assumed			807
All other non-investment sources			(255)
Loss on the Actuarial Obligation			$ 12,731
Investment Return on Actuarial Value of Assets			2,874
Contributions (in excess of) or less than assumed			(292)
Loss on the Actuarial Value of Assets			$ 2,582
Total Actuarial Loss			$ 15,314

Table 9
Asset Adjustment for 1990 Benefit Structure

($ Millions)	2016	2015
Assets Adjustment due for 1990 Structure Changes		
Allocated Market Value at Beginning of Year	$17,663	$15,897
Contributions During the Year		
EC §22901.7 at 0.120% (or 0.56%) / 0.150% of Earned Salaries	(348)	(44)
EC §22950.5 at 2.480% / 0.630% of Earned Salaries	(748)	(180)
EC §22951 at 0.250% of Earned Salaries	(75)	(72)
EC §22955 at 2.017% of second preceding fiscal year Earned Salaries	(548)	(528)
THBF costs reallocated to DB Program	30	31
Total Adjustment to Contributions[(1)]	(1,689)	(793)
Benefits Paid During the Year		
Post-1990 Benefits Paid During the Year	2,046	1,932
Post-1990 Refunds of supplemental member contributions	1	-
Prior 2% DBS redirection contributions refunded	(11)	(12)
Total Adjustment to Benefits Paid [(1)]	2,036	1,920
Estimated Investment Earnings for the Year [(2)]	222	639
Total Allocated Market Value at End of Year	**$18,232**	**$17,663**
Ratio of Actuarial Value to Market Value [(3)]	102.731%	98.022%
Asset Adjustment (Actuarial Value of Assets)	**$18,730**	**$17,314**

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 3.90% for 2014-2015 and 1.25% for 2015-2016.

3. Developed from Table 5.

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

($ Millions)	2016 (7.25%)	2015 (7.50%)
Actuarial Obligation		
Present Value of Projected Benefits		
Benefits Currently Being Paid	$ 120,901	$ 108,609
Benefits to Inactive Members	5,152	4,664
Benefits to Active Members	150,067	134,647
Total	$ 276,120	$ 247,920
Present Value of Future Normal Costs	(58,082)	(51,114)
Actuarial Obligation	$ 218,038	$ 196,806
Actuarial Value of Assets		
Actuarial Value of Assets *(Table 7)*	$ 169,976	$ 165,553
Plus, 1990 Asset Adjustment (Table 9)	18,730	17,314
Theoretical AVA for 1990 Benefits	$188,706	$182,867
Funded Status		
Actuarial Obligation	$ 218,038	$ 196,806
Actuarial Value of Assets	188,706	182,867
Unfunded Actuarial Obligation (Surplus)	$29,332	$13,939
Funded Ratio	86.5%	92.9%
Amortization Sufficiency Under Current Contribution Schedule		
Revenue for 1990 Benefits	16.000%	16.000%
Normal Cost Rate for 1990 Benefits	(16.303)	(15.289)
Normal Cost Surplus / (Deficit) Express as Percent of Employer Payroll	-0.303%	0.711%
Normal Cost Surplus / (Deficit) Express as Percent of State Payroll	-0.325%	0.762%
Level Equivalent Additional Revenue Under EC 22955.1(b)	4.311	4.241
Revenue Available for Amortization	3.986%	5.003%
Revenue Needed for Amortization	5.645	2.742
Revenue Surplus / (Deficit)	(1.659%)	2.261%
Amortization Status under current contribution rate schedule and no changes in ultimate rate	Contribution Intreases Needed	Projected to Fund 1990 UAO by 2046
Contribution Rate for Amortization of 1990 UAO without Statutory Limits		
Current EC 22955.1(b) Contribution Rate	4.311%	4.311%
Increase / (Decrease) in State Contribution Rate for Next Fiscal Year	1.659	(2.261)
Unconstrained Contribution Rate for FYB 2017	5.970%	2.050%
Contribution Rate for Amortization of 1990 UAO		
Current EC 22955.1(b) Contribution Rate	4.311%	4.311%
Increase / (Decrease) in State Contribution Rate for Next Fiscal Year (Increase capped at 0.5%)	0.500	0.000
EC 22955.1(b) Contribution Rate for FYB 2017	**4.811%**	**4.311%** [1]

1. State supplemental contribution rate does not go below 4.311% until 1990 UAO is fully paid off.

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 (within certain parameters) 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.

To determine the pre-2014 assets to be used in the 2016 valuation, a theoretical pre-2014 asset value is 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.

Pre-2014 Unfunded Actuarial Obligation (continued)

An additional adjustment was made to the pre-2014 assets this year. As discussed in the "Actuarial Gains and Losses" subsection of this Section, a technical refinement was made in the application of the payroll in the calculation of the 1990 Normal Cost Rate, which affected both the 1990 Normal Cost Rate and the 1990 Actuarial Obligation for post-2014 service. In the 2014 valuation, the Pre-2014 assets were allocated based on Actuarial Obligation for Pre-2014 service. Since the revision affects the split between the Pre-2014 and Post-2014 assets, a corresponding revision needs to be made to the allocation of assets between Pre- and Post-2014 Service to true up the original allocation. This adjustment shifts $527 million from assets for Pre-2014 service to Post-2014 service.

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.

