

State Actuarial Valuation

As of June 30, 2021



Required Contributions for Fiscal Year
July 1, 2022 through June 30, 2023



Actuarial Certification	1
Highlights and Executive Summary	2
Introduction	3
Purpose of Report	3
Required Employer Contribution Rates	4
Funded Status	5
Changes Since the Prior Year's Valuation	6
Additional Contributions	7
Subsequent Events	8
Projected Future Contribution Rates	8
Assets	9
Reconciliation of Market Value of Assets	10
Asset Allocation	11
CalPERS History of Investment Returns	12
Liabilities and Employer Contributions	13
Key Results	14
Accrued and Unfunded Liabilities	19
Employer Contribution Rates	19
Schedules of Amortization Bases	20
(Gain)/Loss Analysis	26
Reconciliation of Actuarially Required Contribution Rates	29
Reconciliation of Employer Contribution Rates	32
Reconciliation of Employer Contributions	33
History of Employer Contribution Rates	34
History of Funded Status and Funding Progress	38
Normal Cost Information	43
Normal Cost by Group	44
PEPRA Member Contribution Rates	45
State Bargaining Units 5, 9, 16, and 18 Member - Contribution Rates	46
Risk Analysis	47
Projected Contribution Rates	48
Future Investment Return Scenarios	48
Discount Rate Sensitivity and Government Code Section 20229	49
Mortality Rate Sensitivity	60
Inflation Rate Sensitivity	61
Maturity Measures	62
Volatility Ratios	63
Appendix A – Statement of Actuarial Methods and Assumptions	A-1
Appendix B – Principal Plan Provisions	B-1
Appendix C – Participant Data	C-1
Appendix D – Supplemental Pension Payments and Budget Act for Fiscal Year 2022-23	D-1
Appendix E – Glossary of Actuarial Terms	E-1

Actuarial Certification



September 2022

To the best of our knowledge, this report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the State plans and satisfies the actuarial valuation requirements of Government Code section 7504. This valuation is based on the member and financial data as of June 30, 2021 provided by the various CalPERS databases and the benefits under these plans with CalPERS as of the date this report was produced. It is our opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that 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 who satisfy the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States regarding pensions.

Daniel Miller, ASA, MAAA
Senior Actuary, CalPERS

Eddie W. Lee, ASA, EA, FCA, MAAA
Senior Actuary, CalPERS

Scott Terando, ASA, EA, MAAA, FCA, CFA
Chief Actuary, CalPERS

Highlights and Executive Summary

- 3 Introduction
- 3 Purpose of Report
- 4 Required Employer Contribution Rates
- 5 Funded Status
- 6 Changes Since the Prior Year's Valuation
- 7 Additional Contributions
- 8 Subsequent Events
- 8 Projected Future Contribution Rates

Highlights and Executive Summary

Introduction

This report presents the results of the June 30, 2021, actuarial valuation of the State plans of the California Public Employees' Retirement System (CalPERS). This actuarial valuation sets the minimum required employer contributions for fiscal year (FY) 2022-23.

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, 2021. The purpose of the report is to:

- Set forth the assets and accrued liabilities of the State plans as of June 30, 2021
- Determine the minimum required employer contribution rates of these plans for FY July 1, 2022, through June 30, 2023
- Provide actuarial information as of June 30, 2021 to the CalPERS Board of Administration (board) 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 measurements shown in this actuarial valuation may not be appropriate for other purposes. The State should contact the state actuaries before disseminating any portion of this report for any reason that is not explicitly described above.

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; changes in plan provisions or applicable law; and differences between the required contributions determined by the valuation and the actual contributions made by the State.

Assessment and Disclosure of Risk

This report includes the following risk disclosures consistent with the recommendations of Actuarial Standards of Practice No. 51 and recommended by the California Actuarial Advisory Panel (CAAP) in the Model Disclosure Elements document:

- A "Scenario Test," projecting future results under different investment income returns.
- A "Sensitivity Analysis," showing the impact on current valuation results using alternative discount rates of 5.8% and 7.8%.
- A "Sensitivity Analysis," showing the impact on current valuation results assuming rates of mortality are 10% lower or 10% higher than our current post-retirement mortality assumptions adopted in 2021.
- Plan maturity measures indicating how sensitive a plan may be to the risks noted above.

Highlights and Executive Summary

Required Employer Contribution Rates

The actuarially required employer contribution rates for fiscal year July 1, 2022, through June 30, 2023, are shown in the table below. For comparison purposes, the corresponding contribution rates for fiscal year July 1, 2021 through June 30, 2022, are also provided. The estimated contribution amounts that these rates are expected to generate are also shown.

Plan	Fiscal Year 2021-22		Fiscal Year 2022-23	
	Expected Employer Contribution	Required Employer Rate ^{1, 2}	Expected Employer Contribution	Required Employer Rate ²
State Miscellaneous	\$4,160,143,107	29.12%	\$4,452,668,365	30.71%
State Industrial	132,980,339	16.46%	157,441,305	19.51%
State Safety	476,457,256	18.29%	537,135,074	21.13%
State Peace Officers & Firefighters	1,262,870,664	31.19%	1,850,939,503	47.21%
California Highway Patrol	600,841,189	61.46%	599,038,797	63.89%
Total State	\$6,633,292,555		\$7,597,223,044	

¹ Includes supplanting payments under Government Code section 20825.1. For rates prior to these adjustments, see Appendix D for more information.

² Excludes additional contributions pursuant to Government Code section 20683.2, Contribution Stabilization adjustment and Bargaining Unit 5 adjustment. See "Additional Contributions" section on page 7 for more information.

