State Actuarial Valuation

As of June 30, 2016

CalPERS

Required Contributions for the Fiscal Year
July 1, 2017 through June 30, 2018

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Actuarial Certification

October, 2017

To the best of our knowledge, this report is complete and accurate and contains sufficient information to fully and fairly disclose the actuarial funded condition of the State plans. This valuation is based on the member and financial data as of June 30, 2016 provided by the various CalPERS databases and the benefits under these plans with CalPERS as of the date this report was produced. In our opinion, this valuation has been performed in accordance with generally accepted actuarial principles and in accordance with standards of practice prescribed by the Actuarial Standards Board. The assumptions and methods are internally consistent and reasonable for these plans, as prescribed by the CalPERS Board of Administration according to provisions set forth in the California Public Employees' Retirement Law.

The undersigned are actuaries for CalPERS, who are members of the American Academy of Actuaries and the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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Highlights and Executive Summary

Highlights and Executive Summary

INTRODUCTION

This is the actuarial valuation report as of June 30, 2016 for the State plans. This actuarial valuation was used to set the 2017-18 required employer contribution rates.

The five plans included in this valuation provide retirement benefits to members employed by the State of California. This includes employees of the California State University system but generally does not include employees of the University of California system. It also does not cover school employees or employees of local governments that have elected to contract with CalPERS.

PURPOSE OF REPORT

This actuarial valuation was performed by the CalPERS Actuarial Office using data as of June 30, 2016. The purpose of the report is to:

- Set forth the assets and accrued liabilities of the State plans as of June 30, 2016.
- Determine the required employer contribution rates of these plans for the fiscal year July 1, 2017 through June 30, 2018.
- Provide actuarial information as of June 30, 2016 to the CalPERS Board of Administration and other interested parties.

The pension funding information presented in this report should not be used in financial reports subject to Governmental Accounting Standards Board (GASB) Statement Number 68 for an Agent Employer Defined Benefit Pension Plan.

The use of this report for any other purposes may be inappropriate.

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; changes in actuarial policies; and changes in plan provisions or applicable law.

California Actuarial Advisory Panel Recommendations

This report includes all the basic disclosure elements as described in the *Model Disclosure Elements for Actuarial Valuation Reports* recommended in 2011 by the California Actuarial Advisory Panel (CAAP), except for the following:

- Due to the various employee contribution rates within the majority of State plans, we have shown the total normal cost for the plans and shown the average employee portion as “Employee Contribution.” More specific employee normal costs are given in Appendix B.
- The unfunded liability amortization schedule does not give the original base amounts of the various components of the unfunded liabilities in the “Schedule of Amortization Bases”.

Additionally, this report includes the following “Enhanced Risk Disclosures” also recommended by the CAAP in the Model Disclosure Elements document:

- A “Deterministic Stress Test,” projecting future results under different investment income scenarios.
- A “Sensitivity Analysis,” showing the impact on current valuation results using alternate discount rates of 6.0 percent, 7.0 percent and 8.0 percent.

EMPLOYER REQUIRED CONTRIBUTION RATES

The actuarially required employer contribution rates for Fiscal Year July 1, 2017 through June 30, 2018 are shown in the table below. For comparison purposes, the corresponding contribution rates for Fiscal Year July 1, 2016 through June 30, 2017 are also provided. The expected contribution amounts that these rates generate are also shown.

	Fiscal Year 2016-17		Fiscal Year 2017-18	
Plan	Expected Employer Contribution	Required Employer Rate[1]	Expected Employer Contribution	Required Employer Rate[1]
State Miscellaneous	$3,078,231,805	26.634%	$3,397,736,108	28.325%
State Industrial	116,880,314	18.365%	131,131,373	19.527%
State Safety	400,378,501	18.753%	435,662,446	19.402%
State Peace Officers & Firefighters	1,343,176,739	40.276%	1,462,630,279	42.598%
California Highway Patrol	414,975,202	48.719%	447,375,521	52.785%
Total State	**$5,353,642,561**		**$5,874,535,727**	

(1) Excludes additional contributions pursuant to Government Code Section 20683.2. See “Additional Contributions" section on page 5 for more information about that requirement.

Note that the payroll used to calculate the expected dollar contributions is the payroll used in the valuation incorporating two years of payroll growth using the payroll growth assumption of 3 percent. To the extent that payroll in the contribution year is different than the projected payroll, the actual contribution amounts will be different than the expected contributions shown in the table above. State Miscellaneous includes both Tier 1 and Tier 2 benefit levels.

The supporting exhibits in this report entitled “Reconciliation of Employer Contribution Rates” on page 25 and “Reconciliation of Employer Contributions” on page 26 provide explanations of the changes in required contribution rates and expected contribution amounts from Fiscal Year 2016-17 to Fiscal Year 2017-18.

A history of the required contribution rates is included on page 27 of this report.

Reasons for Change in Employer Contributions for the State Plans

Overall, the required contributions for the State plans have increased by $520.9 million, which is a 9.7% relative increase in contribution, between Fiscal Year 2016-17 and Fiscal Year 2017-18. This change is mainly driven by the factors listed below.

CalPERS currently employs an amortization and smoothing policy that spreads rate increases or decreases over a 5-year period, and amortizes all experience gains and losses over a fixed 30-year period. This means that only one fifth of the total anticipated rate change caused by each gain or loss is realized in the first year, culminating in the full increase in the fifth year. As a result, the progression of these gain or loss amortization bases will affect contribution levels in increasing measure throughout the ramp period. A complete description of the actuarial methods used in the June 30, 2016 valuation is shown in Appendix A.

On December 21, 2016, the CalPERS Board of Administration lowered the discount rate from 7.50 percent to 7.00 percent using a three year phase-in beginning with the June 30, 2016 actuarial valuations. The employer contributions for Fiscal Year 2017-18 were calculated using a discount rate of 7.375 percent. The impact on the contributions is approximately $115.2 million which accounts for the increase in normal cost and year one of the five-year phase-in of the increase in unfunded liability, to be paid over twenty years.

Overall, the payroll across the State plans increased by 3.7 percent, as compared to the payroll growth assumption of 3 percent. This led to a contribution increase of $69.6 million. The payroll growth for the year ranges from a 5.5 percent increase for State Industrial to a 0.5 percent decrease in overall payroll growth for California Highway Patrol.

EMPLOYER REQUIRED CONTRIBUTION RATES (CONTINUED)

The Public Employees' Pension Reform Act of 2013 (PEPRA) requires lower benefits for new members as defined by PEPRA, that are hired after January 1, 2013. The normal cost for all of the plans, before reflecting the discount rate change, is lower due to the enrollment of new hires into the lower benefit level. The number of PEPRA members range between a high of 26 percent of active members for State Safety to a low of 7 percent of active members for California Highway Patrol.

The net return on plan assets for the year ending June 30, 2016 of 0.6 percent was less than the assumed return of 7.5 percent. This led to an experience loss that must be amortized with additional contributions over the next thirty years. This was partially offset by demographic gains, predominantly due to lower than expected COLA increases for retirees.

The table below highlights all major contributors to the change in required contributions.

Reason for Change	Change in Required Contribution (Dollars in Millions)
Change due to normal progression of existing amortization bases	$282.1
Change in discount rate to 7.375%	115.2
Change due to increase in overall payroll	69.6
Decrease in normal cost due to new hires in lower benefit level	(48.8)
First installment of the 5-year phased-in 30-year amortization of the following gains and losses:	
Impact of investment experience	117.9
Impact of greater than expected contributions received in 2015-16	(3.2)
Demographic gains and losses	(12.7)
Net effect of all other gains and losses	0.7
Total Change In Required Contributions	**$520.9**

Additional Contributions

One of the provisions of pension reform added Government Code Section 20683.2 which changed the contribution rates of many State members that were effective July 1, 2013, July 1, 2014, and July 1, 2015. Government Code Section 20683.2 also requires that the "savings realized by the state employer as a result of the employee contribution rate increases required by this section shall be allocated to any unfunded liability, subject to appropriation in the annual Budget Act." Under the California Constitution, the Board has "plenary" authority over the actuarial function at CalPERS consistent with the fiduciary duties of a trustee. This includes authority to set employer contribution rates. By statute, the State may pay additional contributions in addition to the actuarially-required contribution rates set by the Board and CalPERS will generally accept these payments.

The table below shows the:

- Actuarially required contributions (these are the rates that staff is recommending the Board set for the State plans),
- Additional contributions that the State is to make to offset the savings due to the increased member contributions, and
- Total contributions that the State is to make for each plan.

Plan	Actuarially Required Employer Contribution for 2017-18	Additional Statutory Contribution to Offset Increased Member Contributions	Total Contribution 2017-18
State Miscellaneous	28.325%	0.098%	28.423%
State Industrial	19.527%	0.881%	20.408%
State Safety	19.402%	1.182%	20.584%
State Peace Officers & Firefighters	42.598%	1.647%	44.245%
California Highway Patrol	52.785%	1.319%	54.104%

EMPLOYER REQUIRED CONTRIBUTION RATES (CONTINUED)

In all cases, the savings are less than the actual increase in member contributions. This is because the additional member contributions increase the value of the benefit in some circumstances. The obvious example is when the member terminates and takes a refund. A less obvious example is for Tier 2 members where the members are assumed to elect to receive a Tier 1 benefit with an actuarial equivalent reduction to offset the missed Tier 1 contributions. Because the members will make additional contributions, a smaller reduction will apply in the future.

The rates and information shown in the remainder of this report reflect the rates set by the Board at its April 2017 meeting (shown above as the actuarially required employer contribution). The additional contribution pursuant to Government Code Section 20683.2 will be realized in future valuations as actuarial gains.

EXPECTED FUTURE CHANGES

The table below shows the required and projected employer contribution rates for the next six fiscal years. Projected results reflect the adopted changes to the discount rate described in Appendix A, "Actuarial Assumptions Applicable to All Plans." The projections reflect an 11.2% investment return for Fiscal Year 2016-17 and also assume that all actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. The projected normal cost percentages in the projections reflect that the normal cost will decline over time as new employees are hired into PEPRA or other lower cost benefit tiers. The State is expected to contribute $6 billion in additional contributions during the 2017-18 Fiscal Year as authorized by SB 84. The expected impact of the additional contribution is reflected in the projected contribution rates.

	New Rate	Projected Future Employer Contribution Rates					
Plan	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
State Miscellaneous	28.325%	29.4%	31.5%	32.6%	33.2%	33.4%	33.8%
State Industrial	19.527%	20.6%	22.6%	23.5%	24.1%	24.3%	24.6%
State Safety	19.402%	19.9%	21.4%	21.8%	22.0%	22.0%	21.4%
State Peace Officers & Firefighters	42.598%	43.9%	47.1%	48.5%	49.3%	49.5%	50.1%
California Highway Patrol	52.785%	54.1%	57.6%	59.2%	60.1%	60.5%	61.4%

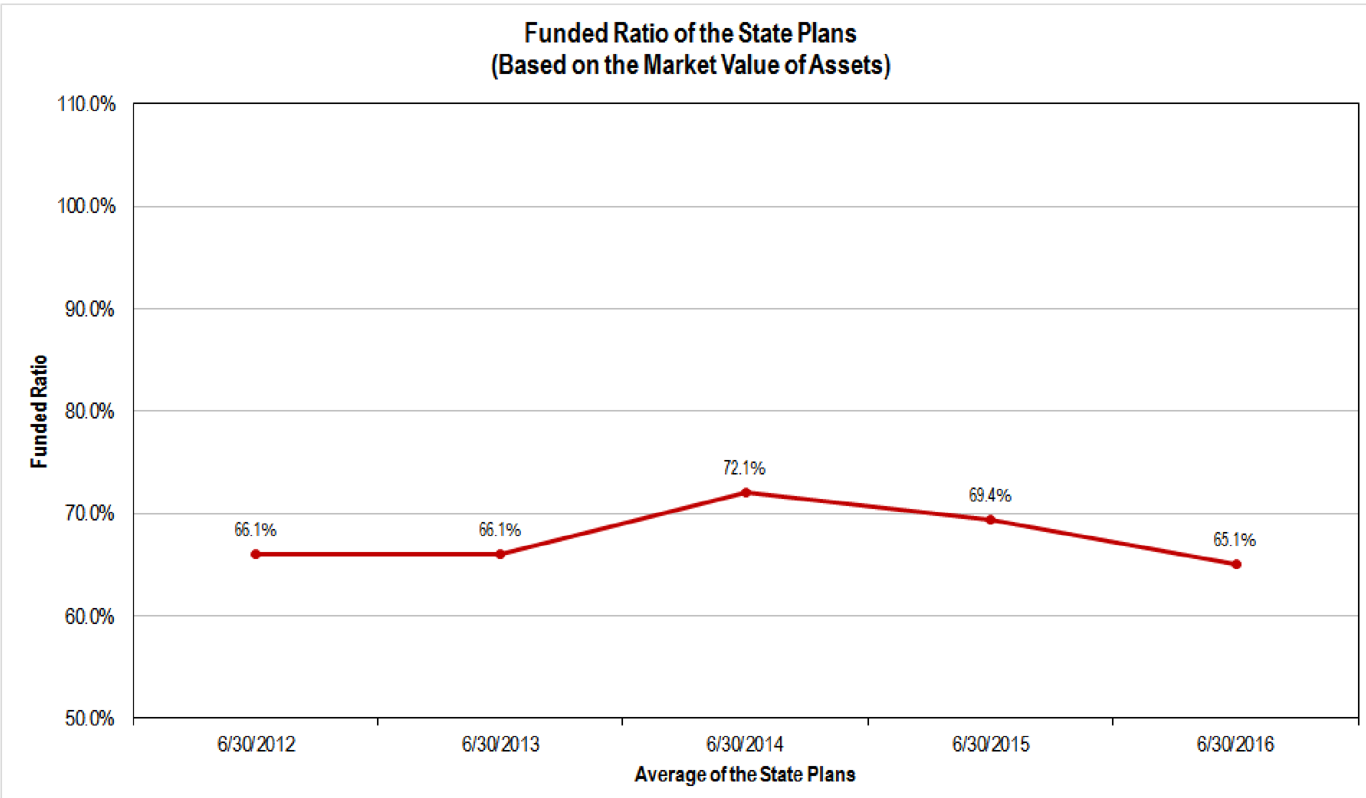
Changes in the Unfunded Accrued Liability (UAL) due to actuarial gains or losses as well as changes in actuarial assumptions or methods are amortized using a 5-year ramp up. For more information, please see “Amortization of the Unfunded Actuarial Accrued Liability” under “Actuarial Methods” in Appendix A. This method phases in the impact of unanticipated changes in UAL over a 5-year period and attempts to minimize employer cost volatility from year to year. As a result of this methodology, dramatic changes in the required employer contributions in any one year are less likely. However, required contributions can change gradually and significantly over the next five years. In years where there is a large increase in UAL the relatively small amortization payments during the ramp up period could result in a funded ratio that is projected to decrease initially while the contribution impact of the increase in the UAL is phased in.

Due to the adopted changes in the discount rate for the next two valuations in combination with the 5-year phase-in ramp, the increases in the required contributions are expected to continue for seven years from Fiscal Year 2017-18 through Fiscal Year 2023-24.

A scenario analysis was performed to determine the effects of various investment returns on future employer contribution rates for three years beyond the estimated 2018-19 employer rates shown above. That information is available in the “Risk Analysis” section of this report.

FUNDED STATUS OF THE PLANS

The funded status of a pension plan is defined as the ratio of assets to a plan's accrued liabilities. Plans with a lower funded ratio are, all other things being equal, more at risk of not being able to meet their future benefit obligations. From June 30, 2015 to June 30, 2016 the funded status for the State plans, on average, decreased by 4.3 percent. This was due to the investment return for 2015-16 being less than expected and the increase in liability due to the change in discount rate assumption. The graph below shows the average funded status for the past five years for the State plans.



The tables below show the funded status of the plans using the market value of assets on June 30, 2016, and for the last five years.

Funded Status and Unfunded Liability on June 30, 2016

Plan	Present Value of Benefits	Entry Age Normal Accrued Liability	Market Value of Assets	Unfunded Liability	Funded Ratio
State Miscellaneous	$116,407,430,627	$102,443,593,272	$66,607,613,590	$35,835,979,682	65.0%
State Industrial	4,973,444,945	3,969,767,411	2,897,811,466	1,071,955,945	73.0%
State Safety	14,678,817,876	11,288,008,411	8,288,200,886	2,999,807,525	73.4%
State Peace Officers & Firefighters	49,422,292,374	41,484,601,481	26,621,971,404	14,862,630,077	64.2%
California Highway Patrol	13,495,219,004	11,470,696,987	6,705,506,460	4,765,190,527	58.5%
Total for the State	**$198,977,204,826**	**$170,656,667,562**	**$111,121,103,806**	**$59,535,563,756**	**65.1%**

Funded Ratio of the Retirement Program (Based on Market Value of Assets)

Plan	June 30, 2012	June 30, 2013	June 30, 2014	June 30, 2015	June 30, 2016
State Miscellaneous	66.3%	66.5%	72.4%	69.6%	65.0%
State Industrial	73.0%	74.7%	81.7%	78.6%	73.0%
State Safety	70.6%	71.6%	79.2%	76.6%	73.4%
State Peace Officers & Firefighters	65.5%	65.0%	71.0%	68.5%	64.2%
California Highway Patrol	60.3%	58.9%	64.3%	61.6%	58.5%
Total for the State	**66.1%**	**66.1%**	**72.1%**	**69.4%**	**65.1%**

CHANGES SINCE THE PRIOR YEAR'S VALUATION

Actuarial Methods and Assumptions

On December 21, 2016, the CalPERS Board of Administration lowered the discount rate from 7.50 percent to 7.00 percent using a three year phase-in beginning with the June 30, 2016 actuarial valuations. The minimum employer contributions for Fiscal Year 2017-18 determined in this valuation were calculated using a discount rate of 7.375 percent. The projected employer contributions shown in this report are calculated assuming that the discount rate will be lowered to 7.25 percent next year and 7.00 percent the following year as adopted by the Board. The decision to reduce the discount rate was primarily based on reduced capital market assumptions provided by external investment consultants and CalPERS investment staff. The specific decision adopted by the Board reflected recommendations from CalPERS staff and additional input from employer and employee stakeholder groups. Based on the investment allocation adopted by the Board and capital market assumptions, the reduced discount rate assumption provides a more realistic assumption for the long term investment return of the fund.

Notwithstanding the Board's decision to phase into a 7.0 percent discount rate, subsequent analysis of the expected investment return of CalPERS assets or changes to the investment allocation may result in a change to this three year discount rate schedule. A comprehensive analysis of all actuarial assumptions and methods including the discount rate will be conducted in late 2017.

A complete description of the actuarial methods and assumptions used in the June 30, 2016 valuation may be found in Appendix A of this report.

Plan Provisions

No changes were made since the prior valuation. Please refer to Appendix B for a summary of the plan provisions used in this valuation.

Risk Mitigation

The CalPERS Board of Administration adopted a Risk Mitigation Policy which is designed to reduce funding risk over time. The policy establishes a mechanism whereby CalPERS investment performance that significantly outperforms the discount rate triggers adjustments to the discount rate, expected investment return and strategic asset allocation targets. A minimum excess investment return of 2 percent above the existing discount rate is necessary to cause a funding risk mitigation event. However, this policy is temporarily suspended until June 30, 2019. More details on the Risk Mitigation Policy can be found on our website.

SUBSEQUENT EVENTS

This actuarial valuation report reflects statutory changes, regulatory changes and CalPERS Board actions through August 2017. Any subsequent changes or actions are not reflected.

Assets

Assets

RECONCILIATION OF THE MARKET VALUE OF ASSETS OVER THE PRIOR FISCAL YEAR

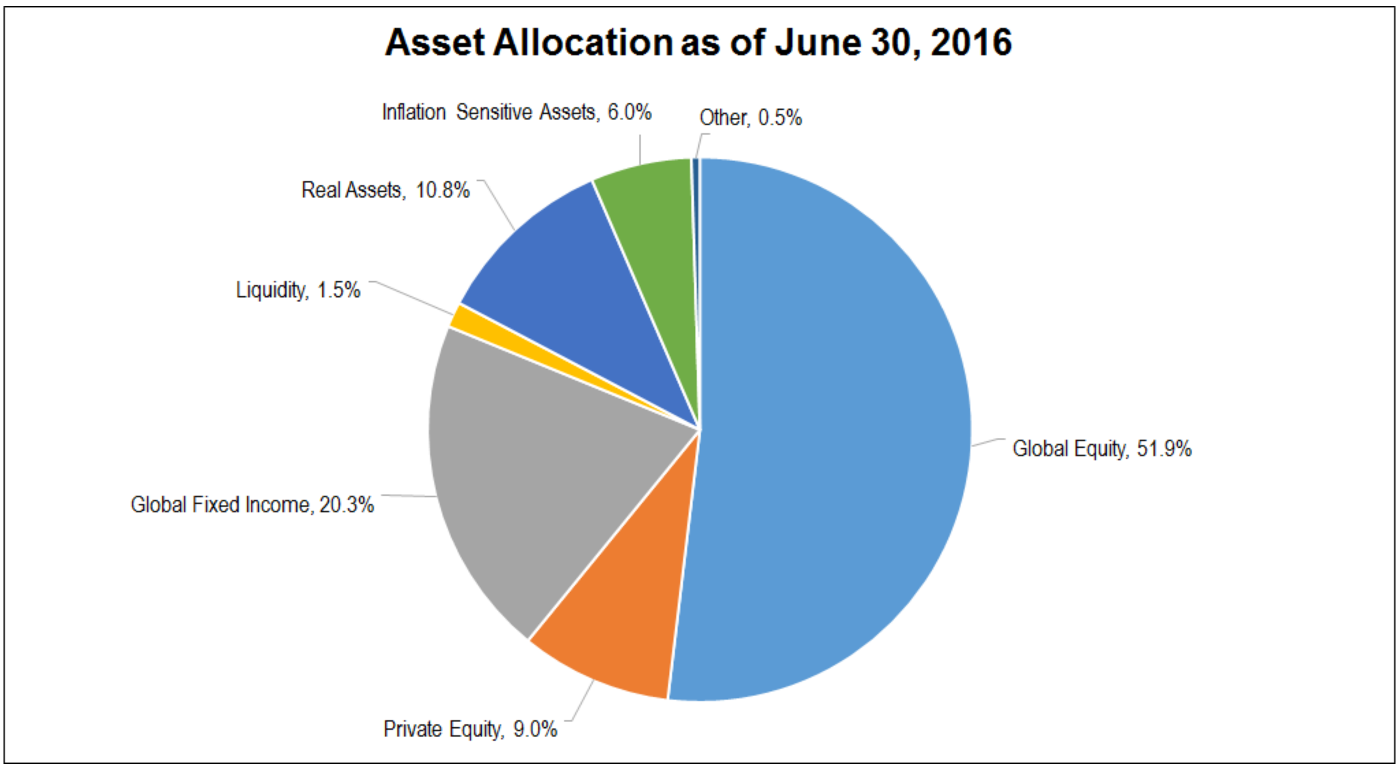
	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
1) Market Value of Assets as of June 30, 2015 Including Receivables for Tier 1 Conversion and Service Buybacks	$68,080,012,254	$2,884,662,214	$7,859,091,661	$26,973,473,591	$6,735,006,541
2a) Receivables for Tier 1 Conversion and Service Buybacks as of June 30, 2015	336,243,026	15,085,562	23,866,179	91,582,365	13,949,650
2b) Adjustment to Remove Safety/POFF transfer	—	—	277,213,774	(277,213,774)	—
3) Market Value of Assets as of June 30, 2015 [(1) - (2a)+(2b)]	67,743,769,228	2,869,576,652	8,112,439,256	26,604,677,452	6,721,056,891
4) Employer Contributions Received in 2015-16	2,818,405,611	116,730,421	401,108,384	1,265,144,817	375,927,754
5) Employee Contributions Received in 2015-16	823,511,379	53,090,275	224,156,326	389,835,752	87,489,317
6) Benefit Payments in 2015-16	(5,321,266,165)	(165,732,651)	(492,964,702)	(1,812,022,453)	(515,191,022)
7) Refunds in 2015-16	(25,597,766)	(1,626,222)	(9,462,654)	(10,818,580)	(1,531,738)
8) Administrative Expense	(37,329,592)	(1,758,442)	(4,966,086)	(16,294,924)	(4,110,934)
9) Transfers In/Out	(1,213,778)	138,348	556,510	161,130	291,738
10) Investment Return	287,669,645	12,320,881	35,999,065	118,303,112	29,002,629
11) Market Value of Assets as of June 30, 2016 [(3) + (4) + (5) + (6) + (7) + (8) + (9) + (10)]	$66,287,948,562	$2,882,739,262	$8,266,866,099	$26,538,986,306	$6,692,934,635
12) Receivables for Tier 1 Conversion and Service Buybacks as of June 30, 2016	$319,665,028	$15,072,204	$21,334,787	$82,985,098	$12,571,825
13) Market Value of Assets as of June 30, 2016 Including Receivables for Tier 1 Conversion and Service Buybacks	$66,607,613,590	$2,897,811,466	$8,288,200,886	$26,621,971,404	$6,705,506,460

ASSET ALLOCATION

CalPERS adheres to an Asset Allocation Strategy which establishes asset class allocation policy targets and ranges, and manages those asset class allocations within their policy ranges. CalPERS Investment Belief No. 6 recognizes that strategic asset allocation is the dominant determinant of portfolio risk and return. On February 19, 2014 the CalPERS Board of Administration adopted changes to the current asset allocation as shown in the Policy Target Allocation below expressed as a percentage of total assets.

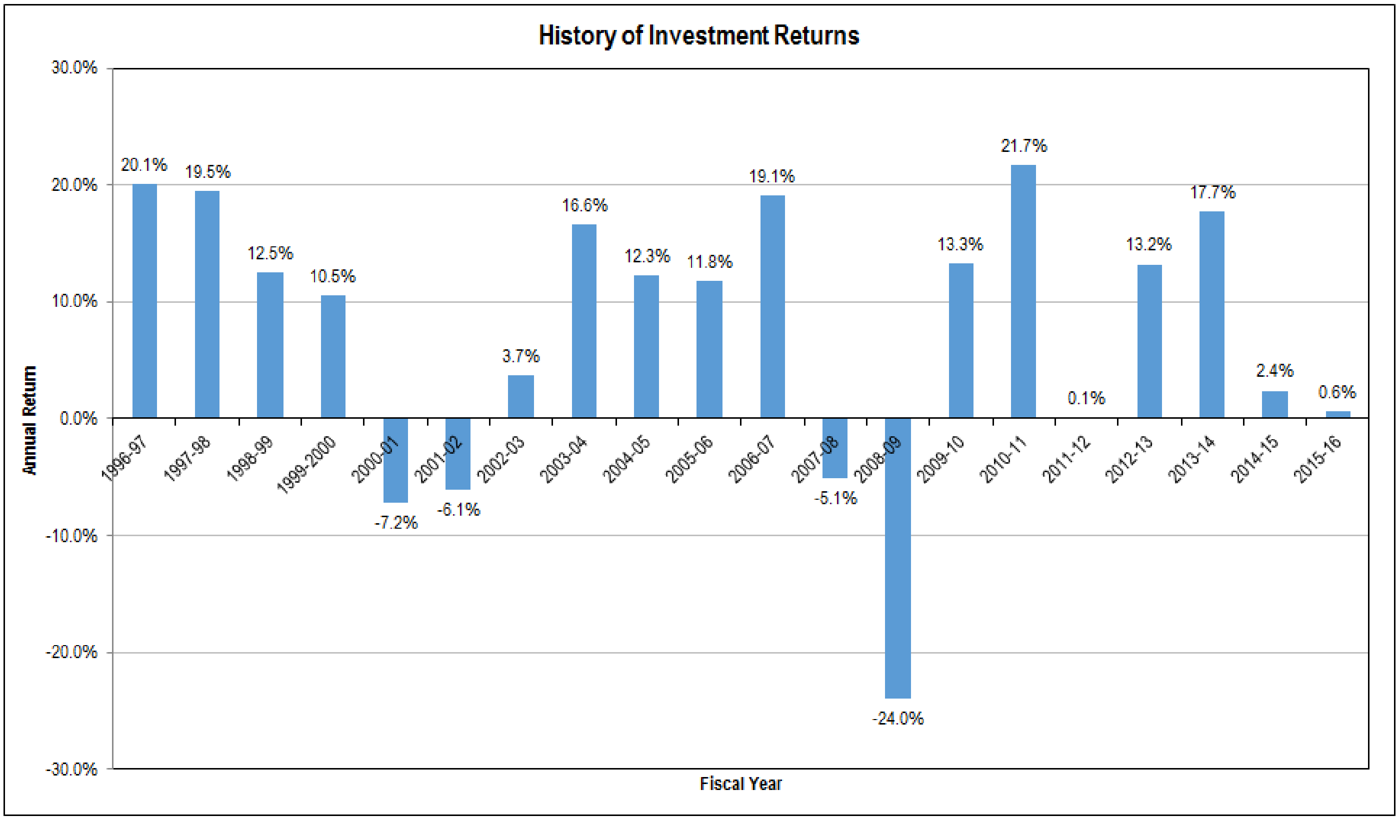
The asset allocation and market value of assets shown below reflect the values of the Public Employees Retirement Fund (PERF) in its entirety as of June 30, 2016. The assets of the State plans are part of the Public Employees Retirement Fund (PERF) and are invested accordingly.

Asset Class	Market Value (Dollars in Billions)	Policy Target Allocation
Global Equity	$153.1	51.0%
Private Equity	26.4	10.0%
Global Fixed Income	59.9	20.0%
Liquidity	4.5	1.0%
Real Assets	31.8	12.0%
Inflation Sensitive Assets	17.8	6.0%
Other	1.6	0.0%
Total Fund	**$295.1**	**100.0%**



CalPERS HISTORY OF INVESTMENT RETURNS

The following is a chart with the 20-year historical annual returns of the Public Employees Retirement Fund for each fiscal year ending on June 30. Beginning in 2002, the figures are reported as gross of fees.



The table below shows historical geometric mean annual returns of the Public Employees Retirement Fund for various time periods ending on June 30, 2016, (figures are reported as gross of fees). The geometric mean rate of return is the average rate per period compounded over multiple periods. It should be recognized that in any given year the rate of return is volatile. The portfolio has an expected volatility of 11.8 percent per year based on the most recent Asset Liability Modelling study. The volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund's total return distribution, expressed as a percentage. Consequently when looking at investment returns it is more instructive to look at returns over longer time horizons.

History of CalPERS Geometric Mean Rates of Return and Volatilities

	1 Year	5 Year	10 Year	20 Year	30 Year
Geometric Return	0.6%	6.6%	5.0%	7.0%	8.2%
Volatility	—%	8.1%	14.0%	11.8%	10.1%

Liabilities and Rates

Liabilities and Rates

COMPARISON OF CURRENT AND PRIOR YEAR

Shown below are the key valuation results for the current valuation compared to the corresponding results from the prior valuation.

STATE MISCELLANEOUS

Participant Information

	June 30, 2015	June 30, 2016
Members Included in the Valuation[1]		
Active Members	168,586	170,986
Transfers from Industrial	36,145	36,786
Vested Terminations[2]	51,939	54,854
Receiving Payments	182,297	186,382
Total	**438,967**	**449,008**
Average Entry Age of Active Members	34.7	34.8
Average Age of Active Members	47.6	47.4
Average Age of Retired Members	71.7	71.9
Average Pay	$64,622	$66,127
Covered Payroll Prior Fiscal Year	$10,894,384,630	$11,306,804,561
Projected Payroll for Contribution Rate	$11,557,852,654	$11,995,388,959

(1) Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting liabilities.

(2) Includes non-vested terminated participants with employee contributions remaining in the plan.

Funded Status of the Retirement Program

	June 30, 2015	June 30, 2016
Present Value of Benefits	$110,878,276,615	$116,407,430,627
Accrued Liability	97,831,157,779	102,443,593,272
Market Value of Assets	68,080,012,254	66,607,613,590
Unfunded Liability/(Surplus)	29,751,145,525	35,835,979,682
Funded Status	69.6%	65.0%

Employer Contribution

	June 30, 2015	June 30, 2016
Contribution Required in Dollars		
Total Normal Cost	$1,779,311,246	$1,887,174,548
Employee Contribution	771,520,245	809,831,131
Employer Normal Costs	1,007,791,001	1,077,343,417
Amortization of Unfunded Liability	2,070,440,804	2,317,753,705
Group Term Life Benefits	—	2,638,986
Total	**$3,078,231,805**	**$3,397,736,108**
Contribution Required (Percent of Payroll)		
Total Normal Cost	15.395%	15.732%
Employee Contribution	6.675%	6.751%
Employer Normal Costs	8.720%	8.981%
Amortization of Unfunded Liability	17.914%	19.322%
Group Term Life Benefits	0.000%	0.022%
Total	**26.634%**	**28.325%**

COMPARISON OF CURRENT AND PRIOR YEAR (CONTINUED)

STATE INDUSTRIAL

Participant Information

	June 30, 2015	June 30, 2016
Members Included in the Valuation[1]		
Active Members	11,104	11,428
Transfers from Industrial	8,784	8,788
Vested Terminations[2]	3,202	3,319
Receiving Payments	12,752	13,421
Total	**35,842**	**36,956**
Average Entry Age of Active Members	36.0	35.9
Average Age of Active Members	45.6	45.3
Average Age of Retired Members	67.6	67.8
Average Pay	$54,026	$55,388
Covered Payroll Prior Fiscal Year	$599,908,510	$632,973,735
Projected Payroll for Contribution Rate	$636,442,938	$671,521,835

(1) Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting liabilities.
(2) Includes non-vested terminated participants with employee contributions remaining in the plan.

Funded Status of the Retirement Program

	June 30, 2015	June 30, 2016
Present Value of Benefits	$4,594,218,730	$4,973,444,945
Accrued Liability	3,669,191,968	3,969,767,411
Market Value of Assets	2,884,662,214	2,897,811,466
Unfunded Liability/(Surplus)	784,529,754	1,071,955,945
Funded Status	78.6%	73.0%

Employer Contribution

	June 30, 2015	June 30, 2016
Contribution Required in Dollars		
Total Normal Cost	$114,687,017	$122,452,007
Employee Contribution	49,687,100	52,768,186
Employer Normal Costs	64,999,917	69,683,821
Amortization of Unfunded Liability	51,880,397	61,447,552
Group Term Life Benefits	—	—
Total	**$116,880,314**	**$131,131,373**
Contribution Required (Percent of Payroll)		
Total Normal Cost	18.020%	18.235%
Employee Contribution	7.807%	7.858%
Employer Normal Costs	10.213%	10.377%
Amortization of Unfunded Liability	8.152%	9.150%
Group Term Life Benefits	0.000%	0.000%
Total	**18.365%**	**19.527%**

COMPARISON OF CURRENT AND PRIOR YEAR (CONTINUED)

STATE SAFETY

Participant Information

	June 30, 2015	June 30, 2016
Members Included in the Valuation[1]		
Active Members	26,096	27,042
Transfers from State Safety	5,440	5,741
Vested Terminations[2]	5,857	6,186
Receiving Payments	22,687	23,680
Total	**60,080**	**62,649**
Average Entry Age of Active Members	39.1	38.8
Average Age of Active Members	47.2	46.9
Average Age of Retired Members	67.9	68.2
Average Pay	$77,115	$78,268
Covered Payroll Prior Fiscal Year	$2,012,401,157	$2,116,513,548
Projected Payroll for Contribution Rate	$2,134,956,387	$2,245,409,223

(1) Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting liabilities.
(2) Includes non-vested terminated participants with employee contributions remaining in the plan.