To determine the pre-2014 assets allocated to the 1990 Structure that are to be used in the 2016 valuation, a theoretical pre-2014 asset value for the 1990 Structure is maintained based on the prior year value adjusted as follows:

- Add contributions equal to 16.00% of prior year payroll,
- Add state supplemental contributions under EC §22955.1(b),
- 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.

7.25%

($ Millions)	Pre-2014 Service		
	Total	1990 Benefits	New Benefits
Funded Status -- Pre-2014 Service			
Actuarial Obligation	$ 241,246	$ 199,422	$ 41,824
Actuarial Value of Assets	146,629	171,731	(25,102)
Unfunded Actuarial Obligation	$ 94,617	$ 27,691	**$ 66,926**

Employer Supplemental Contributions

The statute calls for an adjustment to the employer supplemental contribution rate to amortize the pre-2014 UAO effective with the 2020 actuarial valuation. Therefore, no adjustment to the scheduled employer supplemental contribution is required effective July 1, 2017.

For illustrative purposes, we have shown the adjustment to the employer supplemental contribution rate that would have been calculated if this were the 2020 valuation. As shown in **Table 13**, an increase in the employer supplemental contribution rate of about 0.01% of payroll, above the ultimate rate of 10.85%, 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. Additionally, this calculation is based on the 7.25% investment return assumption; whereas, the projection reflect the scheduled reduction to 7.00% for future valuations.

As noted in Section 1, if the deferred asset loss as of June 30, 2016 and the 7.00% investment return assumption were reflected in the projected employer contribution rates, a small decrease in the employer rate is projected (from the ultimate employer rate of 19.10%). This result may seem counter-intuitive since reflecting deferred assets losses would increase the overall contribution rate the System needs. However, since the state's supplemental contribution rate is based on theoretical assets that are greater than the current CalSTRS assets, the impact on the state can be greater than the impact on the System as a whole. The employer supplemental contribution rate is effectively the balancing item in the equation, and can therefore be a decrease when there is an increase in the state supplemental contribution rate.

Table 11
Total Assets Allocated for Pre-2014 Service[1]

($ Millions)	2016	2015
Asset Value for Pre-2014 Service (excludes SBMA)		
Allocated Market Value at Beginning of Year	$152,849	$158,825
Contributions During the Year		
Total Contributions (excluding SBMA)	7,400	5,785
Less Normal Costs for Year with Expenses	(5,463)	(5,215)
Total Adjusted Contributions	$ 1,937	$ 570
Benefits and Expenses Paid for Pre-2014 Service	(12,742)	(12,172)
Re-Allocation to Assets for Post-2014 Service[2]	(527)	0
Estimated Investment Earnings for the Year [3]	687	5,626
Total Allocated Market Value at End of Year	**$142,731**	**$152,849**
Ratio of Actuarial Value to Market Value [4]	102.731%	98.022%
Actuarial Value of Assets for Pre-2014 Service	**$146,629**	**$149,826**

1. May not add exactly, due to rounding.

2. In the 2016 valuation, a revision was made that reduced the 1990 Actuarial Obligation for Post-2014 service. A corresponding revision needs to be made to the allocation of assets between Pre- and Post-2014 Service which would have been reflected in the original allocation of Pre-2014 assets made with the 2014 valuation, if the correction had been reflected at the time.

3. Based on Fair Market Value excluding SBMA and uniform cash flow for contributions, benefits, and expenses. The rates of return used in these calculations were 3.68% for 2014-2015 and 0.82% for 2015-2016.

4. Developed from Table 5.

Table 12
1990 Assets Allocated for Pre-2014 Service[1]

($ Millions)	2016	2015
1990 Asset Value for Pre-2014 Service (excludes SBMA)		
Allocated Market Value at Beginning of Year	$175,392	$178,657
Contributions During the Year for 1990 Structure		
Total Contributions (excluding SBMA)	5,711	4,992
Less 1990 Normal Costs for Year with Expenses	(4,612)	(4,396)
Total Adjusted Contributions	$ 1,099	$ 596
Benefits and Expenses Paid for Pre-2014 Service	(10,729)	(10,252)
Estimated Investment Earnings for the Year [2]	1,404	6,391
Total 1990 Allocated Market Value at End of Year	**$167,166**	**$175,392**
Ratio of Actuarial Value to Market Value [3]	102.731%	98.022%
1990 Actuarial Value of Assets for Pre-2014 Service	**$171,731**	**$171,923**

1. May not add exactly, due to rounding.

2. Based on Fair Market Value excluding SBMA and uniform cash flow for contributions, benefits, and expenses. The rates of return used in these calculations were 3.68% for 2014-2015 and 0.82% for 2015-2016.