The estimated employer contribution dollar amounts shown above are calculated prior to the contribution year and should not be used for financial disclosure purposes. These amounts should not be confused with the Actuarially Determined Contributions, which are calculated after the contribution year and disclosed in the CalPERS GASB 68 accounting reports.

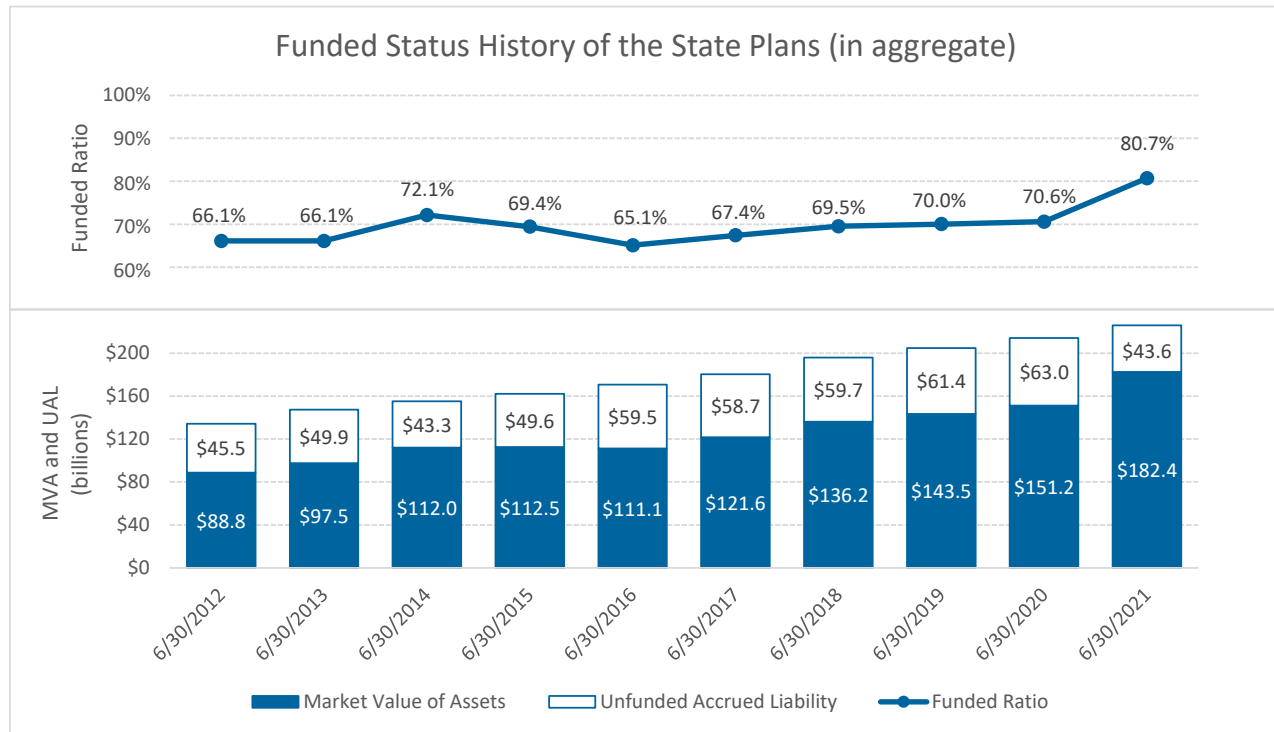
The payroll used to calculate the expected dollar contribution is payroll reported for the fiscal year ending on the valuation date projected forward two years using the annual payroll growth assumption in effect on the valuation date. For example, expected fiscal year 2022-23 contributions are based on fiscal year 2020-21 reported payroll increased by 2.80% per year for two years. Actual contribution amounts will be based on actual payroll during the associated fiscal year and will differ from the expected contributions shown in the table above. State Miscellaneous and State Industrial include both Tier 1 and Tier 2 benefit levels.

The supporting exhibits titled "Reconciliation of Employer Contribution Rates" and "Reconciliation of Employer Contributions" in the Liabilities and Employer Contributions section of this report explain the changes in required contribution rates and expected contribution amounts from fiscal year 2021-22 to fiscal year 2022-23.

Highlights and Executive Summary

Funded Status

The Unfunded Accrued Liability (UAL) and funded ratio are assessments of the need for future employer contributions based on the actuarial cost method used to fund the plan. The UAL is the accrued liability minus the assets, while the funded ratio is the assets divided by the accrued liability. The UAL is the present value of future employer contributions for service that has already been earned and is in addition to future normal cost contributions for active members. The funded ratio, on the other hand, is a relative measure of funded status that allows for comparison between plans of different sizes. From June 30, 2020, to June 30, 2021 the funded ratio for the State plans in aggregate increased by approximately 10.1%.