Funded Status of the Retirement Program

	June 30, 2015	June 30, 2016
Present Value of Benefits	$13,419,044,548	$14,678,817,876
Accrued Liability	10,255,010,865	11,288,008,411
Market Value of Assets	7,859,091,661	8,288,200,886
Unfunded Liability/(Surplus)	2,395,919,204	2,999,807,525
Funded Status	76.6%	73.4%

Employer Contribution

	June 30, 2015	June 30, 2016
Contribution Required in Dollars		
Total Normal Cost	$463,947,373	$491,070,997
Employee Contribution	222,740,000	234,443,177
Employer Normal Costs	241,207,373	256,627,820
Amortization of Unfunded Liability	158,082,300	178,810,085
Group Term Life Benefits	1,088,828	224,541
Total	**$400,378,501**	**$435,662,446**
Contribution Required (Percent of Payroll)		
Total Normal Cost	21.731%	21.870%
Employee Contribution	10.433%	10.441%
Employer Normal Costs	11.298%	11.429%
Amortization of Unfunded Liability	7.404%	7.963%
Group Term Life Benefits	0.051%	0.010%
Total	**18.753%**	**19.402%**

COMPARISON OF CURRENT AND PRIOR YEAR (CONTINUED)

STATE PEACE OFFICERS AND FIREFIGHTERS

Participant Information

	June 30, 2015	June 30, 2016
Members Included in the Valuation[1]		
Active Members	40,525	41,184
Transfers from State POFF	5,712	5,916
Vested Terminations[2]	6,378	6,798
Receiving Payments	34,781	36,757
Total	**87,396**	**90,655**
Average Entry Age of Active Members	29.8	29.7
Average Age of Active Members	42.1	41.7
Average Age of Retired Members	62.8	63.1
Average Pay	$77,570	$78,585
Covered Payroll Prior Fiscal Year	$3,143,530,530	$3,236,457,111
Projected Payroll for Contribution Rate	$3,334,971,539	$3,433,557,349

(1) Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting liabilities.
(2) Includes non-vested terminated participants with employee contributions remaining in the plan.

Funded Status of the Retirement Program

	June 30, 2015	June 30, 2016
Present Value of Benefits	$46,831,518,716	$49,422,292,374
Accrued Liability	39,393,965,231	41,484,601,481
Market Value of Assets	26,973,473,591	26,621,971,404
Unfunded Liability/(Surplus)	12,420,491,640	14,862,630,077
Funded Status	68.5%	64.2%

Employer Contribution

	June 30, 2015	June 30, 2016
Contribution Required in Dollars		
Total Normal Cost	$918,584,561	$958,546,205
Employee Contribution	377,185,281	389,056,383
Employer Normal Costs	541,399,280	569,489,822
Amortization of Unfunded Liability	800,210,022	893,140,457
Group Term Life Benefits	1,567,437	—
Total	**$1,343,176,739**	**$1,462,630,279**
Contribution Required (Percent of Payroll)		
Total Normal Cost	27.544%	27.917%
Employee Contribution	11.310%	11.331%
Employer Normal Costs	16.234%	16.586%
Amortization of Unfunded Liability	23.995%	26.012%
Group Term Life Benefits	0.047%	0.000%
Total	**40.276%**	**42.598%**

COMPARISON OF CURRENT AND PRIOR YEAR (CONTINUED)

CALIFORNIA HIGHWAY PATROL

Participant Information

	June 30, 2015	June 30, 2016
Members Included in the Valuation[1]		
Active Members	7,223	7,150
Transfers from CHP	270	267
Vested Terminations[2]	366	401
Receiving Payments	8,650	8,813
Total	**16,509**	**16,631**
Average Entry Age of Active Members	26.8	26.9
Average Age of Active Members	40.6	40.8
Average Age of Retired Members	68.0	68.1
Average Pay	$111,156	$111,732
Covered Payroll Prior Fiscal Year	$802,876,775	$798,887,020
Projected Payroll for Contribution Rate	$851,771,971	$847,539,240

(1) Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting liabilities.
(2) Includes non-vested terminated participants with employee contributions remaining in the plan.

Funded Status of the Retirement Program

	June 30, 2015	June 30, 2016
Present Value of Benefits	$12,924,742,316	$13,495,219,004
Accrued Liability	10,941,786,412	11,470,696,987
Market Value of Assets	6,735,006,541	6,705,506,460
Unfunded Liability/(Surplus)	4,206,779,871	4,765,190,527
Funded Status	61.6%	58.5%

Employer Contribution

	June 30, 2015	June 30, 2016
Contribution Required in Dollars		
Total Normal Cost	$225,276,651	$230,649,329
Employee Contribution	88,993,135	88,601,752
Employer Normal Costs	136,283,515	142,047,577
Amortization of Unfunded Liability	278,538,368	305,327,944
Group Term Life Benefits	153,319	—
Total	**$414,975,202**	**$447,375,521**
Contribution Required (Percent of Payroll)		
Total Normal Cost	26.448%	27.214%
Employee Contribution	10.448%	10.454%
Employer Normal Costs	16.000%	16.760%
Amortization of Unfunded Liability	32.701%	36.025%
Group Term Life Benefits	0.018%	0.000%
Total	**48.719%**	**52.785%**

DEVELOPMENT OF ACCRUED AND UNFUNDED LIABILITIES

The following table shows the development of the accrued liabilities and the unfunded liabilities.

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
1) Present Value of Benefits					
a) Actives and Inactives	$56,225,789,299	$2,977,607,984	$8,468,181,917	$23,567,086,678	$6,428,973,923
b) Retired	60,181,641,328	1,995,836,961	6,210,635,959	25,855,205,696	7,066,245,081
c) Total	**$116,407,430,627**	**$4,973,444,945**	**$14,678,817,876**	**$49,422,292,374**	**$13,495,219,004**
2) Present Value of Future Employee Contributions	$6,242,449,290	$460,641,382	$1,730,832,855	$3,367,705,413	$786,164,875
3) Present Value of Future Employer Normal Costs	7,721,388,065	543,036,152	1,659,976,610	4,569,985,480	1,238,357,142
4) Accrued Liability [(1c) - (2) - (3)]	102,443,593,272	3,969,767,411	11,288,008,411	41,484,601,481	11,470,696,987
5) Market Value of Assets (MVA)	66,607,613,590	2,897,811,466	8,288,200,886	26,621,971,404	6,705,506,460
6) Unfunded Liability/(Surplus) [(4) - (5)]	35,835,979,682	1,071,955,945	2,999,807,525	14,862,630,077	4,765,190,527
7) Funded Status [(5) / (4)]	65.0%	73.0%	73.4%	64.2%	58.5%

DEVELOPMENT OF EMPLOYER CONTRIBUTION RATES

The following table shows the development of the employer contribution rates.

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
Employer Contribution Amount					
Normal Cost	$1,077,343,417	$69,683,821	$256,627,820	$569,489,822	$142,047,577
Payment on the Unfunded Liability	2,317,753,705	61,447,552	178,810,085	893,140,457	305,327,944
Payment for Term Life Benefits[1]	2,638,986	—	224,541	—	—
Total Employer Contribution Amount	**$3,397,736,108**	**$131,131,373**	**$435,662,446**	**$1,462,630,279**	**$447,375,521**
Projected Payroll	$11,995,388,959	$671,521,835	$2,245,409,223	$3,433,557,349	$847,539,240
Employer Contribution (as a percent of payroll)					
Normal Cost	8.981%	10.377%	11.429%	16.586%	16.760%
Payment on the Unfunded Liability	19.322%	9.150%	7.963%	26.012%	36.025%
Payment for Term Life Benefits[1]	0.022%	0.000%	0.010%	0.000%	0.000%
Total Employer Contribution Rate	**28.325%**	**19.527%**	**19.402%**	**42.598%**	**52.785%**

(1) Sec. 21600-21605

SCHEDULE OF AMORTIZATION BASES FOR THE RETIREMENT PROGRAM

The schedule below shows the development of the payment on the amortization bases used to determine the employer contribution rates. Each row of the schedule gives a brief description of a base (or portion of the Unfunded Actuarial Liability), the date the base was established, the balance of the base on the valuation date, and the number of years remaining in the amortization period. In addition, we show the expected payment for the year immediately following the valuation date, the balance on the date a year after the valuation date, and the scheduled payment for Fiscal Year 2017-18. Please refer to Appendix A for an explanation of how amortization periods are determined.

There is a one-year lag between the valuation date and the start of the contribution fiscal year.

- The assets, liabilities, and funded status of the plan are measured as of the valuation date: June 30, 2016.
- The required employer contributions determined by the valuation are for the fiscal year beginning one year after the valuation date: Fiscal Year 2017-18.

This one-year lag is necessary due to the amount of time needed to extract and test the membership and financial data, and the need to provide with their required employer contribution well in advance of the start of the fiscal year.

The Unfunded Accrued Liability (UAL) is used to determine the employer contribution and therefore must be rolled forward one year from the valuation date to the first day of the fiscal year for which the contribution is being determined. The UAL is rolled forward each year by subtracting the expected payment on the UAL for the fiscal year and adjusting for interest. The expected payment on the UAL for a fiscal year is equal to the Expected Employer Contribution for the fiscal year minus the Expected Normal Cost for the year. The Employer Contribution for the first fiscal year is determined by the actuarial valuation one year ago. The Normal Cost Rate for the fiscal year is assumed to be the same as the rate determined by the current valuation. All expected dollar amounts are determined by multiplying the rate by the expected payroll for the applicable fiscal year, based on payroll as of the valuation date.

State Miscellaneous

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2016	Expected Payment in 2016-17	Amount Remaining on 6/30/2017	Scheduled Payment for Fiscal Year 2017-18	Payment as Percentage of Payroll
Assumption Change	6/30/2003	7	$676,647,737	$101,366,315	$621,512,797	$103,872,249	0.866%
Assumption Change	6/30/2009	13	2,026,835,277	195,287,558	1,973,953,683	199,523,081	1.663%
Assumption Change	6/30/2011	15	1,713,695,177	150,105,697	1,684,537,807	153,218,547	1.277%
Assumption Change	6/30/2013	17	5,434,177,175	456,792,415	5,361,610,722	466,048,487	3.885%
Assumption Change	6/30/2016	20	1,407,997,770	(51,967,132)	1,565,686,939	29,511,167	0.246%
Reclass of BU 7 Members	6/30/2005	9	(78,388,697)	(9,778,167)	(74,037,540)	(10,009,739)	(0.083%)
New Rate Stabilization Policies	6/30/2004	8	(159,213,462)	(21,631,301)	(148,540,689)	(22,154,757)	(0.185%)
Actuarial Equivalent Reduction	6/30/2004	8	220,840,280	30,004,137	206,036,391	30,730,207	0.256%
Benefit Change (SB 1801)	6/30/2003	7	(1,975,043)	(295,875)	(1,814,112)	(303,189)	(0.003%)
(Gain)/Loss Prior to 2009	Various	16	10,471,572,428	879,729,594	10,332,258,297	897,565,280	7.483%
(Gain)/Loss in 2009	6/30/2009	23	1,146,016,690	77,516,016	1,150,211,845	78,853,014	0.657%
(Gain)/Loss in 2010	6/30/2010	24	(44,338,474)	(2,930,526)	(44,571,769)	(2,979,896)	(0.025%)
(Gain)/Loss in 2011	6/30/2011	25	23,306,720	1,507,451	23,463,541	1,532,253	0.013%
(Gain)/Loss	Various	27	310,268,123	19,292,535	313,159,104	19,595,194	0.163%
Payment (Gain)/Loss	Various	27	362,745,371	22,555,581	366,125,318	22,909,431	0.191%
(Gain)/Loss	6/30/2014	28	4,425,916,068	120,930,125	4,627,017,274	184,231,495	1.536%
(Gain)/Loss	6/30/2015	29	3,554,150,350	49,989,249	3,764,469,124	101,460,194	0.846%
(Gain)/Loss	6/30/2016	30	4,345,726,194	36,595,266	4,628,302,788	64,150,688	0.535%
Total			**$35,835,979,682**	**$2,055,068,939**	**$36,349,381,521**	**$2,317,753,705**	**19.322%**

SCHEDULE OF AMORTIZATION BASES FOR THE RETIREMENT PROGRAM (CONTINUED)

State Industrial

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2016	Expected Payment in 2016-17	Amount Remaining on 6/30/2017	Scheduled Payment for Fiscal Year 2017-18	Payment as Percentage of Payroll
Assumption Change	6/30/2003	7	$72,481,991	$10,858,283	$66,575,978	$11,126,716	1.657%
Assumption Change	6/30/2009	13	67,114,072	6,466,506	65,363,018	6,606,756	0.984%
Assumption Change	6/30/2011	15	62,924,572	5,511,678	61,853,953	5,625,978	0.838%
Assumption Change	6/30/2013	17	167,986,261	14,120,787	165,743,019	14,406,917	2.145%
Assumption Change	6/30/2016	20	60,958,259	(3,129,422)	68,696,698	1,294,844	0.193%
New Rate Stabilization Policies	6/30/2004	8	(5,465,735)	(742,594)	(5,099,343)	(760,564)	(0.113%)
Actuarial Equivalent Reduction	6/30/2004	8	9,927,779	1,348,823	9,262,277	1,381,463	0.206%
(Gain)/Loss in 2009	6/30/2009	23	39,631,407	2,680,649	39,776,484	2,726,885	0.406%
(Gain)/Loss in 2010	6/30/2010	24	5,417,369	358,058	5,445,873	364,090	0.054%
(Gain)/Loss in 2011	6/30/2011	25	(7,294,953)	(471,829)	(7,344,038)	(479,592)	(0.071%)
(Gain)/Loss	Various	27	95,779,839	5,955,610	96,672,285	6,049,041	0.901%
Payment (Gain)/Loss	Various	27	(1,446,382)	(89,937)	(1,459,858)	(91,347)	(0.014%)
(Gain)/Loss	6/30/2014	28	138,443,690	3,782,722	144,734,183	5,762,804	0.858%
(Gain)/Loss	6/30/2015	29	149,422,992	2,101,640	158,265,178	4,265,572	0.635%
(Gain)/Loss	6/30/2016	30	216,074,784	3,327,826	228,561,942	3,167,988	0.472%
Total			**$1,071,955,945**	**$52,078,800**	**$1,097,047,649**	**$61,447,552**	**9.150%**

State Safety

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2016	Expected Payment in 2016-17	Amount Remaining on 6/30/2017	Scheduled Payment for Fiscal Year 2017-18	Payment as Percentage of Payroll
Assumption Change	6/30/2003	7	($2,628,202)	($393,722)	($2,414,050)	($403,456)	(0.018%)
Assumption Change	6/30/2009	13	259,487,229	25,001,848	252,717,020	25,544,104	1.138%
Assumption Change	6/30/2011	15	172,599,195	15,118,279	169,662,536	15,431,798	0.687%
Assumption Change	6/30/2013	17	532,274,719	44,742,571	525,166,873	45,649,197	2.033%
Assumption Change	6/30/2016	20	167,215,278	(11,052,645)	191,000,367	3,600,109	0.160%
New Rate Stabilization Policies	6/30/2004	8	(6,166,552)	(837,809)	(5,753,181)	(858,084)	(0.038%)
Benefit Change (Arnett)	6/30/2002	6	77,838,804	13,059,573	70,046,836	13,389,315	0.596%
(Gain)/Loss in 2009	6/30/2009	23	149,151,319	10,088,523	149,697,308	10,262,530	0.457%
(Gain)/Loss in 2010	6/30/2010	24	(111,488,194)	(7,368,749)	(112,074,810)	(7,492,888)	(0.334%)
(Gain)/Loss in 2011	6/30/2011	25	(10,144,353)	(656,125)	(10,212,610)	(666,920)	(0.030%)
(Gain)/Loss	Various	27	827,300,513	51,441,715	835,009,038	52,248,727	2.327%
Payment (Gain)/Loss	Various	27	(42,878,763)	(2,666,210)	(43,278,294)	(2,708,037)	(0.121%)
(Gain)/Loss	6/30/2014	28	174,233,549	4,760,615	182,150,233	7,252,579	0.323%
(Gain)/Loss	6/30/2015	29	411,786,494	5,791,791	436,154,183	11,755,253	0.524%
(Gain)/Loss	6/30/2016	30	401,226,492	11,522,397	418,877,218	5,805,856	0.259%
Total			**$2,999,807,525**	**$158,552,051**	**$3,056,748,667**	**$178,810,085**	**7.963%**

SCHEDULE OF AMORTIZATION BASES FOR THE RETIREMENT PROGRAM (CONTINUED)

State Peace Officers and Firefighters

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2016	Expected Payment in 2016-17	Amount Remaining on 6/30/2017	Scheduled Payment for Fiscal Year 2017-18	Payment as Percentage of Payroll
Assumption Change	6/30/2003	7	$283,898,294	$42,529,846	$260,765,555	$43,581,250	1.269%
Assumption Change	6/30/2009	13	673,031,403	64,847,233	655,471,529	66,253,682	1.930%
Assumption Change	6/30/2011	15	726,602,413	63,644,435	714,239,762	64,964,276	1.892%
Assumption Change	6/30/2013	17	2,497,133,644	209,906,977	2,463,787,634	214,160,363	6.237%
Assumption Change	6/30/2016	20	647,018,499	(26,635,071)	722,335,882	13,615,094	0.397%
Benefit Change (SB 65)	6/30/2006	10	252,640,072	29,221,778	240,992,114	29,898,934	0.871%
New Rate Stabilization Policies	6/30/2004	8	(45,611,484)	(6,196,936)	(42,553,947)	(6,346,896)	(0.185%)
Benefit Change (SB 183)	6/30/2004	8	14,884,600	2,022,274	13,886,821	2,071,211	0.060%
(Gain)/Loss in 2009	6/30/2009	23	371,569,900	25,132,809	372,930,083	25,566,300	0.745%
(Gain)/Loss in 2010	6/30/2010	24	43,989,858	2,907,485	44,221,319	2,956,466	0.086%
(Gain)/Loss in 2011	6/30/2011	25	296,248,049	19,160,978	298,241,372	19,476,232	0.567%
(Gain)/Loss	Various	27	4,595,953,842	285,777,349	4,638,777,494	290,260,591	8.454%
Payment (Gain)/Loss	Various	27	(2,544,866)	(158,240)	(2,568,578)	(160,723)	(0.005%)
(Gain)/Loss	6/30/2014	28	1,515,073,546	41,396,635	1,583,914,236	63,065,874	1.837%
(Gain)/Loss	6/30/2015	29	1,423,203,035	20,017,400	1,507,421,847	40,628,122	1.183%
(Gain)/Loss	6/30/2016	30	1,569,539,271	14,576,471	1,670,188,376	23,149,681	0.674%
Total			**$14,862,630,077**	**$788,151,421**	**$15,142,051,497**	**$893,140,457**	**26.012%**

California Highway Patrol

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2016	Expected Payment in 2016-17	Amount Remaining on 6/30/2017	Scheduled Payment for Fiscal Year 2017-18	Payment as Percentage of Payroll
Assumption Change	6/30/2003	7	$46,630,161	$6,985,507	$42,830,620	$7,158,200	0.845%
Assumption Change	6/30/2009	13	164,531,336	15,852,755	160,238,595	16,196,580	1.911%
Assumption Change	6/30/2011	15	188,408,559	16,503,050	185,202,914	16,845,286	1.988%
Assumption Change	6/30/2013	17	887,827,902	74,630,076	875,972,101	76,142,319	8.984%
Assumption Change	6/30/2016	20	179,072,127	(6,944,885)	199,475,118	3,759,847	0.444%
Benefit Change (AB 2936)	6/30/2008	12	(193,892,007)	(19,733,475)	(187,743,339)	(20,171,081)	(2.380%)
Benefit Change (SB 439)	6/30/2005	9	147,841,628	18,441,691	139,635,316	18,878,438	2.227%
New Rate Stabilization Policies	6/30/2004	8	(15,554,232)	(2,113,253)	(14,511,564)	(2,164,391)	(0.255%)
Benefit Change (SB 1801)	6/30/2003	7	7,387,547	1,106,704	6,785,592	1,134,063	0.134%
Benefit Change (Arnett)	6/30/2002	6	1,446,282	242,653	1,301,504	248,780	0.029%
Benefit Change (AB 2621)	6/30/2001	5	1,868,638	358,384	1,635,086	367,623	0.043%
(Gain)/Loss Prior to 2009	Various	21	1,563,923,213	111,334,405	1,563,895,714	113,346,628	13.374%
(Gain)/Loss in 2009	6/30/2009	23	300,822,104	20,347,462	301,923,306	20,698,415	2.442%
(Gain)/Loss in 2010	6/30/2010	24	100,037,496	6,611,922	100,563,862	6,723,311	0.793%
(Gain)/Loss in 2011	6/30/2011	25	(44,167,193)	(2,856,682)	(44,464,375)	(2,903,683)	(0.343%)
(Gain)/Loss	Various	27	215,321,043	13,388,706	217,327,337	13,598,747	1.604%
Payment (Gain)/Loss	Various	27	(20,738,629)	(1,289,532)	(20,931,865)	(1,309,762)	(0.155%)
(Gain)/Loss	6/30/2014	28	437,730,945	11,960,203	457,620,211	18,220,821	2.150%
(Gain)/Loss	6/30/2015	29	481,178,389	6,767,791	509,652,381	13,736,181	1.621%
(Gain)/Loss	6/30/2016	30	315,515,218	(8,765,403)	347,867,343	4,821,623	0.569%
Total			**$4,765,190,527**	**$262,828,080**	**$4,844,275,855**	**$305,327,944**	**36.025%**

(GAIN)/LOSS ANALYSIS

To calculate the cost requirements of the plan, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year, actual experience is compared to the expected experience based on the actuarial assumptions. This results in actuarial gains or losses, as shown below.

	State Miscellaneous	State Industrial	State Safety
1) Total (Gain)/Loss for the Year			
a) Unfunded Liability/(Surplus) as of June 30, 2015	$29,751,145,525	$784,529,754	$2,395,919,204
b) Expected Payment on the Unfunded Liability During 2015-2016	1,832,740,429	46,726,034	139,124,537
c) Interest Through June 30, 2016 [0.075 x (1a) - $((1 + 0.075)^{1/2}$ - 1) x (1b)]	2,163,850,622	57,119,182	174,571,088
d) Expected Unfunded Liability as of June 30, 2016 After All Changes [(1a) - (1b) + (1c)]	$30,082,255,718	$794,922,902	$2,431,365,755
e) Change Due to Plan Changes	—	—	—
f) Change Due to Assumptions Change	1,407,997,770	60,958,259	167,215,278
g) Expected Unfunded Liability After All Other Changes [(1d) + (1e) + (1f)]	$31,490,253,488	$855,881,161	$2,598,581,033
h) Actual Unfunded Liability as of June 30, 2016	35,835,979,682	1,071,955,945	2,999,807,525
i) Total (Gain)/Loss for 2015/2016 [(1h) - (1g)]	**$4,345,726,194**	**$216,074,784**	**$401,226,492**
2) Contribution (Gain)/Loss for the Year			
a) Expected Contribution for 2015-16	$3,552,720,913	$157,627,761	$589,931,978
b) Actuarial Contribution for 2015-16	3,641,916,990	169,820,696	625,264,710
c) Contribution (Gain)/Loss for 2015-16 [(2a) - (2b)]	**($89,196,077)**	**($12,192,935)**	**($35,332,732)**
3) Asset (Gain)/Loss for the Year			
a) Market Value of Assets as of June 30, 2015	$68,080,012,254	$2,884,662,214	$7,859,091,661
b) Receivables as of June 30, 2015	(336,243,026)	(15,085,562)	(23,866,179)
c) Receivables as of June 30, 2016	319,665,028	15,072,204	21,334,787
d) Contributions Received During 2015-16	3,641,916,990	169,820,696	625,264,710
e) Benefits and Refunds Paid During 2015-16	(5,346,863,931)	(167,358,873)	(502,427,356)
f) Transfers In/Out 2015-16	(1,213,778)	138,348	556,510
g) Expected Interest for 2015-16 [0.075 x (3a + 3b) + $((1 + 0.075)^{1/2}$ - 1) x ((3d) + (3e) + (3f))]	5,017,958,327	215,313,993	592,185,528
h) Expected Assets as of June 30, 2016 [(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]	71,375,231,864	3,102,563,020	8,572,139,661
i) Actual Market Value of Assets as of June 30, 2016	66,607,613,590	2,897,811,466	8,288,200,886
j) Asset (Gain)/Loss for 2015-16 [(3h) - (3i)]	**$4,767,618,274**	**$204,751,554**	**$283,938,775**
4) Liability (Gain)/Loss for the Year			
a) Total (Gain)/Loss for 2015-16 (1i)	$4,345,726,194	$216,074,784	$401,226,492
b) Contribution (Gain)/Loss for 2015-16 (2c)	(89,196,077)	(12,192,935)	(35,332,732)
c) Asset (Gain)/Loss for 2015-16 (3j)	4,767,618,274	204,751,554	283,938,775
d) Liability (Gain)/Loss for 2015-16 [(4a) - (4b) - (4c)]	**($332,696,003)**	**$23,516,166**	**$152,620,449**

(GAIN)/LOSS ANALYSIS (CONTINUED)

	State Peace Officers and Firefighters	California Highway Patrol
1) Total (Gain)/Loss for the Year		
a) Unfunded Liability/(Surplus) as of June 30, 2015	$12,420,491,640	$4,206,779,871
b) Expected Payment on the Unfunded Liability During 2015-2016	680,884,626	242,746,742
c) Interest Through June 30, 2016 [0.075 x (1a) - ((1 + 0.075)$^{1/2}$ - 1) x (1b)]	906,465,293	306,570,053
d) Expected Unfunded Liability as of June 30, 2016 After All Changes [(1a) - (1b) + (1c)]	$12,646,072,307	$4,270,603,182
e) Change Due to Plan Changes	—	—
f) Change Due to Assumptions Change	647,018,499	179,072,127
g) Expected Unfunded Liability After All Other Changes [(1d) + (1e) + (1f)]	$13,293,090,806	$4,449,675,309
h) Actual Unfunded Liability as of June 30, 2016	14,862,630,077	4,765,190,527
i) Total (Gain)/Loss for 2015/2016 [(1h) - (1g)]	**$1,569,539,271**	**$315,515,218**
2) Contribution (Gain)/Loss for the Year		
a) Expected Contribution for 2015-16	$1,578,801,429	$460,965,759
b) Actuarial Contribution for 2015-16	1,654,980,569	463,417,071
c) Contribution (Gain)/Loss for 2015-16 [(2a) - (2b)]	**($76,179,140)**	**($2,451,312)**
3) Asset (Gain)/Loss for the Year		
a) Market Value of Assets as of June 30, 2015	$26,973,473,591	$6,735,006,541
b) Receivables as of June 30, 2015	(91,582,365)	(13,949,650)
c) Receivables as of June 30, 2016	82,985,098	12,571,825
d) Contributions Received During 2015-16	1,654,980,569	463,417,071
e) Benefits and Refunds Paid During 2015-16	(1,822,841,033)	(516,722,760)
f) Transfers In/Out 2015-16	161,130	291,738
g) Expected Interest for 2015-16 [0.075 x (3a + 3b) + ((1 + 0.075)$^{1/2}$ - 1) x ((3d) + (3e) + (3f))]	2,009,966,806	502,127,184
h) Expected Assets as of June 30, 2016 [(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]	28,807,143,796	7,182,741,949
i) Actual Market Value of Assets as of June 30, 2016	26,621,971,404	6,705,506,460
j) Asset (Gain)/Loss for 2015-16 [(3h) - (3i)]	**$2,185,172,392**	**$477,235,489**
4) Liability (Gain)/Loss for the Year		
a) Total (Gain)/Loss for 2015-16 (1i)	$1,569,539,271	$315,515,218
b) Contribution (Gain)/Loss for 2015-16 (2c)	(76,179,140)	(2,451,312)
c) Asset (Gain)/Loss for 2015-16 (3j)	2,185,172,392	477,235,489
d) Liability (Gain)/Loss for 2015-16 [(4a) - (4b) - (4c)]	**($539,453,981)**	**($159,268,959)**

DEVELOPMENT OF GROUP TERM LIFE INSURANCE (GTLI) CONTRIBUTIONS

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
1) GTLI Market Value of Assets as of June 30, 2015	$10,404,822	$1,419,083	$1,365,164	$1,225,826	$427,610
2) Contributions Received for GTLI During Fiscal Year 2015-16	33,667	261	1,492,563	2,419,665	418,564
3) Benefits Paid for GTLI During Fiscal Year 2015-16	(2,835,497)	(123,864)	(566,354)	(867,948)	(181,833)
4) Investment Return During Fiscal Year 2015-16	33,992	4,501	7,060	7,389	1,921
5) GTLI Market Value of Assets as of June 30, 2016	$7,636,984	$1,299,981	$2,298,433	$2,784,932	$666,262
6) Expected GTLI Benefit Payments for Fiscal Year 2016-17	6,769,046	390,763	1,667,532	1,864,256	381,752
7) Closed Group Projected Payroll for Fiscal Year 2016-17	11,306,629,981	643,573,396	2,115,715,832	3,305,697,490	814,465,358
8) Required GTLI Contribution Rate [(1.5 x (6) - (5), but not less than zero) / (7)]	0.022%	0.000%	0.010%	0.000%	0.000%
9) Projected Payroll for Contributions	$11,995,388,959	$671,521,835	$2,245,409,223	$3,433,557,349	$847,539,240
10) Required GTLI Contribution for Fiscal Year 2017-18[1] [(8) x (9)]	$2,638,986	$0	$224,541	$0	$0

(1) The Required GTLI Contribution for Miscellaneous Tier 1 and Tier 2 is divided equally between the two groups as a percentage of payroll.

RECONCILIATION OF EMPLOYER CONTRIBUTION RATES

Change in Normal Cost Rate from 2016-17 to 2017-18 for the Retirement Program

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Normal Cost Rate	8.720%	10.213%	11.298%	16.234%	16.000%
Effect of Changes in Demographic Results	(0.185%)	(0.316%)	(0.376%)	(0.447%)	(0.084%)
Effect of Change in Assumptions	0.446%	0.480%	0.507%	0.799%	0.844%
2017-18 Normal Cost Rate	8.981%	10.377%	11.429%	16.586%	16.760%

Change in Unfunded Liability Amortization Rate from 2016-17 to 2017-18 for the Retirement Program

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Rate to Amortize the Unfunded Liability	17.914%	8.152%	7.404%	23.995%	32.701%
Effect of Progression of Amortization Bases and Change in Payroll	0.813%	0.418%	0.222%	1.231%	2.698%
Effect of (Gain)/Loss	0.543%	0.479%	0.263%	0.685%	0.578%
Effect of Change in Assumptions	0.052%	0.101%	0.074%	0.101%	0.048%
2017-18 Rate to Amortize the Unfunded Liability	19.322%	9.150%	7.963%	26.012%	36.025%

Change in Group Term Life Rate from 2016-17 to 2017-18

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Group Term Life Rate	0.000%	0.000%	0.051%	0.047%	0.018%
Effect of Changes in Demographic Results	0.022%	0.000%	(0.041%)	(0.047%)	(0.018%)
Effect of Change in Assumptions	0.000%	0.000%	0.000%	0.000%	0.000%
2017-18 Group Term Life Rate	0.022%	0.000%	0.010%	0.000%	0.000%

Change in Total Rate from 2016-17 to 2017-18

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Employer Rates	26.634%	18.365%	18.753%	40.276%	48.719%
Effect of Progression of Amortization Bases and Change in Payroll	0.813%	0.418%	0.222%	1.231%	2.698%
Effect of (Gain)/Loss and Changes in Demographic results	0.380%	0.163%	(0.154%)	0.191%	0.476%
Effect of Change in Assumptions	0.498%	0.581%	0.581%	0.900%	0.892%
2017-18 Employer Rates	28.325%	19.527%	19.402%	42.598%	52.785%

RECONCILIATION OF EMPLOYER CONTRIBUTIONS

Change in Normal Cost Contribution from 2016-17 to 2017-18 for the Retirement Program

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Normal Cost Contribution	$1,007,791,001	$64,999,917	$241,207,373	$541,399,280	$136,283,515
Effect of Change in Payroll	38,153,166	3,582,608	12,478,961	16,004,420	(677,237)
Effect of Changes in Demographic Results	(22,150,416)	(2,122,009)	(8,442,739)	(15,348,001)	(711,933)
Effect of Change in Assumptions	53,549,666	3,223,305	11,384,225	27,434,123	7,153,232
2017-18 Normal Cost Contribution	$1,077,343,417	$69,683,821	$256,627,820	$569,489,822	$142,047,577

Change in Unfunded Liability Amortization Contribution from 2016-17 to 2017-18 for the Retirement Program

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Amortization of the Unfunded Liability	$2,070,440,804	$51,880,397	$158,082,300	$800,210,022	$278,538,368
Effect of Progression of Amortization Bases	175,881,167	5,669,202	13,159,731	65,943,492	21,486,480
Effect of (Gain)/Loss	65,173,333	3,218,502	5,898,479	23,518,729	4,898,388
Effect of Change in Assumptions	6,258,401	679,451	1,669,575	3,468,214	404,708
2017-18 Amortization of the Unfunded Liability	$2,317,753,705	$61,447,552	$178,810,085	$893,140,457	$305,327,944

Change in Group Term Life Rate from 2016-17 to 2017-18

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Group Term Life Contribution	$0	$0	$1,088,828	$1,567,437	$153,319
Effect of Change in Payroll	—	—	56,331	46,335	(762)
Effect of Changes in Demographic Results	2,638,986	—	(920,618)	(1,613,772)	(152,557)
Effect of Change in Assumptions	—	—	—	—	—
2017-18 Group Term Life Contribution	$2,638,986	$0	$224,541	$0	$0

Change in Total Contribution from 2016-17 to 2017-18

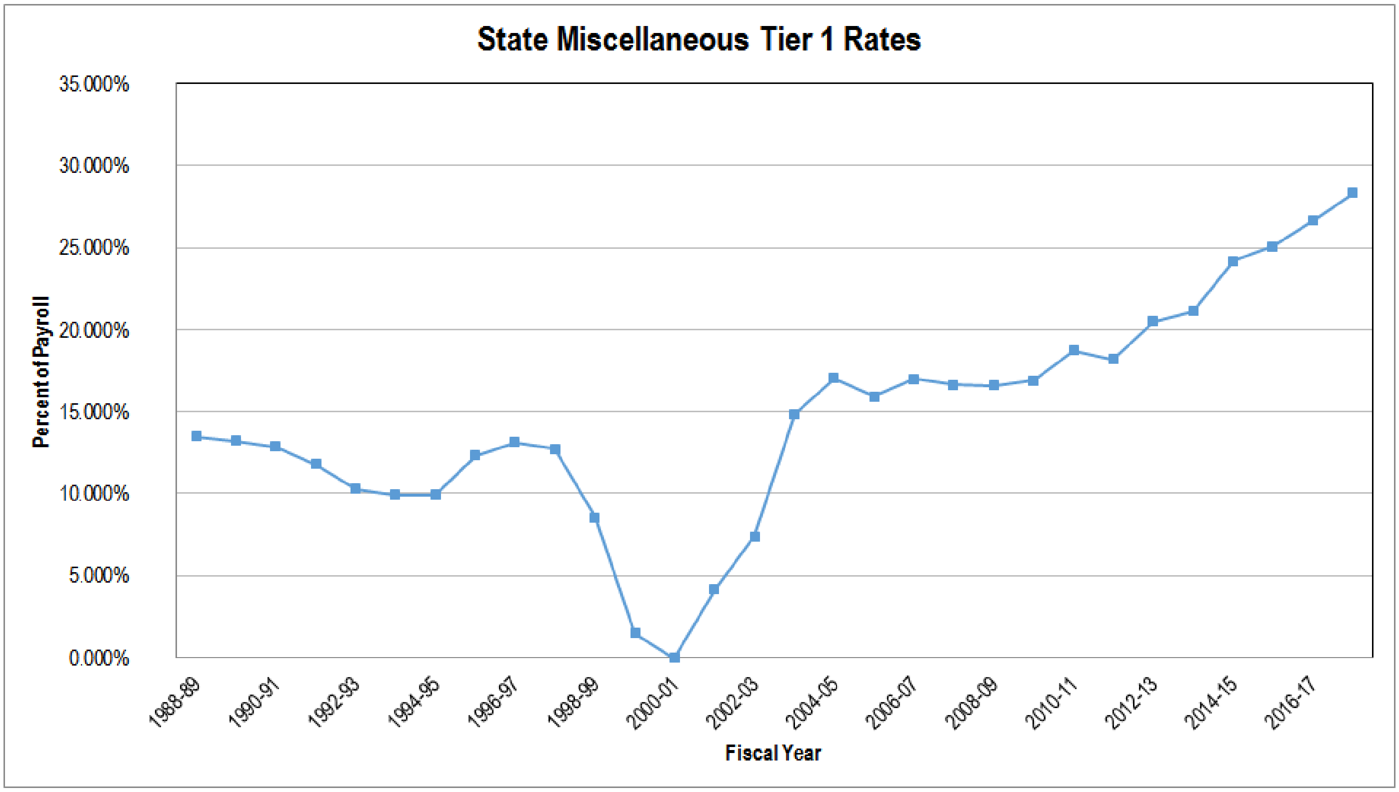
	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2016-17 Employer Contribution	$3,078,231,805	$116,880,314	$400,378,501	$1,343,176,739	$414,975,202
Effect of Change in Payroll and Progression of Amortization Bases	214,034,333	9,251,810	25,695,023	81,994,247	20,808,481
Effect of (Gain)/Loss and Changes in Demographic results	45,661,903	1,096,493	(3,464,878)	6,556,956	4,033,898
Effect of Change in Assumptions	59,808,067	3,902,756	13,053,800	30,902,337	7,557,940
2017-18 Employer Contribution	$3,397,736,108	$131,131,373	$435,662,446	$1,462,630,279	$447,375,521

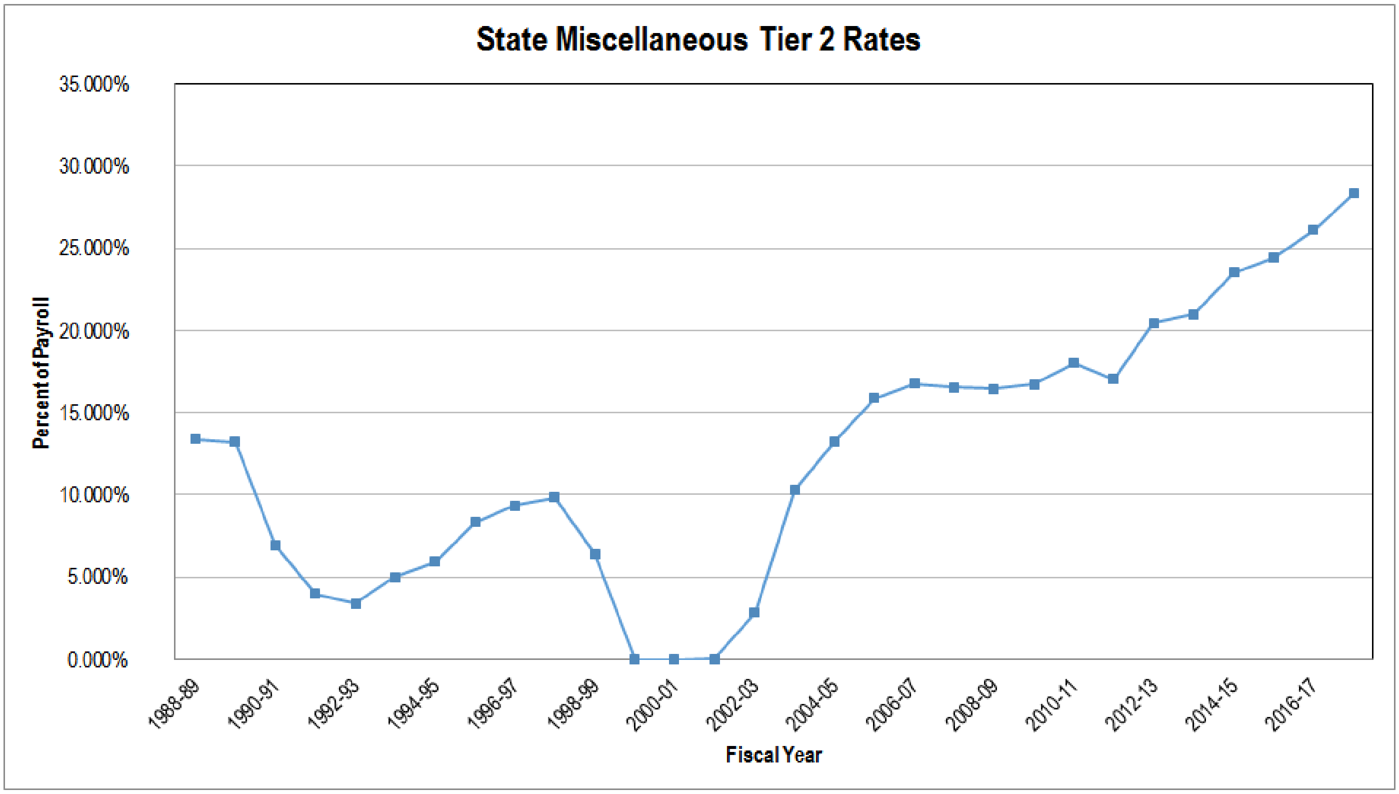
EMPLOYER CONTRIBUTION RATE HISTORY

The table below provides a history of the contribution rates for the various State plans. In cases where the contribution rate changed during the course of a fiscal year, the entry shown is the weighted average of the rates effective during the fiscal year.