3. Developed from Table 5.

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

($ Millions)	2016 (7.25%)	2015 (7.50%)
Funded Status		
Total Unfunded Actuarial Obligation (Pre-2014 Service)		
Total Actuarial Obligation for Pre-2014 Service	$241,246	$224,371
Total AVA for Pre-2014 Service	146,629	149,826
Total UAO (pre-2014 Service)	$94,617	$74,545
1990 Unfunded Actuarial Obligation (Pre-2014 Service)		
1990 Actuarial Obligation for Pre-2014 Service	$199,422	$184,517
1990 AVA for Pre-2014 Service	171,731	171,923
1990 UAO (pre-2014 Service)	$27,691	$12,594
Post-1990 UAO (Pre-2014 Service)	$66,926	$61,951
Amortization Sufficiency Under Current Contribution Schedule		
Revenue from Member Contributions[(1)]	9.774%	9.743%
Revenue from Employer Contributions (22950 & 22951)[(1)]	8.250	8.250
Revenue from State Contributions EC 22955(a)[(1)]	1.882	1.860
Equivalent Normal Cost Rate for Total Benefits	(18.124)	(17.091)
Normal Cost Rate (Surplus)/Deficit for 1990 Benefits	0.303	(0.711)
Additional Revenue Under EC 22950.5[(1)]	10.074	9.676
Revenue Available for Amortization	12.159%	11.727%
Revenue Needed for Amortization	12.171	11.904
Revenue Surplus / (Deficit)	(0.012%)	(0.177%)
Amortization Status under current contribution rate schedule and no changes in ultimate rate	Contribution Increase Needed	Contribution Increase Needed
Contribution Rate for Amortization of UAO for pre-2014 Service and New Benefits [Illustrative Purposes Only. Not Applicable for 2016 Valuation]		
Current EC 22950.5 Contribution Rate	10.850%	10.850%
Adjustment in Employer Contribution Rate for Next Fiscal Year[(2)]	0.012	0.177
EC 22955.1(b) Contribution Rate for FYB 2021[(2)]	**10.862%**	**11.027%**

1. Equivalent level contribution rate payable through June 30, 2046 as detailed in Tables 14 and 15.
2. 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 and the scheduled reduction in the investment return assumption. See "Looking Ahead" subsection of Section 1.

Section 8 Funding Sufficiency

The contributions to fund the DB Program include those listed below and described in **Table 14,** including reference to the relevant section of the California Education Code. Since each contribution is not paid uniformly over time as a percentage of payroll, 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.

The revenue calculation assumes no changes in the contribution rates specified in the Education Code once contribution rates grade to the ultimate rates. For example, the equivalent for the state supplemental contribution rate is based on 4.311% of payroll. Since the payroll used is effectively two years old, the equivalent rate is somewhat less than 4.311%. Note that in practice, the state and employer contribution rates will increase or decrease depending primarily on the relevant funded status. These additional increases (limited to 0.5% per year for the state and 1.0% per year for the employers) are not included in the Equivalent Contribution Rate calculation shown below, as the purpose of this exhibit is to assess the approximate magnitude of the combined increases needed over and above those rates scheduled in the legislation (i.e., assuming no action by the board to change the rates already scheduled in the Education Code).

7.00%

Source of Revenue	FYB2016 Rate	Equivalent Rate
Members[(1)]	10.154 %	10.219 %
Employers – Base Rate	8.000	8.000
Employers – Sick Leave	0.250	0.250
Employers – Supplemental Rate	4.330	10.096
State – Base Rate	2.017	1.881
State – Supplemental Rate	4.311	4.021
Equivalent Level Contribution Rate through 2046 (assuming no changes in scheduled rates)		**34.467 %**

1. *Member rates differ between 2% at 60 and 2% at 62 members. Rate shown is blended average.*

The basic state contribution rate will be 2.017% of the second preceding fiscal year payroll, which is equivalent to a lesser percentage of current payroll. For example, the state contribution for the 2016-2017 year will be equal to 2.017% of the 2014-2015 payroll. Based on two years of known future contributions and projections for the other years, the equivalent rate for the full period is 1.881% of current payroll.

The calculation of the equivalent rates in **Table 15** results in a combined equivalent contribution of 34.467% of payroll over the period ending June 30, 2046.

Funding Sufficiency (continued)

Table 16 shows the amortization of the UAO for the total DB Program on a year-by-year basis, based on 7.00% future returns, additional contribution rate increases, and the future recognition of the currently deferred asset losses. Assuming all other future experience emerges as assumed, the UAO will not be amortized by June 30, 2046. However, the CalSTRS board has rate-setting authority (within certain parameters) to adjust the state and employer contribution rates to pay down the UAO. Assuming the contribution rates are adjusted in the future, the UAO is projected to be fully paid off, except for a small portion of the UAO attributable to New Benefits and Post-2014 service that is not actuarially funded. Note that it is our understanding the legislation did not provide the board the authority to adjust contribution rates to fund this orphan portion of the UAO. In total, the funded ratio is projected to be 99.2% under the assumptions described in the "Looking Ahead" subsection of Section 1, including the reduction to a 7.00% investment return assumption. Table 16 differs from Tables 15 and 17 in that it assumes increases above the ultimate contribution rates specified in the Education Code.

Table 17 shows a comparison of the scheduled revenue and the contributions needed as of June 30, 2016. 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 revenue deficit (3.673% of payroll), we would expect the overall DB Program contribution rate to increase from the ultimate rates and effectively pay down this projected deficit. Note that the calculation below is based on the 7.00% investment return assumption and reflects the deferred asset losses by using market value of assets. The "Looking Ahead" subsection of Section 1 shows the projected impact on contribution rates for each of the stakeholder groups.

(Percent of Earned Salaries)	2016 Valuation (7.00%)	2015 Valuation (7.50%)
Additional Revenue Needed for 100% Funding by 2046		
Equivalent Normal Cost Rate[(1)]	19.316%	17.091%
Amortization Rate Needed[(2)]	18.824%	13.398%
Total Level Rate over the Amortization Period	38.140%	30.489%
Equivalent Contribution Rate[(3)]	34.467%	33.439%
Contribution Deficit / (Buffer)	3.673%	(2.950%)
Additional Revenue Needed	3.673%	None

1. Normal Cost Rate shown is the 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. It differs from the Normal Cost Rate as of the valuation date shown in Table 1.