Unfunded Accrued Liability and Funded Ratio on June 30, 2021

Plan	Present Value of Benefits	Entry Age Actuarial Accrued Liability	Market Value of Assets	Unfunded Accrued Liability	Funded Ratio
State Miscellaneous	\$152,647,723,471	\$130,697,372,927	\$104,354,925,163	\$26,342,447,764	79.8%
State Industrial	6,886,845,838	5,550,468,220	4,951,791,018	598,677,202	89.2%
State Safety	21,037,827,749	16,397,024,160	14,950,460,803	1,446,563,357	91.2%
State Peace Officers & Firefighters	67,950,091,223	57,507,446,617	46,172,239,586	11,335,207,031	80.3%
California Highway Patrol	18,454,375,105	15,822,003,794	11,924,100,686	3,897,903,108	75.4%
Total for the State	\$266,976,863,386	\$225,974,315,718	\$182,353,517,256	\$43,620,798,462	80.7%

Funded Ratio History

Plan	June 30, 2017	June 30, 2018	June 30, 2019	June 30, 2020	June 30, 2021
State Miscellaneous	67.5%	69.5%	69.8%	69.8%	79.8%
State Industrial	76.4%	76.9%	77.3%	78.1%	89.2%
State Safety	76.4%	77.6%	78.6%	79.8%	91.2%
State Peace Officers & Firefighters	65.9%	68.3%	69.0%	70.8%	80.3%
California Highway Patrol	60.2%	63.8%	64.5%	64.3%	75.4%
Total for the State	67.4%	69.5%	70.0%	70.6%	80.7%

Highlights and Executive Summary

Changes Since the Prior Year's Valuation

Overall, the required contributions for the State plans increased by \$964 million between fiscal years 2021-22 and 2022-23, a 14.5% relative increase. The table below highlights major contributors to the change in required contributions.

Reason for Change	Change in Required Contribution (in millions)
Change due to normal progression of existing amortization bases	\$305.3
Expiration of supplanting payment (G.C. §20825.1)	1,404.5
Change due to increase in overall payroll	(17.9)
Decrease in normal cost due to new demographics	(60.9)
Decrease due to change in member contribution rates	(14.2)
Increase in Normal Cost & amortization due to Risk Mitigation	130.6
Decrease due to Supplemental Pension Payment	(450.7)
Changes due to experience and actuarial assumptions:	
• Investment experience (reflects five-year ramp)	(417.9)
• Demographic gains and losses	(168.5)
• Actuarial assumptions change	253.6
Total Change in Required Contributions	\$963.9

Key changes are discussed in detail below.

Assumptions and Methods

On November 17, 2021, the board adopted new actuarial assumptions based on the recommendations in the 2021 CalPERS Experience Study and Review of Actuarial Assumptions. This study reviewed the retirement rates, termination rates, mortality rates, rates of salary increase, and inflation assumptions for the State plans. These new assumptions are incorporated in this actuarial valuation and impacted the required contribution for FY 2022-23. In addition, the board adopted a new asset portfolio as part of its Asset Liability Management process. The new asset allocation supports a 6.80% discount rate, together with a price inflation assumption of 2.30%.

Beginning with this valuation there will no longer be a separate employer contribution rate for preretirement group term life insurance (GTLI). The GTLI benefits for each rate plan will be funded by including the GTLI normal cost in the plan's total normal cost. This results in an increase in the total normal cost rate of 0.03% for each of the five State rate plans and eliminates the GTLI contribution rate, effective July 1, 2022.

Except as described above, no other changes were made since the prior valuation. A complete description of the actuarial methods and assumptions used in this valuation can be found in Appendix A of this report.

Plan Provisions

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

Plan Experience

The return on plan assets for the year ending June 30, 2021, was approximately 21.3% before reduction for administrative expenses. This return resulted in a reduction to the discount rate from 7.00% to 6.80% as required by the Funding Risk Mitigation Policy. Pursuant to the policy, a portion of this investment gain was used to fully offset the impact of the reduction in discount rate with the remaining investment gain being amortized over 20 years with a five-year ramp.

Payroll across the State plans decreased by 0.2%, compared to the payroll growth assumption of 2.75%, resulting in a decrease of \$17.9 million in the required contribution. The change in payroll for the year ranges from a 1.4% increase for State Miscellaneous to a 4.2% decrease for California Highway Patrol.

Highlights and Executive Summary

The California Public Employees' Pension Reform Act of 2013 (PEPRA) requires lower benefits for new members as defined by PEPRA who are hired on or after January 1, 2013. The normal cost for all the plans is lower due to the enrollment of new hires into lower benefit levels. PEPRA membership ranges from a high of 44% of payroll for State Safety to a low of 21% of payroll for California Highway Patrol.

The plans in aggregate experienced a non-investment gain due to demographic sources and a gain due to actual contributions being greater than expected. The net effect was a non-investment experience gain that will be amortized over 20 years beginning in 2022-23.

Additional Contributions

Every year since FY 2013-14, the State employer contribution rates in the annual Budget Act have exceeded the actuarially required contribution rates adopted by the board. Although the additional amounts arose at different times and through different processes, there is a common goal, which is to reduce the State's unfunded liability and create long-term savings.

One of the provisions of pension reform added Government Code section 20683.2, which changed the contribution rates of many State members effective July 1, 2013, July 1, 2014, and July 1, 2015. Government Code section 20683.2 also stipulates that "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.

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. One example is when a member terminates and takes a refund of his/her accumulated contributions with interest. Another example is Tier 2 members, who are assumed to elect to convert to a Tier 1 benefit with an actuarial equivalent reduction to offset missed Tier 1 contributions; because the members will make additional contributions, a smaller reduction will apply in the future.

In 2014, California voters passed Proposition 2, which amended the State Constitution to require certain funds be appropriated to repay specific State debts, including unfunded liabilities for state-level pension plans. These payments totaling \$1.88 billion were made on July 28, 2021 and are reflected in the amortization schedules in this report. The Constitution does not allow these payments to supplant funding that would have otherwise been used to pay for the unfunded liability in the fiscal year the payment was appropriated or the subsequent fiscal year. The supplemental payments, however, do reduce the actuarially required contribution rates in FY 2022-23 and later. The objective of the supplemental payments is to generate long-term savings rather than short-term savings, and to pay off the unfunded liability sooner than if the payments had not been made, which can be accomplished by budgeting and appropriating a contribution rate that is higher than the actuarially required rate. This adjustment, referred to as the Contribution Stabilization adjustment, affords the State some budget flexibility and allows the contribution rates in the Budget Act to closely align with the State's own budget projections.