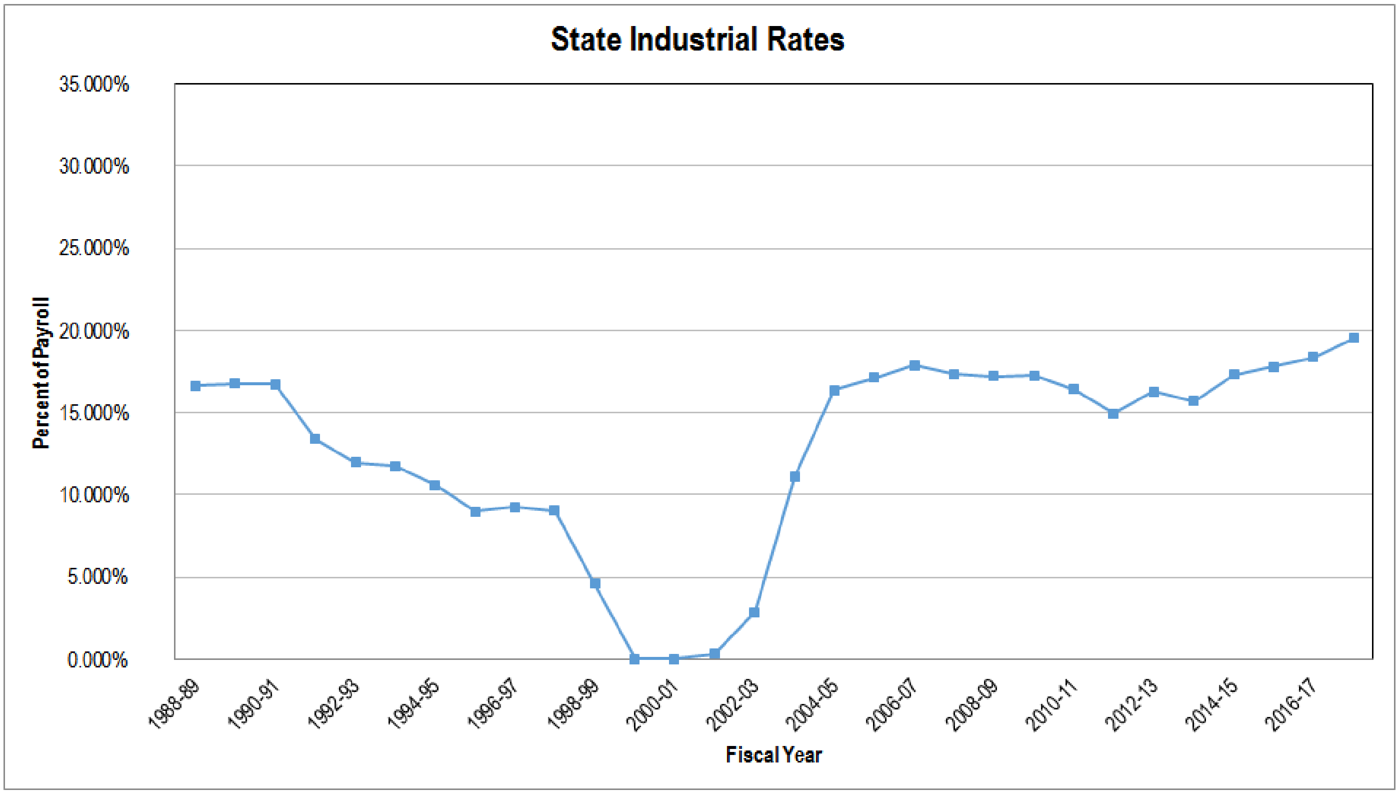
	State Miscellaneous					
Fiscal Year	Tier 1	Tier 2	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2017-18	28.325%	28.325%	19.527%	19.402%	42.598%	52.785%
2016-17	26.646%	26.095%	18.365%	18.753%	40.276%	48.719%
2015-16	25.068%	24.389%	17.775%	18.082%	37.338%	45.406%
2014-15	24.198%	23.510%	17.286%	18.156%	35.180%	42.175%
2013-14	21.121%	20.992%	15.682%	17.205%	30.495%	34.616%
2012-13	20.503%	20.457%	16.302%	17.503%	30.297%	33.728%
2011-12	18.175%	17.025%	14.934%	16.428%	27.415%	31.264%
2010-11	18.725%	18.032%	16.433%	18.187%	28.722%	31.291%
2009-10	16.917%	16.737%	17.251%	18.099%	25.848%	28.438%
2008-09	16.574%	16.470%	17.236%	18.411%	26.064%	32.149%
2007-08	16.633%	16.565%	17.345%	18.835%	25.552%	32.212%
2006-07	16.997%	16.778%	17.861%	19.294%	24.505%	31.463%
2005-06	15.942%	15.890%	17.147%	19.026%	23.563%	26.396%
2004-05	17.022%	13.216%	16.386%	20.773%	23.841%	33.434%
2003-04	14.843%	10.265%	11.099%	21.930%	20.325%	32.653%
2002-03	7.413%	2.813%	2.858%	17.055%	13.925%	23.076%
2001-02	4.166%	0.036%	0.350%	12.923%	9.638%	16.897%
2000-01	0.000%	0.000%	0.026%	6.808%	2.729%	13.711%
1999-00	1.491%	0.000%	0.026%	7.487%	0.000%	13.345%
1998-99	8.541%	6.437%	4.583%	9.440%	9.591%	13.541%
1997-98	12.721%	9.822%	9.048%	13.754%	15.270%	15.515%
1996-97	13.106%	9.345%	9.260%	14.656%	15.401%	15.851%
1995-96	12.350%	8.326%	8.981%	14.228%	14.350%	14.778%
1994-95	9.934%	5.947%	10.597%	13.927%	12.817%	15.552%
1993-94	9.939%	5.005%	11.765%	15.485%	15.202%	16.940%
1992-93	10.266%	3.391%	11.995%	15.698%	15.560%	17.074%
1991-92	11.804%	3.986%	13.399%	17.376%	17.386%	21.721%
1990-91	12.878%	6.975%	16.720%	17.916%	15.702%	18.090%
1989-90	13.224%	13.218%	16.783%	17.424%	16.200%	18.318%
1988-89	13.464%	13.413%	16.626%	17.296%	16.431%	18.453%

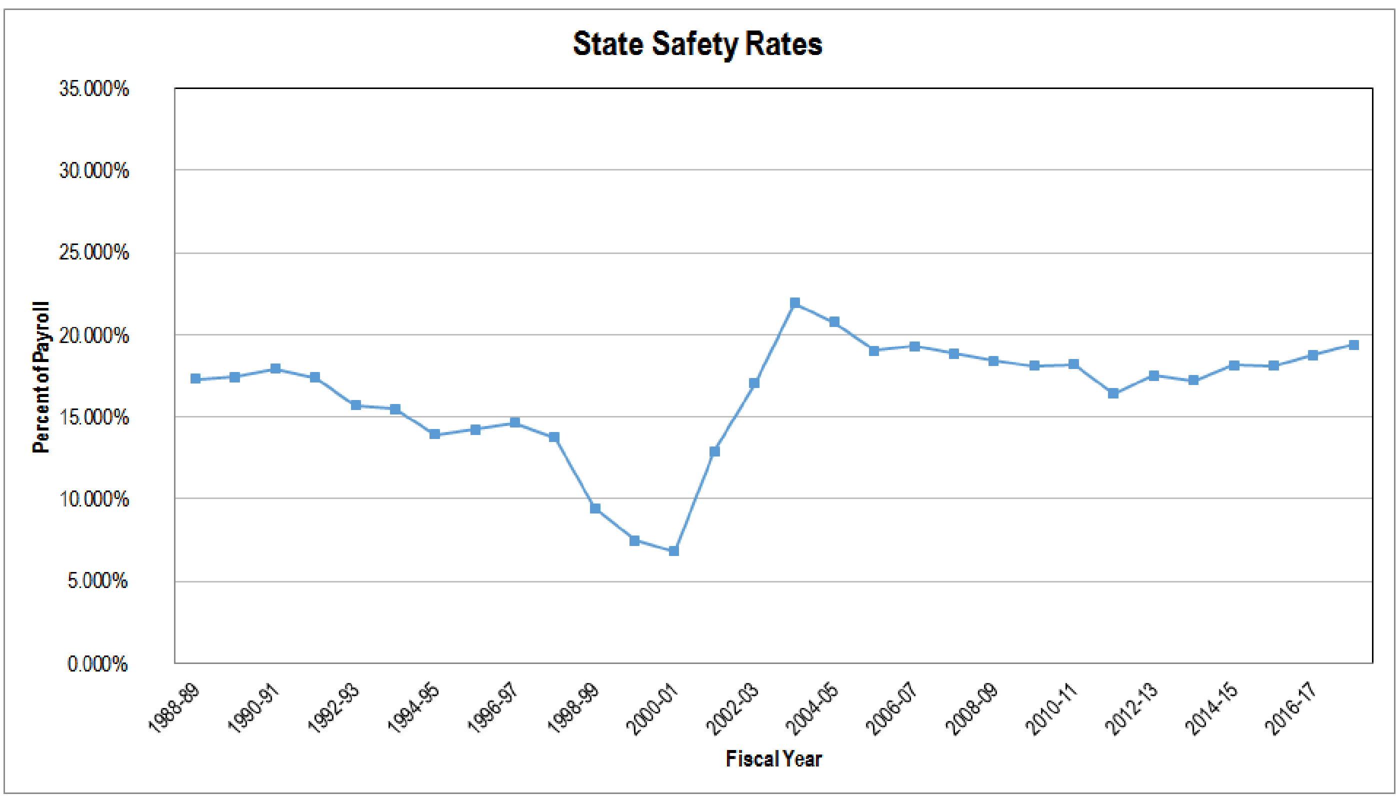
EMPLOYER CONTRIBUTION RATE HISTORY (CONTINUED)



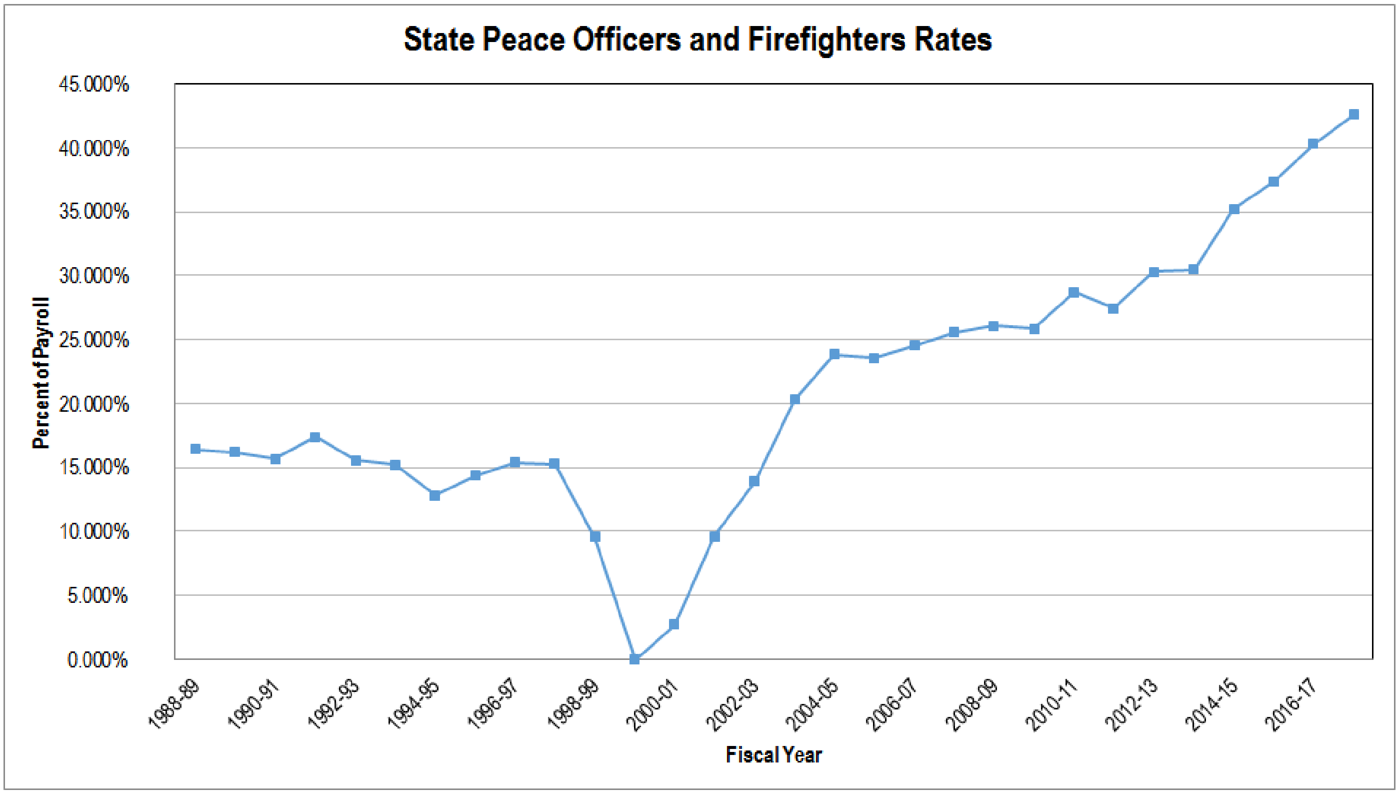


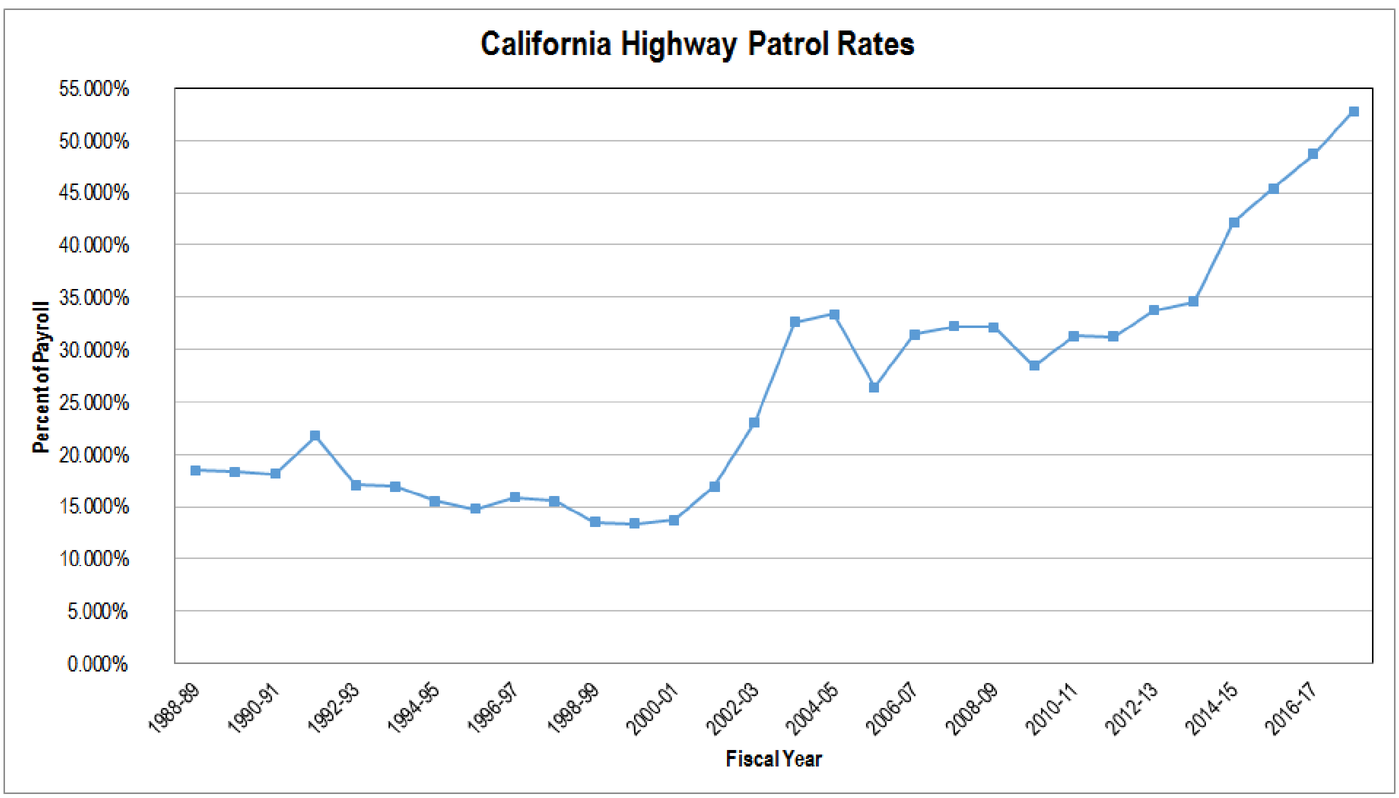
EMPLOYER CONTRIBUTION RATE HISTORY (CONTINUED)





EMPLOYER CONTRIBUTION RATE HISTORY (CONTINUED)





HISTORY OF FUNDED STATUS AND FUNDING PROGRESS

Shown below is the history of funding progress for the plans. One could view the trend in the ratio of the unfunded liability to covered payroll as a measure of the ability of the employer to address the unfunded liability.

State Miscellaneous (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets (MVA)	Funded Status (MVA)	Unfunded Liabilities/(Surplus) (MVA)	Projected Payroll for Contribution	Unfunded/(Surplus) as a % of Payroll
6/30/16	$102,444	$66,608	65.0%	$35,836	$11,995	298.7%
6/30/15	97,831	68,080	69.6%	29,751	11,558	257.4%
6/30/14	94,442	68,359	72.4%	26,084	10,854	240.3%
6/30/13	90,277	60,029	66.5%	30,248	10,014	302.1%
6/30/12	83,524	55,371	66.3%	28,152	10,254	274.6%
6/30/11	81,271	57,452	70.7%	23,819	10,426	228.5%
6/30/10	76,980	48,646	63.2%	28,335	10,515	269.5%
6/30/09	74,763	44,094	59.0%	30,669	10,465	293.1%
6/30/08	69,648	59,979	86.1%	9,669	10,241	94.4%
6/30/07	65,342	64,442	98.6%	900	9,530	9.4%
6/30/06	61,299	55,051	89.8%	6,248	8,956	69.8%
6/30/05	58,267	50,231	86.2%	8,036	8,897	90.3%
6/30/04	54,701	45,460	83.1%	9,241	9,079	101.8%
6/30/03	51,559	39,324	76.3%	12,235	9,207	132.9%
6/30/02	48,118	39,530	82.2%	8,588	9,238	93.0%
6/30/01	45,261	43,933	97.1%	1,328	8,816	15.1%
6/30/00	42,386	49,208	116.1%	(6,822)	8,246	(82.7%)
6/30/99	35,771	46,176	129.1%	(10,405)	7,332	(141.9%)
6/30/98	34,169	42,011	122.9%	(7,842)	6,592	(119.0%)
6/30/97	32,557	35,959	110.4%	(3,401)	6,624	(51.4%)
6/30/96	31,742	30,452	95.9%	1,290	6,881	18.8%
6/30/95	29,960	27,088	90.4%	2,872	7,009	41.0%
6/30/94	27,821	24,278	87.3%	3,542	6,827	51.9%
6/30/93	26,162	24,715	94.5%	1,447	6,310	22.9%
6/30/92	24,887	22,979	92.3%	1,908	6,243	30.6%
6/30/91	23,153	22,441	96.9%	711	6,303	11.3%
6/30/90	22,442	16,027	71.4%	6,415	5,816	110.3%
6/30/89	19,972	17,132	85.8%	2,840	5,348	53.1%
6/30/88	18,552	14,534	78.3%	4,017	4,912	81.8%
6/30/87	17,217	14,341	83.3%	2,875	4,633	62.1%

HISTORY OF FUNDED STATUS AND FUNDING PROGRESS (CONTINUED)

State Industrial (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets (MVA)	Funded Status (MVA)	Unfunded Liabilities/(Surplus) (MVA)	Projected Payroll for Contribution	Unfunded/(Surplus) as a % of Payroll
6/30/16	$3,970	$2,898	73.0%	$1,072	$672	159.6%
6/30/15	3,669	2,885	78.6%	785	636	123.3%
6/30/14	3,458	2,825	81.7%	633	581	108.9%
6/30/13	3,236	2,418	74.7%	818	532	153.7%
6/30/12	2,968	2,168	73.0%	800	578	138.4%
6/30/11	2,832	2,180	77.0%	652	616	105.7%
6/30/10	2,614	1,785	68.3%	830	616	134.7%
6/30/09	2,467	1,556	63.1%	912	574	158.9%
6/30/08	2,235	2,034	91.0%	201	522	38.5%
6/30/07	2,044	2,119	103.7%	(76)	440	(17.2%)
6/30/06	1,870	1,776	95.0%	94	381	24.6%
6/30/05	1,754	1,586	90.4%	168	380	44.2%
6/30/04	1,602	1,415	88.3%	187	378	49.5%
6/30/03	1,462	1,201	82.1%	261	381	68.5%
6/30/02	1,295	1,200	92.7%	95	390	24.4%
6/30/01	1,196	1,325	110.8%	(129)	390	(33.1%)
6/30/00	1,079	1,463	135.6%	(384)	379	(101.3%)
6/30/99	880	1,360	154.5%	(480)	344	(139.5%)
6/30/98	790	1,226	155.2%	(436)	297	(147.1%)
6/30/97	741	1,042	140.7%	(302)	285	(106.0%)
6/30/96	721	861	119.4%	(140)	294	(47.7%)
6/30/95	659	751	113.9%	(91)	271	(33.7%)
6/30/94	619	665	107.5%	(46)	235	(19.7%)
6/30/93	597	668	111.8%	(71)	278	(25.4%)
6/30/92	540	610	113.0%	(70)	268	(26.2%)
6/30/91	492	579	117.6%	(87)	256	(33.8%)
6/30/90	460	401	87.2%	59	224	26.2%
6/30/89	386	406	105.0%	(19)	191	(10.1%)
6/30/88	345	347	100.8%	(3)	167	(1.6%)
6/30/87	316	350	110.8%	(34)	146	(23.4%)

HISTORY OF FUNDED STATUS AND FUNDING PROGRESS (CONTINUED)

State Safety (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets (MVA)	Funded Status (MVA)	Unfunded Liabilities/(Surplus) (MVA)	Projected Payroll for Contribution	Unfunded/(Surplus) as a % of Payroll
6/30/16	$11,288	$8,288	73.4%	$3,000	$2,245	133.6%
6/30/15	10,255	7,859	76.6%	2,396	2,135	112.2%
6/30/14	9,551	7,562	79.2%	1,990	2,038	97.6%
6/30/13	8,834	6,327	71.6%	2,507	1,881	133.3%
6/30/12	7,827	5,524	70.6%	2,303	1,899	121.3%
6/30/11	7,224	5,390	74.6%	1,835	1,984	92.5%
6/30/10	6,436	4,196	65.2%	2,239	2,004	111.7%
6/30/09	6,006	3,514	58.5%	2,492	2,048	121.7%
6/30/08	5,146	4,365	84.8%	781	1,914	40.8%
6/30/07	4,467	4,342	97.2%	126	1,530	8.2%
6/30/06	3,907	3,486	89.2%	421	1,226	34.3%
6/30/05	3,473	3,000	86.4%	473	1,107	42.7%
6/30/04	3,087	2,509	81.3%	579	889	65.1%
6/30/03	2,788	2,049	73.5%	739	891	82.9%
6/30/02	2,476	1,926	77.8%	551	876	62.9%
6/30/01	2,179	2,000	91.8%	180	850	21.1%
6/30/00	1,865	2,122	113.8%	(257)	759	(33.9%)
6/30/99	1,364	1,927	141.3%	(563)	682	(82.6%)
6/30/98	1,285	1,672	130.1%	(386)	511	(75.7%)
6/30/97	1,086	1,404	129.2%	(318)	414	(76.8%)
6/30/96	947	1,123	118.6%	(176)	474	(37.2%)
6/30/95	914	936	102.5%	(23)	408	(5.5%)
6/30/94	761	762	100.1%	(1)	385	(0.2%)
6/30/93	644	722	112.0%	(77)	265	(29.2%)
6/30/92	602	680	112.8%	(77)	263	(29.4%)
6/30/91	548	637	116.2%	(89)	262	(33.8%)
6/30/90	499	426	85.3%	73	232	31.5%
6/30/89	420	440	104.8%	(20)	185	(11.0%)
6/30/88	370	372	100.7%	(2)	134	(1.9%)
6/30/87	350	387	110.8%	(38)	113	(33.4%)

HISTORY OF FUNDED STATUS AND FUNDING PROGRESS (CONTINUED)

State Peace Officers and Firefighters (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets (MVA)	Funded Status (MVA)	Unfunded Liabilities/(Surplus) (MVA)	Projected Payroll for Contribution	Unfunded/(Surplus) as a % of Payroll
6/30/16	$41,485	$26,622	64.2%	$14,863	$3,434	432.9%
6/30/15	39,394	26,973	68.5%	12,420	3,335	372.4%
6/30/14	37,466	26,591	71.0%	10,875	3,206	339.2%
6/30/13	35,271	22,919	65.0%	12,352	3,087	400.1%
6/30/12	31,336	20,526	65.5%	10,810	3,132	345.2%
6/30/11	30,127	20,801	69.0%	9,326	3,393	274.8%
6/30/10	27,712	17,199	62.1%	10,512	3,455	304.3%
6/30/09	26,291	15,083	57.4%	11,208	3,592	312.0%
6/30/08	24,004	19,734	82.2%	4,270	3,589	119.0%
6/30/07	22,250	20,539	92.3%	1,711	3,420	50.0%
6/30/06	19,737	16,973	86.0%	2,764	3,058	90.4%
6/30/05	17,753	14,985	84.4%	2,769	2,860	96.8%
6/30/04	15,668	12,999	83.0%	2,670	2,604	102.5%
6/30/03	14,220	11,038	77.6%	3,182	2,507	126.9%
6/30/02	12,827	10,731	83.7%	2,095	2,407	87.1%
6/30/01	11,949	11,574	96.9%	375	2,304	16.3%
6/30/00	10,720	12,668	118.2%	(1,947)	2,227	(87.4%)
6/30/99	8,091	11,685	144.4%	(3,594)	2,018	(178.1%)
6/30/98	7,016	10,322	147.1%	(3,306)	1,540	(214.6%)
6/30/97	6,495	8,436	129.9%	(1,941)	1,410	(137.7%)
6/30/96	6,129	6,860	111.9%	(731)	1,654	(44.2%)
6/30/95	5,552	5,892	106.1%	(340)	1,592	(21.4%)
6/30/94	4,884	5,032	103.0%	(148)	1,505	(9.8%)
6/30/93	4,476	4,867	108.7%	(392)	1,348	(29.1%)
6/30/92	4,193	4,232	100.9%	(39)	1,332	(2.9%)
6/30/91	3,773	3,854	102.1%	(81)	1,320	(6.1%)
6/30/90	3,440	2,585	75.2%	855	1,151	74.3%
6/30/89	2,665	2,595	97.4%	70	1,002	7.0%
6/30/88	2,323	2,060	88.7%	263	893	29.4%
6/30/87	2,047	1,903	93.0%	144	791	18.2%

HISTORY OF FUNDED STATUS AND FUNDING PROGRESS (CONTINUED)

California Highway Patrol (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets (MVA)	Funded Status (MVA)	Unfunded Liabilities/(Surplus) (MVA)	Projected Payroll for Contribution	Unfunded/(Surplus) as a % of Payroll
6/30/16	$11,471	$6,706	58.5%	$4,765	$848	562.2%
6/30/15	10,942	6,735	61.6%	4,207	852	493.9%
6/30/14	10,329	6,645	64.3%	3,684	801	460.0%
6/30/13	9,775	5,760	58.9%	4,014	767	523.5%
6/30/12	8,659	5,220	60.3%	3,439	773	445.0%
6/30/11	8,193	5,336	65.1%	2,857	780	366.4%
6/30/10	7,704	4,440	57.6%	3,264	767	425.4%
6/30/09	7,300	3,932	53.9%	3,368	734	459.1%
6/30/08	6,609	5,238	79.3%	1,371	675	203.2%
6/30/07	6,249	5,546	88.8%	703	613	114.6%
6/30/06	5,744	4,682	81.5%	1,062	556	191.0%
6/30/05	5,349	4,249	79.4%	1,100	546	201.4%
6/30/04	4,742	3,734	78.7%	1,008	509	198.2%
6/30/03	4,421	3,230	73.1%	1,191	476	250.3%
6/30/02	4,138	3,159	76.3%	979	461	212.3%
6/30/01	3,981	3,466	87.1%	515	455	113.2%
6/30/00	3,635	3,443	94.7%	192	433	44.4%
6/30/99	2,983	3,249	108.9%	(266)	402	(66.1%)
6/30/98	2,756	2,901	105.3%	(145)	367	(39.5%)
6/30/97	2,621	2,912	111.1%	(291)	371	(78.6%)
6/30/96	2,328	2,496	107.2%	(168)	343	(49.0%)
6/30/95	2,134	2,207	103.4%	(73)	302	(24.2%)
6/30/94	1,971	1,968	99.9%	2	288	0.8%
6/30/93	1,773	1,941	109.5%	(168)	279	(60.2%)
6/30/92	1,733	1,956	112.9%	(224)	282	(79.2%)
6/30/91	1,629	1,916	117.6%	(287)	288	(99.7%)
6/30/90	1,613	1,395	86.5%	218	271	80.3%
6/30/89	1,415	1,484	104.9%	(69)	249	(27.6%)
6/30/88	1,291	1,300	100.7%	(9)	226	(4.2%)
6/30/87	1,197	1,326	110.8%	(129)	216	(59.8%)

Risk Analysis

Risk Analysis

PROJECTED RATES

The table below shows the required and projected employer contribution rates for the next six fiscal years. Projected results reflect the adopted changes to the discount rate described in Appendix A, "Actuarial Assumptions Applicable to All Plans." The projections reflect an 11.2% investment return for Fiscal Year 2016-17 and also assume that all actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. The projected normal cost percentages in the projections reflect that the normal cost will decline over time as new employees are hired into PEPRA or other lower cost benefit tiers. The State is expected to contribute $6 billion in additional contributions during the 2017-18 Fiscal year as authorized by SB 84. The expected impact of the additional contribution is reflected in the projected contribution rates.

	New Rate	Projected Future Employer Contribution Rates					
Plan	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
State Miscellaneous	28.325%	29.4%	31.5%	32.6%	33.2%	33.4%	33.8%
State Industrial	19.527%	20.6%	22.6%	23.5%	24.1%	24.3%	24.6%
State Safety	19.402%	19.9%	21.4%	21.8%	22.0%	22.0%	21.4%
State Peace Officers &	42.598%	43.9%	47.1%	48.5%	49.3%	49.5%	50.1%
California Highway Patrol	52.785%	54.1%	57.6%	59.2%	60.1%	60.5%	61.4%

Changes in the Unfunded Accrued Liability (UAL) due to actuarial gains or losses as well as changes in actuarial assumptions or methods are amortized using a 5-year ramp up. For more information, please see “Amortization of the Unfunded Actuarial Accrued Liability” under “Actuarial Methods” in Appendix A. This method phases in the impact of unanticipated changes in UAL over a 5-year period and attempts to minimize employer cost volatility from year to year. As a result of this methodology, dramatic changes in the required employer contributions in any one year are less likely. However, required contributions can change gradually and significantly over the next five years. In years where there is a large increase in UAL the relatively small amortization payments during the ramp up period could result in a funded ratio that is projected to decrease initially while the contribution impact of the increase in the UAL is phased in.

Due to the adopted changes in the discount rate for the next two valuations in combination with the 5-year phase-in ramp, the increases in the required contributions are expected to continue for seven years from Fiscal Year 2017-18 through Fiscal Year 2023-24.

ANALYSIS OF FUTURE INVESTMENT RETURN SCENARIOS

Analysis was performed to determine the effects of various future investment returns on required employer contributions. The projections below provide a range of results based on an 11.2 % investment return for Fiscal Year 2016-17 and five investment return scenarios assumed to occur during the three following fiscal years (2017-18, 2018-19 and 2019-20). The projections also assume that all other actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur. The projected normal cost percentages in the projections reflect that the normal cost will decline over time as new employees are hired into PEPRA or other lower cost benefit tiers. The projected rates also reflect the $6 billion additional contribution the State is expected to make in the 2017-18 Fiscal Year.