2. Reflects market value of assets and 7.00% investment return assumption. The 2015 Valuation column has been changed from the prior report to reflect market value of assets.

3. Assumes no change in the contribution rate once the ultimate level is reached in 2016 for the state and 2020 for the employers. (See Section 8 for details of this calculation.)

Table 14
Contributions

		FY2016-2017 Rate	Ultimate Rate	Equivalent Rate[1]
EC §22901 & EC §22901.7	Members[2]	10.25% / 9.205%	10.25% / 10.205%	10.219%
EC §22950 & 22951	Employers	8.25%	8.25%	8.250%
EC §22950.5(a)	Employers – Supplemental[2]	4.33%	10.85%	10.096%
EC §22950(c)	Employers for THBF[3]	0.00%	*as needed*	0.000%
EC §22955.1(a)	State[4]	2.017%	2.017%	1.881%
EC §22955.1(b)	State – Supplemental[2]	4.311%	4.311%	4.021%
	Equivalent Level Contribution Rate through June 30, 2046			**34.467%**

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. Contribution rates for 2% at 62 members are assumed to increase to 10.205% effective July 1, 2018.

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.

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

($ Millions) FYE	Projected Salaries	Member *22901 & 22901.7*	Employer *22950 & 22951*	Employer *22950.5*	State *22955(a)*	State *22955.1(b)*	Total Contrib.
2017	$31,303	$3,178	$2,582	$1,356	$581	$1,243	$8,940
2018	32,398	3,280	2,673	2,002	608	1,300	9,863
2019	33,532	3,435	2,766	2,693	631	1,349	10,874
2020	34,706	3,555	2,863	3,429	653	1,397	11,897
2021	35,920	3,679	2,963	3,897	676	1,446	12,661
2022	37,178	3,807	3,067	4,034	700	1,496	13,104
2023	38,479	3,940	3,175	4,175	725	1,549	13,564
2024	39,826	4,077	3,286	4,321	750	1,603	14,037
2025	41,219	4,219	3,401	4,472	776	1,659	14,527
2026	42,662	4,366	3,520	4,629	803	1,717	15,035
2027	44,155	4,518	3,643	4,791	831	1,777	15,560
2028	45,701	4,676	3,770	4,959	860	1,839	16,104
2029	47,300	4,839	3,902	5,132	891	1,904	16,668
2030	48,956	5,007	4,039	5,312	922	1,970	17,250
2031	50,669	5,182	4,180	5,498	954	2,039	17,853
2032	52,443	5,362	4,327	5,690	987	2,110	18,476
2033	54,278	5,549	4,478	5,889	1,022	2,184	19,122
2034	56,178	5,742	4,635	6,095	1,058	2,261	19,791
2035	58,144	5,942	4,797	6,309	1,095	2,340	20,483
2036	60,179	6,149	4,965	6,529	1,133	2,422	21,198
2037	62,285	6,364	5,139	6,758	1,173	2,507	21,941
2038	64,465	6,585	5,318	6,994	1,214	2,594	22,705
2039	66,722	6,815	5,505	7,239	1,256	2,685	23,500
2040	69,057	7,053	5,697	7,493	1,300	2,779	24,322
2041	71,474	7,299	5,897	7,755	1,346	2,876	25,173
2042	73,976	7,553	6,103	8,026	1,393	2,977	26,052
2043	76,565	7,817	6,317	8,307	1,442	3,081	26,964
2044	79,244	8,090	6,538	8,598	1,492	3,189	27,907
2045	82,018	8,372	6,766	8,899	1,544	3,301	28,882
2046	84,889	8,665	7,003	9,210	1,598	3,416	29,892
PV [1]	$584,017	$59,678	$48,181	$58,962	$10,985	$23,484	$201,291
Level Rate [2]		**10.219%**	**8.250%**	**10.096%**	**1.881%**	**4.021%**	**34.467%**

1. Present Value, as of the valuation date, of projected contributions through June 30, 2046 using a 7.00% investment return assumption.

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. Contribution rates for 2% at 62 members are assumed to increase to 10.205% effective July 1, 2018.

7.00%

Table 16
Amortization of Unfunded Actuarial Obligation[1][3]
(Reflecting Projected Contribution Increases)[2]