An additional \$293 million in supplemental pension payments were made in 2020 and 2021 towards to the California Highway Patrol Plan. Under the terms of the agreement between the State and the California Association of Highway Patrolmen (Bargaining Unit 5), the supplemental payments may not decrease employer contributions during the term of the agreement, which expires on July 1, 2023. Since the payments reduced the unfunded liability, they also reduced the actuarially required contribution rate. To comply with the agreement, the State must contribute in excess of the actuarially required contribution rate by the same amount the supplemental payments decreased the actuarially required contribution rate, 2.33% of payroll.

Highlights and Executive Summary

The table below shows the actuarially required contribution rate (set by the board based on staff recommendation), the additional contributions under Government Code section 20683.2, the contribution stabilization and Bargaining Unit 5 adjustments and the resulting total contribution rate for fiscal year 2022-23 to be paid by the State for each plan.

Plan	Actuarially Required Employer Contribution FY 2022-23	Additional Statutory Contribution per GC §20683.2	Contribution Stabilization & Bargaining Unit 5 Adjustments	Total Contribution FY 2022-23
State Miscellaneous	30.71%	0.10%	1.19%	32.00%
State Industrial	19.51%	0.88%	0.61%	21.00%
State Safety	21.13%	1.18%	0.44%	22.75%
State Peace Officers & Firefighters	47.21%	1.65%	1.14%	50.00%
California Highway Patrol	63.89%	1.32%	2.33%	67.54%

The rates and information shown in the remainder of this report reflect the rates set by the board at its April 2022 meeting (shown above as the actuarially required employer contribution). The additional contributions pursuant to Government Code section 20683.2 will be allocated to the UAL.

Subsequent Events

This actuarial valuation report reflects statutory and regulatory changes and fund investment return through July 2022 and board actions through August 2022.

On May 25, 2022, the State contributed a supplemental pension payment of \$25 million from the Motor Vehicle Account to the California Highway Patrol plan under Government Code section 20825.15. This payment is not reflected in this valuation report.

On July 29, 2022, the State contributed a supplemental pension payment of \$2.925 billion under Government Code section 20825.14. In accordance with the statute, the funds were applied to the State rate plans as show below. These payments are not reflected in this valuation report.

Plan	Supplemental Pension Payments Made on July 29, 2022
State Miscellaneous	\$1,333,958,000
State Industrial	81,612,000
State Safety	171,392,000
State Peace Officers & Firefighters	1,338,038,000
California Highway Patrol	0
Total	\$2,925,000,000

To the best of our knowledge, there have been no other subsequent events that could materially affect current or future certifications rendered in this report.

Highlights and Executive Summary

Projected Future Contribution Rates

The following table illustrates projected actuarially required employer contribution rates for the next five fiscal years. Projected results reflect an estimated investment return of -7.4% for FY 2021-22 based on preliminary market value and investment return information provided by the Investment Office. The actual investment loss will be based on final audited assets as of June 30, 2022, which are not yet available. Projected rates assume all other actuarial assumptions will be realized, including the investment return of 6.80% per year beyond June 30, 2022, and no changes to assumptions, methods, or benefits will occur during the projection period. Projected rates further reflect member rate changes known to date and the estimated decrease in normal cost due to new hires entering lower cost benefit formulas.

Rates do not include the additional contributions pursuant to G.C. section 20683.2 or the State's Proposition 2 contribution stabilization strategy shown in Appendix D. The Bargaining Unit 5 agreement to delay savings expires June 30, 2023 and is reflected in the projected employer rates for California Highway Patrol plan beginning in FY 2023-24.

Plan	Actual	Projected Future Employer Contribution Rates				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
State Miscellaneous	30.71%	32.0%	32.9%	33.7%	34.1%	36.0%
State Industrial	19.51%	20.3%	21.0%	21.7%	22.0%	23.6%
State Safety	21.13%	21.3%	21.9%	22.5%	22.8%	24.3%
State Peace Officers & Firefighters	47.21%	49.4%	50.7%	51.8%	52.4%	55.3%
California Highway Patrol	63.89%	65.4%	64.9%	65.3%	63.6%	66.4%

Assets

- 10 Reconciliation of Market Value of Assets
- 11 Asset Allocation
- 12 CalPERS History of Investment Returns