For fiscal years 2017-18, 2018-19, and 2019-20 each scenario assumes an alternate fixed annual return. The fixed return assumptions for the five scenarios are -3.0 percent, 3.0 percent, 7.0 percent, (7.25 percent for 2017-18), 11.0 percent and 17.0 percent.

The alternate investment returns were chosen based on stochastic analysis of possible future investment returns over the four year period ending June 30, 2020. Using the expected returns and volatility of the asset classes in which the funds are invested, we produced ten thousand stochastic outcomes for this period. We then selected annual returns that approximate the 5th, 25th, 50th, 75th, and 95th percentiles for these outcomes. For example, of all of the 4-year outcomes generated in the stochastic analysis, approximately 25 percent of them had an average annual return of 3.0 percent or less.

ANALYSIS OF FUTURE INVESTMENT RETURN SCENARIOS (CONTINUED)

Required contributions outside of this range are also possible. In particular, while it is unlikely that investment returns will average less than -3.0 percent or greater than 17.0 percent over this four year period, the possibility of a single investment return less than -3.0 percent or greater than 17.0 percent in any given year is much greater.

The tables below show the projected contribution rates for 2019-20 through 2021-22 for the various State Plans under the five different scenarios.

Estimated: 2019-20 Rates as a % of Payroll

	Investment Scenario				
	1st Scenario	2nd Scenario	3rd Scenario	4th Scenario	5th Scenario
Plan	(3.0%)	3.0%	Assumed	11.0%	17.0%
State Miscellaneous	32.4%	31.9%	31.5%	31.2%	30.7%
State Industrial	23.3%	22.9%	22.6%	22.3%	21.9%
State Safety	22.0%	21.6%	21.4%	21.1%	20.8%
State Peace Officers & Firefighters	48.3%	47.6%	47.1%	46.6%	45.9%
California Highway Patrol	58.9%	58.1%	57.6%	57.1%	56.3%

Estimated: 2020-21 Rates as a % of Payroll

	Investment Scenario				
	1st Scenario	2nd Scenario	3rd Scenario	4th Scenario	5th Scenario
Plan	(3.0%)	3.0%	Assumed	11.0%	17.0%
State Miscellaneous	35.1%	33.6%	32.6%	31.6%	30.0%
State Industrial	25.5%	24.3%	23.5%	22.7%	21.5%
State Safety	23.6%	22.5%	21.8%	21.1%	20.0%
State Peace Officers & Firefighters	52.1%	50.0%	48.5%	47.1%	44.8%
California Highway Patrol	62.9%	60.8%	59.2%	57.8%	55.4%

Estimated: 2021-22 Rates as a % of Payroll

	Investment Scenario				
	1st Scenario	2nd Scenario	3rd Scenario	4th Scenario	5th Scenario
Plan	(3.0%)	3.0%	Assumed	11.0%	17.0%
State Miscellaneous	38.0%	35.3%	33.2%	31.2%	27.9%
State Industrial	28.0%	25.8%	24.1%	22.5%	11.3%
State Safety	25.4%	23.5%	22.0%	20.6%	11.8%
State Peace Officers & Firefighters	56.3%	52.3%	49.3%	46.4%	41.6%
California Highway Patrol	67.3%	63.2%	60.1%	57.1%	52.1%

Given the temporary suspension of the Risk Mitigation Policy during the period over which the discount rate assumption is being phased down to 7.0 percent, the projections above were performed without reflection of any possible impact of this Policy.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229

The discount rate reflects expectations of what the markets will deliver in the future and it is calculated based on two components: expected price inflation and real rate of return. A change in either of those components over the long term would necessitate further evaluation of the discount rate.

This section includes an analysis of discount rate sensitivity on employer contribution rates under two different discount rate scenarios. This type of analysis gives the reader a sense of the long-term risk to the employer contribution rates and changes to the funded status on a Market Value of Assets basis.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

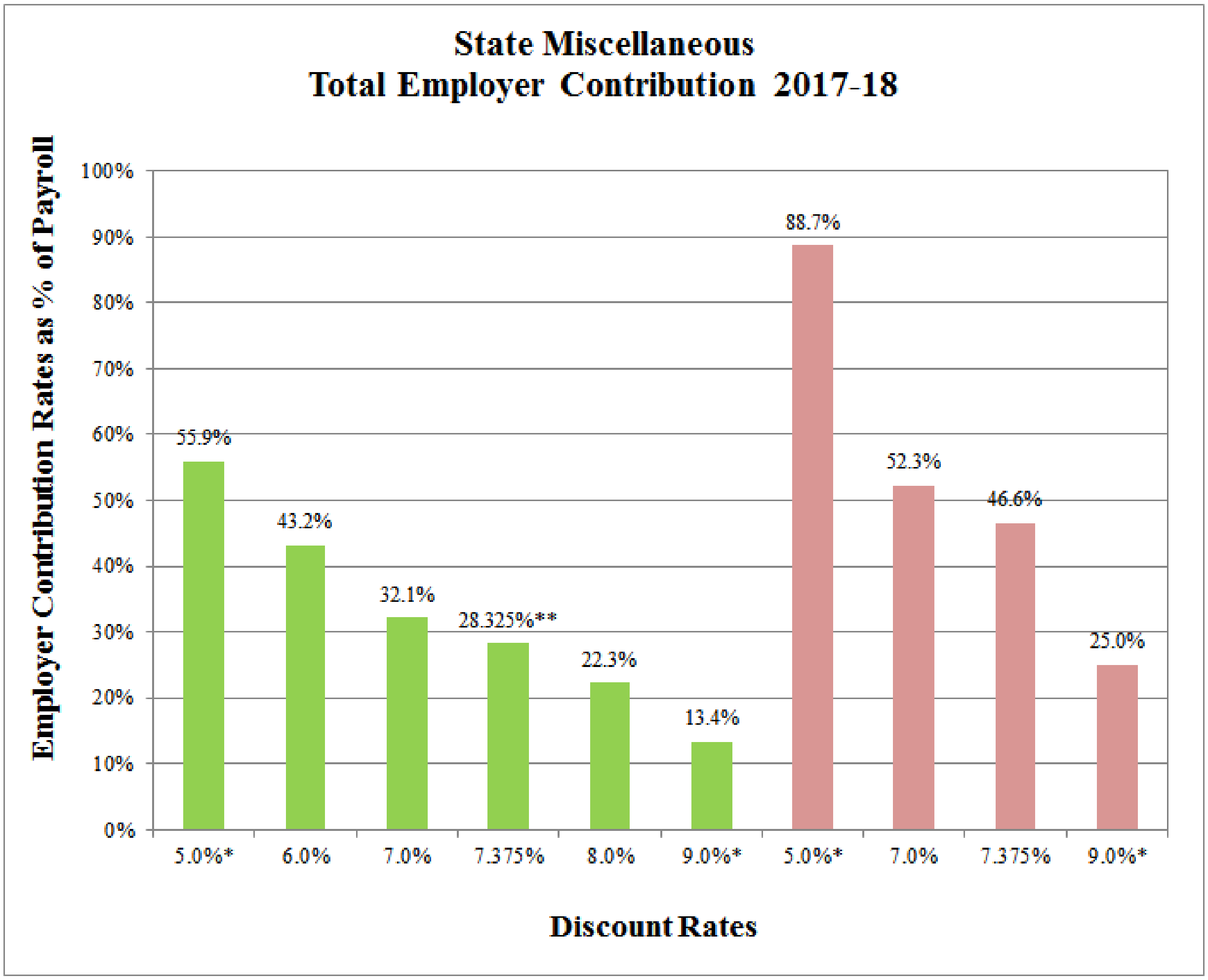
The first section shows the impact on employer contribution rates using the current discount rate of 7.375 percent as well as alternate discount rates of 6.0 percent, 7.0 percent, and 8.0 percent. The alternate rate of 7.0 percent was selected since the Board has adopted this rate as the final discount rate at the end of the three year phase-in of the reduction in this assumption. The rates of 6.0 percent and 8.0 percent were selected since they illustrate the impact of a 1 percent increase or decrease to the 7.0 percent assumption. This analysis shows the potential plan impacts if the PERF were to realize investment returns of 6.0 percent, 7.0 percent, or 8.0 percent over the long-term.

The second section is in response to Government Code section 20229 which requires the CalPERS Board to provide an annual report which includes a calculation of the contribution rates and liabilities utilizing investment return and discount rate assumptions which are 2 percentage points above and 2 percentage points below the current investment return and discount rate assumptions utilized by the board, and a calculation of the rates based on an amortization period equal to the estimated average remaining service periods (EARSP) of the employees covered by the contributions. The results are presented for three different investment return assumptions (5.00 percent, 7.00 percent and 9.00 percent) for all the State plans. For comparison, contribution rates for the current fiscal year have been calculated using both the current amortization method and amortization over the estimated average remaining service periods of the employees covered by the contributions.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

The results of the analysis are presented in three sections. The first section is a graphical representation of the impact on employer rates for both +/- 1 percent change in discount rate, and +/- 2 percent change in discount rate due to G.C. 20229 from the ultimate discount rate of 7.0%. The second and third sections are the numeric representations. The reader may use the data points presented in the graph to estimate data points of interest using interpolation.

State Miscellaneous - Total Employer Contribution 2017-18



Analysis of discount rate sensitivity based on current amortization method (varies from 7 to 30 years) or normal cost if in a surplus position

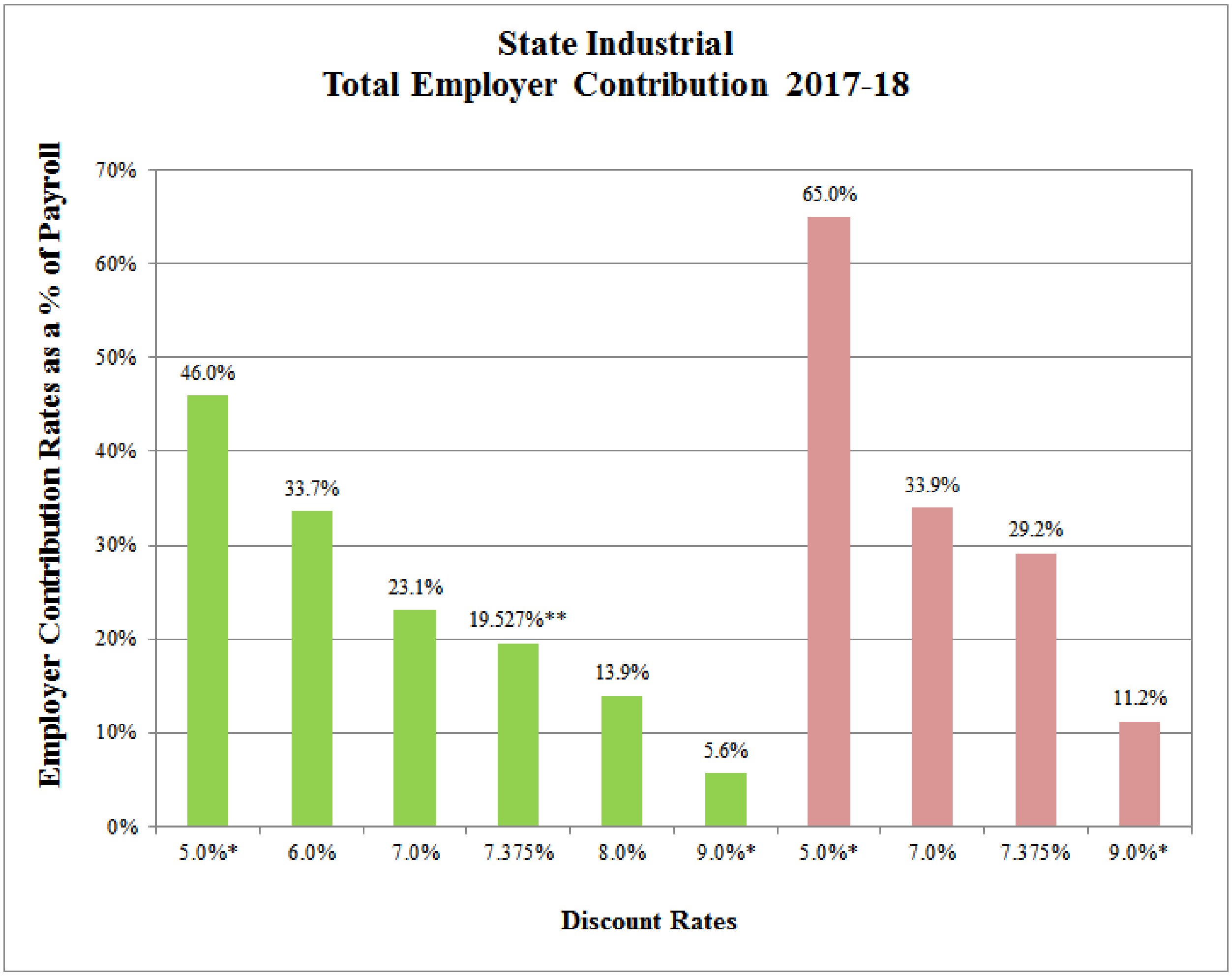
Analysis of discount rate sensitivity based on amortization of UL over EARSP (10 years)

* Required by Government Code Section 20229

** Actuarially required contribution rate for 2017-18 adopted by the CalPERS Board

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

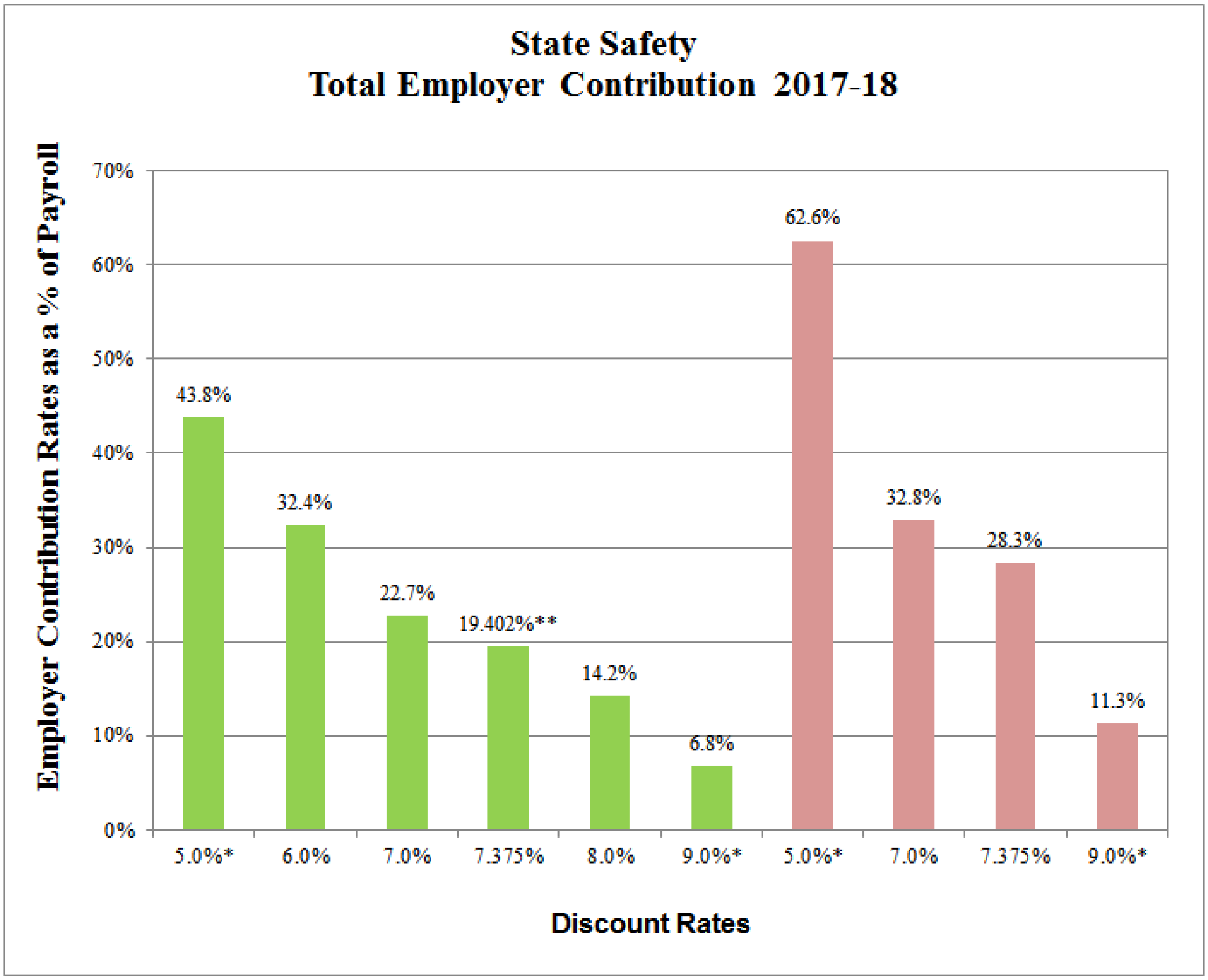
State Industrial - Total Employer Contribution 2017-18



(green)	Analysis of discount rate sensitivity based on current amortization method (varies from 7 to 30 years) or normal cost if in a surplus position
(red)	Analysis of discount rate sensitivity based on amortization of UL over EARSP (11 years)
*	Required by Government Code Section 20229
**	Actuarially required contribution rate for 2017-18 adopted by the CalPERS Board

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State Safety - Total Employer Contribution 2017-18



Analysis of discount rate sensitivity based on current amortization method (varies from 6 to 30 years) or normal cost if in a surplus position

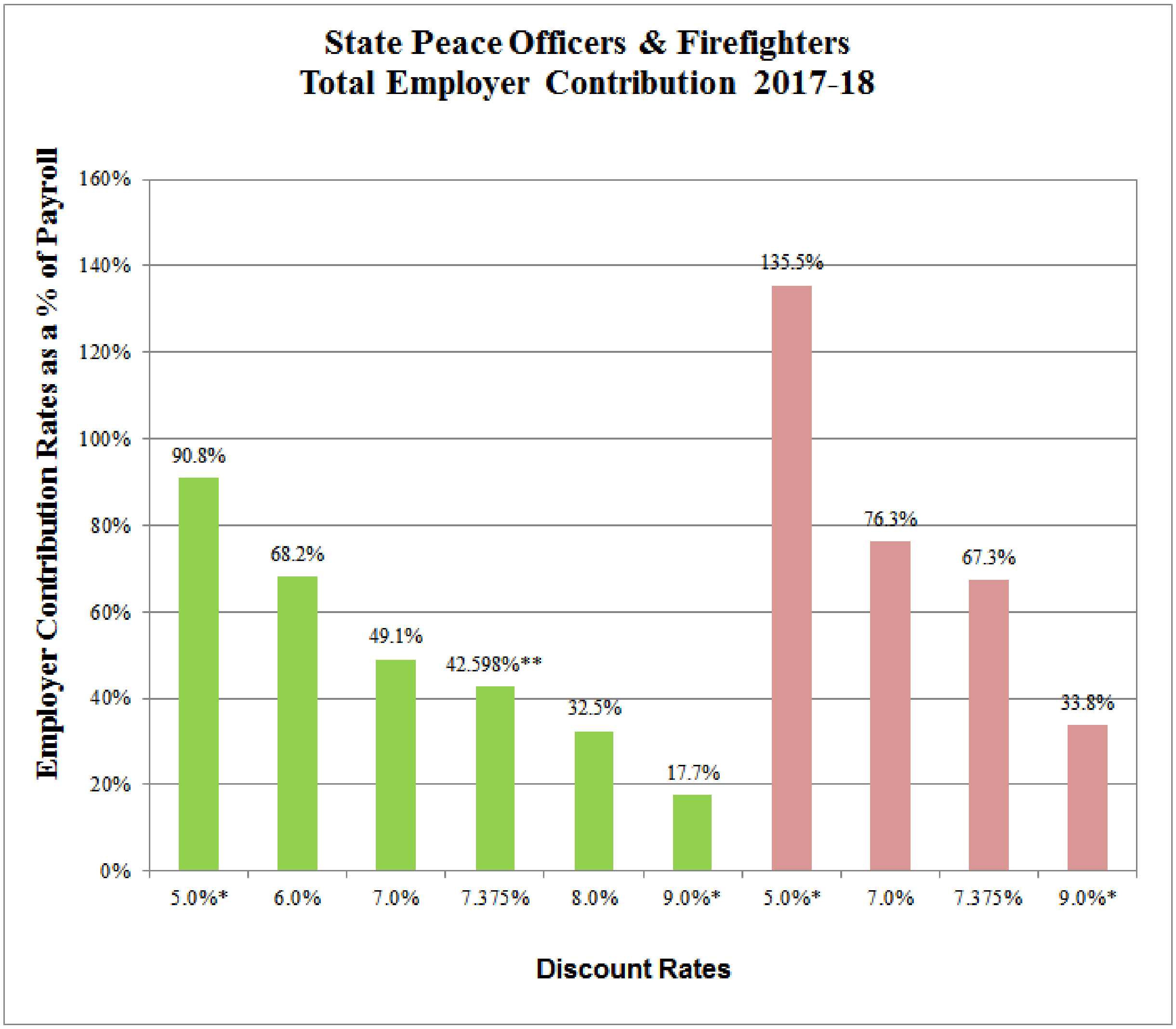
Analysis of discount rate sensitivity based on amortization of UL over EARSP (10 years)

* Required by Government Code Section 20229

** Actuarially required contribution rate for 2017-18 adopted by the CalPERS Board

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State Peace Officers & Firefighters - Total Employer Contribution 2017-18



Analysis of discount rate sensitivity based on current amortization method (varies from 7 to 30 years) or normal cost if in a surplus position

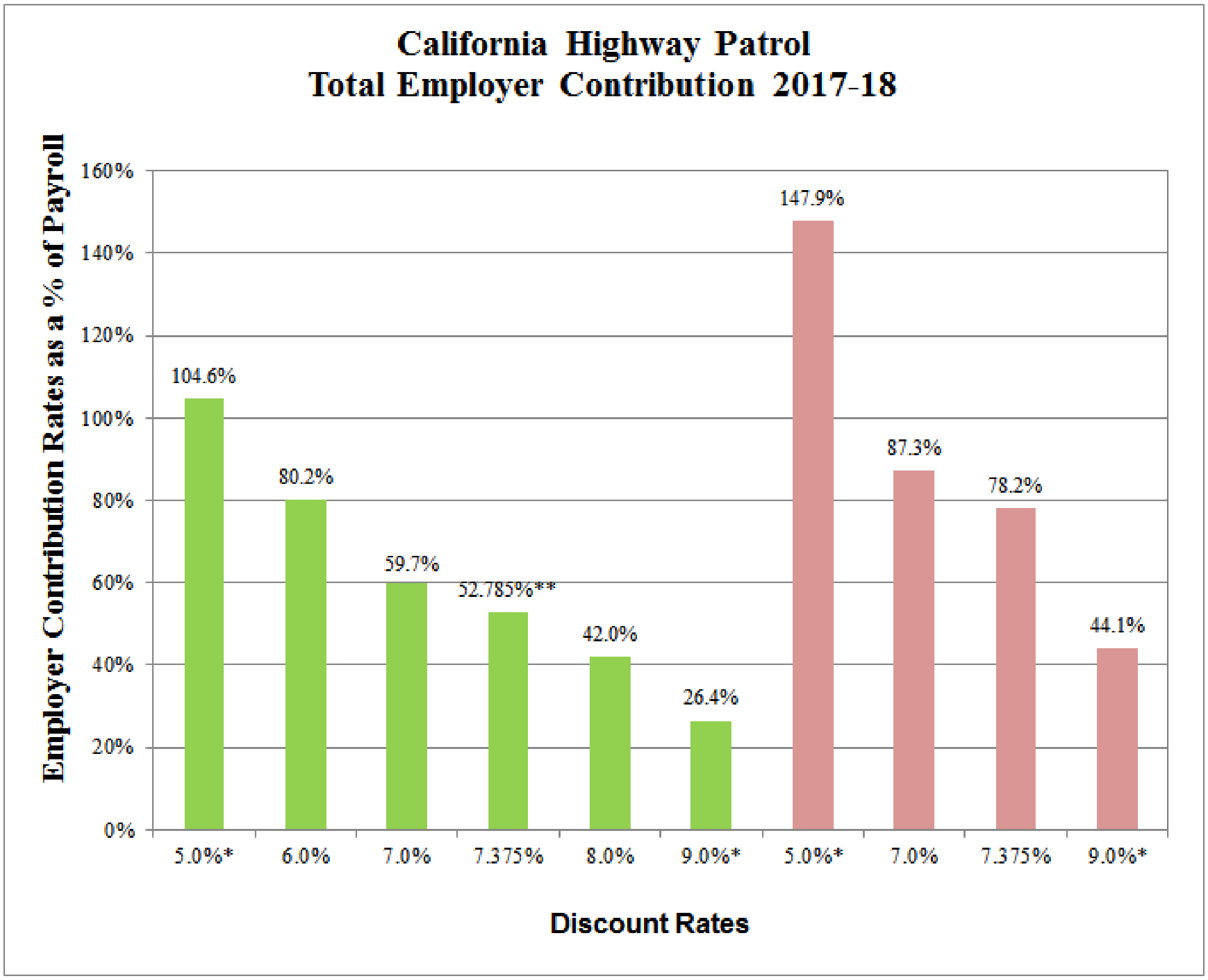
Analysis of discount rate sensitivity based on amortization of UL over EARSP (11 years)

* Required by Government Code Section 20229

** Actuarially required contribution rate for 2017-18 adopted by the CalPERS Board

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State California Highway Patrol - Total Employer Contribution 2017-18



Analysis of discount rate sensitivity based on current amortization method (varies from 5 to 30 years) or normal cost if in a surplus position

Analysis of discount rate sensitivity based on amortization of UL over EARSP (12 years)

* Required by Government Code Section 20229

** Actuarially required contribution rate for 2017-18 adopted by the CalPERS Board

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State Miscellaneous

Analysis of Discount Rate Sensitivity (+/- 1% Change in ultimate discount rate)

Sensitivity Analysis							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	8.981%	19.322%	0.022%	28.325%	$102,443,593,272	$35,835,979,682	65.0%
6%	15.0%	28.1%	0.0%	43.2%	120,205,263,105	53,597,649,515	55.4%
7%	10.4%	21.7%	0.0%	32.1%	106,857,278,820	40,249,665,230	62.3%
8%	6.9%	15.4%	0.0%	22.3%	95,702,679,029	29,095,065,439	69.6%

Government Section Code 20229 (+/- 2% change in ultimate discount rate)

Current Amortization Method							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	8.981%	19.322%	0.022%	28.325%	$102,443,593,272	$35,835,979,682	65.0%
5%	21.3%	34.7%	0.0%	55.9%	136,294,248,636	69,686,635,046	48.9%
7%	10.4%	21.7%	0.0%	32.1%	106,857,278,820	40,249,665,230	62.3%
9%	4.2%	9.1%	0.0%	13.4%	86,311,253,185	19,703,639,595	77.2%

Amortization of Unfunded Accrued Liability over EARSP (10 years)							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	9.0%	37.6%	0.0%	46.6%	$102,443,593,272	$35,835,979,682	65.0%
5%	21.3%	67.5%	0.0%	88.7%	136,294,248,636	69,686,635,046	48.9%
7%	10.4%	41.8%	0.0%	52.3%	106,857,278,820	40,249,665,230	62.3%
9%	4.2%	20.8%	0.0%	25.0%	86,311,253,185	19,703,639,595	77.2%

- The change in accrued liability due to the change in ultimate discount rate of +/-1% or +/-2% was amortized over 20 years as a level percentage of pay (except for the "Amortization of Unfunded Liability over EARSP").
- In the case of a surplus, rates were calculated to equal the employer normal cost rate. This is based on a provision in the Public Employees' Pension Reform Act of 2013 (PEPRA) that requires a minimum employer contribution rate in combination with employee contributions shall not be less than the normal cost rate.
- Numbers may not add due to rounding.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State Industrial

Analysis of Discount Rate Sensitivity (+/- 1% Change in ultimate discount rate)

Sensitivity Analysis							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	10.377%	9.150%	0.000%	19.527%	$3,969,767,411	$1,071,955,945	73.0%
6%	16.9%	16.8%	0.0%	33.7%	4,748,896,630	1,851,085,164	61.0%
7%	11.9%	11.2%	0.0%	23.1%	4,161,874,834	1,264,063,368	69.6%
8%	8.1%	5.8%	0.0%	13.9%	3,679,137,736	781,326,270	78.8%

Government Section Code 20229 (+/- 2% change in ultimate discount rate)

Current Amortization Method							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	10.377%	9.150%	0.000%	19.527%	$3,969,767,411	$1,071,955,945	73.0%
5%	23.4%	22.6%	0.0%	46.0%	5,469,122,566	2,571,311,100	53.0%
7%	11.9%	11.2%	0.0%	23.1%	4,161,874,834	1,264,063,368	69.6%
9%	5.2%	0.5%	0.0%	5.6%	3,278,694,706	380,883,240	88.4%

Amortization of Unfunded Accrued Liability over EARSP (11 years)							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	10.4%	18.8%	0.0%	29.2%	$3,969,767,411	$1,071,955,945	73.0%
5%	23.4%	41.7%	0.0%	65.0%	5,469,122,566	2,571,311,100	53.0%
7%	11.9%	22.0%	0.0%	33.9%	4,161,874,834	1,264,063,368	69.6%
9%	5.2%	6.0%	0.0%	11.2%	3,278,694,706	380,883,240	88.4%

- The change in accrued liability due to the change in ultimate discount rate of +/-1% or +/-2% was amortized over 20 years as a level percentage of pay (except for the "Amortization of Unfunded Liability over EARSP").
- In the case of a surplus, rates were calculated to equal the employer normal cost rate. This is based on a provision in the Public Employees' Pension Reform Act of 2013 (PEPRA) that requires a minimum employer contribution rate in combination with employee contributions shall not be less than the normal cost rate.
- Numbers may not add due to rounding.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State Safety

Analysis of Discount Rate Sensitivity (+/- 1% Change in ultimate discount rate)

Sensitivity Analysis							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	11.429%	7.963%	0.010%	19.402%	$11,288,008,411	$2,999,807,525	73.4%
6%	18.2%	14.2%	0.0%	32.4%	13,411,884,465	5,123,683,579	61.8%
7%	13.0%	9.6%	0.0%	22.7%	11,808,009,594	3,519,808,708	70.2%
8%	9.0%	5.2%	0.0%	14.2%	10,484,464,784	2,196,263,898	79.1%

Government Section Code 20229 (+/- 2% change in ultimate discount rate)

Current Amortization Method							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	11.429%	7.963%	0.010%	19.402%	$11,288,008,411	$2,999,807,525	73.4%
5%	24.9%	18.9%	0.0%	43.8%	15,373,694,688	7,085,493,802	53.9%
7%	13.0%	9.6%	0.0%	22.7%	11,808,009,594	3,519,808,708	70.2%
9%	5.9%	0.8%	0.0%	6.8%	9,382,624,591	1,094,423,705	88.3%

Amortization of Unfunded Accrued Liability over EARSP (10 years)							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	11.4%	16.9%	0.0%	28.3%	$11,288,008,411	$2,999,807,525	73.4%
5%	24.9%	37.7%	0.0%	62.6%	15,373,694,688	7,085,493,802	53.9%
7%	13.0%	19.8%	0.0%	32.8%	11,808,009,594	3,519,808,708	70.2%
9%	5.9%	5.3%	0.0%	11.3%	9,382,624,591	1,094,423,705	88.3%

- The change in accrued liability due to the change in ultimate discount rate of +/-1% or +/-2% was amortized over 20 years as a level percentage of pay (except for the "Amortization of Unfunded Liability over EARSP").
- In the case of a surplus, rates were calculated to equal the employer normal cost rate. This is based on a provision in the Public Employees' Pension Reform Act of 2013 (PEPRA) that requires a minimum employer contribution rate in combination with employee contributions shall not be less than the normal cost rate.
- Numbers may not add due to rounding.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

State Peace Officers and Firefighters

Analysis of Discount Rate Sensitivity (+/- 1% Change in ultimate discount rate)

Sensitivity Analysis							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	16.586%	26.012%	0.000%	42.598%	$41,484,601,481	$14,862,630,077	64.2%
6%	27.5%	40.7%	0.0%	68.2%	49,801,292,988	23,179,321,584	53.5%
7%	19.2%	29.9%	0.0%	49.1%	43,526,160,927	16,904,189,523	61.2%
8%	12.9%	19.6%	0.0%	32.5%	38,402,340,346	11,780,368,942	69.3%

Government Section Code 20229 (+/- 2% change in ultimate discount rate)

Current Amortization Method							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	16.586%	26.012%	0.000%	42.598%	$41,484,601,481	$14,862,630,077	64.2%
5%	38.7%	52.1%	0.0%	90.8%	57,568,323,079	30,946,351,675	46.2%
7%	19.2%	29.9%	0.0%	49.1%	43,526,160,927	16,904,189,523	61.2%
9%	8.1%	9.7%	0.0%	17.7%	34,175,567,107	7,553,595,703	77.9%

Amortization of Unfunded Accrued Liability over EARSP (11 years)							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	16.6%	50.7%	0.0%	67.3%	$41,484,601,481	$14,862,630,077	64.2%
5%	38.7%	96.7%	0.0%	135.5%	57,568,323,079	30,946,351,675	46.2%
7%	19.2%	57.1%	0.0%	76.3%	43,526,160,927	16,904,189,523	61.2%
9%	8.1%	25.7%	0.0%	33.8%	34,175,567,107	7,553,595,703	77.9%

- The change in accrued liability due to the change in ultimate discount rate of +/-1% or +/-2% was amortized over 20 years as a level percentage of pay (except for the "Amortization of Unfunded Liability over EARSP").
- In the case of a surplus, rates were calculated to equal the employer normal cost rate. This is based on a provision in the Public Employees' Pension Reform Act of 2013 (PEPRA) that requires a minimum employer contribution rate in combination with employee contributions shall not be less than the normal cost rate.
- Numbers may not add due to rounding.

ANALYSIS OF DISCOUNT RATE SENSITIVITY & GOVERNMENT CODE SECTION 20229 (CONTINUED)

California Highway Patrol

Analysis of Discount Rate Sensitivity (+/- 1% Change in ultimate discount rate)

Sensitivity Analysis							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	16.760%	36.025%	0.000%	52.785%	$11,470,696,987	$4,765,190,527	58.5%
6%	28.4%	51.8%	0.0%	80.2%	13,774,585,038	7,069,078,578	48.7%
7%	19.5%	40.2%	0.0%	59.7%	12,035,775,850	5,330,269,390	55.7%
8%	12.8%	29.2%	0.0%	42.0%	10,617,651,252	3,912,144,792	63.2%

Government Section Code 20229 (+/- 2% change in ultimate discount rate)

Current Amortization Method							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	16.760%	36.025%	0.000%	52.785%	$11,470,696,987	$4,765,190,527	58.5%
5%	40.4%	64.1%	0.0%	104.6%	15,929,976,066	9,224,469,606	42.1%
7%	19.5%	40.2%	0.0%	59.7%	12,035,775,850	5,330,269,390	55.7%
9%	7.8%	18.6%	0.0%	26.4%	9,448,780,462	2,743,274,002	71.0%

Amortization of Unfunded Accrued Liability over EARSP (12 years)							
As of June 30, 2016	Employer Normal Cost	Unfunded Liability Rate	Group Term Life Insurance	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Status
7.375% (current discount rate)	16.8%	61.4%	0.0%	78.2%	$11,470,696,987	$4,765,190,527	58.5%
5%	40.4%	107.5%	0.0%	147.9%	15,929,976,066	9,224,469,606	42.1%
7%	19.5%	67.8%	0.0%	87.3%	12,035,775,850	5,330,269,390	55.7%
9%	7.8%	36.3%	0.0%	44.1%	9,448,780,462	2,743,274,002	71.0%

- The change in accrued liability due to the change in ultimate discount rate of +/-1% or +/-2% was amortized over 20 years as a level percentage of pay (except for the "Amortization of Unfunded Liability over EARSP").
- In the case of a surplus, rates were calculated to equal the employer normal cost rate. This is based on a provision in the Public Employees' Pension Reform Act of 2013 (PEPRA) that requires a minimum employer contribution rate in combination with employee contributions shall not be less than the normal cost rate.
- Numbers may not add due to rounding.

VOLATILITY RATIOS

The actuarial calculations supplied in this communication are based on a number of assumptions about long-term demographic and economic behavior. Unless these assumptions (terminations, deaths, disabilities, retirements, salary growth, and investment return) are exactly realized each year, there will be differences on a year-to-year basis. The year-to-year differences between actual experience and the assumptions are called actuarial gains and losses and serve to lower or raise the employer's rates from one year to the next. Therefore, the rates will inevitably fluctuate, especially due to the ups and downs of investment returns.