($Millions)		Beginning	Amortization Payment			Interest	Ending
		Unfunded	Total	Normal	Available	Charge	Unfunded
Year	FYE	Act. Oblig.	Contrib.	Cost	Amtzn.	at 7.00%	Act. Oblig.
1	2017	$105,075	$8,941	$6,366	$2,575	$7,267	$111,499
2	2018	111,499	10,015	6,563	3,452	7,686	116,970
3	2019	116,970	11,188	6,767	4,421	8,036	121,468
4	2020	121,468	12,383	6,977	5,406	8,317	125,008
5	2021	125,008	13,332	7,193	6,139	8,539	127,857
6	2022	127,857	13,600	7,415	6,185	8,737	130,729
7	2023	130,729	14,205	7,643	6,562	8,925	133,320
8	2024	133,320	14,884	7,877	7,007	9,091	135,568
9	2025	135,568	15,594	8,118	7,476	9,233	137,441
10	2026	137,441	16,335	8,366	7,969	9,347	138,900
11	2027	138,900	17,111	8,620	8,491	9,431	139,900
12	2028	139,900	17,920	8,881	9,039	9,482	140,384
13	2029	140,384	18,766	9,148	9,618	9,496	140,293
14	2030	140,293	19,649	9,422	10,227	9,469	139,556
15	2031	139,556	20,570	9,702	10,868	9,395	138,098
16	2032	138,098	21,428	9,989	11,439	9,273	135,942
17	2033	135,942	22,177	10,284	11,893	9,107	133,164
18	2034	133,164	22,951	10,589	12,362	8,896	129,703
19	2035	129,703	23,753	10,904	12,849	8,637	125,496
20	2036	125,496	24,581	11,230	13,351	8,325	120,473
21	2037	120,473	25,439	11,566	13,873	7,956	114,558
22	2038	114,558	26,326	11,915	14,411	7,523	107,671
23	2039	107,671	27,244	12,276	14,968	7,022	99,725
24	2040	99,725	28,194	12,651	15,543	6,446	90,628
25	2041	90,628	29,177	13,041	16,136	5,789	80,281
26	2042	80,281	30,195	13,448	16,747	5,043	68,579
27	2043	68,579	31,251	13,872	17,379	4,203	55,402
28	2044	55,402	32,339	14,313	18,026	3,258	40,634
29	2045	40,634	33,464	14,773	18,691	2,201	24,144
30	2046	24,144	34,627	15,254	19,373	1,023	5,796

1. Based on the actuarial value of assets with projected recognition of deferred known asset gains and losses.

2. Contribution rates include projected increases and decreases.

3. Based on June 30, 2016 valuation and 7.00% investment return assumption.

Table 17
Funding Sufficiency

($ Millions)	June, 2016 (7.00%)	June, 2015 (7.50%)
Funded Status ***(Table 7)***		
Actuarial Obligation	$ 266,704	$ 241,753
Actuarial Value of Assets	169,976	165,553
Unfunded Actuarial Obligation	$ 96,728	$ 76,200
Funded Ratio	63.7%	68.5%
Level Contributions over 30 Years ***(Table 14)***	34.467%	33.439%
Amortization Period based on Current Revenues		
Total Level Rate over the Amortization Period	34.467%	33.439%
Equivalent Normal Cost Rate[1]	19.316	17.091
Amortization Rate	15.151%	16.348%
Amortization Period (Based on current revenue projections)	*Not projected to Amortize by 2046*	*Projected to Amortize by 2046*
Calculated Contribution Rate for Amortization by 2046		
Equivalent Normal Cost Rate[1]	19.316%	17.091%
Amortization Rate	18.824	13.398
Total Level Rate over the Amortization Period	38.140%	30.489%
Estimated Additional Revenue Needed *(Based on current revenue projections and valuation assumptions)*	3.673%	None

1. 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. It differs from the table on page 1 which shows the Normal Cost Rate as of the valuation date.

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 and augmented by consultation with CalSTRS staff. The provisions used in this valuation are summarized below for reference purposes.

Member Contributions

Base Contribution Rate:

2% at 60 Members: 8.0% of creditable compensation. 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 payroll 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.

Supplemental Contribution Rates:

In addition to the base contribution rates, members make additional contributions for fiscal years beginning July 1, 2016 and later:

2% at 60 Members: 2.250% of creditable compensation

2% at 62 Members: 1.205% 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.

Twelve-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 120% of the Social Security Wage Base. The limit effective July 1, 2016 is $139,320 (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.

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, 1996.

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 half-percent reduction in the normal retirement allowance for each full month or partial month the member is younger than age 60, plus a reduction of a quarter percent for each full month or partial month the member is younger than age 55. 2% at 62 Members: A half-percent reduction in the normal retirement allowance for each full month or partial month the member is younger than age 62

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.

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 annuity option had been elected, payment of the unpaid contributions and interest, if any, remaining in the retiree's account will be made.

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 were reviewed and changed for the June 30, 2016 actuarial valuation as a result of the 2015 Experience Analysis. Please refer to that Experience Analysis report dated December 30, 2016 for the data and rationale used in the recommendation of each assumption.

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 payroll 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 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.

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 smoothing is applied on the total DB Program assets and then the SBMA is deducted to determine the net actuarial value for funding purposes.

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**.

Payroll Growth Assumption

The wage growth assumption is equal to 3.50%, and the active population is assumed to be stable. Thus, the DB Program payroll is assumed to increase at a rate of 3.50% each year.

Table B.1
List of Major Valuation Assumptions

I. Economic Assumptions

A.	Investment Return[1] (net of investment and administrative expenses)	7.25%
B.	Interest on Member Accounts	3.00%
C.	Wage Growth	3.50%
D.	Inflation	2.75%

1. 7.00% used where noted.