Assets

Reconciliation of Market Value of Assets

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
1a) Market Value of Assets as of June 30, 2020, Including Receivables for Tier 1 Conversion and Service Buybacks	\$87,046,873,448	\$4,083,794,798	\$12,249,799,444	\$38,327,136,595	\$9,501,361,017
1b) GTLI Balance as of June 30, 2020	2,789,560	953,739	741,760	2,194,857	(96,158)
2) Receivables for Tier 1 Conversion and Service Buybacks as of June 30, 2020	201,747,207	12,515,270	12,900,845	60,743,140	9,100,933
3) Market Value of Assets as of June 30, 2020 [(1a) + (1b) - (2)]	\$86,847,915,801	\$4,072,233,267	\$12,237,640,359	\$38,268,588,312	\$9,492,163,926
4) Employer Contributions Received in 2020-21	3,778,448,681	128,161,745	429,343,301	1,310,946,858	802,326,773
5) Employee Contributions Received in 2020-21	900,259,345	56,663,655	221,206,048	415,376,697	93,220,907
6) Benefit Payments in 2020-21	(6,816,936,303)	(235,380,038)	(715,930,230)	(2,549,173,796)	(693,918,102)
7) Refunds in 2020-21	(37,892,716)	(3,111,586)	(18,666,110)	(12,547,900)	(1,261,153)
8) Transfers In/(Out)	(2,557,641)	(662,726)	1,512,863	(65,565)	1,773,069
9) SCP Payment and Interest	48,891,687	2,945,120	4,112,371	17,494,096	3,847,339
10) Miscellaneous Adjustments	68,898	(47,072)	9,320	12,735	1,990
11) Investment Return	19,571,395,669	924,552,437	2,795,629,971	8,717,820,991	2,230,125,903
12) Administrative Expense	(109,993,783)	(5,134,276)	(15,387,926)	(48,080,015)	(11,996,187)
13) Market Value of Assets as of June 30, 2021 [(3) + (4) + (5) + (6) + (7) + (8) + (9) + (10) + (11) + (12)]	\$104,179,599,638	\$4,940,220,526	\$14,939,469,967	\$46,120,372,413	\$11,916,284,465
14) Receivables for Tier 1 Conversion and Service Buybacks as of June 30, 2021	175,323,525	11,570,492	10,990,836	51,867,173	7,816,221
15) Market Value of Assets as of June 30, 2021, Including Receivables for Tier 1 Conversion and Service Buybacks	\$104,354,925,163	\$4,951,791,018	\$14,950,460,803	\$46,172,239,586	\$11,924,100,686

Assets

Asset Allocation

CalPERS adheres to an Asset Allocation Strategy that sets 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.

The asset allocation shown below reflects the allocation of the Public Employees' Retirement Fund (PERF) in its entirety as of June 30, 2021. The assets of the State plans are part of the PERF and are invested accordingly.

Asset Class	Actual Allocation	Policy Target Allocation
Public Equity	51.4%	50.0%
Private Equity	8.3%	8.0%
Global Fixed Income	29.8%	28.0%
Real Assets	9.6%	13.0%
Liquidity	1.0%	1.0%
Inflation Sensitive Assets	2.5%	0.0%
Trust Level ¹	(2.6%)	0.0%
Total Fund	100.0%	100.0%

¹ Trust Level includes Multi-Asset Class, Completion Overlay, Risk Mitigation, Absolute Return Strategies, Plan Level Transition and other Total Fund level portfolios

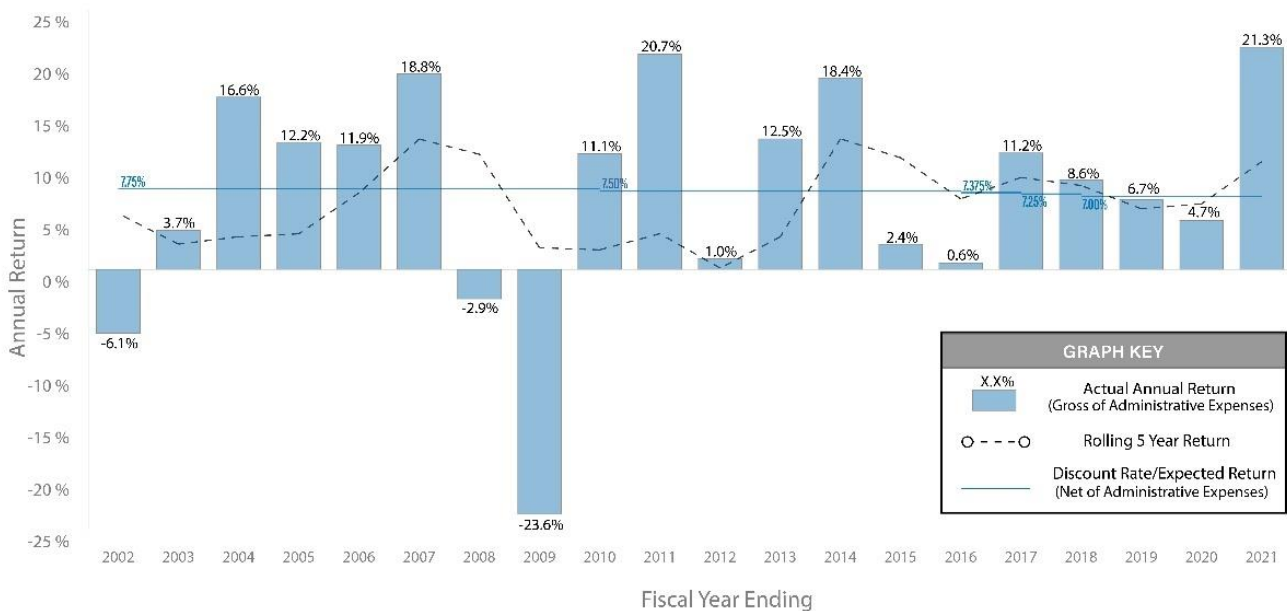
On November 17, 2021, the board adopted changes to the strategic asset allocation as shown in the Policy Target Allocation below expressed as a percentage of total assets.