Asset Volatility Ratio

Plans that have higher asset-to-payroll ratios produce more volatile employer rates due to investment return. For example, a plan with an asset to payroll ratio of 8 may experience twice the contribution volatility due to investment return volatility, than a plan with an asset-to-payroll ratio of 4. Shown below is the asset volatility ratio, a measure of the plan's current rate volatility. It should be noted that this ratio is a measure of the current situation. It increases over time but generally tends to stabilize as the plan matures.

Liability Volatility Ratio

Plans that have higher liability-to-payroll ratios produce more volatile employer rates due to investment return and changes in liability. For example, a plan with a liability-to-payroll ratio of 8 is expected to have twice the contribution volatility of a plan with a liability-to-payroll ratio of 4. The liability volatility ratio is also included in the table below. It should be noted that this ratio indicates a longer-term potential for contribution volatility and the asset volatility ratio, described above, will tend to move closer to this ratio as the plan matures. Since the liability volatility ratio is a long-term measure, it is shown below at the ultimate discount rate the board has adopted to determine the contribution requirement in the June 30, 2018 actuarial valuation (7.00 percent).

Rate Volatility

	Market Value of Assets without Receivables	Annual Covered Payroll	Asset Volatility Ratio	Accrued Liability (7.00% Discount rate)	Liability Volatility Ratio
Plan	(1)	(2)	(1)/(2)	(3)	(3)/(2)
State Miscellaneous	$66,287,948,562	$11,306,804,561	5.9	$106,857,278,820	9.5
State Industrial	2,882,739,262	632,973,735	4.6	4,161,874,834	6.6
State Safety	8,266,866,099	2,116,513,548	3.9	11,808,009,594	5.6
State Peace Officers & Firefighters	26,538,986,306	3,236,457,111	8.2	43,526,160,927	13.4
California Highway Patrol	6,692,934,635	798,887,020	8.4	12,035,775,850	15.1

The above analysis shows that the CHP, POFF and Miscellaneous plans are expected to have more volatile contributions than the Industrial and Safety plans. It also shows that the contribution volatility is expected to increase as the plans become better funded. The contribution volatility would be 43 percent to 80 percent greater if the plans were 100 percent funded at the 7.00 percent discount rate.

Appendix A
Statement of Actuarial Methods and Assumptions

ACTUARIAL DATA

As stated in the Actuarial Certification, the data, which serves as the basis for this valuation, has been obtained from the various CalPERS databases. We have reviewed the valuation data and believe that it is reasonable and appropriate in aggregate. We are unaware of any potential data issues that would have a material effect on the results of this valuation, except that data does not always contain the latest salary information for former members now in reciprocal systems and does not recognize the potential for unusually large salary deviation in certain cases such as elected officials. Therefore, salary information in these cases may not be accurate. These situations are relatively infrequent, however, and when they do occur, they generally do not have a material impact on the employer contribution rates.

ACTUARIAL METHODS

Actuarial Cost Method

The actuarial cost method used for this report is the Entry Age Normal Cost Method. Under this method, projected benefits are determined for all members and the associated liabilities are spread in a manner that produces level annual cost as a percent of pay in each year from the member's age of hire (entry age) to their assumed retirement age on the valuation date. The cost allocated to the current fiscal year is called the normal cost.

The actuarial accrued liability for active members is then calculated as the portion of the total cost of the plan allocated to prior years. The actuarial accrued liability for members currently receiving benefits and for members entitled to deferred benefits is equal to the present value of the benefits expected to be paid. No normal costs are applicable for these participants.

Amortization of Unfunded Actuarial Accrued Liability

The excess of the total actuarial accrued liability over the market value of plan assets is called the unfunded actuarial accrued liability (UAL). Funding requirements are determined by adding the normal cost and an amortization payment toward the unfunded liability. Commencing with the June 30, 2014 valuation, all new gains or losses are tracked and amortized over a fixed 30-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. All changes in liability due to plan amendments (other than golden handshakes), changes in actuarial assumptions, or changes in actuarial methodology are amortized separately over a 20-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. Changes in unfunded accrued liability due to a Golden Handshake will be amortized over a period of 5 years.

The 5-year ramp up means that the payments in the first four years of the amortization period are 20 percent, 40 percent, 60 percent and 80 percent of the "full" payment which begins in year five. The 5-year ramp down means that the reverse is true in the final four years of the amortization period.

Exceptions for Inconsistencies:

An exception to the amortization rules above is used whenever their application results in inconsistencies. In these cases, a "fresh start" approach is used. This means that the current unfunded actuarial liability is projected and amortized over a set number of years. For example, a fresh start is needed in the following situations:

1) When a positive payment would be required on a negative unfunded actuarial liability (or conversely a negative payment on a positive unfunded actuarial liability); or
2) When there are excess assets, rather than an unfunded liability. In this situation, a 30-year fresh start is used.

ACTUARIAL METHODS (CONTINUED)

It should be noted that the actuary may determine that a fresh start is necessary under other circumstances. In all cases of a fresh start, the period is set by the actuary at what is deemed appropriate; however, the period will not be greater than 30 years.

By State statute for California Highway Patrol only, a portion of the assets in excess of the Entry Age Normal accrued liability can be applied as a direct offset to required employer and employee contributions.

The 1959 Survivor Program valuation is not provided in this report. A separate report for that program is available.

The Term Insurance Method is used for the State Group Term Life Insurance Program. The required contribution for the coming fiscal year is the difference between the reserves for that benefit and one and one-half times the expected benefit payments, but not less than zero.

Purchasing Power Protection Act (PPPA) Method

PPPA benefits are cost-of-living adjustments intended to maintain the individual's current retirement benefit at 75 percent of the original benefit at retirement adjusted for inflation since retirement. The PPPA benefit is paid, if necessary, in addition to any other cost-of-living adjustment provided under the terms of the plan. Prior to January 1, 2001, there was a single PPPA pool covering all CalPERS employers. However, commencing January 1, 2001, separate PPPA pools were established. A pool was set up for all State plans and a separate pool for School employers. The public agencies were removed entirely from PPPA pooling resulting in each public agency plan paying for its own PPPA benefits. The creation of separate pools effectively eliminates the cross subsidization between the State, Schools and public agencies. Because there is a single PPPA pool for all State plans, cross subsidization between State plans still occurs.

For the State plans, the total annual outlay for PPPA benefits is limited by State statute to earnings of up to 1.1 percent of accumulated member contributions. If this annual outlay is insufficient to provide the PPPA benefits in a given fiscal year, the 75 percent maintenance target would be proportionately reduced. Since the inception of the PPPA benefit program, 1.1 percent has proved more than sufficient to provide the 75 percent maintenance. Under the inflation assumption of 2.75 percent compounded annually, the 1.1 percent appears to remain more than sufficient in the foreseeable future.

The actuarial model mimics the PPPA administrative procedure by deriving the employer contribution rate for the plan as the lesser of two separate actuarially computed rates:

1) The rate that results if a full 1.1 percent investment return on the value of each future year's employee assets in the plan is used for that plan's PPPA payments; or
2) The rate that results if the plan pays the full 75 percent purchasing power for itself.

In this way, those plans for which future PPPA costs equal or exceed a 1.1 percent return on current and future employee assets are charged an employer rate that replaces the 1.1 percent return on employee assets. Those plans that require less than the 1.1 percent return on current and future employee assets to maintain 75 percent purchasing power are charged the rate necessary to maintain the 75 percent purchasing power. It must be noted that nothing is charged in the rates for any cross-subsidization. That is, the model assumes that cross subsidization for PPPA for State plans will remain so small that it can be ignored.

Internal Revenue Code Section 415

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year, the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base.

Internal Revenue Code Section 401(a)(17)

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base.

ACTUARIAL METHODS (CONTINUED)

PEPRA Assumptions

The Public Employees' Pension Reform Act of 2013 (PEPRA) mandated new benefit formulas and new member contributions for new members (as defined by PEPRA) hired after January 1, 2013. Different assumptions for these new PEPRA members are disclosed below.

Asset Valuation Method

It is the policy of the CalPERS Board of Administration to use professionally accepted amortization methods to eliminate a surplus or an unfunded accrued liability in a manner that maintains benefit security for the members of the System while minimizing substantial variations in required employer contribution rates. On April 17, 2013, the CalPERS Board of Administration approved a recommendation to change the CalPERS amortization and rate smoothing policies. Beginning with the June 30, 2014 valuations for the State plans that set the 2015-16 rates, CalPERS employs a policy that amortizes all gains and losses over a fixed 30-year period. The increase or decrease in the rate is then spread directly over a 5-year period. This method is referred to as "direct rate smoothing." CalPERS no longer uses an actuarial value of assets and only uses the market value of assets. The direct rate smoothing method is equivalent to a method using a 5-year asset smoothing period with no actuarial value of asset corridor and a 25-year amortization period for gains and losses.

Accounts Receivable

In preparing valuations and setting employer contribution rates, the asset figures used include accounts receivable. The CalPERS Actuarial Office assumes that all assets are accruing interest at the actuarially assumed rate. Therefore, the rates depicted assume that all payments have been made and are accruing interest.

ACTUARIAL ASSUMPTIONS APPLICABLE TO ALL PLANS

In 2014, CalPERS completed a 2-year asset liability management study incorporating actuarial assumptions and strategic asset allocation. On February 19, 2014, the CalPERS Board of Administration adopted relatively modest changes to the current asset allocation that will reduce the expected volatility of returns. The adopted asset allocation is expected to have a long-term blended return that supports a discount rate assumption of 7.5 percent. The Board also approved several changes to the demographic assumptions that more closely align with actual experience. The most significant of these is mortality improvement to acknowledge the greater life expectancies we are seeing in our membership and expected continued improvements. The new actuarial assumptions were first used in the June 30, 2013 valuation to set the Fiscal Year 2014-15 contribution for the state plans. The increase in liability due to new actuarial assumptions is amortized over a 20-year period with a 3-year ramp-up/ramp-down. These new actuarial assumptions are set forth in this section.

For more details and additional rationale for the selection of the actuarial assumptions, please refer to the CalPERS Experience Study and Review of Actuarial Assumptions report from January 2014 that can be found on the CalPERS website under: "Forms and Publications". Click on "View All" and search for Experience Study.

On December 21, 2016, the CalPERS Board of Administration lowered the discount rate from 7.50 percent to 7.00 percent using a three year phase-in beginning with the June 30, 2016 actuarial valuations. The minimum employer contributions for Fiscal Year 2017-18 determined in this valuation were calculated using a discount rate of 7.375 percent. The projected employer contributions shown in this report are calculated assuming that the discount rate will be lowered to 7.25 percent next year and 7.00 percent the following year as adopted by the Board. The decision to reduce the discount rate was primarily based on reduced capital market assumptions provided by external investment consultants and CalPERS investment staff. The specific decision adopted by the Board reflected recommendations from CalPERS staff and additional input from employer and employee stakeholder groups. Based on the investment allocation adopted by the Board and capital market assumptions, the reduced discount rate assumption provides a more realistic assumption for the long term investment return of the fund.

Notwithstanding the Board's decision to phase into a 7.0 percent discount rate, subsequent analysis of the expected investment return of CalPERS assets or changes to the investment allocation may result in a change to this three year discount rate schedule. A comprehensive analysis of all actuarial assumptions and methods including the discount rate will be conducted in late 2017. All actuarial assumptions represent an estimate of future experience rather than observations of the estimates inherent in market data.

Economic Assumptions

Discount Rate

The prescribed discount rate assumption adopted by the Board on December 21, 2016 is 7.375 percent compounded annually (net of investment and administrative expenses) as of 6/30/2016.

The Board also prescribed that the assumed discount rate will reduce to 7.25 percent compounded annually (net of expenses) as of 6/30/2017, and 7.0 percent compounded annually (net of expenses) as of 6/30/2018. These further changes to the discount rate assumption are not reflected in the determination of required contributions determined in this report for Fiscal Year 2017-18.

Salary Growth

Annual increases vary by entry age and duration of service. A sample of assumed increases is shown below.

Annual Percentage Increase

State Miscellaneous Tier 1 & Tier 2

Duration of Service	Entry Age		
	20	30	40
0	9.50%	8.60%	7.30%
3	7.50%	6.80%	5.60%
5	6.90%	6.20%	5.20%
10	5.20%	4.70%	4.10%
15	4.30%	4.10%	3.70%
20	3.80%	3.70%	3.50%
25	3.50%	3.50%	3.40%
30	3.50%	3.50%	3.40%

State Industrial

Duration of Service	Entry Age		
	20	30	40
0	10.00%	10.00%	9.20%
3	7.70%	7.40%	6.60%
5	7.00%	6.60%	5.80%
10	5.90%	5.30%	4.60%
15	5.00%	4.70%	4.30%
20	4.40%	4.30%	4.10%
25	3.90%	3.90%	3.80%
30	3.60%	3.60%	3.60%

State Safety

Duration of Service	Entry Age		
	20	30	40
0	11.20%	10.00%	8.30%
3	6.50%	6.10%	5.60%
5	5.10%	4.90%	4.80%
10	3.60%	3.60%	3.60%
15	3.60%	3.50%	3.40%
20	3.60%	3.50%	3.20%
25	3.60%	3.50%	3.20%
30	3.60%	3.50%	3.20%

State Peace Officers & Firefighters

Duration of Service	Entry Age		
	20	30	40
0	17.30%	18.20%	18.60%
3	9.70%	9.70%	9.40%
5	7.50%	7.20%	6.70%
10	4.20%	4.00%	3.70%
15	4.20%	4.00%	3.70%
20	4.20%	4.00%	3.70%
25	4.20%	4.00%	3.70%
30	4.20%	4.00%	3.70%

California Highway Patrol

Duration of Service	Entry Age		
	20	30	40
0	8.00%	8.00%	8.00%
3	6.50%	6.50%	6.50%
5	5.40%	5.40%	5.40%
10	3.80%	3.80%	3.80%
15	3.80%	3.80%	3.80%
20	4.50%	4.50%	4.50%
25	4.50%	4.50%	4.50%
30	3.80%	3.80%	3.80%

Overall Payroll Growth

3 percent compounded annually (used in projecting the payroll over which the unfunded liability is amortized). For the State Miscellaneous plan, the payroll of the Second Tier members is assumed to decrease in accordance with actuarial assumptions based on the assumption that all new entrants will elect the State Miscellaneous First Tier. The payroll of the First Tier members is assumed to grow at the rate necessary for the overall payroll of the State Miscellaneous plan to grow annually at a rate of 3 percent.

Inflation

2.75 percent compounded annually.

Demographic Assumptions

Post-Retirement Mortality

Rates vary by age, type of retirement and gender. See sample rates in the table below. These rates are used for all plans.

	Healthy Recipients		Non-Industrial Disability (Not Job-Related)		Industrial Disability (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
50	0.00501	0.00466	0.01680	0.01158	0.00501	0.00466
55	0.00599	0.00416	0.01973	0.01149	0.00599	0.00416
60	0.00710	0.00436	0.02289	0.01235	0.00754	0.00518
65	0.00829	0.00588	0.02451	0.01607	0.01122	0.00838
70	0.01305	0.00993	0.02875	0.02211	0.01635	0.01395
75	0.02205	0.01722	0.03990	0.03037	0.02834	0.02319
80	0.03899	0.02902	0.06083	0.04725	0.04899	0.03910
85	0.06969	0.05243	0.09731	0.07762	0.07679	0.06251
90	0.12974	0.09887	0.14804	0.12890	0.12974	0.09887
95	0.22444	0.18489	0.22444	0.21746	0.22444	0.18489
100	0.32536	0.30017	0.32536	0.30017	0.32536	0.30017

The post-retirement mortality rates above include 20 years of projected on-going mortality improvement using Scale BB published by the Society of Actuaries.

Marital Status

For active members, it is assumed the following are married upon retirement.

Plan	Percent Married
State Miscellaneous	85%
State Industrial	85%
State Safety	90%
State Peace Officers & Firefighters	90%
California Highway Patrol	90%

Age of Spouse

It is assumed that female spouses are 3 years younger than male spouses.

Terminated Members

It is assumed that terminated members refund immediately if non-vested. Terminated members who are vested are assumed to follow the same service retirement pattern as active members but with a load to reflect the expected higher rates of retirement, especially at lower ages. The following table shows the load factors that are applied to the service retirement assumption for active members to obtain the service retirement pattern for separated vested members:

	Load Factor	
Age	Miscellaneous Plans	Safety Plans
50	190%	310%
51	110%	190%
52	110%	105%
53 through 54	100%	105%
55	100%	140%
56 and above	100%	100%

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1 percent for those plans with the provision providing Credit for Unused Sick Leave.

Norris Decision (Best Factors)

Employees hired prior to July 1, 1982 have projected benefit amounts increased in order to reflect the use of "Best Factors" in the calculation of optional benefit forms. This is due to a 1983 Supreme Court decision, known as the Norris decision, which required males and females to be treated equally in the determination of benefit amounts. Consequently, anyone already employed at that time is given the best possible conversion factor when optional benefits are determined. No loading is necessary for employees hired after July 1, 1982.

Miscellaneous Assumptions

Tier 2 Members electing Tier 1 benefits

Tier 2 members of both the State Miscellaneous and State Industrial plans have the right to convert their Tier 2 service to Tier 1 service provided that they make up the shortfall in their accumulated contributions with interest. In this valuation, we have assumed that all Tier 2 members will elect to convert their Tier 2 service to Tier 1 service.

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS

STATE MISCELLANEOUS TIER 1

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.002	0.008	0.014	0.017	0.024	0.036	0.041
52	0.002	0.009	0.013	0.016	0.024	0.036	0.040
54	0.007	0.022	0.031	0.038	0.052	0.068	0.077
56	0.014	0.039	0.057	0.070	0.090	0.113	0.129
58	0.017	0.048	0.069	0.086	0.108	0.134	0.155
60	0.027	0.074	0.105	0.130	0.163	0.198	0.228
62	0.050	0.136	0.192	0.238	0.295	0.353	0.406
65	0.054	0.146	0.207	0.255	0.316	0.378	0.435
70	0.047	0.128	0.181	0.223	0.278	0.332	0.383
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
52	0.003	0.008	0.011	0.014	0.018	0.020	0.023
54	0.006	0.015	0.021	0.026	0.032	0.038	0.043
56	0.010	0.027	0.038	0.046	0.057	0.067	0.076
58	0.014	0.038	0.053	0.065	0.080	0.093	0.108
60	0.021	0.056	0.078	0.097	0.118	0.138	0.160
62	0.038	0.100	0.141	0.174	0.213	0.249	0.287
65	0.049	0.131	0.184	0.225	0.276	0.323	0.374
70	0.050	0.134	0.188	0.231	0.284	0.331	0.383
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE MISCELLANEOUS TIER 1 (CONTINUED)

Termination with Refund

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
0	0.1401	0.1340	0.1280	0.1220	0.1160
1	0.1249	0.1189	0.1128	0.1068	0.1009
2	0.1097	0.1037	0.0978	0.0917	0.0857
3	0.0945	0.0886	0.0826	0.0766	0.0705
4	0.0794	0.0734	0.0674	0.0614	0.0553
5	0.0104	0.0094	0.0084	0.0075	0.0065
10	0.0059	0.0051	0.0042	0.0034	0.0026
15	0.0040	0.0033	0.0025	0.0018	0.0011
20	0.0025	0.0019	0.0013	0.0007	0.0001
25	0.0013	0.0008	0.0003	0.0001	0.0001
30	0.0005	0.0001	0.0001	0.0001	0.0001

Termination with Vested Deferred Benefits

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
5	0.0556	0.0504	0.0452	0.0400	0.0349
6	0.0526	0.0472	0.0420	0.0368	0.0316
7	0.0495	0.0441	0.0389	0.0335	0.0280
8	0.0463	0.0409	0.0356	0.0299	0.0245
9	0.0430	0.0374	0.0321	0.0264	0.0209
10	0.0395	0.0340	0.0283	0.0226	—
14	0.0349	0.0289	0.0229	0.0171	—
15	0.0335	0.0275	0.0216	—	—
19	0.0277	0.0213	0.0150	—	—
20	0.0262	0.0198	—	—	—
24	0.0196	0.0130	—	—	—
25	0.0179	—	—	—	—
29	0.0103	—	—	—	—
30	—	—	—	—	—

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE MISCELLANEOUS TIER 1 (CONTINUED)

Non-Industrial (Not Job-Related) Death and Disability

Rates vary by age and gender. See sample rates in the table below.

	Non-Industrial Death (Not Job-Related)		Non-Industrial Disability (Not Job-Related)	
Attained Age	Male	Female	Male	Female
20	0.00031	0.00020	0.00020	0.00040
25	0.00040	0.00023	0.00020	0.00040
30	0.00049	0.00025	0.00020	0.00050
35	0.00057	0.00035	0.00040	0.00100
40	0.00075	0.00050	0.00100	0.00210
45	0.00106	0.00071	0.00200	0.00350
50	0.00155	0.00100	0.00270	0.00420
55	0.00228	0.00138	0.00240	0.00330
60	0.00308	0.00182	0.00200	0.00260

STATE MISCELLANEOUS TIER 2

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.002	0.008	0.014	0.017	0.024	0.036	0.041
52	0.002	0.009	0.013	0.016	0.024	0.036	0.040
54	0.007	0.022	0.031	0.038	0.052	0.068	0.077
56	0.014	0.039	0.057	0.070	0.090	0.113	0.129
58	0.017	0.048	0.069	0.086	0.108	0.134	0.155
60	0.027	0.074	0.105	0.130	0.163	0.198	0.228
62	0.050	0.136	0.192	0.238	0.295	0.353	0.406
65	0.054	0.146	0.207	0.255	0.316	0.378	0.435
70	0.047	0.128	0.181	0.223	0.278	0.332	0.383
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
52	0.003	0.008	0.011	0.014	0.018	0.020	0.023
54	0.006	0.015	0.021	0.026	0.032	0.038	0.043
56	0.010	0.027	0.038	0.046	0.057	0.067	0.076
58	0.014	0.038	0.053	0.065	0.080	0.093	0.108
60	0.021	0.056	0.078	0.097	0.118	0.138	0.160
62	0.038	0.100	0.141	0.174	0.213	0.249	0.287
65	0.049	0.131	0.184	0.225	0.276	0.323	0.374
70	0.050	0.134	0.188	0.231	0.284	0.331	0.383
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE MISCELLANEOUS TIER 2 (CONTINUED)

Termination with Refund

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
0	0.1496	0.1433	0.1370	0.1307	0.1244
1	0.1365	0.1302	0.1239	0.1176	0.1113
2	0.1234	0.1172	0.1109	0.1046	0.0983
3	0.1104	0.1041	0.0978	0.0915	0.0852
4	0.0973	0.0910	0.0848	0.0785	0.0722
5	0.0843	0.0780	0.0717	0.0654	0.0591
6	0.0792	0.0729	0.0666	0.0603	0.0540
7	0.0741	0.0678	0.0615	0.0553	0.0490
8	0.0691	0.0628	0.0565	0.0502	0.0439
9	0.0640	0.0577	0.0514	0.0451	0.0388

Termination with Vested Deferred Benefits

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
10	0.0589	0.0526	0.0463	0.0400	0.0000
14	0.0480	0.0417	0.0354	0.0291	—
15	0.0453	0.0390	0.0327	—	—
19	0.0344	0.0281	0.0218	—	—
20	0.0317	0.0254	—	—	—
24	0.0208	0.0145	—	—	—
25	0.0180	—	—	—	—
29	0.0071	—	—	—	—
30	—	—	—	—	—

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

Non-Industrial (Not Job-Related) Death and Disability

Rates vary by age and gender. See sample rates in the table below.

Attained Age	Non-Industrial Death (Not Job-Related)		Non-Industrial Disability (Not Job-Related)	
	Male	Female	Male	Female
20	0.00031	0.00020	0.0001	0.0001
25	0.00040	0.00023	0.0002	0.0004
30	0.00049	0.00025	0.0003	0.0006
35	0.00057	0.00035	0.0003	0.0017
40	0.00075	0.00050	0.0023	0.0041
45	0.00106	0.00071	0.0042	0.0068
50	0.00155	0.00100	0.0058	0.0099
55	0.00228	0.00138	0.0073	0.0123
60	0.00308	0.00182	0.0081	0.0134

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE INDUSTRIAL TIER 1

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.006	0.011	0.018	0.026	0.031	0.033	0.039
52	0.006	0.011	0.018	0.026	0.031	0.033	0.039
54	0.016	0.029	0.045	0.067	0.079	0.084	0.100
56	0.020	0.037	0.057	0.085	0.100	0.106	0.126
58	0.025	0.046	0.071	0.106	0.125	0.132	0.157
60	0.038	0.070	0.109	0.162	0.191	0.202	0.240
62	0.076	0.139	0.217	0.321	0.378	0.402	0.476
65	0.083	0.153	0.238	0.353	0.416	0.442	0.523
70	0.089	0.163	0.254	0.376	0.444	0.472	0.559
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
52	0.004	0.008	0.013	0.018	0.022	0.023	0.027
54	0.011	0.020	0.032	0.047	0.055	0.059	0.070
56	0.014	0.026	0.040	0.060	0.070	0.074	0.088
58	0.019	0.035	0.053	0.080	0.094	0.099	0.118
60	0.030	0.056	0.087	0.130	0.153	0.162	0.192
62	0.061	0.111	0.174	0.257	0.302	0.322	0.381
65	0.075	0.138	0.214	0.318	0.374	0.398	0.471
70	0.089	0.163	0.254	0.376	0.444	0.472	0.559
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
0	0.0829	0.0794	0.0758	0.0723	0.0687
1	0.0740	0.0704	0.0669	0.0633	0.0598
2	0.0650	0.0615	0.0579	0.0544	0.0507
3	0.0560	0.0524	0.0489	0.0453	0.0418
4	0.0470	0.0435	0.0399	0.0364	0.0328
5	0.0095	0.0086	0.0077	0.0068	0.0059
10	0.0054	0.0046	0.0039	0.0031	0.0024
15	0.0036	0.0030	0.0023	0.0017	0.0010
20	0.0023	0.0017	0.0011	0.0006	0.0002
25	0.0011	0.0007	0.0003	0.0002	0.0002
30	0.0005	0.0002	0.0002	0.0002	0.0002

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE INDUSTRIAL TIER 1 (CONTINUED)

Termination with Vested Deferred Benefits

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
5	0.0496	0.0449	0.0405	0.0356	0.0311
6	0.0470	0.0421	0.0377	0.0328	0.0281
7	0.0442	0.0393	0.0346	0.0297	0.0250
8	0.0414	0.0365	0.0316	0.0267	0.0220
9	0.0384	0.0335	0.0285	0.0234	0.0187
10	0.0353	0.0302	0.0253	0.0201	—
14	0.0311	0.0257	0.0206	0.0152	—
15	0.0302	0.0246	0.0194	—	—
19	0.0248	0.0190	0.0136	—	—
20	0.0232	0.0176	—	—	—
24	0.0173	0.0115	—	—	—
25	0.0159	—	—	—	—
29	0.0091	—	—	—	—
30	—	—	—	—	—

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

Non-Industrial (Not Job-Related) Death

Rates vary by age and gender. See sample rates in the table below.

Non-Industrial (Not Job-Related) Disability, Industrial (Job-Related) Disability & Industrial (Job-Related) Death

Rates vary by age. See sample rates in the table below.

Attained Age	Non-Industrial Death		Non-Industrial Disability	Industrial Death	Industrial Disability
	Male	Female	Male and Female	Male and Female	Male and Female
20	0.00031	0.00020	0.00043	0.00003	0.00015
25	0.00040	0.00023	0.00085	0.00007	0.00015
30	0.00049	0.00025	0.00136	0.00010	0.00015
35	0.00057	0.00035	0.00204	0.00012	0.00029
40	0.00075	0.00050	0.00315	0.00013	0.00029
45	0.00106	0.00071	0.00468	0.00014	0.00044
50	0.00155	0.00100	0.00621	0.00015	0.00044
55	0.00228	0.00138	0.00791	0.00016	0.00058
60	0.00308	0.00182	0.00918	0.00017	0.00058

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE INDUSTRIAL TIER 2

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.006	0.011	0.018	0.026	0.031	0.033	0.039
52	0.006	0.011	0.018	0.026	0.031	0.033	0.039
54	0.016	0.029	0.045	0.067	0.079	0.084	0.100
56	0.020	0.037	0.057	0.085	0.100	0.106	0.126
58	0.025	0.046	0.071	0.106	0.125	0.132	0.157
60	0.038	0.070	0.109	0.162	0.191	0.202	0.240
62	0.076	0.139	0.217	0.321	0.378	0.402	0.476
65	0.083	0.153	0.238	0.353	0.416	0.442	0.523
70	0.089	0.163	0.254	0.376	0.444	0.472	0.559
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.000	0.000	0.000	0.000	0.000	0.000	0.000
52	0.004	0.008	0.013	0.018	0.022	0.023	0.027
54	0.011	0.020	0.032	0.047	0.055	0.059	0.070
56	0.014	0.026	0.040	0.060	0.070	0.074	0.088
58	0.019	0.035	0.053	0.080	0.094	0.099	0.118
60	0.030	0.056	0.087	0.130	0.153	0.162	0.192
62	0.061	0.111	0.174	0.257	0.302	0.322	0.381
65	0.075	0.138	0.214	0.318	0.374	0.398	0.471
70	0.089	0.163	0.254	0.376	0.444	0.472	0.559
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
0	0.0829	0.0794	0.0758	0.0723	0.0687
1	0.0740	0.0704	0.0669	0.0633	0.0598
2	0.0650	0.0615	0.0579	0.0544	0.0507
3	0.0560	0.0524	0.0489	0.0453	0.0418
4	0.0470	0.0435	0.0399	0.0364	0.0328
5	0.0095	0.0086	0.0077	0.0068	0.0059
10	0.0054	0.0046	0.0039	0.0031	0.0024
15	0.0036	0.0030	0.0023	0.0017	0.0010
20	0.0023	0.0017	0.0011	0.0006	0.0002
25	0.0011	0.0007	0.0003	0.0002	0.0002
30	0.0005	0.0002	0.0002	0.0002	0.0002

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE INDUSTRIAL TIER 2 (CONTINUED)

Termination with Vested Deferred Benefits

Rates vary by entry age and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
5	0.0496	0.0449	0.0405	0.0356	0.0311
6	0.0470	0.0421	0.0377	0.0328	0.0281
7	0.0442	0.0393	0.0346	0.0297	0.0250
8	0.0414	0.0365	0.0316	0.0267	0.0220
9	0.0384	0.0335	0.0285	0.0234	0.0187
10	0.0353	0.0302	0.0253	0.0201	—
14	0.0311	0.0257	0.0206	0.0152	—
15	0.0302	0.0246	0.0194	—	—
19	0.0248	0.0190	0.0136	—	—
20	0.0232	0.0176	—	—	—
24	0.0173	0.0115	—	—	—
25	0.0159	—	—	—	—
29	0.0091	—	—	—	—
30	—	—	—	—	—

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

Non-Industrial (Not Job-Related) Death

Rates vary by age and gender. See sample rates in the table below.

Non-Industrial (Not Job-Related) Disability, Industrial (Job-Related) Disability & Industrial (Job-Related) Death

Rates vary by age. See sample rates in the table below.

Attained Age	Non-Industrial Death		Non-Industrial Disability	Industrial Death	Industrial Disability
	Male	Female	Male and Female	Male and Female	Male and Female
20	0.00031	0.00020	0.00043	0.00003	0.00015
25	0.00040	0.00023	0.00085	0.00007	0.00015
30	0.00049	0.00025	0.00136	0.00010	0.00015
35	0.00057	0.00035	0.00204	0.00012	0.00029
40	0.00075	0.00050	0.00315	0.00013	0.00029
45	0.00106	0.00071	0.00468	0.00014	0.00044
50	0.00155	0.00100	0.00621	0.00015	0.00044
55	0.00228	0.00138	0.00791	0.00016	0.00058
60	0.00308	0.00182	0.00918	0.00017	0.00058

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE SAFETY

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.005	0.012	0.018	0.035	0.039	0.067	0.075
52	0.003	0.009	0.014	0.032	0.034	0.061	0.067
54	0.017	0.032	0.046	0.067	0.075	0.113	0.131
56	0.031	0.056	0.077	0.105	0.117	0.167	0.195
58	0.035	0.062	0.087	0.115	0.128	0.182	0.212
60	0.042	0.073	0.102	0.134	0.148	0.208	0.243
62	0.067	0.115	0.158	0.199	0.222	0.305	0.357
65	0.086	0.148	0.203	0.252	0.281	0.382	0.448
70	0.083	0.143	0.196	0.244	0.271	0.368	0.433
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.010	0.018	0.024	0.028	0.031	0.041	0.048
52	0.007	0.012	0.016	0.020	0.021	0.028	0.033
54	0.018	0.031	0.041	0.048	0.054	0.070	0.083
56	0.029	0.048	0.065	0.076	0.085	0.110	0.131
58	0.032	0.054	0.074	0.086	0.096	0.124	0.147
60	0.039	0.065	0.088	0.104	0.115	0.149	0.177
62	0.056	0.094	0.127	0.149	0.166	0.216	0.256
65	0.086	0.144	0.195	0.229	0.256	0.332	0.393
70	0.086	0.144	0.195	0.229	0.255	0.331	0.393
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

Rates vary by service. See sample rates in the table below.

Duration of Service										
0	1	2	3	4	5	10	15	20	25	30
0.1313	0.0967	0.0622	0.0461	0.0374	0.0080	0.0058	0.0039	0.0025	0.0013	0.0009

Termination with Vested Deferred Benefits

Rates vary by service. See sample rates in the table below.

Duration of Service										
5	6	7	8	9	10	15	20	25	30	35
0.0369	0.0363	0.0357	0.0349	0.0341	0.0333	0.0286	0.0226	0.0159	0.0131	0.0000

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE SAFETY (CONTINUED)

Non-Industrial (Not Job-Related) Death

Rates vary by age and gender. See sample rates in the table below.

Non-Industrial (Not Job-Related) Disability, Industrial (Job-Related) Disability & Industrial (Job-Related) Death

Rates vary by age. See sample rates in the table below.

	Non-Industrial Death		Non-Industrial Disability	Industrial Death	Industrial Disability
Attained Age	Male	Female	Male and Female	Male and Female	Male and Female
20	0.00031	0.00020	0.00036	0.00003	0.00002
25	0.00040	0.00023	0.00054	0.00007	0.00076
30	0.00049	0.00025	0.00063	0.00010	0.00170
35	0.00057	0.00035	0.00072	0.00012	0.00264
40	0.00075	0.00050	0.00072	0.00013	0.00360
45	0.00106	0.00071	0.00108	0.00014	0.00457
50	0.00155	0.00100	0.00216	0.00015	0.00557
55	0.00228	0.00138	0.00306	0.00016	0.00658
60	0.00308	0.00182	0.00387	0.00017	0.00762

STATE PEACE OFFICERS AND FIREFIGHTERS

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.016	0.052	0.070	0.091	0.146	0.213	0.247
52	0.014	0.044	0.060	0.080	0.125	0.180	0.209
54	0.019	0.064	0.087	0.110	0.176	0.261	0.302
56	0.022	0.074	0.100	0.126	0.203	0.301	0.350
58	0.025	0.081	0.109	0.137	0.220	0.328	0.381
60	0.026	0.088	0.120	0.149	0.241	0.360	0.418
62	0.030	0.099	0.133	0.164	0.267	0.401	0.467
65	0.030	0.103	0.139	0.171	0.277	0.418	0.486
70	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members - 2.5% @ 57

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.011	0.036	0.049	0.064	0.102	0.149	0.173
52	0.010	0.031	0.042	0.056	0.088	0.126	0.146
54	0.014	0.048	0.065	0.083	0.132	0.196	0.227
56	0.018	0.059	0.080	0.101	0.162	0.241	0.280
58	0.023	0.073	0.098	0.123	0.198	0.295	0.343
60	0.025	0.084	0.114	0.142	0.229	0.342	0.397
62	0.030	0.099	0.133	0.164	0.267	0.401	0.467
65	0.030	0.103	0.139	0.171	0.277	0.418	0.486
70	1.000	1.000	1.000	1.000	1.000	1.000	1.000

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

STATE PEACE OFFICERS AND FIREFIGHTERS (CONTINUED)

Service Retirement - PEPRA Members - 2.7% @ 57

Rates vary by age and service. See sample rates in the table below.