II. Demographic Assumptions

A. Mortality[2]

Active	- Male	RP-2014 White Collar Employee Male set back 2 years	Table B.2
	- Female	RP-2014 White Collar Employee Female set back 2 years	Table B.2
Retired & Beneficiary	- Male	2016 CalSTRS Retired Male	Table B.2
	- Female	2016 CalSTRS Retired Female	Table B.2
Disabled	- Male	RP-2014 Disabled Retiree Male set back 2 years	Table B.2
	- Female	RP-2014 Disabled Retiree Female set back 2 years (select rates in first three years for both Males and Females)	Table B.2

2. All proposed tables use 110% of the MP-2016 Ultimate Projection Scale. The combined base tables and projection scale specified contain a margin for expected future mortality improvement. See Table B.9 of this report for a key to the custom mortality tables used for CalSTRS.

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

Table B.2
Mortality as of 6/30/2016

Active Members[1]		
Age	**Male**	**Female**
25	0.035%	0.014%
30	0.030	0.016
35	0.034	0.021
40	0.039	0.028
45	0.054	0.044
50	0.093	0.075
55	0.157	0.118
60	0.259	0.173
65	0.451	0.257

	Retired Members and Beneficiaries[1]		Disabled Members (After Year 3) [1]	
Age	**Male**	**Female**	**Male**	**Female**
50	0.243%	0.124%	1.868%	1.055%
55	0.358	0.213	2.172	1.320
60	0.480	0.283	2.464	1.558
65	0.682	0.427	2.867	1.861
70	1.091	0.704	3.556	2.416
75	1.958	1.294	4.689	3.438
80	3.592	2.482	6.491	5.092
85	6.907	4.950	9.430	7.566
90	13.297	10.051	14.273	11.159
95	22.668	18.791	21.289	16.477

Select rates for disability:		
First year of disability	4.0%	3.0%
Second year of disability	3.5	2.5
Third year of disability	3.0	2.0

1. *Projected improvement based on 110% of the MP-2016 Ultimate Projection Scale. Projection scale does not apply to select minimum rates.*

Table B.3
Service Retirement

			DB Program – 2% at 60 Members				DB Program – 2% at 62 Members	
	Only for the 1990 Benefit Structure		Under 30 Years[1]		30 or More Years		All Years	
Age	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
50	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	0.0%	0.0%
51	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0
52	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0
53	0.0	0.0	0.0	0.0	3.0	3.0	0.0	0.0
54	1.5	1.5	0.0	0.0	3.0	3.0	0.0	0.0
55	5.8	7.0	2.7	3.5	6.0	8.0	3.0	4.0
56	3.9	4.5	1.8	2.5	6.0	8.0	2.0	3.0
57	4.9	4.5	1.8	2.5	8.0	10.0	3.0	3.5
58	6.8	7.0	2.7	3.5	12.0	15.0	4.0	4.0
59	17.5	14.0	4.5	5.0	16.0	18.0	6.0	6.0
60	25.0	22.0	6.3	7.0	25.0	29.0	9.0	9.0
61	16.5	15.0	7.0	9.0	50.0	50.0	15.0	15.0
62	16.5	15.0	11.0	12.5	45.0	45.0	15.0	17.0
63	15.0	15.0	12.0	16.0	35.0	40.0	15.0	18.0
64	17.5	18.0	13.0	14.0	30.0	35.0	15.0	18.0
65	20.0	18.0	14.0	17.0	32.5	37.5	30.0	30.0
66	16.0	18.0	13.0	15.0	30.0	32.0	25.0	25.0
67	16.0	18.0	13.0	15.0	27.0	32.0	25.0	25.0
68	16.0	16.0	12.0	14.0	27.0	30.0	20.0	20.0
69	16.0	16.0	12.0	14.0	25.0	30.0	20.0	20.0
70	100.0	100.0	12.0	14.0	25.0	30.0	20.0	20.0
71			11.0	13.5	25.0	30.0	20.0	20.0
72			11.0	13.5	25.0	30.0	20.0	20.0
73			11.0	13.5	25.0	30.0	20.0	20.0
74			11.0	13.5	25.0	30.0	20.0	20.0
75			100.0	100.0	100.0	100.0	100.0	100.0

1. If credited 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 credited service are multiplied by 225%. For example, a 63-year old female member with 26 years of credited service would have a 36.0% probability of retirement (2.25 times the rate for service less than 25 years of 16.0%). For members with 28 but less than 30 years of credited service, the rates are equal to 125% of the assumed retirement rates shown above for members with less than 25 years of credited service.

The assumptions shown above are for retirement from active status. It is assumed that all vested terminated members retire at age 60 (2% at 60 members) or age 62 (2% at 62 members).

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

Table B.5
Withdrawal

Year[1]	Male	Female
0	16.0%	15.0%
1	11.0	9.0
2	8.5	7.0
3	6.3	5.5
4	4.0	4.0
5	3.5	3.0
10	1.8	1.8
15	1.2	1.2
20	0.9	0.9
25	0.7	0.7
30	0.6	0.6

1. Based on elapsed service since membership date.

Table B.6
Probability of Refund

Entry Ages – Male

Year[1]	Under 25	25 - 29	30 - 34	35 - 39	40 and Up
Under 5	100%	100%	100%	100%	100%
5	60	60	60	56	45
10	46	46	38	36	36
15	38	38	31	21	
20	31	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%
5	60	60	60	52	35
10	34	34	32	32	29
15	27	24	24	24	
20	19	14	14		
25	10	10			
30	10				

1. Assumption applied at time of assumed termination. Based on elapsed service since membership date. Members who terminate with less than five years of credited service are assumed to have a 100% probability of refund.