Asset Class	Policy Target Allocation
Global Equity Cap-weighted	30.0%
Global Equity Non-cap-weighted	12.0%
Private Equity	13.0%
Private Debt	5.0%
Emerging Market Sovereign Bonds	5.0%
High Yield Bonds	5.0%
Investment Grade Corporates	10.0%
Mortgage-backed Securities	5.0%
Treasuries	5.0%
Real Assets	15.0%
Leverage	(5.0%)
Total Fund	100.0%

CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the PERF for each fiscal year ending on June 30 as reported by the Investment Office. Investment returns reported are net of investment expenses but without reduction for administrative expenses. The assumed rate of return, however, is net of both investment and administrative expenses. The Investment Office uses a three-month lag on private assets for investment performance reporting purposes. This can lead to a timing difference in the returns below and those used for financial reporting purposes. The investment gain or loss calculation in this report relies on assets that have been audited and are appropriate for financial reporting. Because of these differences, it is possible for the Investment Office to report a return higher than the discount rate while the rate plan experiences an investment loss, or a return lower than the discount rate while the rate plan experiences an investment gain.

History of Investment Returns (2002 - 2021)



The table below shows annualized investment returns of the PERF for various time periods ending on June 30, 2021 (figures reported are net of investment expenses but without reduction for administrative expenses). These returns are the annual rates of return that if compounded over the indicated number of years would equate to the actual time-weighted investment performance of the PERF. It should be recognized that in any given year the rate of return is volatile. The portfolio has an expected volatility of 12.0% per year based on the most recent Asset Liability Management study. The realized volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund’s total monthly return distribution, expressed as an annual percentage. Due to their volatile nature, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Geometric Rates of Return and Volatilities

	1 Year	5 Year	10 Year	20 Year	30 Year
Geometric Return	21.3%	10.3%	8.5%	6.9%	8.4%
Volatility	—	7.3%	7.2%	8.5%	8.5%

Liabilities and Employer Contributions

- 14 Key Results
- 19 Accrued and Unfunded Liabilities
- 19 Employer Contribution Rates
- 20 Schedule of Amortization Bases
- 26 (Gain)/Loss Analysis
- 29 Reconciliation of Actuarially Required Contribution Rates
- 32 Reconciliation of Employer Contribution Rates
- 33 Reconciliation of Employer Contributions
- 34 History of Employer Contribution Rates
- 38 History of Funded Status and Funding Progress

Liabilities and Employer Contributions

Key Results

Key results of the current and prior valuations are shown below.

State Miscellaneous

Participant Information

	June 30, 2020	June 30, 2021
Members Included in the Valuation		
Active Members	178,628	178,955
Transfers from State Miscellaneous	30,130	29,331
Vested Terminations ¹	64,394	68,270
Receiving Payments	202,078	206,393
Total	475,230	482,949
Average Entry Age of Active Members	34.9	34.9
Average Age for Active Members	46.7	46.5
Average Age of Retired Members	72.5	72.6
Average Pay	\$75,760	\$76,659
Covered Payroll in Fiscal Year Ending on Valuation Date	\$13,532,810,988	\$13,718,513,822
Projected Payroll for Contribution Rate	\$14,287,349,781	\$14,497,505,911

Funded Status

	June 30, 2020	June 30, 2021
Present Value of Benefits	\$143,390,494,888	\$152,647,723,471
Accrued Liability	124,694,577,728	130,697,372,927
Market Value of Assets	87,046,873,448	104,354,925,163
Unfunded Accrued Liability/(Surplus)	37,647,704,280	26,342,447,764
Funded Ratio	69.8%	79.8%

Employer Contribution

	June 30, 2020	June 30, 2021
Contribution Required in Dollars		
Total Normal Cost	\$2,354,555,244	\$2,567,508,297
Employee Contribution	1,017,259,304	1,039,471,174
Employer Normal Costs	1,337,295,940	1,528,037,123
Amortization of Unfunded Accrued Liability	2,819,989,697	2,924,631,242
Group Term Life Benefits	2,857,470	0
Total	\$4,160,143,107	\$ 4,452,668,365

Contribution Required (Percent of Payroll)

Total Normal Cost	16.48%	17.71%
Employee Contribution	7.12%	7.17%
Employer Normal Costs	9.36%	10.54%
Amortization of Unfunded Accrued Liability	19.74%	20.17%
Group Term Life Benefits	0.02%	0.00%
Total	29.12%	30.71%

¹ Includes non-vested terminated participants with employee contributions remaining in the plan.

Liabilities and Employer Contributions

Key Results (continued)

State Industrial

Participant Information

	June 30, 2020	June 30, 2021
Members Included in the Valuation		
Active Members	11,899	11,525
Transfers from State Industrial	7,840	7,710
Vested Terminations ¹	3,705	4,043
Receiving Payments	16,050	16,788
Total	39,494	40,066
Average Entry Age of Active Members	35.6	35.4
Average Age for Active Members	45.0	44.9
Average Age of Retired Members	68.9	69.1
Average Pay	\$64,323	\$66,254
Covered Payroll in Fiscal Year Ending on Valuation Date	\$765,383,759	\$763,577,368
Projected Payroll for Contribution Rate	\$808,058,687	\$806,936,345

Funded Status

	June 30, 2020	June 30, 2021
Present Value of Benefits	\$6,399,770,897	\$6,886,845,838
Accrued Liability	5,226,527,840	5,550,468,220
Market Value of Assets	4,083,794,798	4,951,791,018
Unfunded Accrued Liability/(Surplus)	1,142,733,042	598,677,202
Funded Ratio	78.1%	89.2%

Employer Contribution

	June 30, 2020	June 30, 2021
Contribution Required in Dollars		
Total Normal Cost	\$145,369,758	\$153,317,906
Employee Contribution	65,937,589	66,088,087
Employer Normal Costs	79,432,169	87,229,819
Amortization of Unfunded Accrued Liability	53,548,170	70,211,486
Group Term Life Benefits	0	0
Total	\$132,980,339	\$157,441,305

Contribution Required (Percent of Payroll)

Total Normal Cost	17.99%	19.00%
Employee Contribution	8.16%	8.19%
Employer Normal Costs	9.83%	10.81%
Amortization of Unfunded Accrued Liability	6.63%	8.70%
Group Term Life Benefits	0.00%	0.00%
Total	16.46%	19.51%

¹ Includes non-vested terminated participants with employee contributions remaining in the plan.