	Years of Service						
Attained Age	5	10	15	20	25	30	35
50	0.011	0.036	0.049	0.064	0.102	0.149	0.173
52	0.011	0.033	0.045	0.060	0.094	0.135	0.157
54	0.015	0.051	0.070	0.088	0.141	0.209	0.242
56	0.019	0.063	0.085	0.107	0.173	0.256	0.298
58	0.025	0.081	0.109	0.137	0.220	0.328	0.381
60	0.026	0.088	0.120	0.149	0.241	0.360	0.418
62	0.030	0.099	0.133	0.164	0.267	0.401	0.467
65	0.030	0.103	0.139	0.171	0.277	0.418	0.486
70	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

Rates vary by service. See sample rates in the table below.

Duration of Service										
0	1	2	3	4	5	10	15	20	25	30
0.1217	0.0779	0.0431	0.0353	0.0275	0.0056	0.0039	0.0025	0.0015	0.0006	0.0003

Termination with Vested Deferred Benefits

Rates vary by service. See sample rates in the table below.

Duration of Service										
5	6	7	8	9	10	15	20	25	30	35
0.0173	0.0168	0.0164	0.0159	0.0155	0.0149	0.0120	0.0086	0.0046	0.0030	0.0000

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

Non-Industrial (Not Job-Related) Death

Rates vary by age and gender. See sample rates in the table below.

Non-Industrial (Not Job-Related) Disability, Industrial (Job-Related) Disability & Industrial (Job-Related) Death

Rates vary by age. See sample rates in the table below.

	Non-Industrial Death		Non-Industrial Disability	Industrial Death	Industrial Disability
Attained Age	Male	Female	Male and Female	Male and Female	Male and Female
20	0.00031	0.00020	0.00010	0.00003	0.00039
25	0.00040	0.00023	0.00010	0.00007	0.00087
30	0.00049	0.00025	0.00010	0.00010	0.00167
35	0.00057	0.00035	0.00020	0.00012	0.00289
40	0.00075	0.00050	0.00040	0.00013	0.00464
45	0.00106	0.00071	0.00060	0.00014	0.00706
50	0.00155	0.00100	0.00098	0.00015	0.01027
55	0.00228	0.00138	0.00143	0.00016	0.01442
60	0.00308	0.00182	0.00188	0.00017	0.01966

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

CALIFORNIA HIGHWAY PATROL

Service Retirement - Classic Members

Rates vary by age and service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.050	0.050	0.050	0.050	0.149	0.283	0.326
52	0.040	0.040	0.040	0.040	0.121	0.230	0.265
54	0.051	0.051	0.051	0.051	0.153	0.290	0.334
56	0.051	0.051	0.051	0.051	0.152	0.288	0.332
58	0.049	0.049	0.049	0.049	0.146	0.277	0.319
60	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.035	0.035	0.035	0.035	0.104	0.198	0.228
52	0.030	0.030	0.030	0.030	0.091	0.173	0.199
54	0.041	0.041	0.041	0.041	0.122	0.232	0.267
56	0.043	0.043	0.043	0.043	0.129	0.245	0.282
58	0.044	0.044	0.044	0.044	0.131	0.249	0.287
60	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

Rates vary by service. See sample rates in the table below.

Duration of Service										
0	1	2	3	4	5	10	15	20	25	30
0.0129	0.0124	0.0121	0.0116	0.0113	0.0040	0.0029	0.0019	0.0011	0.0006	0.0003

Termination with Vested Deferred Benefits

Rates vary by service. See sample rates in the table below.

Duration of Service										
5	6	7	8	9	10	15	20	25	30	35
0.0093	0.0091	0.0090	0.0087	0.0085	0.0082	0.0070	0.0053	0.0033	0.0026	0.0000

- When a member is eligible to retire, the termination with vested benefits probability is set to zero.
- After termination with vested benefits, a miscellaneous member is assumed to retire at age 59 and a safety member at age 54.

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (CONTINUED)

CALIFORNIA HIGHWAY PATROL (CONTINUED)

Non-Industrial (Not Job-Related) Death

Rates vary by age and gender. See sample rates in the table below.

Non-Industrial (Not Job-Related) Disability, Industrial (Job-Related) Disability & Industrial (Job-Related) Death

Rates vary by age. See sample rates in the table below.

	Non-Industrial Death		Non-Industrial Disability	Industrial Death	Industrial Disability
Attained Age	Male	Female	Male and Female	Male and Female	Male and Female
20	0.00031	0.00020	0.00014	0.00003	0.00026
25	0.00040	0.00023	0.00014	0.00007	0.00058
30	0.00049	0.00025	0.00014	0.00010	0.00114
35	0.00057	0.00035	0.00014	0.00012	0.00204
40	0.00075	0.00050	0.00014	0.00013	0.00337
45	0.00106	0.00071	0.00028	0.00014	0.00527
50	0.00155	0.00100	0.00028	0.00015	0.02023
55	0.00228	0.00138	0.00028	0.00016	0.09011
60	0.00308	0.00182	0.00028	0.00017	0.34051

Appendix B
Principal Plan Provisions

STATE MISCELLANEOUS TIER 1

The following is a summary of the major plan provisions for the most representative group used in calculating the liabilities of this plan. Many of the statements in this summary are general in nature, and are intended to provide a summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Service Retirement

Eligibility

A CalPERS Classic and Safety PEPRA members become eligible for Service Retirement upon attainment of age 50 with at least 5 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). PEPRA Miscellaneous members become eligible for Service Retirement upon attainment of age 52 with at least five years of service.

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor, years of service*, and *final compensation*, where

- The *benefit factor* for this group of employees comes from the **2% at 55** benefit factor table. New Classic members hired on or after January 15, 2011 are subject to the **2% at 60** benefit factor table. New PEPRA members hired on or after January 1, 2013 are subject to the **2% at 62** benefit factor table. The factor depends on the member's age at retirement. Listed below are the factors for retirement at whole year ages:

Retirement Age	2% at 55 Factor	2% at 60 Factor	2% at 62 Factor
50	1.100%	1.092%	N/A
51	1.280%	1.156%	N/A
52	1.460%	1.224%	1.000%
53	1.640%	1.296%	1.100%
54	1.820%	1.376%	1.200%
55	2.000%	1.460%	1.300%
56	2.064%	1.552%	1.400%
57	2.126%	1.650%	1.500%
58	2.188%	1.758%	1.600%
59	2.250%	1.874%	1.700%
60	2.314%	2.000%	1.800%
61	2.376%	2.134%	1.900%
62	2.438%	2.272%	2.000%
63	2.500%	2.418%	2.100%
64	2.500%	2.418%	2.200%
65	2.500%	2.418%	2.300%
66	2.500%	2.418%	2.400%
67 & Up	2.500%	2.418%	2.500%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.

STATE MISCELLANEOUS TIER 1 (CONTINUED)

- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For some new members hired after July 1, 2006 and for all new members hired on or after January 15, 2011, final compensation is based on the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- Employees may or may not be covered by Social Security. For employees covered by Social Security, the final compensation is offset by $133.33 (or by one third if the final compensation is less than $400). For some PEPRA members, the final compensation is not offset.
- The Service Retirement benefit is not capped.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS Classic and Safety PEPRA members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50. PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes disabled and has at least five years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. Disabled means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit.

Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *Service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

STATE MISCELLANEOUS TIER 1 (CONTINUED)

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Post-Retirement Death Benefit

Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 25 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, *without* a reduction in the retiree's allowance. This additional benefit is often referred to as *post retirement survivor allowance* (PRSA) or simply as *survivor continuance*.

In other words, 25 percent of the allowance, the *continuance portion*, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

The remaining 75 percent of the retirement allowance, which may be referred to as the *option portion* of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this *option portion* to be paid to **any** designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility

An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit

The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

STATE MISCELLANEOUS TIER 1 (CONTINUED)

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility
An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit
The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

For members with more than 20 years of service credit and not age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility
This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

Benefit
The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

For members who are age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility
An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Optional Settlement 2W Death benefit.

Benefit
The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

STATE MISCELLANEOUS TIER 1 (CONTINUED)

Optional Settlement 2W Death Benefit

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

Cost-of-Living Adjustments

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon one of the following schedules. The employer may choose to "pick-up" these contributions for the employees.

For employees covered by Social Security, the monthly compensation breakpoint is $513 and the contribution schedule is as follows:

> The percent contributed below the monthly compensation breakpoint is 0 percent.
> The percent contributed above the monthly compensation breakpoint ranges from 5 percent to 10 percent.

There are a small number of employees not covered by Social Security in this plan. For those employees, the monthly compensation breakpoint is $317 and contributions are as follows:

> The percent contributed below the monthly compensation breakpoint is 0 percent.
> The percent contributed above the monthly compensation breakpoint is 1 percent greater than those covered by Social Security.

For some new PEPRA members, the monthly compensation breakpoint is $0 and contributions are as follows:

> The percent contributed below the monthly compensation breakpoint is 0 percent.
> The percent contributed above the monthly compensation breakpoint is 6 percent.

STATE MISCELLANEOUS TIER 1 (CONTINUED)

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

STATE MISCELLANEOUS TIER 2

The following is a summary of the major plan provisions applicable to State Miscellaneous Tier 2 members. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Tier 2 Members electing Tier 1 benefits

State Miscellaneous Tier 2 members have the right to convert their Tier 2 service to Tier 1 service provided that they make up the shortfall in their accumulated contributions with interest. In this valuation, we have assumed that all State Miscellaneous Tier 2 members will elect to convert their Tier 2 service to Tier 1 service.

Service Retirement

Eligibility

A CalPERS member becomes eligible for Service Retirement upon attainment of age 55 with at least 10 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

STATE MISCELLANEOUS TIER 2 (CONTINUED)

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor*, *years of service*, and *final compensation*, where

- The *benefit factor* for Classic employees comes from the **1.25% at 65** Tier 2 benefit factor table. New PEPRA members hired on or after January 1, 2013 are subject to the **1.25% at 67** benefit factor table. The factor depends on the member's age at retirement. Listed below are the factors for retirement at whole year ages:

Retirement Age	1.25% at 65 Tier 2 Factor	1.25% at 67 Tier 2 Factor
50	0.500%	N/A
51	0.550%	N/A
52	0.600%	0.650%
53	0.650%	0.690%
54	0.700%	0.730%
55	0.750%	0.770%
56	0.800%	0.810%
57	0.850%	0.850%
58	0.900%	0.890%
59	0.950%	0.930%
60	1.000%	0.970%
61	1.050%	1.010%
62	1.100%	1.050%
63	1.150%	1.090%
64	1.200%	1.130%
65	1.250%	1.170%
66	1.250%	1.210%
67 & Up	1.250%	1.250%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.
- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For some new members hired after July 1, 2006 and for all new members hired on or after January 15, 2011, final compensation is based on the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers
- Employees may or may not be covered by Social Security. The final compensation is not offset by a dollar amount.
- The Service Retirement benefit is not capped.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, and has earned at least 10 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

STATE MISCELLANEOUS TIER 2 (CONTINUED)

Eligibility to Start Receiving Benefits

The CalPERS member becomes eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 55. Members with five years of service before January 1, 1985, are eligible at age 50.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes disabled and has at least 10 years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. Disabled means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit. Members with five years of service before January 1, 1985 are also eligible.

Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.125 percent of final compensation, multiplied by service, which is determined as follows:

Service is CalPERS credited service, for members with less than 10 years of service or greater than 29.628 years of service; or

- Service is CalPERS credited service plus the additional number of years that the member would have worked until age 65, for members with at least 10 years but not more than 29.628 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Post-Retirement Death Benefit

Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 25 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. This additional benefit is often referred to as post retirement survivor allowance (PRSA) or simply as survivor continuance.

STATE MISCELLANEOUS TIER 2 (CONTINUED)

In other words, 25 percent of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

The remaining 75 percent of the retirement allowance, which may be referred to as the option portion of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this option portion to be paid to any designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility

An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit

The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

For members with more than 20 years of service credit and not age-eligible to retire:

In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility

This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

Benefit

The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

STATE MISCELLANEOUS TIER 2 (CONTINUED)

For members who are age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility
An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed and has attained retirement eligibility. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Optional Settlement 2W Death benefit.

Benefit
The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

Optional Settlement 2W Death Benefit

Eligibility
An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed and has attained retirement eligibility. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

Benefit
The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

Cost-of-Living Adjustments

Beginning the second calendar year after the year of retirement, retirement and survivor allowances will be annually adjusted on a compound basis by 3 percent.

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon one of the following schedules. The employer may choose to "pick-up" these contributions for the employees.

The percent contributed above the monthly compensation breakpoint is 3.75 percent.
The monthly compensation breakpoint is $0.
The percent contributed below the monthly compensation breakpoint is 0 percent.

STATE MISCELLANEOUS TIER 2 (CONTINUED)

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

STATE INDUSTRIAL TIER 1

The following is a summary of the major plan provisions for the most representative group used in calculating the liabilities of the plan. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Service Retirement

Eligibility

A CalPERS Classic and Safety PEPRA members become eligible for Service Retirement upon attainment of age 50 with at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). PEPRA Miscellaneous members become eligible for Service Retirement upon attainment of age 52 with at least five years of service.

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor*, *years of service*, and *final compensation*, where

- The *benefit factor* for this group of employees comes from the **2% at 55** benefit factor table. New Classic members hired on or after January 15, 2011 are subject to the **2% at 60** benefit factor table. New PEPRA members hired on or after January 1, 2013 are subject to the **2% at 62** benefit factor table. The factor depends on the member's age at retirement. Listed below are the factors for retirement at whole year ages:

Retirement Age	2% at 55 Factor	2% at 60 Factor	2% at 62 Factor
50	1.100%	1.092%	N/A
51	1.280%	1.156%	N/A
52	1.460%	1.224%	1.000%
53	1.640%	1.296%	1.100%
54	1.820%	1.376%	1.200%
55	2.000%	1.460%	1.300%
56	2.064%	1.552%	1.400%
57	2.126%	1.650%	1.500%
58	2.188%	1.758%	1.600%
59	2.250%	1.874%	1.700%
60	2.314%	2.000%	1.800%
61	2.376%	2.134%	1.900%
62	2.438%	2.272%	2.000%
63	2.500%	2.418%	2.100%
64	2.500%	2.418%	2.200%
65	2.500%	2.418%	2.300%
66	2.500%	2.418%	2.400%
67 & Up	2.500%	2.418%	2.500%

STATE INDUSTRIAL TIER 1 (CONTINUED)

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.
- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For some new members hired after July 1, 2006 and for all new members hired on or after January 15, 2011, final compensation is based on the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- Employees may or may not be covered by Social Security. For employees covered by Social Security, the final compensation is offset by $133.33 (or by one third if the final compensation is less than $400). For some PEPRA members, the final compensation is not offset.
- The Service Retirement benefit is not capped.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, and has earned at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS Classic and Safety PEPRA members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50. PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes disabled and has at least five years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. Disabled means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit.

STATE INDUSTRIAL TIER 1 (CONTINUED)

Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job-Related) Disability Retirement

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes d*isabled* while working, where *disabled* means the member is unable to perform the duties of the job because of a work-related illness or injury which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described in the next paragraph.

Benefit

The Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation. However, if a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit. For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return or annuitization of the accumulated member contributions with respect to employment in this group.

Post-Retirement Death Benefit

Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 25 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, *without* a reduction in the retiree's allowance. This additional benefit is often referred to as *post retirement survivor allowance* (PRSA) or simply as *survivor continuance*.

In other words, 25 percent of the allowance, the *continuance portion*, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

STATE INDUSTRIAL TIER 1 (CONTINUED)

The remaining 75 percent of the retirement allowance, which may be referred to as the *option portion* of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this *option portion* to be paid to **any** designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility

An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit

The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

Special Death Benefit

Eligibility

An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The Special Death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death, at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

STATE INDUSTRIAL TIER 1 (CONTINUED)

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

For members with more than 20 years of service credit and not age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility
This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

Benefit
The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

For members who are age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility
An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Special Death benefit.

Benefit
The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

Optional Settlement 2W Death Benefit

Eligibility
An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

STATE INDUSTRIAL TIER 1 (CONTINUED)

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

Cost-of-Living Adjustments

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual’s allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon one of the following schedules. The employer may choose to “pick-up” these contributions for the employees.

For employees covered by Social Security, the monthly compensation breakpoint is $513 and the contribution schedule is as follows:

- The percent contributed below the monthly compensation breakpoint is 0 percent.
- The percent contributed above the monthly compensation breakpoint is ranges from 9 percent to 10 percent.

There are a small number of employees not covered by Social Security in this plan. For those employees, the monthly compensation breakpoint is $317 and contributions are as follows:

- The percent contributed below the monthly compensation breakpoint is 0 percent.
- The percent contributed above the monthly compensation breakpoint is 1 percent greater than those covered by Social Security.

Refund of Employee Contributions

If the member’s service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

STATE INDUSTRIAL TIER 2

The following is a summary of the major plan provisions applicable to State Industrial Tier 2 Members. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Tier 2 Members electing Tier 1 benefits

State Industrial Tier 2 members have the right to convert their Tier 2 service to Tier 1 service provided that they make up the shortfall in their accumulated contributions with interest. In this valuation, we have assumed that all Stat Industrial Tier 2 members will elect to convert their Tier 2 service to Tier 1 service.

Service Retirement

Eligibility

A CalPERS member becomes eligible for Service Retirement upon attainment of age 55 with at least 10 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). Members with 5 years of service before January 1, 1985 are also eligible.

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor, years of service*, and *final compensation*, where

- The *benefit factor* for Classic employees comes from the **1.25% at 65** Tier 2 benefit factor table. New PEPRA members hired on or after January 1, 2013 are subject to the **1.25% at 67** benefit factor table. The factor depends on the member's age at retirement. Listed below are the factors for retirement at whole year ages:

Retirement Age	1.25% at 65 Tier 2 Factor	1.25% at 67 Tier 2 Factor
50	0.500%	N/A
51	0.550%	N/A
52	0.600%	0.650%
53	0.650%	0.690%
54	0.700%	0.730%
55	0.750%	0.770%
56	0.800%	0.810%
57	0.850%	0.850%
58	0.900%	0.890%
59	0.950%	0.930%
60	1.000%	0.970%
61	1.050%	1.010%
62	1.100%	1.050%
63	1.150%	1.090%
64	1.200%	1.130%
65	1.250%	1.170%
66	1.250%	1.210%
67 & Up	1.250%	1.250%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.

STATE INDUSTRIAL TIER 2 (CONTINUED)

- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For some new members hired after July 1, 2006 and for all new members hired on or after January 15, 2011, final compensation is based on the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- The employees in this group may or may not be covered by Social Security. The final compensation is not offset by a dollar amount.
- The Service Retirement benefit is not capped.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least 10 years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). Members with five years of service before January 1, 1985 are also eligible.

Eligibility to Start Receiving Benefits

The CalPERS member becomes eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 55. Members with five years of service before January 1, 1985 are eligible at age 50.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least 10 years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit. Members with five years of service before January 1, 1985 are also eligible.

Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.125 percent of final compensation, multiplied by *service*, which is determined as follows:

- *service* is CalPERS credited service, for members with less than 10 years of service or greater than 29.628 years of service; or
- *service* is CalPERS credited service plus the additional number of years that the member would have worked until age 65, for members with at least 10 years but not more than 29.628 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

STATE INDUSTRIAL TIER 2 (CONTINUED)

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job-Related) Disability Retirement

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes *disabled* while working, where *disabled* means the member is unable to perform the duties of the job because of a work-related illness or injury which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described in the next paragraph.

Benefit

The Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation. However, if a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit. For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return or annuitization of the accumulated member contributions with respect to employment in this group.

Post-Retirement Death Benefit

Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 25 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, *without* a reduction in the retiree's allowance. This additional benefit is often referred to as *post retirement survivor allowance* (PRSA) or simply as *survivor continuance*.

In other words, 25 percent of the allowance, the *continuance portion*, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

The remaining 75 percent of the retirement allowance, which may be referred to as the *option portion* of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this *option portion* to be paid to **any** designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

STATE INDUSTRIAL TIER 2 (CONTINUED)

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility

An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit

The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

Special Death Benefit

Eligibility

An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The Special Death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death, at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

STATE INDUSTRIAL TIER 2 (CONTINUED)

For members with more than 20 years of service credit and not age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility
This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

Benefit
The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

For members who are age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility
An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed and has attained retirement eligibility. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Special Death benefit.

Benefit
The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

Optional Settlement 2W Death Benefit

Eligibility
An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed and has attained retirement eligibility. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

Benefit
The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

STATE INDUSTRIAL TIER 2 (CONTINUED)

Cost-of-Living Adjustments

Beginning the second calendar year after the year of retirement, retirement and survivor allowances will be annually adjusted on a compound basis by 3 percent.

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon one of the following schedules. The employer may choose to "pick-up" these contributions for the employees.

The percent contributed above the monthly compensation breakpoint is 3.75 percent.

The monthly compensation breakpoint is $0.

The percent contributed below the monthly compensation breakpoint is 0 percent.

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

STATE SAFETY

The following is a summary of the major plan provisions for the most representative group used in calculating the liabilities of the plan. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Service Retirement

Eligibility

A CalPERS Classic and Safety PEPRA members become eligible for Service Retirement upon attainment of age 50 with at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). PEPRA Miscellaneous members become eligible for Service Retirement upon attainment of age 52 with at least five years of service.

STATE SAFETY (CONTINUED)

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor, years of service*, and *final compensation*, where

- The *benefit factor* for this group of employees comes from the **2.5% at 55 Safety** benefit factor table. New Classic members hired on or after January 15, 2011 are subject to either the **2.5% at 60 Safety** or the **2% at 55 Safety** benefit factor table. New PEPRA members hired on or after January 1, 2013 are subject to the **2% at 57** benefit factor table. The factor depends on the member's age at retirement. Listed below are the factors for retirement at whole year ages:

Retirement Age	2.5% at 55 Factor	2.5% at 60 Factor	2% at 55 Factor	2% at 57 Factor
50	1.700%	1.426%	1.426%	1.426%
51	1.800%	1.522%	1.522%	1.508%
52	1.900%	1.628%	1.628%	1.590%
53	2.000%	1.742%	1.742%	1.672%
54	2.250%	1.866%	1.866%	1.754%
55	2.500%	2.000%	2.000%	1.836%
56	2.500%	2.100%	2.000%	1.918%
57	2.500%	2.200%	2.000%	2.000%
58	2.500%	2.300%	2.000%	2.000%
59	2.500%	2.400%	2.000%	2.000%
60 & Up	2.500%	2.500%	2.000%	2.000%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.
- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For some new members hired after July 1, 2006 and for all new members hired on or after January 15, 2011, final compensation is based on the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- The employees in this group are not covered by Social Security. The final compensation is not offset by a dollar amount.
- The Service Retirement benefit is capped at 80 percent of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS Classic and Safety PEPRA members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50. PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 52.

STATE SAFETY (CONTINUED)

Benefit
The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility
A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least five years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit.

Benefit
The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job-Related) Disability Retirement

Eligibility
An employee is eligible for Industrial Disability Retirement if he or she becomes *disabled* while working, where *disabled* means the member is unable to perform the duties of the job because of a work-related illness or injury which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described in the next paragraph.

Benefit
The Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation. However, if a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit. For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return or annuitization of the accumulated member contributions with respect to employment in this group.

Post-Retirement Death Benefit

Lump Sum Payment
Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

STATE SAFETY (CONTINUED)

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 50 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, *without* a reduction in the retiree's allowance. This additional benefit is often referred to as *post retirement survivor allowance* (PRSA) or simply as *survivor continuance*.

In other words, 50 percent of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

The remaining 50 percent of the retirement allowance, which may be referred to as the *option portion* of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this *option portion* to be paid to **any** designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility

An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit

The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

STATE SAFETY (CONTINUED)

Special Death Benefit

Eligibility

An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The Special Death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death, at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

For members with more than 20 years of service credit and not age-eligible to retire:

In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility

This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

Benefit

The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

For members who are age-eligible to retire:

In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Special Death benefit.

STATE SAFETY (CONTINUED)

Benefit

The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

Optional Settlement 2W Death Benefit

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

Cost-of-Living Adjustments

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon the following schedule. The employer may choose to "pick-up" these contributions for the employees.

The active population is subject to the following schedule:

> The percent contributed below the monthly compensation breakpoint is 0 percent.
> The monthly compensation breakpoint is $317.
> The percent contributed above the monthly compensation breakpoint is 11 percent.

STATE SAFETY (CONTINUED)

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

STATE PEACE OFFICERS AND FIREFIGHTERS

The following is a summary of the major plan provisions for the most representative group used in calculating the liabilities of this plan. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Service Retirement

Eligibility

A CalPERS Classic and Safety PEPRA members become eligible for Service Retirement upon attainment of age 50 with at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). PEPRA Miscellaneous members become eligible for Service Retirement upon attainment of age 52 with at least five years of service.

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor*, *years of service*, and *final compensation*, where

- The *benefit factor* for this group of employees comes from either the **3% at 55** or the **3% at 50** benefit factor table. New Classic members, except firefighters, hired on or after January 15, 2011 are subject to the **2.5% at 55** Safety benefit factor table. New Classic firefighters hired on or after October 31, 2010 are subject to the **3% at 55** benefit factor table. The factor depends on the member's age at retirement. New PEPRA members hired on or after January 1, 2013 are subject to the **2.5% at 57** or **2.7% at 57** benefit factor table. Listed below are the factors for retirement at whole year ages:

Retirement Age	3% at 50 Factor	3% at 55 Factor	2.5% at 55 Factor	2.7% at 57 Factor	2.5% at 57 Factor
50	3.000%	2.400%	2.000%	2.000%	2.000%
51	3.000%	2.520%	2.100%	2.100%	2.071%
52	3.000%	2.640%	2.200%	2.200%	2.143%
53	3.000%	2.760%	2.300%	2.300%	2.214%
54	3.000%	2.880%	2.400%	2.400%	2.286%
55	3.000%	3.000%	2.500%	2.500%	2.357%
56	3.000%	3.000%	2.500%	2.600%	2.429%
57 & Up	3.000%	3.000%	2.500%	2.700%	2.500%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.

STATE PEACE OFFICERS AND FIREFIGHTERS (CONTINUED)

- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For some new members hired after January 1, 2007 and for all new members hired on or after January 15, 2011, final compensation is based on the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- The employees in this group are not covered by Social Security. The final compensation is not offset by a dollar amount.
- The Service Retirement benefit is capped at 90 percent of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS Classic and Safety PEPRA members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50. PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least five years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit.

Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

STATE PEACE OFFICERS AND FIREFIGHTERS (CONTINUED)

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job-Related) Disability Retirement

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes *disabled* while working, where *disabled* means the member is unable to perform the duties of the job because of a work-related illness or injury which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described in the next paragraph.

Benefit

The Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation. However, if a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit. For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return or annuitization of the accumulated member contributions with respect to employment in this group.

Post-Retirement Death Benefit

Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 50 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, *without* a reduction in the retiree's allowance. This additional benefit is often referred to as *post retirement survivor allowance* (PRSA) or simply as *survivor continuance*. In other words, 50 percent of the allowance, the *continuance portion*, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

The remaining 50 percent of the retirement allowance, which may be referred to as the *option portion* of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this *option portion* to be paid to **any** designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

STATE PEACE OFFICERS AND FIREFIGHTERS (CONTINUED)

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility
An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit
The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility
An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit
The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

Special Death Benefit

Eligibility
An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit
The Special Death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death, at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

STATE PEACE OFFICERS AND FIREFIGHTERS (CONTINUED)

For members with more than 20 years of service credit and not age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility
This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

Benefit
The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

For members who are age-eligible to retire:
In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility
An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Special Death benefit.

Benefit
The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

Optional Settlement 2W Death Benefit

Eligibility
An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

STATE PEACE OFFICERS AND FIREFIGHTERS (CONTINUED)

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

Cost-of-Living Adjustments

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon one of the following schedules. The employer may choose to "pick-up" these contributions for the employees.

The active population has a monthly compensation breakpoint ranging from \$513 to \$863 and is subject to the following schedule:

The percent contributed below the monthly compensation breakpoint is 0 percent.
The percent contributed above the monthly compensation breakpoint is 13 percent.

A small portion of the active population has a monthly compensation breakpoint of \$238 and is subject to the following schedule:

The percent contributed below the monthly compensation breakpoint is 0 percent.
The percent contributed above the monthly compensation breakpoint is 8 percent.

For some new PEPRA members, the monthly compensation breakpoint is \$0 and contributions are as follows:

The percent contributed below the monthly compensation breakpoint is 0 percent.
The percent contributed above the monthly compensation breakpoint is 11 percent.

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

CALIFORNIA HIGHWAY PATROL

The following is a summary of the major plan provisions used in calculating the liabilities of the plan. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Service Retirement

Eligibility

A CalPERS Classic and Safety PEPRA members become eligible for Service Retirement upon attainment of age 50 with at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements). PEPRA Miscellaneous members become eligible for Service Retirement upon attainment of age 52 with at least five years of service.

Benefit

The Service Retirement benefit calculated for service earned by this group of employees is a monthly allowance equal to the product of the *benefit factor, years of service*, and *final compensation*, where

- The *benefit factor* for this group of employees is **3% at 50**. New Classic members hired on or after October 31, 2010 are subject to the **3% at 55** benefit factor table. New PEPRA members hired on or after January 1, 2013 are subject to the **2.7% at 57** benefit factor table.

Retirement Age	3% at 50	3% at 55 Factor	2.7% at 57 Factor
50	3.000%	2.400%	2.000%
51	3.000%	2.520%	2.100%
52	3.000%	2.640%	2.200%
53	3.000%	2.760%	2.300%
54	3.000%	2.880%	2.400%
55	3.000%	3.000%	2.500%
56	3.000%	3.000%	2.600%
57 & Up	3.000%	3.000%	2.700%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS including service at the CHP Academy for graduating members). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. Any unused sick leave accumulated at the time of retirement will be converted to credited service at the rate of 0.004 years of service for each day of sick leave.
- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). The *final compensation* for an employee hired on or after October 31, 2010 is the monthly average of the member's highest 36 consecutive months' full-time equivalent monthly pay. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security Contribution and Benefit Base. For employees that participate in Social Security this cap is $117,020 for 2016 and for those employees that do not participate in social security the cap for 2016 is $140,424. Adjustments to the caps are permitted annually based on changes to the CPI for All Urban Consumers.
- The employees in this group are not covered by Social Security. The final compensation is not offset by a dollar amount.
- The Service Retirement benefit is capped at 90 percent of final compensation.

CALIFORNIA HIGHWAY PATROL (CONTINUED)

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least five years of credited service (total service across all CalPERS employers, and with certain other Retirement Systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS Classic and Safety PEPRA members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50. PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the Service Retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least five years of credited service (total service across all PERS employers, and with certain other Retirement Systems with which PERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively working with any CalPERS employer at the time of disability in order to be eligible for this benefit.

Benefit

The Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8 percent of final compensation, multiplied by *service*, which is determined as follows:

- *service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or
- *service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent of Final Compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job-Related) Disability Retirement

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes *disabled* while working, where *disabled* means the member is unable to perform the duties of the job because of a work-related illness or injury which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described in the next paragraph.

CALIFORNIA HIGHWAY PATROL (CONTINUED)

Benefit

The Industrial Disability Retirement benefit is a monthly allowance equal to 50 percent of final compensation. For members who, as a result of a single event, incur serious bodily injury, the benefit provided is equal to the greater of 50 percent of final compensation, or, three percent of final compensation multiplied by the number of years of service credited to the member, plus an annuity purchased with the accumulated additional contributions, if any. However, if a member is eligible for Service Retirement and if the Service Retirement benefit is more than the Industrial Disability Retirement benefit, the member may choose to receive the larger benefit, plus an annuity purchased with the accumulated additional contributions, if any. For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return or annuitization of the accumulated member contributions with respect to employment in this group.

Post-Retirement Death Benefit

Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $2,000 will be made to the retiree's designated survivor(s), or to the retiree's estate.

Form of Payment for Retirement Allowance

Generally, the retirement allowance is paid to the retiree in the form of an annuity for as long as he or she is alive. The retiree may choose to provide for a portion of his or her allowance to be paid to any designated beneficiary after the retiree's death. CalPERS provides for a variety of such benefit options, which the retiree pays for by taking a reduction in his or her retirement allowance. Such reduction takes into account the amount to be provided to the beneficiary and the probable duration of payments (based on the ages of the member and beneficiary) made subsequent to the member's death.

For retirement allowances with respect to service earned by employment in this group, 50 percent of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, *without* a reduction in the retiree's allowance. This additional benefit is often referred to as *post retirement survivor allowance* (PRSA) or simply as *survivor continuance*.

In other words, 50 percent of the allowance, the *continuance portion*, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime.

The remaining 50 percent of the retirement allowance, which may be referred to as the *option portion* of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. Or, the retiree may choose to provide for some of this *option portion* to be paid to **any** designated beneficiary after the retiree's death. Benefit options applicable to the *option portion* are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the *option portion*.

Pre-Retirement Death Benefits

Group Term Life Insurance

Eligibility

An employee's beneficiary (or estate) will receive the Group Term Life Insurance benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. This benefit is in addition to other pre-retirement death benefits.

Benefit

The benefit is a lump sum payment of $5,000 plus an additional amount equal to 50 percent of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount shall not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

CALIFORNIA HIGHWAY PATROL (CONTINUED)

For members with less than 20 years of service credit and not age-eligible to retire:

Basic Death Benefit

Eligibility

An employee's beneficiary (or estate) may receive the Basic Death benefit if the member dies while actively employed. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit described below may choose to receive that death benefit instead of this Basic Death benefit.

Benefit

The Basic Death Benefit is a lump sum in the amount of the member's accumulated contributions, where interest is currently credited at 7.5 percent per year. In addition, a lump sum in the amount of six months' salary shall be paid only if the member is eligible for service retirement or eligible for the Alternate Death Benefit. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

Special Death Benefit

Eligibility

An employee's *eligible survivor(s)* may receive the Special Death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried children under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The Special Death benefit is a monthly allowance equal to 50 percent of final compensation, and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death, at which time the allowance is continued to any unmarried children under age 22. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving children (*eligible* means unmarried children under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

For members with more than 20 years of service credit and not age-eligible to retire:

In addition to the above pre-retirement death benefits, members are eligible for:

Alternate Death Benefit

Eligibility

This benefit may be received in lieu of the lump sum Basic Death Benefit if there is a surviving spouse or minor child of the member. The member must have died before reaching the minimum retirement age and must have been credited with at least 20 years of state service.

CALIFORNIA HIGHWAY PATROL (CONTINUED)

Benefit

The Alternate Death Benefit is calculated as though the member were the minimum retirement age and elected an optional form of benefit that provided 100 percent continuance to the member's spouse. If the member did not have a spouse at the time of death, one-half of the formula benefit would be paid to the surviving child. If the benefit is payable to a surviving child, the benefit will be discontinued upon death or the attainment of age 18.

For members who are age-eligible to retire:

In addition to the above pre-retirement death benefits, members are eligible for:

1957 Survivor Benefit

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried children under age 18. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the Special Death benefit.

Benefit

The 1957 Survivor benefit is a monthly allowance equal to one-half of the unmodified Service Retirement benefit that the member would have been entitled to receive if the member had retired on the date of his or her death. If the benefit is payable to the spouse, the benefit is discontinued upon the death of the spouse. If the benefit is payable to a dependent child, the benefit will be discontinued upon death or attainment of age 18, unless the child is disabled. There is a guarantee that the total amount paid will at least equal the Basic Death benefit.

Optional Settlement 2W Death Benefit

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2W Death benefit if the member dies while actively employed, has attained at least age 50 for Classic and Safety PEPRA members and age 52 for Miscellaneous PEPRA members, and has at least five years of credited service (total service across all CalPERS employers and with certain other Retirement Systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor may choose this benefit in lieu of the Basic Death benefit or the 1957 Survivor benefit.

Benefit

The Optional Settlement 2W Death benefit is a monthly allowance equal to the Service Retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2W. (A retiree who elects Optional Settlement 2W receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) The allowance is payable as long as the surviving spouse lives. Upon the death of the surviving spouse, the benefit shall be continued to minor children. There is a guarantee that the total amount paid will at least equal the Basic Death Benefit.

Cost-of-Living Adjustments

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any particular year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

CALIFORNIA HIGHWAY PATROL (CONTINUED)

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 75 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan. The total annual outlay for PPPA is limited to 1.1 percent of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75 percent target would be proportionately reduced.

Employee Contributions

Each employee contributes toward his or her retirement based upon the following schedule. The employer may choose to "pick-up" these contributions for the employees.

The percent contributed below the monthly compensation breakpoint is 0 percent.