Table B.7
Merit Salary Increases[1]

	Entry Age - Annual Increase in Salaries Due to Merit					
Year[2]	**Under 25**	**25 - 29**	**30 - 34**	**35 - 39**	**40 - 44**	**45 & up**
0	6.4%	5.8%	5.3%	4.8%	4.5%	3.7%
1	6.4	5.8	5.3	4.8	4.5	3.7
2	6.0	5.5	5.0	4.5	4.3	3.5
3	5.6	5.3	4.8	4.3	4.1	3.3
4	5.4	5.0	4.5	4.1	3.9	3.0
5	5.2	4.8	4.3	3.9	3.8	2.8
10	3.7	3.4	3.0	2.7	2.5	1.8
15	1.8	1.7	1.5	1.2	1.2	0.9
20	1.3	1.2	1.2	0.8	0.8	0.6
25	1.1	1.0	0.9	0.6	0.6	
30	0.9	0.8	0.7	0.5		
35	0.8	0.7	0.6			
40	0.8	0.7				
45	0.8					

1. The total expected increase in salary includes both merit (shown above) and the general wage increase assumption of 3.50% per annum. The total result is compounded rather than additive. For example, the total assumed increase for service less than one year (Year 0 above) is 10.124% (1.064 x 1.035) for members in the entry age under 25 group.

2. Based on elapsed service since membership date.

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 1.8%.

Optional Forms

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

Probability of Marriage

Male: 85%
Female: 65%

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

Number of Children

Married members under age 60 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	0.0%	0.0%	0.0%	0.0%
Disability	0.0%	0.0%	0.0%	0.0%

Table B.8
Supplemental Assumptions (continued)

Valuation of Inactive Members

Salary and benefit information is not available on the valuation data provided for inactive members. Therefore, we estimate the projected retirement benefits for inactive members as follows:

1) The inactive member's earnable salary information is retrieved from when they were active by matching with a database of active valuation data back to 2001 and taking the highest earnable salary for the member during the period.
2) For those members who cannot be located on the active database (because they terminated prior to 2001 or another reason), their earnable salary is estimated based on 120% of the average earnable salary for all active members in the year the member terminated.
3) The earnable salary amount from the prior steps is treated as the member's final compensation with two additional adjustments.
    a. An additional load of 5% for all inactive members is applied to their salary amount to account for potential post-termination increases in salary due to factors such as reciprocity.
    b. Final compensation is increased by an additional 5% if the member has 25 or more years of credited service.
4) Based on the salary data described above and the birth date and credited service from the current year's valuation data, the projected benefit amount is calculated and valued as a deferred service retirement.
5) Non-vested members who have been inactive for less than two years are assumed to take an immediate refund of their member contributions.

Table B.9
Custom Mortality Table Key

Inactives, Healthy (Service) Retirees and Beneficiaries -- Males	
Current:	RP-2014 Healthy Male White Collar -1 to age 70 smoothed to +1 at age 95
Inactives, Healthy (Service) Retirees and Beneficiaries -- Females	
Current:	RP-2014 Healthy Female White Collar -4 to age 70 smoothed to +1 at age 95
Disabled Retirees -- Males	
Current:	All Ages: RP-2014 Disabled Male -2 (select rates in first three years, regardless of age)
Disabled Retirees -- Females	
Current:	All Ages: RP-2014 Disabled Female -2 (select rates in first three years, regardless of age)
Active Members -- Males	
Current:	RP-2014 Healthy Male White Collar Employee set back 2 years
Active Members -- Females	
Current:	RP-2014 Healthy Female White Collar Employee set back 2 years

Notes: *1. All proposed tables use 110% of the MP-2016 Ultimate Projection Scale. Projection scale does not apply to select minimum rates.*
2. All proposed tables to be used in the June 30, 2016 actuarial valuations include two years of mortality improvement from the 2014 tables shown above.

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, 2016	June 30, 2015
Number of Members		
Active Members [1]	438,537	429,460
Inactive Members [1]	187,722	184,396
Retirees and Beneficiaries		
Service Retirees	252,672	247,353
Disabled Retirees	9,940	9,848
Survivors	25,583	24,899
Total Benefit Recipients	288,195	282,100
Total Membership in Valuation	914,454	895,956
Active Member Statistics		
Earned Salaries [2]	$ 29,826 million	$ 28,013 million
Average Earned Salary	$ 68,013	$ 65,229
Average Age	45.4 years	45.5 years
Average Service	12.1 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.

2. Total of prior year Earned Salaries for all active members. This differs from the payroll amounts shown elsewhere in this report which reflect annualized amounts for members who were hired part way through the prior year.