Liabilities and Employer Contributions

Key Results (continued)

State Safety

Participant Information

	June 30, 2020	June 30, 2021
Members Included in the Valuation		
Active Members	29,307	28,451
Transfers from State Safety	5,449	5,545
Vested Terminations ¹	8,095	8,971
Receiving Payments	27,905	29,168
Total	70,756	72,135
Average Entry Age of Active Members	38.2	38.0
Average Age for Active Members	46.5	46.5
Average Age of Retired Members	69.3	69.5
Average Pay	\$84,207	\$84,552
Covered Payroll in Fiscal Year Ending on Valuation Date	\$2,467,855,569	\$2,405,580,360
Projected Payroll for Contribution Rate	\$2,605,453,941	\$2,542,178,835

Funded Status

	June 30, 2020	June 30, 2021
Present Value of Benefits	\$19,760,856,662	\$21,037,827,749
Accrued Liability	15,352,141,590	16,397,024,160
Market Value of Assets	12,249,799,444	14,950,460,803
Unfunded Accrued Liability/(Surplus)	3,102,342,146	1,446,563,357
Funded Ratio	79.8%	91.2%

Employer Contribution

	June 30, 2020	June 30, 2021
Contribution Required in Dollars		
Total Normal Cost	\$596,909,498	\$602,242,166
Employee Contribution	275,657,027	270,742,046
Employer Normal Costs	321,252,471	331,500,120
Amortization of Unfunded Accrued Liability	154,683,694	205,634,954
Group Term Life Benefits	521,091	0
Total	\$476,457,256	\$537,135,074

Contribution Required (Percent of Payroll)

Total Normal Cost	22.91%	23.69%
Employee Contribution	10.58%	10.65%
Employer Normal Costs	12.33%	13.04%
Amortization of Unfunded Accrued Liability	5.94%	8.09%
Group Term Life Benefits	0.02%	0.00%
Total	18.29%	21.13%

¹ Includes non-vested terminated participants with employee contributions remaining in the plan.

Liabilities and Employer Contributions

Key Results (continued)

State Peace Officers and Firefighters

Participant Information

	June 30, 2020	June 30, 2021
Members Included in the Valuation		
Active Members	41,787	41,242
Transfers from State POFF	5,322	5,285
Vested Terminations ¹	7,408	8,085
Receiving Payments	43,525	45,937
Total	98,042	100,549
Average Entry Age of Active Members	29.5	29.3
Average Age for Active Members	41.4	40.9
Average Age of Retired Members	64.8	65.0
Average Pay	\$91,766	\$89,949
Covered Payroll in Fiscal Year Ending on Valuation Date	\$3,834,616,755	\$3,709,697,013
Projected Payroll for Contribution Rate	\$4,048,420,605	\$3,920,348,448

Funded Status

	June 30, 2020	June 30, 2021
Present Value of Benefits	\$63,722,940,433	\$67,950,091,223
Accrued Liability	54,101,543,037	57,507,446,617
Market Value of Assets	38,327,136,595	46,172,239,586
Unfunded Accrued Liability/(Surplus)	15,774,406,442	11,335,207,031
Funded Ratio	70.8%	80.3%

Employer Contribution

	June 30, 2020	June 30, 2021
Contribution Required in Dollars		
Total Normal Cost	\$1,183,353,343	\$1,229,421,273
Employee Contribution	470,426,474	458,288,734
Employer Normal Costs	712,926,869	771,132,539
Amortization of Unfunded Accrued Liability	549,943,795	1,079,806,964
Group Term Life Benefits	0	0
Total	\$1,262,870,664	\$1,850,939,503
Contribution Required (Percent of Payroll)		
Total Normal Cost	29.23%	31.36%
Employee Contribution	11.62%	11.69%
Employer Normal Costs	17.61%	19.67%
Amortization of Unfunded Accrued Liability	13.58%	27.54%
Group Term Life Benefits	0.00%	0.00%
Total	31.19%	47.21%

¹ Includes non-vested terminated participants with employee contributions remaining in the plan.

Liabilities and Employer Contributions

Key Results (continued)

California Highway Patrol

Participant Information

	June 30, 2020	June 30, 2021
Members Included in the Valuation		
Active Members	7,027	6,662
Transfers from CHP	261	250
Vested Terminations ¹	532	562
Receiving Payments	9,519	9,786
Total	17,339	17,260
Average Entry Age of Active Members	27.6	27.4
Average Age for Active Members	41.2	41.5
Average Age of Retired Members	68.9	68.9
Average Pay	\$131,769	\$133,171
Covered Payroll in Fiscal Year Ending on Valuation Date	\$925,937,291	\$887,184,683
Projected Payroll for Contribution Rate	\$977,564,082	\$937,562,578

Funded Status

	June 30, 2020	June 30, 2021
Present Value of Benefits	\$17,285,877,581	\$18,454,375,105
Accrued Liability	14,785,866,497	15,822,003,794
Market Value of Assets	9,501,361,017	11,924,100,686
Unfunded Accrued Liability/(Surplus)	5,284,505,480	3,897,903,108
Funded Ratio	64.3%	75.4%