The monthly compensation breakpoint is $863.

The percent contributed above the monthly compensation breakpoint is 11.5 percent.

Refund of Employee Contributions

If the member's service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited annually with 6 percent interest.

1959 SURVIVOR BENEFITS PROGRAM

For these benefits, please refer to the 1959 Survivor Report.

Appendix C
Participant Data

SOURCE OF THE PARTICIPANT DATA

The data was extracted from various databases within CalPERS and placed in a data warehouse by a series of extract programs. Included in this data is:

- Individual member and beneficiary information,
- Employment and payroll information,
- Accumulated contributions with interest,
- Service information,
- Benefit payment information,
- Information about the various organizations which contract with CalPERS, and
- Detailed information about the plan provisions applicable to each group of members.

DATA VALIDATION TEST AND ADJUSTMENTS

Once the information is extracted from the various computer systems into the data warehouse, update queries are then run against this data to correct for flaws found in the data. This part of the process is intended to validate the participant data for all CalPERS plans. It is not specific to the State plans.

Checks on the data included:

- A reconciliation of the membership of the plans,
- Comparisons of various member statistics (average attained age, average entry age, average salary, etc.) for each plan with those from the prior valuation
- Pension amounts for each retiree and beneficiary receiving payments were compared with the pension amounts from the prior valuation
- Checks for invalid ages and dates, and
- Reasonableness checks on various key data elements such as service and salary.

As a result of the tests on the data, a number of adjustments were determined to be necessary. These included:

- Dates of hire and dates of entry were adjusted where necessary to be consistent with the service fields, the date of birth and each other, and

In addition, it is also known that records relating to pre-1984 State Safety retirees who were transferred to the State Peace Officers and Firefighters plan upon its creation have not had their records updated to reflect the transfer. In this valuation, as in prior valuations, this deficiency has been handled by adjusting the assets and liabilities rather than by trying to correct the data. The member counts and summary of retiree data have not been adjusted to correct for this deficiency.

DATA STATEMENT

The data does not contain information about reciprocal systems and hence salary information for terminated participants covered by reciprocal systems may not be up to date. This situation is not expected to have a material impact on the employer contribution rates since the total present value for all terminated participants represents less than 2 percent of the present value of benefits for all members.

We are unaware of any other data issues that would have a material effect on the results of this valuation.
It is our opinion that, after the adjustments noted above, the participant data was sufficient and reliable for the purposes of the valuation.

RECONCILIATION OF PARTICIPANTS

State Miscellaneous Tier 1 - For the Fiscal Year Ending June 30, 2016

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2015	**163,609**	**26,372**	**50,456**	**176,437**	**416,874**
Retirements	(6,066)	(1,096)	(579)	7,741	—
Industrial Disabilities	(6)	(56)	(1)	63	—
Ordinary Disabilities	(241)	(20)	(37)	298	—
Deaths[1]	(244)	(49)	(72)	(6,227)	(6,592)
New Survivors	n/a	n/a	n/a	1,767	1,767
Non-vested Terminations[2]	(3,756)	(459)	4,218	(3)	—
Vested Terminations	(1,324)	(107)	1,437	(6)	—
Refunds of Contributions	(589)	(113)	(1,010)	—	(1,712)
Transfers	(2,379)	3,119	(705)	(35)	—
Redeposits/Rehires	1,696	(548)	(1,071)	(77)	—
First Year in Status	15,999	781	1,323	451	18,554
Moved from Tier 2	177	351	91	16	635
Data Corrections[3]	(307)	(946)	(803)	(107)	(2,163)
As of June 30, 2016	**166,569**	**27,229**	**53,247**	**180,318**	**427,363**

(1) Includes both deaths without survivors and deaths with survivors receiving a benefit
(2) Includes non-vested terminated participants with employee contributions left in the plan.
(3) May include the combining of data records into a single record.

State Miscellaneous Tier 2 - For the Fiscal Year Ending June 30, 2016

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2015	**4,977**	**9,773**	**1,483**	**5,860**	**22,093**
Retirements	(41)	(161)	(68)	270	—
Industrial Disabilities	—	(2)	—	2	—
Ordinary Disabilities	(12)	(19)	(6)	37	—
Deaths[1]	(15)	(11)	(30)	(162)	(218)
New Survivors	n/a	n/a	n/a	46	46
Non-vested Terminations[2]	(29)	(152)	182	(1)	—
Vested Terminations	(55)	(5)	60	—	—
Refunds of Contributions	(6)	(14)	(56)	—	(76)
Transfers	(306)	513	(203)	(4)	—
Redeposits/Rehires	41	(30)	(11)	—	—
First Year in Status	43	46	32	43	164
Moved from Tier 2	(177)	(351)	(91)	(16)	(635)
Data Corrections[3]	(3)	(30)	315	(11)	271
As of June 30, 2016	**4,417**	**9,557**	**1,607**	**6,064**	**21,645**

(1) Includes both deaths without survivors and deaths with survivors receiving a benefit
(2) Includes non-vested terminated participants with employee contributions left in the plan.
(3) May include the combining of data records into a single record.

RECONCILIATION OF PARTICIPANTS (CONTINUED)

State Industrial - For the Fiscal Year Ending June 30, 2016

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2015	**11,104**	**8,784**	**3,202**	**12,752**	**35,842**
Retirements	(337)	(419)	(37)	793	—
Industrial Disabilities	(1)	(22)	(1)	24	—
Ordinary Disabilities	(34)	(10)	(11)	55	—
Deaths[1]	(9)	(13)	(8)	(281)	(311)
New Survivors	n/a	n/a	n/a	84	84
Non-vested Terminations[2]	(139)	(34)	173	—	—
Vested Terminations	(100)	(97)	197	—	—
Refunds of Contributions	(51)	(25)	(67)	—	(143)
Transfers	(613)	726	(101)	(12)	—
Redeposits/Rehires	227	(158)	(60)	(9)	—
First Year in Status	1,430	131	58	18	1,637
Data Corrections[3]	(49)	(75)	(26)	(3)	(153)
As of June 30, 2016	**11,428**	**8,788**	**3,319**	**13,421**	**36,956**

(1) Includes both deaths without survivors and deaths with survivors receiving a benefit
(2) Includes non-vested terminated participants with employee contributions left in the plan.
(3) May include the combining of data records into a single record.

State Safety - For the Fiscal Year Ending June 30, 2016

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2015	**26,096**	**5,440**	**5,857**	**22,687**	**60,080**
Retirements	(797)	(248)	(71)	1,116	—
Industrial Disabilities	(144)	(12)	(15)	171	—
Ordinary Disabilities	(40)	(10)	(3)	53	—
Deaths[1]	(52)	(10)	(9)	(575)	(646)
New Survivors	n/a	n/a	n/a	224	224
Non-vested Terminations[2]	(413)	(34)	447	—	—
Vested Terminations	(262)	(50)	315	(3)	—
Refunds of Contributions	(198)	(19)	(206)	—	(423)
Transfers	(611)	746	(120)	(15)	—
Redeposits/Rehires	366	(151)	(192)	(23)	—
First Year in Status	3,104	134	200	56	3,494
Data Corrections[3]	(7)	(45)	(17)	(11)	(80)
As of June 30, 2016	**27,042**	**5,741**	**6,186**	**23,680**	**62,649**

(1) Includes both deaths without survivors and deaths with survivors receiving a benefit
(2) Includes non-vested terminated participants with employee contributions left in the plan.
(3) May include the combining of data records into a single record.

RECONCILIATION OF PARTICIPANTS (CONTINUED)

State Peace Officers and Firefighters - For the Fiscal Year Ending June 30, 2016

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2015	**40,525**	**5,712**	**6,378**	**34,781**	**87,396**
Retirements	(1,542)	(152)	(104)	1,798	—
Industrial Disabilities	(333)	(24)	(13)	370	—
Ordinary Disabilities	(22)	(5)	(4)	31	—
Deaths[1]	(52)	(4)	(8)	(513)	(577)
New Survivors	n/a	n/a	n/a	264	264
Non-vested Terminations[2]	(477)	(38)	516	(1)	—
Vested Terminations	(253)	(51)	306	(2)	—
Refunds of Contributions	(74)	(11)	(120)	—	(205)
Transfers	(345)	510	(154)	(11)	—
Redeposits/Rehires	304	(71)	(214)	(19)	—
First Year in Status	3,486	71	259	77	3,893
Data Corrections[3]	(33)	(21)	(44)	(18)	(116)
As of June 30, 2016	**41,184**	**5,916**	**6,798**	**36,757**	**90,655**

(1) Includes both deaths without survivors and deaths with survivors receiving a benefit
(2) Includes non-vested terminated participants with employee contributions left in the plan.
(3) May include the combining of data records into a single record.

California Highway Patrol - For the Fiscal Year Ending June 30, 2016

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2015	**7,223**	**270**	**366**	**8,650**	**16,509**
Retirements	(215)	(9)	(19)	243	—
Industrial Disabilities	(61)	(1)	—	62	—
Ordinary Disabilities	(1)	—	(1)	2	—
Deaths[1]	(5)	—	—	(225)	(230)
New Survivors	n/a	n/a	n/a	101	101
Non-vested Terminations[2]	(12)	(1)	13	—	—
Vested Terminations	(22)	(4)	26	—	—
Refunds of Contributions	(4)	—	(7)	—	(11)
Transfers	(3)	10	(6)	(1)	—
Redeposits/Rehires	14	(2)	(6)	(6)	—
First Year in Status	236	5	35	7	283
Data Corrections[3]	—	(1)	—	(20)	(21)
As of June 30, 2016	**7,150**	**267**	**401**	**8,813**	**16,631**

(1) Includes both deaths without survivors and deaths with survivors receiving a benefit
(2) Includes non-vested terminated participants with employee contributions left in the plan.
(3) May include the combining of data records into a single record.

ACTIVE MEMBERS

Distribution of Active Members By Age and Service
State Miscellaneous Tier 1 - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Payroll
15-24	2,757	3	0	0	0	0	2,760	$95,512,229
25-29	10,349	1,040	15	—	—	—	11,404	499,408,447
30-34	10,993	4,784	931	89	—	—	16,797	921,216,776
35-39	8,330	5,331	3,242	1,332	87	—	18,322	1,135,773,318
40-44	6,232	4,646	3,817	3,687	692	65	19,139	1,290,595,494
45-49	5,679	4,301	4,316	4,990	2,343	1,322	22,951	1,611,763,448
50-54	4,997	3,914	3,783	5,204	2,920	5,399	26,217	1,900,394,513
55-59	4,194	3,396	3,318	4,654	2,543	6,985	25,090	1,821,101,219
60-64	2,368	2,457	2,370	3,033	1,580	4,280	16,088	1,178,125,795
65 and Over	1,256	1,369	1,246	1,463	701	1,766	7,801	577,228,552
Total	**57,155**	**31,241**	**23,038**	**24,452**	**10,866**	**19,817**	**166,569**	**$11,031,119,792**

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Average Annual Salaries By Age and Service
State Miscellaneous Tier 1 - As of June 30, 2016

	Years of Service at Valuation Date						
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Average Salary
15-24	$34,594	$45,664	$0	$0	$0	$0	$34,606
25-29	42,878	52,830	48,346	—	—	—	43,792
30-34	51,168	60,831	65,798	72,599	—	—	54,844
35-39	55,669	65,046	67,644	74,018	84,981	—	61,990
40-44	56,478	67,657	71,580	78,012	84,032	81,329	67,433
45-49	56,339	65,851	71,272	78,888	83,662	84,197	70,226
50-54	55,797	64,073	70,251	77,652	82,778	85,058	72,487
55-59	55,010	62,609	68,583	76,243	81,642	84,146	72,583
60-64	55,993	63,542	68,652	75,061	81,558	86,492	73,230
65 and Over	51,751	63,542	71,016	78,935	84,827	91,624	73,994
Average	**$51,516**	**$63,920**	**$69,738**	**$77,229**	**$82,755**	**$85,561**	**$66,226**

ACTIVE MEMBERS (CONTINUED)

Distribution of Active Members By Age and Service

State Miscellaneous Tier 2 - As of June 30, 2016

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15-24	2	0	0	0	0	0	2	$98,436
25-29	22	2	—	—	—	—	24	1,311,268
30-34	28	9	—	—	—	—	37	2,214,015
35-39	19	18	19	75	—	—	131	7,640,458
40-44	18	23	44	287	94	4	470	29,565,155
45-49	31	40	55	381	312	86	905	56,583,618
50-54	18	23	40	368	315	272	1,036	65,362,440
55-59	13	24	33	308	269	291	938	57,215,652
60-64	7	14	28	185	148	207	589	37,061,432
65 and Over	13	10	7	102	70	83	285	18,632,294
Total	**171**	**163**	**226**	**1,706**	**1,208**	**943**	**4,417**	**$275,684,769**

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Average Annual Salaries By Age and Service

State Miscellaneous Tier 2 - As of June 30, 2016

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15-24	$49,218	$0	$0	$0	$0	$0	$49,218
25-29	55,500	45,140	—	—	—	—	54,636
30-34	59,277	61,585	—	—	—	—	59,838
35-39	55,614	70,027	52,415	57,699	—	—	58,324
40-44	59,461	54,398	57,683	64,427	63,005	73,191	62,905
45-49	59,732	60,310	57,891	59,643	66,480	65,929	62,523
50-54	53,390	56,237	57,704	57,579	66,539	68,570	63,091
55-59	46,525	45,870	50,618	57,826	62,310	66,212	60,997
60-64	62,346	51,603	44,033	60,069	63,254	68,576	62,923
65 and Over	74,143	37,724	85,297	63,788	65,447	67,548	65,376
Average	**$58,035**	**$55,599**	**$55,427**	**$59,883**	**$64,842**	**$67,532**	**$62,414**

ACTIVE MEMBERS (CONTINUED)

Distribution of Active Members By Age and Service
State Industrial - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Payroll
15 - 24	258	0	0	0	0	0	258	$8,677,686
25 - 29	808	140	1	—	—	—	949	39,162,809
30 - 34	840	480	53	3	—	—	1,376	66,244,542
35 - 39	601	524	172	68	—	—	1,365	73,731,241
40 - 44	557	463	238	162	33	3	1,456	83,306,139
45 - 49	527	471	253	253	106	50	1,660	97,088,522
50 - 54	470	487	285	282	178	146	1,848	111,558,345
55 - 59	320	353	236	253	127	135	1,424	85,132,318
60 - 64	177	209	119	127	54	54	740	45,474,314
65 and Over	69	107	66	63	28	19	352	22,597,819
Total	**4,627**	**3,234**	**1,423**	**1,211**	**526**	**407**	**11,428**	**$632,973,735**

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Average Annual Salaries By Age and Service
State Industrial - As of June 30, 2016

	Years of Service at Valuation Date						
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Average Salary
15 - 24	$33,634	$0	$0	$0	$0	$0	$33,634
25 - 29	40,127	47,673	66,294	—	—	—	41,267
30 - 34	46,098	50,453	58,477	68,463	—	—	48,143
35 - 39	52,100	54,990	55,368	60,013	—	—	54,016
40 - 44	54,268	56,323	61,094	61,694	68,926	64,100	57,216
45 - 49	53,939	59,016	60,199	61,948	63,148	65,387	58,487
50 - 54	57,303	60,008	59,480	60,334	65,150	67,393	60,367
55 - 59	53,289	60,828	59,142	59,096	65,287	69,683	59,784
60 - 64	59,298	65,253	57,326	57,539	66,001	67,542	61,452
65 and Over	72,472	58,507	58,537	61,863	78,694	72,251	64,198
Average	**$49,550**	**$56,950**	**$59,068**	**$60,383**	**$65,825**	**$68,129**	**$55,388**

ACTIVE MEMBERS (CONTINUED)

Distribution of Active Members By Age and Service
State Safety - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Payroll
15 - 24	376	2	0	0	0	0	378	$16,153,879
25 - 29	1,568	177	3	—	—	—	1,748	98,957,845
30 - 34	1,991	727	131	—	—	—	2,849	187,345,871
35 - 39	1,642	1,098	427	54	—	—	3,221	229,348,840
40 - 44	1,457	1,157	704	189	10	—	3,517	284,552,081
45 - 49	1,352	1,169	802	390	120	10	3,843	311,164,570
50 - 54	1,207	1,094	910	491	226	109	4,037	320,911,867
55 - 59	967	988	852	564	236	123	3,730	312,911,561
60 - 64	511	714	572	432	181	83	2,493	226,985,993
65 and Over	161	365	328	216	101	55	1,226	128,181,040
Total	**11,232**	**7,491**	**4,729**	**2,336**	**874**	**380**	**27,042**	**$2,116,513,548**

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Distribution of Average Annual Salaries By Age and Service
State Safety - As of June 30, 2016

	Years of Service at Valuation Date						
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Average Salary
15 - 24	$42,614	$65,426	$0	$0	$0	$0	$42,735
25 - 29	55,857	62,786	86,919	—	—	—	56,612
30 - 34	64,382	69,584	65,446	—	—	—	65,758
35 - 39	67,100	75,957	75,416	66,079	—	—	71,204
40 - 44	71,498	91,081	83,316	82,874	68,073	—	80,908
45 - 49	71,828	88,422	83,143	85,006	83,897	78,713	80,969
50 - 54	70,883	85,762	78,784	85,465	84,832	79,842	79,493
55 - 59	74,184	91,855	82,918	88,562	82,864	83,512	83,890
60 - 64	79,627	100,209	89,927	91,077	91,199	89,836	91,049
65 and Over	97,508	110,989	97,386	109,708	108,677	97,369	104,552
Average	**$67,391**	**$86,853**	**$82,912**	**$88,758**	**$88,054**	**$85,720**	**$78,268**

ACTIVE MEMBERS (CONTINUED)

Distribution of Active Members By Age and Service

State Peace Officers and Firefighters - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Payroll
15 - 24	1,640	0	0	0	0	0	1,640	$72,710,195
25 - 29	3,633	316	2	—	—	—	3,951	206,663,247
30 - 34	2,246	2,748	682	3	—	—	5,679	393,031,792
35 - 39	1,143	2,204	2,538	715	5	—	6,605	518,166,851
40 - 44	615	1,526	2,138	2,298	627	5	7,209	608,774,568
45 - 49	367	1,078	1,490	2,040	2,136	572	7,683	687,097,422
50 - 54	225	667	950	1,147	1,119	816	4,924	441,571,311
55 - 59	116	289	471	580	524	415	2,395	212,986,742
60 - 64	48	124	177	222	172	119	862	74,789,778
65 and Over	12	26	49	62	44	43	236	20,665,204
Total	**10,045**	**8,978**	**8,497**	**7,067**	**4,627**	**1,970**	**41,184**	**$3,236,457,111**

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Distribution of Average Annual Salaries By Age and Service

State Peace Officers and Firefighters - As of June 30, 2016

	Years of Service at Valuation Date						
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Average Salary
15 - 24	$44,335	$0	$0	$0	$0	$0	$44,335
25 - 29	50,795	69,539	75,276	—	—	—	52,307
30 - 34	53,203	78,542	84,207	91,016	—	—	69,208
35 - 39	55,571	79,443	84,789	89,335	97,201	—	78,451
40 - 44	60,498	81,405	84,909	89,442	95,346	97,891	84,446
45 - 49	65,140	82,991	85,400	90,095	95,837	101,364	89,431
50 - 54	73,128	83,976	85,844	89,210	93,348	98,987	89,677
55 - 59	72,179	85,273	85,164	88,477	93,444	95,364	88,930
60 - 64	68,047	85,202	85,405	86,295	90,315	93,698	86,763
65 and Over	66,561	83,158	84,575	85,787	91,706	97,822	87,564
Average	**$52,789**	**$80,193**	**$85,028**	**$89,373**	**$94,654**	**$98,566**	**$78,585**

ACTIVE MEMBERS (CONTINUED)

Distribution of Active Members By Age and Service

California Highway Patrol - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Payroll
15 - 24	106	0	0	0	0	0	106	$8,207,115
25 - 29	340	145	—	—	—	—	485	44,926,427
30 - 34	298	768	108	—	—	—	1,174	121,196,297
35 - 39	144	592	436	269	—	—	1,441	155,912,157
40 - 44	35	319	400	650	287	3	1,694	192,124,998
45 - 49	—	25	184	475	525	246	1,455	173,819,162
50 - 54	1	1	7	69	240	342	660	84,410,201
55 - 59	1	—	2	3	22	106	134	18,050,460
60 - 64	—	—	—	—	—	1	1	240,202
65 and Over	—	—	—	—	—	—	—	—
Total	**925**	**1,850**	**1,137**	**1,466**	**1,074**	**698**	**7,150**	**$798,887,020**

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Distribution of Average Annual Salaries By Age and Service

California Highway Patrol - As of June 30, 2016

	Years of Service at Valuation Date						
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Average Salary
15 - 24	$77,426	$0	$0	$0	$0	$0	$77,426
25 - 29	86,557	106,875	—	—	—	—	92,632
30 - 34	89,240	107,657	110,390	—	—	—	103,234
35 - 39	93,176	107,809	110,472	113,405	—	—	108,197
40 - 44	94,574	107,421	110,413	114,583	123,905	114,231	113,415
45 - 49	—	106,860	109,568	113,916	121,909	133,637	119,463
50 - 54	77,004	53,758	87,021	116,023	121,433	136,026	127,894
55 - 59	143,739	—	140,136	133,932	128,801	135,764	134,705
60 - 64	—	—	—	—	—	240,202	240,202
65 and Over	—	—	—	—	—	—	—
Average	**$87,760**	**$107,564**	**$110,205**	**$114,258**	**$122,477**	**$135,200**	**$111,732**

TRANSFERRED AND TERMINATED PARTICIPANTS

Distribution by By Age and Service - Transfers to Other CalPERS Plans

State Miscellaneous Tier 1 - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15-24	222	0	0	0	0	0	222	$57,457
25-29	1,547	64	1	—	—	—	1,612	58,792
30-34	2,619	506	41	—	—	—	3,166	64,694
35-39	2,736	727	150	12	1	—	3,626	70,608
40-44	2,368	781	241	47	11	1	3,449	73,757
45-49	2,373	943	375	148	63	12	3,914	76,755
50-54	2,291	923	543	279	152	59	4,247	79,031
55-59	2,117	726	373	276	127	77	3,696	76,478
60-64	1,367	472	214	113	53	46	2,265	76,182
65 and Over	708	186	71	39	18	10	1,032	77,352
Total	**18,348**	**5,328**	**2,009**	**914**	**425**	**205**	**27,229**	**$73,226**

Distribution by By Age and Service - Terminated Participants With Funds on Deposit

State Miscellaneous Tier 1 - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15-24	608	0	0	0	0	0	608	$29,834
25-29	3,212	76	—	—	—	—	3,288	35,767
30-34	5,682	614	31	2	—	—	6,329	39,644
35-39	6,624	1,133	201	33	1	—	7,992	43,149
40-44	5,561	1,325	399	70	9	—	7,364	48,022
45-49	5,104	1,543	605	168	65	8	7,493	50,204
50-54	4,464	1,523	658	262	83	44	7,034	49,999
55-59	4,037	1,149	440	179	60	26	5,891	46,109
60-64	3,389	752	255	76	25	15	4,512	43,751
65 and Over	2,275	321	101	25	7	7	2,736	42,208
Total	**40,956**	**8,436**	**2,690**	**815**	**250**	**100**	**53,247**	**$45,026**

TRANSFERRED AND TERMINATED PARTICIPANTS (CONTINUED)

Distribution by By Age and Service - Transfers to Other CalPERS Plans

State Miscellaneous Tier 2 - As of June 30, 2016

Attained Age	Years of Service at Valuation Date 0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15-24	0	0	0	0	0	0	0	$0
25-29	5	—	—	—	—	—	5	44,361
30-34	12	2	—	—	—	—	14	72,594
35-39	339	47	15	10	—	—	411	69,934
40-44	1,046	246	73	61	8	—	1,434	74,973
45-49	1,378	679	218	82	66	9	2,432	73,926
50-54	1,192	581	390	156	87	40	2,446	70,468
55-59	837	341	232	132	81	70	1,693	69,187
60-64	405	134	138	56	44	33	810	70,532
65 and Over	168	56	34	18	17	19	312	69,486
Total	**5,382**	**2,086**	**1,100**	**515**	**303**	**171**	**9,557**	**$71,737**

Distribution by By Age and Service - Terminated Participants With Funds on Deposit

State Miscellaneous Tier 2 - As of June 30, 2016

Attained Age	Years of Service at Valuation Date 0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15-24	1	0	0	0	0	0	1	$37,308
25-29	9	—	—	—	—	—	9	45,148
30-34	14	—	1	—	—	—	15	71,660
35-39	10	4	10	3	—	—	27	44,409
40-44	10	13	62	26	4	—	115	50,818
45-49	15	4	199	52	22	3	295	51,354
50-54	17	11	269	78	27	3	405	48,034
55-59	5	5	256	75	11	6	358	42,675
60-64	6	10	155	49	18	3	241	38,828
65 and Over	7	9	89	29	4	3	141	37,174
Total	**94**	**56**	**1,041**	**312**	**86**	**18**	**1,607**	**$45,452**

TRANSFERRED AND TERMINATED PARTICIPANTS (CONTINUED)

Distribution by By Age and Service - Transfers to Other CalPERS Plans
State Industrial - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15 - 24	27	0	0	0	0	0	27	$36,039
25 - 29	332	22	—	—	—	—	354	48,440
30 - 34	626	119	2	—	—	—	747	58,531
35 - 39	689	184	29	5	—	—	907	64,687
40 - 44	838	226	71	17	—	—	1,152	68,563
45 - 49	1,129	359	138	48	18	2	1,694	70,413
50 - 54	1,109	367	131	58	31	10	1,706	72,445
55 - 59	856	258	111	31	21	8	1,285	72,192
60 - 64	454	127	52	31	10	6	680	71,280
65 and Over	178	37	13	7	1	—	236	77,432
Total	**6,238**	**1,699**	**547**	**197**	**81**	**26**	**8,788**	**$68,489**

Distribution by By Age and Service - Terminated Participants With Funds on Deposit
State Industrial - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15 - 24	18	0	0	0	0	0	18	$31,326
25 - 29	134	12	—	—	—	—	146	35,670
30 - 34	255	32	2	—	—	—	289	39,299
35 - 39	305	48	6	1	—	—	360	39,581
40 - 44	336	78	16	8	—	—	438	39,810
45 - 49	442	109	34	10	4	—	599	42,227
50 - 54	375	91	38	12	4	2	522	40,931
55 - 59	310	64	16	6	1	—	397	37,467
60 - 64	215	40	6	2	—	—	263	37,537
65 and Over	249	36	—	1	1	—	287	39,122
Total	**2,639**	**510**	**118**	**40**	**10**	**2**	**3,319**	**$39,605**

TRANSFERRED AND TERMINATED PARTICIPANTS (CONTINUED)

Distribution by By Age and Service - Transfers to Other CalPERS Plans

State Safety - As of June 30, 2016

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15 - 24	24	0	0	0	0	0	24	$41,535
25 - 29	167	12	—	—	—	—	179	54,981
30 - 34	423	71	3	—	—	—	497	65,594
35 - 39	572	148	6	—	—	—	726	74,141
40 - 44	643	188	33	2	—	—	866	82,145
45 - 49	653	211	40	15	5	—	924	84,113
50 - 54	667	221	78	33	11	—	1,010	84,412
55 - 59	567	192	53	20	6	3	841	87,434
60 - 64	338	113	34	10	3	1	499	87,209
65 and Over	137	26	8	4	—	—	175	93,608
Total	**4,191**	**1,182**	**255**	**84**	**25**	**4**	**5,741**	**$80,963**

Distribution by By Age and Service - Terminated Participants With Funds on Deposit

State Safety - As of June 30, 2016

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15 - 24	46	0	0	0	0	0	46	$36,401
25 - 29	275	9	—	—	—	—	284	47,325
30 - 34	553	68	1	—	—	—	622	54,597
35 - 39	679	122	8	—	—	—	809	60,991
40 - 44	716	129	23	7	3	—	878	67,474
45 - 49	808	154	46	13	3	—	1,024	67,054
50 - 54	668	140	32	11	1	—	852	65,367
55 - 59	663	86	10	3	—	—	762	59,300
60 - 64	534	35	12	2	1	1	585	65,387
65 and Over	296	23	3	2	—	—	324	64,969
Total	**5,238**	**766**	**135**	**38**	**8**	**1**	**6,186**	**$62,480**

TRANSFERRED AND TERMINATED PARTICIPANTS (CONTINUED)

Distribution by By Age and Service - Transfers to Other CalPERS Plans
State Peace Officers and Firefighters - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15 - 24	43	0	0	0	0	0	43	$48,620
25 - 29	419	10	—	—	—	—	429	62,282
30 - 34	730	94	2	—	—	—	826	75,268
35 - 39	949	117	16	1	—	—	1,083	85,135
40 - 44	884	142	35	10	—	—	1,071	89,128
45 - 49	866	180	49	14	5	3	1,117	91,860
50 - 54	637	119	46	15	7	4	828	90,421
55 - 59	266	55	21	1	1	3	347	84,969
60 - 64	108	23	5	3	—	2	141	79,473
65 and Over	24	2	2	2	1	—	31	85,825
Total	**4,926**	**742**	**176**	**46**	**14**	**12**	**5,916**	**$84,426**

Distribution by By Age and Service - Terminated Participants With Funds on Deposit
State Peace Officers and Firefighters - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15 - 24	200	0	0	0	0	0	200	$36,032
25 - 29	606	10	—	—	—	—	616	35,855
30 - 34	996	103	4	—	—	—	1,103	38,622
35 - 39	990	153	39	5	—	—	1,187	41,481
40 - 44	846	144	71	30	6	1	1,098	43,417
45 - 49	795	201	94	56	23	9	1,178	47,885
50 - 54	559	120	36	8	2	2	727	40,718
55 - 59	315	48	22	5	3	—	393	41,011
60 - 64	167	28	7	6	1	2	211	40,697
65 and Over	72	5	6	1	1	—	85	42,321
Total	**5,546**	**812**	**279**	**111**	**36**	**14**	**6,798**	**$41,647**

TRANSFERRED AND TERMINATED PARTICIPANTS (CONTINUED)

Distribution by By Age and Service - Transfers to Other CalPERS Plans

California Highway Patrol - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15 - 24	0	0	0	0	0	0	0	$0
25 - 29	8	—	—	—	—	—	8	65,111
30 - 34	15	2	—	—	—	—	17	67,777
35 - 39	29	6	1	—	—	—	36	87,939
40 - 44	55	15	8	1	1	—	80	93,326
45 - 49	41	9	3	4	—	—	57	95,459
50 - 54	34	5	2	2	—	—	43	78,513
55 - 59	9	6	1	1	—	—	17	74,577
60 - 64	4	2	—	—	—	—	6	80,177
65 and Over	2	1	—	—	—	—	3	108,333
Total	**197**	**46**	**15**	**8**	**1**	**—**	**267**	**$86,877**

Distribution by By Age and Service - Terminated Participants With Funds on Deposit

California Highway Patrol - As of June 30, 2016

	Years of Service at Valuation Date							
Attained Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	Total	Average Salary
15 - 24	2	0	0	0	0	0	2	$56,766
25 - 29	14	2	—	—	—	—	16	64,221
30 - 34	25	10	—	—	—	—	35	78,129
35 - 39	39	21	6	—	—	—	66	81,749
40 - 44	51	37	20	3	—	—	111	79,063
45 - 49	46	32	16	7	2	1	104	73,702
50 - 54	23	10	3	1	1	1	39	71,836
55 - 59	7	10	5	—	—	—	22	74,165
60 - 64	6	—	—	—	—	—	6	42,970
65 and Over	—	—	—	—	—	—	—	—
Total	**213**	**122**	**50**	**11**	**3**	**2**	**401**	**$75,818**

RETIRED MEMBERS AND BENEFICIARIES

Number of Retirees and Beneficiaries - By Age and Retirement Type

State Miscellaneous Tier 1 - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	1	0	10	2	197	210
30-34	—	8	6	—	—	139	153
35-39	—	40	17	6	3	192	258
40-44	—	101	28	15	3	196	343
45-49	—	347	68	33	7	318	773
50-54	1,489	879	239	94	12	537	3,250
55-59	10,123	1,692	439	203	12	905	13,374
60-64	23,956	2,070	478	279	10	1,439	28,232
65-69	34,166	2,153	495	355	5	2,351	39,525
70-74	25,301	1,517	265	293	7	2,833	30,216
75-79	17,994	1,070	208	254	9	3,354	22,889
80-84	12,811	588	101	198	5	3,936	17,639
85 and Over	14,763	548	61	273	3	7,808	23,456
Total	**140,603**	**11,014**	**2,405**	**2,013**	**78**	**24,205**	**180,318**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Age and Retirement Type

State Miscellaneous Tier 1 - Annual Amounts Including PPPA Payments - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$2,030	$0	$94,402	$372	$1,390,557	$1,487,361
30 - 34	—	34,912	376	—	—	1,270,080	1,305,368
35 - 39	—	458,069	25,304	118,035	35,424	1,962,282	2,599,114
40 - 44	—	1,048,024	65,673	364,487	28,332	2,285,402	3,791,918
45 - 49	—	4,184,586	162,901	600,839	25,548	4,531,760	9,505,634
50 - 54	17,462,241	12,966,251	672,812	2,169,382	151,252	7,290,341	40,712,279
55 - 59	275,071,419	26,553,099	1,820,461	4,865,849	158,158	13,652,541	322,121,527
60 - 64	789,702,020	33,282,197	1,827,126	7,160,976	8,133	27,319,596	859,300,048
65 - 69	1,148,963,253	33,771,652	2,121,720	9,821,879	83,556	51,376,274	1,246,138,334
70 - 74	865,037,171	24,990,026	1,344,640	7,841,012	21,968	70,131,829	969,366,646
75 - 79	615,709,266	17,710,518	949,337	7,232,260	13,079	88,110,454	729,724,914
80 - 84	418,418,111	9,134,422	413,301	5,396,433	4,968	104,899,210	538,266,445
85 and Over	425,575,290	7,581,170	172,150	6,876,731	2,443	178,373,035	618,580,819
Total	**$4,555,938,771**	**$171,716,956**	**$9,575,801**	**$52,542,285**	**$533,233**	**$552,593,361**	**$5,342,900,407**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Years Retired and Retirement Type

State Miscellaneous Tier 1 - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	36,988	1,779	323	372	3	8,009	47,474
5 - 9	33,645	1,528	285	377	18	5,776	41,629
10 - 14	27,647	1,918	460	295	5	4,201	34,526
15 - 19	17,557	2,285	432	287	15	2,635	23,211
20 - 24	12,421	1,574	415	203	10	1,743	16,366
25 - 29	6,712	920	271	186	10	1,012	9,111
30 and Over	5,633	1,010	219	293	17	829	8,001
Total	**140,603**	**11,014**	**2,405**	**2,013**	**78**	**24,205**	**180,318**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Years Retired and Retirement Type

State Miscellaneous Tier 1 - Annual Amounts Including PPPA Payments - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$1,213,209,075	$27,332,677	$1,751,956	$9,627,478	$67,249	$204,112,117	$1,456,100,552
5 - 9	1,181,220,828	24,212,390	1,752,300	10,376,440	162,594	139,399,254	1,357,123,806
10 - 14	955,797,452	32,974,392	2,415,680	7,708,341	1,838	94,202,156	1,093,099,859
15 - 19	574,071,227	37,658,016	1,893,221	7,882,688	254,958	56,608,700	678,368,810
20 - 24	378,541,933	25,169,764	1,117,162	5,844,399	30,992	32,361,196	443,065,446
25 - 29	164,480,908	13,122,428	469,705	5,033,758	5,004	16,278,269	199,390,072
30 and Over	88,617,348	11,247,289	175,777	6,069,181	10,598	9,631,669	115,751,862
Total	**$4,555,938,771**	**$171,716,956**	**$9,575,801**	**$52,542,285**	**$533,233**	**$552,593,361**	**$5,342,900,407**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Age and Retirement Type
State Miscellaneous Tier 2 - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	1	0	21	22
30-34	—	—	—	—	—	14	14
35-39	—	2	—	1	—	18	21
40-44	—	14	1	2	—	16	33
45-49	—	79	8	5	—	33	125
50-54	111	166	11	7	—	35	330
55-59	376	255	20	21	—	75	747
60-64	689	332	4	33	2	103	1,163
65-69	923	309	14	23	—	154	1,423
70-74	602	168	5	10	—	118	903
75-79	423	90	4	11	—	99	627
80-84	296	34	1	2	—	86	419
85 and Over	159	9	1	3	—	65	237
Total	**3,579**	**1,458**	**69**	**119**	**2**	**837**	**6,064**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Age and Retirement Type
State Miscellaneous Tier 2 - Annual Amounts Including PPPA Payments - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$0	$0	$2,335	$0	$101,924	$104,259
30 - 34	—	—	—	—	—	60,843	60,843
35 - 39	—	17,497	—	98	—	96,221	113,816
40 - 44	—	149,290	28,328	10,447	—	124,794	312,859
45 - 49	—	783,578	170,384	13,501	—	205,733	1,173,196
50 - 54	204,472	1,966,156	257,047	31,307	—	373,832	2,832,814
55 - 59	1,555,454	3,388,070	382,655	180,080	—	641,711	6,147,970
60 - 64	4,183,536	4,812,851	82,033	317,610	53,108	1,112,620	10,561,758
65 - 69	6,553,208	4,929,537	342,131	197,827	—	1,766,757	13,789,460
70 - 74	4,436,359	2,715,957	89,376	182,139	—	1,408,456	8,832,287
75 - 79	3,842,852	1,631,934	79,671	138,546	—	1,010,221	6,703,224
80 - 84	3,439,497	552,922	26,833	14,742	—	1,074,290	5,108,284
85 and Over	1,903,444	152,002	35,408	134,042	—	760,251	2,985,147
Total	**$26,118,822**	**$21,099,794**	**$1,493,866**	**$1,222,674**	**$53,108**	**$8,737,653**	**$58,725,917**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Years Retired and Retirement Type