Retired Member Statistics[3]	June 30, 2016	June 30, 2015
Average Age		
Service Retiree	73.3	73.0
Disabled Retiree	65.6	65.3
Survivors	77.3	77.2
All Benefit Recipients	73.3	73.1
Average Monthly Benefit		
Service Retirees	$ 3,884	$ 3,786
Disabled Retirees	2,695	2,631
Survivors	2,443	2,349
All Benefit Recipients	$ 3,732	$ 3,636

3. 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, 2016	June 30, 2015
Average Age	49.1	48.7
Average Account Balance	$ 11,953	$ 11,825

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

Male

	Years of Service					
Age	**1 & Under**	**greater than 1 & under 5**	**5-9**	**10-14**	**15-19**	**20-24**
Less than 25	1,113	272				
25 to 30	3,204	4,336	461			
30 to 35	2,190	4,927	4,330	839	1	
35 to 40	1,596	3,293	4,412	5,942	974	6
40 to 45	1,126	2,224	2,717	5,164	7,089	576
45 to 50	959	1,902	2,020	3,561	6,706	4,229
50 to 55	811	1,414	1,452	2,294	3,780	3,522
55 to 60	621	1,174	1,215	1,768	2,683	2,289
60 to 65	429	928	958	1,386	1,874	1,385
65 to 70	271	590	559	702	767	547
70 and over	123	335	314	247	203	156
Age Unknown						
Total	12,443	21,395	18,438	21,903	24,077	12,710

	Years of Service					
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45 & Over**	**Total**
Less than 25						1,385
25 to 30						8,001
30 to 35						12,287
35 to 40						16,223
40 to 45	5					18,901
45 to 50	319	4				19,700
50 to 55	2,716	271	1			16,261
55 to 60	2,839	1,880	187	1		14,657
60 to 65	1,497	931	616	50	1	10,055
65 to 70	415	224	157	92	11	4,335
70 and over	124	65	48	53	52	1,720
Age Unknown						
Total	7,915	3,375	1,009	196	64	123,525

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

Female

	Years of Service					
Age	**1 & Under**	**greater than 1 & under 5**	**5-9**	**10-14**	**15-19**	**20-24**
Less than 25	3,798	1,405				
25 to 30	7,995	15,918	2,012	1		
30 to 35	4,691	13,316	15,186	3,297	1	
35 to 40	3,448	7,911	12,620	18,728	3,051	3
40 to 45	2,659	5,953	7,553	13,433	17,081	1,357
45 to 50	2,252	5,014	6,216	8,930	13,650	8,753
50 to 55	1,646	3,532	4,451	6,382	8,582	6,900
55 to 60	1,072	2,666	3,428	5,334	7,173	5,619
60 to 65	614	1,765	2,105	3,346	5,026	3,964
65 to 70	259	749	862	1,123	1,618	1,268
70 and over	113	341	361	274	382	271
Age Unknown						
Total	28,547	58,570	54,794	60,848	56,564	28,135

	Years of Service					
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45 & Over**	**Total**
Less than 25						5,203
25 to 30						25,926
30 to 35						36,491
35 to 40						45,761
40 to 45	2					48,038
45 to 50	911	5				45,731
50 to 55	6,542	769	1			38,805
55 to 60	5,779	4,201	538	1		35,811
60 to 65	3,359	1,880	1,216	68		23,343
65 to 70	943	401	232	141	24	7,620
70 and over	219	134	91	46	51	2,283
Age Unknown						
Total	17,755	7,390	2,078	256	75	315,012

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

Total

	Years of Service					
Age	**1 & Under**	**greater than 1 & under 5**	**5-9**	**10-14**	**15-19**	**20-24**
Less than 25	4,911	1,677				
25 to 30	11,199	20,254	2,473	1		
30 to 35	6,881	18,243	19,516	4,136	2	
35 to 40	5,044	11,204	17,032	24,670	4,025	9
40 to 45	3,785	8,177	10,270	18,597	24,170	1,933
45 to 50	3,211	6,916	8,236	12,491	20,356	12,982
50 to 55	2,457	4,946	5,903	8,676	12,362	10,422
55 to 60	1,693	3,840	4,643	7,102	9,856	7,908
60 to 65	1,043	2,693	3,063	4,732	6,900	5,349
65 to 70	530	1,339	1,421	1,825	2,385	1,815
70 and over	236	676	675	521	585	427
Age Unknown						
Total	40,990	79,965	73,232	82,751	80,641	40,845

	Years of Service					
Age	**25-29**	**30-34**	**35-39**	**40-44**	**45 & Over**	**Total**
Less than 25						6,588
25 to 30						33,927
30 to 35						48,778
35 to 40						61,984
40 to 45	7					66,939
45 to 50	1,230	9				65,431
50 to 55	9,258	1,040	2			55,066
55 to 60	8,618	6,081	725	2		50,468
60 to 65	4,856	2,811	1,832	118	1	33,398
65 to 70	1,358	625	389	233	35	11,955
70 and over	343	199	139	99	103	4,003
Age Unknown						
Total	25,670	10,765	3,087	452	139	438,537

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
2015	36,953	184,396	29.3	70.7
2016	38,014	187,722	29.4	70.6

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
2015	11,825	48.7	2.9	10.4
2016	11,953	49.1	2.9	10.8

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
2015	247,353	32.7	67.3
2016	252,672	32.3	67.7

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
2015	61.3	25.9	5,597	3,786
2016	61.3	25.8	5,716	3,884

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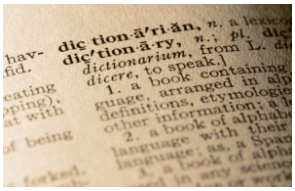
Appendix D Glossary


dic·tion·ā'ri·ăn, n, a lexic
dic'tion·ā·ry, n.; pl. dic
dictionarium, from L. d
dicere, to speak.]
1. a book containing
guage, arranged in alp
definitions, etymologie
other information; a l
2. a book of alphab
language with their
language; as, a Spa
1. a book of alph
in any scien

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.

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, 2016.