State Miscellaneous Tier 2 - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	1,481	241	10	31	0	248	2,011
5 - 9	614	130	2	27	—	191	964
10 - 14	367	206	13	28	—	175	789
15 - 19	694	457	29	16	1	132	1,329
20 - 24	311	261	10	12	1	69	664
25 - 29	98	149	5	4	—	22	278
30 and Over	14	14	—	1	—	—	29
Total	**3,579**	**1,458**	**69**	**119**	**2**	**837**	**6,064**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Years Retired and Retirement Type

State Miscellaneous Tier 2 - Annual Amounts Including PPPA Payments - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$9,773,334	$2,328,079	$108,853	$206,904	$0	$1,931,962	$14,349,132
5 - 9	3,861,188	1,386,433	31,559	198,462	—	1,788,963	7,266,605
10 - 14	1,755,742	2,658,231	292,157	239,628	—	1,983,442	6,929,200
15 - 19	6,039,296	6,971,891	622,742	248,201	36,242	1,706,747	15,625,119
20 - 24	3,615,021	4,944,746	331,149	261,514	16,866	1,009,561	10,178,857
25 - 29	977,452	2,550,073	107,406	47,810	—	316,978	3,999,719
30 and Over	96,789	260,341	—	20,155	—	—	377,285
Total	**$26,118,822**	**$21,099,794**	**$1,493,866**	**$1,222,674**	**$53,108**	**$8,737,653**	**$58,725,917**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Appendix C - Participant Data (continued)

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Age and Retirement Type

State Industrial - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	1	0	1	0	23	25
30 - 34	—	2	—	—	—	6	8
35 - 39	—	13	2	—	—	21	36
40 - 44	—	22	11	—	—	14	47
45 - 49	—	100	25	2	—	21	148
50 - 54	251	176	59	7	—	36	529
55 - 59	1,350	259	95	15	1	65	1,785
60 - 64	2,426	288	111	13	1	97	2,936
65 - 69	2,638	257	89	17	—	148	3,149
70 - 74	1,699	153	53	18	1	151	2,075
75 - 79	936	90	25	13	3	135	1,202
80 - 84	552	35	23	7	1	138	756
85 and Over	457	25	6	6	4	227	725
Total	**10,309**	**1,421**	**499**	**99**	**11**	**1,082**	**13,421**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Age and Retirement Type

State Industrial - Annual Amounts Including PPPA Payments - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$1,541	$0	$5,110	$0	$69,804	$76,455
30 - 34	—	6,752	—	—	—	16,122	22,874
35 - 39	—	88,830	479	—	—	102,463	191,772
40 - 44	—	159,053	140,574	—	—	102,604	402,231
45 - 49	—	841,840	187,004	4,881	—	142,398	1,176,123
50 - 54	1,618,724	1,635,544	185,461	128,522	—	132,567	3,700,818
55 - 59	16,038,097	2,302,624	548,401	151,159	1,114	498,663	19,540,058
60 - 64	31,577,789	2,566,372	744,719	107,562	65	671,451	35,667,958
65 - 69	35,622,322	2,382,490	579,628	86,687	—	1,187,878	39,859,005
70 - 74	24,186,848	1,465,720	359,105	264,505	18,647	1,419,438	27,714,263
75 - 79	14,408,089	926,684	152,066	245,368	23,359	1,420,930	17,176,496
80 - 84	8,736,111	567,639	203,716	226,589	30,316	1,771,741	11,536,112
85 and Over	7,872,504	315,359	62,715	128,791	92,199	3,661,443	12,133,011
Total	**$140,060,484**	**$13,260,448**	**$3,163,868**	**$1,349,174**	**$165,700**	**$11,197,502**	**$169,197,176**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Years Retired and Retirement Type

State Industrial - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	3,551	380	109	22	1	396	4,459
5 - 9	2,978	226	70	19	1	287	3,581
10 - 14	1,970	308	128	20	—	179	2,605
15 - 19	993	278	84	17	1	97	1,470
20 - 24	467	132	58	12	—	70	739
25 - 29	201	66	29	6	—	30	332
30 and Over	149	31	21	3	8	23	235
Total	**10,309**	**1,421**	**499**	**99**	**11**	**1,082**	**13,421**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Years Retired and Retirement Type

State Industrial - Annual Amounts Including PPPA Payments - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$47,613,293	$3,497,226	$683,818	$290,022	$65	$4,274,729	$56,359,153
5 - 9	41,943,733	2,140,904	637,704	288,746	1,114	2,336,225	47,348,426
10 - 14	27,700,448	2,996,402	754,213	295,617	—	2,366,336	34,113,016
15 - 19	12,527,039	2,577,291	503,697	106,981	78	1,115,438	16,830,524
20 - 24	5,905,913	1,190,072	301,264	236,335	—	538,100	8,171,684
25 - 29	2,449,705	607,534	108,131	104,266	—	303,545	3,573,181
30 and Over	1,920,353	251,019	175,041	27,207	164,443	263,129	2,801,192
Total	**$140,060,484**	**$13,260,448**	**$3,163,868**	**$1,349,174**	**$165,700**	**$11,197,502**	**$169,197,176**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Age and Retirement Type

State Safety - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	5	1	2	26	34
30 - 34	—	1	21	—	—	22	44
35 - 39	—	3	53	—	—	16	72
40 - 44	—	8	86	1	1	24	120
45 - 49	—	38	177	6	2	34	257
50 - 54	340	66	330	15	—	70	821
55 - 59	1,937	122	609	41	8	166	2,883
60 - 64	3,400	181	810	56	19	232	4,698
65 - 69	4,233	171	950	66	12	358	5,790
70 - 74	2,759	103	586	34	8	412	3,902
75 - 79	1,533	50	319	31	14	358	2,305
80 - 84	731	32	193	21	14	393	1,384
85 and Over	550	17	135	13	9	646	1,370
Total	**15,483**	**792**	**4,274**	**285**	**89**	**2,757**	**23,680**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Age and Retirement Type

State Safety - Annual Amounts Including PPPA Payments - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$0	$127,087	$511	$25,928	$211,834	$365,360
30 - 34	—	3,954	620,993	—	—	196,714	821,661
35 - 39	—	44,233	1,390,137	—	—	173,412	1,607,782
40 - 44	—	78,238	2,312,712	25,319	28,686	194,893	2,639,848
45 - 49	—	254,867	5,161,282	122,244	74,302	302,315	5,915,010
50 - 54	3,540,590	671,233	8,876,939	421,468	—	1,122,476	14,632,706
55 - 59	39,104,861	1,273,395	15,767,454	610,812	264,128	2,332,045	59,352,695
60 - 64	75,325,795	2,390,517	21,440,953	939,906	544,702	3,777,869	104,419,742
65 - 69	92,417,730	2,374,302	24,856,878	1,089,044	357,157	5,721,309	126,816,420
70 - 74	60,463,695	1,239,610	15,853,137	716,373	260,884	6,730,650	85,264,349
75 - 79	32,298,525	795,090	8,794,371	535,489	429,441	5,314,482	48,167,398
80 - 84	13,704,887	528,918	5,512,763	421,286	372,304	6,304,621	26,844,779
85 and Over	11,029,023	352,415	3,711,151	243,718	263,454	10,057,858	25,657,619
Total	**$327,885,106**	**$10,006,772**	**$114,425,857**	**$5,126,170**	**$2,620,986**	**$42,440,478**	**$502,505,369**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Years Retired and Retirement Type

State Safety - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	5,497	282	997	63	1	1,051	7,891
5 - 9	4,792	150	650	70	11	657	6,330
10 - 14	2,927	126	805	75	4	430	4,367
15 - 19	1,297	119	571	32	17	268	2,304
20 - 24	511	60	324	12	5	180	1,092
25 - 29	191	23	222	12	5	76	529
30 and Over	268	32	705	21	46	95	1,167
Total	**15,483**	**792**	**4,274**	**285**	**89**	**2,757**	**23,680**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Years Retired and Retirement Type

State Safety - Annual Amounts Including PPPA Payments - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$131,837,645	$4,620,104	$31,865,475	$1,410,682	$126,310	$17,315,128	$187,175,344
5 - 9	114,846,291	2,257,593	20,439,236	1,318,499	400,924	10,172,651	149,435,194
10 - 14	49,404,399	1,180,066	20,840,374	1,168,551	126,069	6,687,303	79,406,762
15 - 19	17,701,521	1,041,961	13,912,515	474,816	430,143	3,489,772	37,050,728
20 - 24	6,221,987	438,988	7,438,517	173,368	171,667	2,333,860	16,778,387
25 - 29	2,769,484	152,109	4,362,903	188,881	115,287	1,075,931	8,664,595
30 and Over	5,103,779	315,951	15,566,837	391,373	1,250,586	1,365,833	23,994,359
Total	**$327,885,106**	**$10,006,772**	**$114,425,857**	**$5,126,170**	**$2,620,986**	**$42,440,478**	**$502,505,369**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Age and Retirement Type
State Peace Officers and Firefighters - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	2	5	3	43	53
30 - 34	—	4	56	—	2	18	80
35 - 39	—	8	223	2	2	36	271
40 - 44	—	16	458	1	10	32	517
45 - 49	—	48	858	12	18	51	987
50 - 54	3,375	84	1,548	26	26	116	5,175
55 - 59	5,101	110	1,817	46	25	228	7,327
60 - 64	5,186	98	1,627	47	20	358	7,336
65 - 69	4,850	96	1,498	51	23	436	6,954
70 - 74	2,716	43	829	34	13	433	4,068
75 - 79	1,437	28	359	11	10	401	2,246
80 - 84	675	13	146	11	6	286	1,137
85 and Over	352	3	57	5	—	189	606
Total	**23,692**	**551**	**9,478**	**251**	**158**	**2,627**	**36,757**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Age and Retirement Type
State Peace Officers and Firefighters - Annual Amounts Including PPPA Payments - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$0	$20,552	$80,663	$56,374	$552,296	$709,885
30 - 34	—	30,228	1,835,096	—	38,448	177,865	2,081,637
35 - 39	—	119,341	7,543,471	77,173	84,993	708,477	8,533,455
40 - 44	—	240,620	15,780,300	24,847	491,454	733,052	17,270,273
45 - 49	—	788,498	30,096,886	665,674	820,233	1,207,692	33,578,983
50 - 54	214,397,197	1,805,581	61,717,072	1,125,725	1,016,065	3,985,330	284,046,970
55 - 59	319,188,920	2,762,856	72,143,937	2,067,808	1,032,180	8,178,722	405,374,423
60 - 64	309,269,465	2,543,976	68,886,799	1,910,748	698,662	13,401,328	396,710,978
65 - 69	273,554,213	2,578,916	64,711,305	1,990,891	833,068	17,004,520	360,672,913
70 - 74	140,230,884	1,108,058	35,072,181	1,442,111	460,397	16,802,860	195,116,491
75 - 79	67,655,001	816,171	14,726,370	434,522	411,452	14,814,436	98,857,952
80 - 84	29,298,255	356,791	5,692,752	343,586	189,394	10,008,318	45,889,096
85 and Over	13,435,572	65,266	1,994,460	185,139	—	6,085,877	21,766,314
Total	**$1,367,029,507**	**$13,216,302**	**$380,221,181**	**$10,348,887**	**$6,132,720**	**$93,660,773**	**$1,870,609,370**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Years Retired and Retirement Type
State Peace Officers and Firefighters - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	8,112	154	2,105	56	12	1,114	11,553
5 - 9	7,592	97	1,367	51	27	686	9,820
10 - 14	4,200	93	2,034	58	38	424	6,847
15 - 19	2,123	127	1,729	48	36	219	4,282
20 - 24	1,052	54	1,243	23	15	119	2,506
25 - 29	446	25	823	11	17	57	1,379
30 and Over	167	1	177	4	13	8	370
Total	**23,692**	**551**	**9,478**	**251**	**158**	**2,627**	**36,757**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Years Retired and Retirement Type
State Peace Officers and Firefighters - Annual Amounts Including PPPA Payments - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$467,749,718	$4,348,022	$93,178,139	$2,474,188	$593,567	$44,038,405	$612,382,039
5 - 9	483,734,591	2,825,665	66,472,694	2,376,305	1,229,329	23,683,813	580,322,397
10 - 14	238,671,465	1,976,536	83,858,340	2,404,329	1,359,097	13,946,338	342,216,105
15 - 19	103,263,450	2,594,199	63,623,158	1,597,413	1,326,646	6,970,421	179,375,287
20 - 24	48,497,588	974,672	44,453,825	991,106	662,281	3,366,217	98,945,689
25 - 29	18,962,809	490,388	24,189,929	342,600	579,763	1,463,380	46,028,869
30 and Over	6,149,886	6,820	4,445,096	162,946	382,037	192,199	11,338,984
Total	**$1,367,029,507**	**$13,216,302**	**$380,221,181**	**$10,348,887**	**$6,132,720**	**$93,660,773**	**$1,870,609,370**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Age and Retirement Type

California Highway Patrol - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	0	5	5	10
30 - 34	—	—	3	—	5	4	12
35 - 39	—	2	17	—	4	2	25
40 - 44	—	2	36	—	8	7	53
45 - 49	—	—	93	5	19	3	120
50 - 54	509	3	248	1	18	18	797
55 - 59	875	8	437	6	16	42	1,384
60 - 64	670	6	410	6	7	67	1,166
65 - 69	504	6	551	9	18	144	1,232
70 - 74	589	5	771	5	9	223	1,602
75 - 79	338	5	549	4	20	252	1,168
80 - 84	150	3	302	1	12	199	667
85 and Over	135	2	153	2	7	278	577
Total	**3,770**	**42**	**3,570**	**39**	**148**	**1,244**	**8,813**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Age and Retirement Type

California Highway Patrol - Annual Amounts Including PPPA Payments - As of June 30, 2016

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$0	$0	$0	$141,769	$105,986	$247,755
30 - 34	—	—	131,595	—	365,890	25,167	522,652
35 - 39	—	33,548	782,553	—	309,529	45,840	1,171,470
40 - 44	—	38,681	1,723,728	—	499,067	29,896	2,291,372
45 - 49	—	—	4,099,836	319,556	1,340,254	45,560	5,805,206
50 - 54	46,683,571	49,233	14,838,035	117,243	1,142,982	755,335	63,586,399
55 - 59	81,933,454	207,535	28,096,578	416,886	976,288	2,235,280	113,866,021
60 - 64	58,730,422	141,411	27,303,837	398,935	305,170	2,882,890	89,762,665
65 - 69	34,775,046	364,420	35,607,318	557,088	485,092	5,208,774	76,997,738
70 - 74	33,309,036	185,550	40,771,678	240,727	235,572	7,701,483	82,444,046
75 - 79	15,603,073	68,050	23,626,501	140,716	556,097	7,976,601	47,971,038
80 - 84	6,530,870	93,420	12,419,236	6,736	306,512	5,712,573	25,069,347
85 and Over	5,117,072	42,029	5,912,361	61,809	188,451	6,335,333	17,657,055
Total	**$282,682,544**	**$1,223,877**	**$195,313,256**	**$2,259,696**	**$6,852,673**	**$39,060,718**	**$527,392,764**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number of Retirees and Beneficiaries - By Years Retired and Retirement Type

California Highway Patrol - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	956	7	276	4	18	396	1,657
5 - 9	1,038	2	345	5	21	283	1,694
10 - 14	624	6	628	7	18	213	1,496
15 - 19	594	6	534	10	10	145	1,299
20 - 24	287	8	576	4	12	84	971
25 - 29	129	4	435	3	8	58	637
30 and Over	142	9	776	6	61	65	1,059
Total	**3,770**	**42**	**3,570**	**39**	**148**	**1,244**	**8,813**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Annual Allowance Amounts for Retirees and Beneficiaries - By Years Retired and Retirement Type

California Highway Patrol - Annual Amounts Including PPPA Payments - As of June 30, 2016

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$86,913,652	$197,782	$22,203,994	$316,008	$1,087,436	$14,990,248	$125,709,120
5 - 9	95,251,102	247,967	30,242,721	349,362	1,421,891	9,698,868	137,211,911
10 - 14	43,490,852	309,425	48,458,263	570,850	1,158,688	5,996,576	99,984,654
15 - 19	33,273,537	148,225	31,425,562	561,225	569,761	3,875,206	69,853,516
20 - 24	13,259,936	102,095	26,181,648	201,914	516,361	1,897,326	42,159,280
25 - 29	5,524,628	102,388	16,178,905	118,786	386,331	1,338,643	23,649,681
30 and Over	4,968,837	115,995	20,622,163	141,551	1,712,205	1,263,851	28,824,602
Total	**$282,682,544**	**$1,223,877**	**$195,313,256**	**$2,259,696**	**$6,852,673**	**$39,060,718**	**$527,392,764**

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number Counts and Benefits - By Year of Retirement - As of June 30, 2016

State Miscellaneous Tier 1

Year Retired	Total Retirement	Total Benefits	Average Benefits
2016[1]	2,495	$70,113,554	$28,102
2015	8,512	275,341,420	32,347
2014	8,610	274,081,891	31,833
2013	7,396	219,469,671	29,674
2012	8,254	262,166,989	31,762
2011	8,327	261,469,516	31,400
2010	9,178	316,611,307	34,497
2009	8,023	289,306,666	36,060
2008	6,776	232,018,873	34,241
2007	6,497	206,840,962	31,836
2006	6,263	182,935,005	29,209
2005	7,101	226,608,007	31,912
2004	8,372	283,702,407	33,887
2003	5,824	178,933,150	30,723
2002	5,744	182,148,507	31,711
2001	5,853	207,970,615	35,532
2000	7,803	278,383,906	35,677
1999	2,883	65,126,270	22,590
1998	4,167	107,499,863	25,798
1997	4,184	110,897,138	26,505
1996	3,940	106,875,225	27,126
1995	3,568	98,595,248	27,633
1994	3,559	96,363,005	27,076
1993	2,685	58,144,887	21,655
1992	4,244	124,260,437	29,279
1991	4,639	157,105,768	33,866
1990	2,531	62,839,339	24,828
1989	2,291	49,632,921	21,664
1988	2,465	60,152,125	24,402
1987	2,602	60,520,978	23,259
1986	2,038	43,039,040	21,118
1985	1,993	36,256,829	18,192
1984 or earlier	11,501	157,488,888	13,693
Total	**180,318**	**$5,342,900,407**	**$29,630**

State Miscellaneous Tier 2

Year Retired	Total Retirement	Total Benefits	Average Benefits
2016[1]	130	$733,929	$5,646
2015	329	2,330,786	7,084
2014	368	2,595,179	7,052
2013	386	2,767,941	7,171
2012	436	2,996,717	6,873
2011	315	2,216,222	7,036
2010	200	1,319,713	6,599
2009	169	1,134,267	6,712
2008	143	1,176,338	8,226
2007	130	1,095,091	8,424
2006	126	832,624	6,608
2005	145	1,157,794	7,985
2004	118	971,084	8,230
2003	127	1,186,497	9,342
2002	156	1,330,650	8,530
2001	200	1,488,843	7,444
2000	243	2,247,178	9,248
1999	270	2,899,506	10,739
1998	351	4,053,475	11,548
1997	333	4,332,057	13,009
1996	268	3,535,786	13,193
1995	215	3,290,473	15,305
1994	144	2,365,893	16,430
1993	135	2,041,050	15,119
1992	129	1,887,371	14,631
1991	133	1,971,497	14,823
1990	71	1,035,367	14,583
1989	85	1,198,998	14,106
1988	82	1,085,285	13,235
1987	49	593,083	12,104
1986	42	475,014	11,310
1985	28	318,032	11,358
1984 or earlier	8	62,177	7,772
Total	**6,064**	**$58,725,917**	**$9,684**

(1) The number for 2016 are for the first 6 months of the calendar year only.

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number Counts and Benefits - By Year of Retirement - As of June 30, 2016 (continued)

State Industrial

Year Retired	Total Retirement	Total Benefits	Average Benefits
2016[1]	274	$3,255,098	$11,880
2015	887	11,299,130	12,739
2014	832	10,400,665	12,501
2013	765	9,134,314	11,940
2012	891	12,154,927	13,642
2011	812	10,211,858	12,576
2010	938	13,388,750	14,274
2009	759	10,487,194	13,817
2008	599	7,913,055	13,210
2007	504	6,546,386	12,989
2006	543	6,502,812	11,976
2005	536	7,425,874	13,854
2004	649	8,549,165	13,173
2003	451	5,314,168	11,783
2002	445	5,453,594	12,255
2001	434	6,025,465	13,884
2000	549	7,419,898	13,515
1999	190	1,728,874	9,099
1998	286	2,667,187	9,326
1997	261	2,699,125	10,341
1996	216	1,982,327	9,177
1995	194	1,944,099	10,021
1994	166	1,696,856	10,222
1993	138	1,263,718	9,157
1992	172	2,532,802	14,726
1991	154	2,382,500	15,471
1990	100	896,741	8,967
1989	105	1,060,214	10,097
1988	66	724,199	10,973
1987	79	1,031,452	13,056
1986	45	686,890	15,264
1985	59	745,985	12,644
1984 or earlier	322	3,671,854	11,403
Total	**13,421**	**$169,197,176**	**$12,607**

State Safety

Year Retired	Total Retirement	Total Benefits	Average Benefits
2016[1]	486	$11,805,484	$24,291
2015	1,428	36,344,371	25,451
2014	1,417	33,912,072	23,932
2013	1,357	33,685,592	24,824
2012	1,489	36,293,068	24,374
2011	1,411	35,328,161	25,038
2010	1,596	43,883,949	27,496
2009	1,327	34,446,849	25,958
2008	1,020	23,827,582	23,360
2007	940	19,391,058	20,629
2006	923	16,213,941	17,567
2005	999	18,548,032	18,567
2004	1,026	19,485,342	18,992
2003	772	14,112,497	18,280
2002	737	12,913,700	17,522
2001	691	12,270,986	17,758
2000	828	15,011,493	18,130
1999	378	5,433,975	14,376
1998	400	5,506,257	13,766
1997	358	5,411,643	15,116
1996	319	4,794,609	15,030
1995	247	3,337,462	13,512
1994	265	3,657,016	13,800
1993	171	2,763,515	16,161
1992	238	4,273,836	17,957
1991	219	3,238,453	14,787
1990	138	2,203,826	15,970
1989	146	2,384,379	16,331
1988	107	1,605,399	15,004
1987	122	2,081,115	17,058
1986	87	1,517,816	17,446
1985	134	2,106,292	15,719
1984 or earlier	1,904	34,715,599	18,233
Total	**23,680**	**$502,505,369**	**$21,221**

(1) The number for 2016 are for the first 6 months of the calendar year only.

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

RETIRED MEMBERS AND BENEFICIARIES (CONTINUED)

Number Counts and Benefits - By Year of Retirement - As of June 30, 2016 (continued)

State Peace Officers and Firefighters

Year Retired	Total Retirement	Total Benefits	Average Benefits
2016[1]	728	$38,468,691	$52,842
2015	2,112	118,778,594	56,240
2014	2,096	110,431,079	52,687
2013	2,033	104,658,660	51,480
2012	2,375	132,040,970	55,596
2011	2,107	113,970,373	54,091
2010	2,303	134,720,942	58,498
2009	2,082	131,392,975	63,109
2008	1,511	93,064,451	61,591
2007	1,699	107,232,223	63,115
2006	1,952	117,959,689	60,430
2005	1,222	63,321,424	51,818
2004	1,408	68,421,898	48,595
2003	1,198	56,023,068	46,764
2002	1,314	62,538,216	47,594
2001	1,222	57,094,162	46,722
2000	1,626	81,736,023	50,268
1999	609	19,842,413	32,582
1998	703	23,495,324	33,422
1997	735	26,885,761	36,579
1996	668	26,433,176	39,571
1995	585	23,248,057	39,740
1994	523	18,853,700	36,049
1993	501	18,476,736	36,880
1992	612	24,616,657	40,223
1991	588	25,650,025	43,622
1990	326	10,487,758	32,171
1989	360	11,326,300	31,462
1988	347	11,262,181	32,456
1987	417	13,744,687	32,961
1986	334	10,222,616	30,607
1985	254	7,668,103	30,189
1984 or earlier	207	6,542,438	31,606
Total	**36,757**	**$1,870,609,370**	**$50,891**

California Highway Patrol

Year Retired	Total Retirement	Total Benefits	Average Benefits
2016[1]	69	$4,932,865	$71,491
2015	304	28,965,696	95,282
2014	242	21,234,709	87,747
2013	244	20,630,239	84,550
2012	304	26,815,331	88,208
2011	309	27,920,187	90,357
2010	333	30,670,930	92,105
2009	298	28,945,997	97,134
2008	239	21,130,252	88,411
2007	239	19,127,288	80,030
2006	283	21,460,153	75,831
2005	316	25,690,244	81,298
2004	252	18,000,315	71,430
2003	180	11,099,923	61,666
2002	261	17,960,638	68,815
2001	297	21,077,925	70,969
2000	425	27,356,955	64,369
1999	142	6,897,342	48,573
1998	193	9,379,777	48,600
1997	238	11,543,404	48,502
1996	264	14,174,867	53,693
1995	228	11,206,253	49,150
1994	188	8,091,104	43,038
1993	233	10,318,985	44,287
1992	182	7,219,167	39,666
1991	203	8,778,132	43,242
1990	129	4,862,153	37,691
1989	172	6,298,785	36,621
1988	177	6,816,740	38,513
1987	135	4,812,431	35,648
1986	159	5,244,786	32,986
1985	126	4,028,062	31,969
1984 or earlier	1,449	34,701,129	23,948
	8,813	**$527,392,764**	**$59,843**

(1) The number for 2016 are for the first 6 months of the calendar year only.

Counts of members do not include alternate payees receiving benefits while the member is still working. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Appendix D
Normal Cost Information

NORMAL COST CHART

The normal cost is determined using the Entry Age Cost method using a 7.375 percent discount rate. Some important features of this method are that the costs are dependent upon a member's entry age in the plan and benefit level of the plan. In general the lower the entry age the lower the total normal cost. Note that future costs may vary as the entry age of the members change or with changes to actuarial assumptions or methods. FAC means Final Average Compensation.

	State Plans	Total Normal Cost	Employee Contribution[2]	Range of Breakpoints[3]	Average Effective Member Rate[4, 5]	Employer Normal Cost
PEPRA	State Miscellaneous (Including CSU) - 2% @ 62	14.4%	6% - 11%	$317 - $513	6.9%	7.5%
	State Miscellaneous - 2nd Tier 2% @ 62[5]	12.8%	3.75%	$0	3.4%	9.4%
	State Industrial - 2% @ 62	15.7%	6% - 11%	$317 - $513	7.8%	7.9%
	State Safety - 2% @ 57	17.9%	11%	$317	10.3%	7.6%
	POFF (90% of current members) - 2.5% @ 57	22.5%	11% - 13%	$238 - $863	10.5%	12.0%
	POFF (10% of current members) - 2.7% @ 57	23.6%	13%	$863	9.6%	14.0%
	CHP - 2.7% @ 57	21.8%	11.5%	$863	10.0%	11.8%
CLASSIC	State Miscellaneous - 2% @ 60 & 3 Year FAC	15.5%	5% - 11%	$317 - $513	6.6%	8.9%
	State Miscellaneous - 2% @ 55[1]	16.1%	5% - 11%	$317 - $513	6.8%	9.3%
	State Miscellaneous - 2nd Tier 2% @ 55[5]	12.2%	3.75%	$0	3.4%	8.8%
	State Industrial - 2% @ 60 & 3 Year FAC	17.3%	5% - 11%	$317 - $513	8.2%	9.1%
	State Industrial - 2% @ 55[1]	19.1%	5% - 11%	$317 - $513	8.0%	11.1%
	State Industrial - 2nd Tier 2% @ 55[5]	14.7%	3.75%	$0	3.3%	11.4%
	State Safety - 2% @ 55 & 3 Year FAC	19.3%	11%	$317	10.4%	8.9%
	State Safety - 2.5% @ 60 & 3 Year FAC	20.9%	11%	$317	10.6%	10.3%
	State Safety - 2.5% @ 55[1]	23.3%	11%	$317	10.5%	12.8%
	State POFF - 2.5% @ 55 & 3 Year FAC	26.8%	8% - 13%	$238 - $863	10.8%	16.0%
	State POFF - 3% @ 55 & 3 Year FAC	29.2%	8% - 13%	$238 - $863	10.7%	18.5%
	State POFF - 3% @ 50[1]	28.7%	8% - 13%	$238 - $863	11.4%	17.3%
	CHP - 3% @ 55 & 3 Year FAC	27.1%	11.5%	$863	10.3%	16.8%
	CHP - 3% @ 50[1]	27.5%	11.5%	$863	10.5%	17.0%
BLENDED	State Miscellaneous	15.7%	3.75% - 11%	$0 - $513	6.8%	9.0%
	State Industrial	18.2%	3.75% - 11%	$0 - $513	7.9%	10.4%
	State Safety	21.9%	11%	$317	10.4%	11.4%
	POFF	27.9%	8% - 13%	$238 - $863	11.3%	16.6%
	CHP	27.2%	11.5%	$863	10.5%	16.8%

(1) Most current employees have benefits based on a final one year compensation period while new hires' benefits are based on a final three compensation period.
(2) Employee contribution rates are based on rates in effect at the valuation date.
(3) Employees only make contributions to the pension plan based on salaries earned above the breakpoint.
(4) The average effective member rate was calculated based on data as of June 30, 2016 and is reflective of the breakpoint and the different contribution rates paid by members within the same plans. For example, a member earning $6,000 a month with an 8 percent contribution rate and a breakpoint of $513 will pay $438.96 and have an effective contribution rate of 7.316 percent of salary. This is calculated as ($6,000-$513) * 8% divided by $6,000.
(5) Reflects the Total Normal cost assuming conversion to Tier 1 benefits for members with Tier 2 service.

DEVELOPMENT OF PEPRA MEMBER CONTRIBUTION RATES

With the enactment of PEPRA, new PEPRA members are required to contribute at least 50 percent of the total annual normal cost of their pension benefit as determined by the actuary. As per Government Code Section 7522.30, State employees are excluded from this requirement except for employees of the Legislature, California State University (CSU), and the judicial branch. The PEPRA total normal cost for the plan is calculated assuming the entire active population, including the classic members, is subject to the adopted PEPRA formula and applicable compensation limits. Should the total normal cost of the plan change by one percent or more from the base total normal cost established for the plan, the new member rate shall be 50 percent of the new normal cost rounded to the nearest quarter percent.

The table below shows the determination of the Member contribution rates based on 50 percent of the Total Normal Cost for each respective plan on June 30, 2016.

	Basis for Current Rate		7/1/2017			
Plan	Total Normal Cost	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
State Miscellaneous - CSU, Legislature and Judicial	13.16%	6.50%	13.56%	0.40%	No	6.50%
POFF - CSU, Legislature and Judicial	22.04%	11.00%	22.50%	0.46%	No	11.00%

Appendix E
Glossary of Actuarial Terms

Accrued Liability: (also called Actuarial Accrued Liability or Entry Age Normal Accrued Liability) The total dollars needed as of the valuation date to fund all benefits earned in the past for *current* members.

Actuarial Assumptions: Assumptions made about certain events that will affect pension costs. Assumptions generally can be broken down into two categories: demographic and economic. Demographic assumptions include such things as mortality, disability and retirement rates. Economic assumptions include discount rate, salary growth and inflation.

Actuarial Methods: Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include funding method, setting the length of time to fund the Accrued Liability and determining the Value of Assets.

Actuarial Valuation: The determination, as of a valuation date of the Normal Cost, Accrued Liability, and related actuarial present values for a pension plan. These valuations are performed annually or when an employer is contemplating a change to their plan provisions.

Amortization Bases: Separate payment schedules for different portions of the Unfunded Liability. The total Unfunded Liability of a plan can be segregated by "cause," creating “bases” and each such base will be separately amortized and paid for over a specific period of time. However, all bases are amortized using investment and payroll assumptions from the current valuation. This can be likened to a home having a first mortgage of 24 years remaining payments and a second mortgage that has 10 years remaining payments. Each base or each mortgage note has its own terms (payment period, principal, etc.)

Generally, in an actuarial valuation, the separate bases consist of changes in unfunded liability due to contract amendments, actuarial assumption changes, actuarial methodology changes, and/or gains and losses. Amortization methodology is determined by Board policy.

Amortization Period: The number of years required to pay off an Amortization Base.

Classic Member (under PEPRA): A classic member is a member who joined CalPERS prior to January, 1, 2013 and who is not defined as a new member under PEPRA. (See definition of new member below)

Discount Rate Assumption: The actuarial assumption that was called “investment return” in earlier CalPERS reports or “actuarial interest rate” in Section 20014 of the California Public Employees’ Retirement Law (PERL).

Entry Age: The earliest age at which a plan member begins to accrue benefits under a defined benefit pension Plan or risk pool. In most cases, this is the same as the date of hire.

(The assumed retirement age less the entry age is the amount of time required to fund a member's total benefit. Generally, the older a member is at hire, the greater the entry age normal cost. This is mainly because there is less time to earn investment income to fund the future benefits.)

Entry Age Normal Cost Method: An actuarial cost method designed to fund a member's total plan benefit over the course of his or her career. This method is designed to yield a rate expressed as a level percentage of payroll.

(The assumed retirement age less the entry age is the amount of time required to fund a member's total benefit. Generally, the older a member on the date of hire, the greater the entry age normal cost. This is mainly because there is less time to earn investment income to fund the future benefits.)

Fresh Start: A Fresh Start is when multiple amortization bases are collapsed to one base and amortized together over a new funding period.

Funded Status: A measure of how well funded, or how "on track" a plan or risk pool is with respect to assets versus accrued liabilities. A ratio greater than 100% means the plan or risk pool has more assets than liabilities and a ratio less than 100% means liabilities are greater than assets.

GASB 68: Statement No. 68 of the Governmental Accounting Standards Board. The accounting standard governing a state or local governmental employer's accounting and financial reporting for pensions. GASB 68 replaces GASB 27 effective the first fiscal year beginning after June 15, 2014.

New Member (under PEPRA): A new member includes an individual who becomes a member of a public retirement system for the first time on or after January 1, 2013, and who was not a member of another public retirement system prior to that date, and who is not subject to reciprocity with another public retirement system.

Normal Cost: The annual cost of service accrual for the upcoming fiscal year for active employees. The normal cost should be viewed as the long term contribution rate.

Pension Actuary: A business professional that is authorized by the Society of Actuaries, and the American Academy of Actuaries to perform the calculations necessary to properly fund a pension plan.

PEPRA: The California Public Employees' Pension Reform Act of 2013

Present Value of Benefits (PVB): The total dollars needed as of the valuation date to fund all benefits earned in the past or expected to be earned in the future for *current* members.

Superfunded: A condition existing when a plan's Market Value of Assets exceeds its Present Value of Benefits. Prior to the passage of PEPRA, when this condition existed on a given valuation date for a given plan, employee contributions for the rate year covered by that valuation could be waived.

Unfunded Liability (UAL): When a plan or pool's Value of Assets is less than its Accrued Liability, the difference is the plan or pool's Unfunded Liability. If the Unfunded Liability is positive, the plan or pool will have to pay contributions exceeding the Normal Cost.

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