Employer Contribution

	June 30, 2020	June 30, 2021
Contribution Required in Dollars		
Total Normal Cost	\$286,035,250	\$308,270,576
Employee Contribution	113,006,408	117,195,322
Employer Normal Costs	173,028,842	191,075,254
Amortization of Unfunded Accrued Liability	427,323,565	407,963,543
Group Term Life Benefits	488,782	0
Total	\$600,841,189	\$599,038,797
Contribution Required (Percent of Payroll)		
Total Normal Cost	29.26%	32.88%
Employee Contribution	11.56%	12.50%
Employer Normal Costs	17.70%	20.38%
Amortization of Unfunded Accrued Liability	43.71%	43.51%
Group Term Life Benefits	0.05%	0.00%
Total	61.46%	63.89%

¹ Includes non-vested terminated participants with employee contributions remaining in the plan.

Liabilities and Employer Contributions

Accrued and Unfunded Liabilities

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

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
1) Present Value of Benefits					
a) Actives and Inactives	\$73,344,401,577	\$3,914,439,536	\$11,723,132,589	\$30,611,347,595	\$8,556,853,022
b) Retired	79,303,321,894	2,972,406,302	9,314,695,160	37,338,743,628	9,897,522,083
c) Total	\$152,647,723,471	\$6,886,845,838	\$21,037,827,749	\$67,950,091,223	\$18,454,375,105
2) Present Value of Future Employee Contributions	\$9,530,374,780	\$629,849,677	\$2,231,599,031	\$4,200,270,386	\$994,711,373
3) Present Value of Future Employer Normal Costs	12,419,975,764	706,527,941	2,409,204,558	6,242,374,220	1,637,659,938
4) Accrued Liability [(1c) – (2) – (3)]	130,697,372,927	5,550,468,220	16,397,024,160	57,507,446,617	15,822,003,794
5) Market Value of Assets	\$104,354,925,163	4,951,791,018	14,950,460,803	46,172,239,586	11,924,100,686
6) Unfunded Accrued Liability/(Surplus) [(4) – (5)]	\$26,342,447,764	\$598,677,202	\$1,446,563,357	\$11,335,207,031	\$3,897,903,108
7) Funded Ratio [(5) ÷ (4)]	79.8%	89.2%	91.2%	80.3%	75.4%

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	\$1,528,037,123	\$87,229,819	\$331,500,120	\$771,132,539	\$191,075,254
Payment on the Unfunded Accrued Liability	2,924,631,242	70,211,486	205,634,954	1,079,806,964	407,963,543
Total Employer Contribution Amount	\$4,452,668,365	\$157,441,305	\$537,135,074	\$1,850,939,503	\$599,038,797
Projected Payroll	\$14,497,505,911	\$806,936,345	\$2,542,178,835	\$3,920,348,448	\$937,562,578
Employer Contribution (as a percent of payroll)					
Normal Cost	10.54%	10.81%	13.04%	19.67%	20.38%
Payment on the Unfunded Accrued Liability	20.17%	8.70%	8.09%	27.54%	43.51%
Total Employer Contribution Rate	30.71%	19.51%	21.13%	47.21%	63.89%

Liabilities and Employer Contributions

Schedule of Amortization Bases

Note that 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, 2021).
- The required employer contributions determined by the valuation are for the fiscal year beginning one year after the valuation date (fiscal year 2022-23).

This one-year lag is necessary due to the amount of time required to extract and test the membership and financial data as well as the need to provide employers with their required employer contribution 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. Additional discretionary payments are reflected in the Expected Payments column in the fiscal year they were made by the State.

Liabilities and Employer Contributions

Schedule of Amortization Bases (continued)

State Miscellaneous

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2021	Expected Payment in 2021-22	Balance on 6/30/2022	Scheduled Payment for Fiscal Year 2022-2023	Payment as Percentage of Payroll
(Gain)/Loss	Various	22	318,376,930	21,574,684	317,730,401	21,643,657	0.15%
(Gain)/Loss Prior to 2009	Various	11	9,303,517,552	992,490,195	8,910,476,830	1,005,831,193	6.94%
Payment (Gain)/Loss	Various	22	372,225,662	25,223,721	371,469,783	25,304,360	0.17%
Assumption Change	6/30/2003	2	321,331,260	317,625,942	14,934,161	7,864,053	0.05%
Benefit Change (SB 1801)	6/30/2003	2	(937,922)	(336,590)	(653,855)	(344,308)	-
Actuarial Equivalent Reduction Benefits	6/30/2004	2	124,214,784	34,100,624	97,420,411	51,299,787	0.35%
New Rate Stabilization Policies	6/30/2004	2	(89,551,896)	(24,584,639)	(70,234,655)	(36,984,270)	(0.26%)
Reclass of BU 7 Members	6/30/2005	2	(49,569,240)	(11,102,605)	(41,466,063)	(21,835,262)	(0.15%)
(Gain)/Loss	6/30/2009	18	1,136,437,250	86,946,621	1,123,860,793	87,529,881	0.60%
Assumption Change	6/30/2009	8	1,643,371,897	908,007,551	816,749,086	120,129,013	0.83%
(Gain)/Loss	6/30/2010	19	(44,400,413)	(3,284,517)	(44,025,287)	(3,303,592)	(0.02%)
(Gain)/Loss	6/30/2011	20	23,547,699	1,688,261	23,404,225	1,696,571	0.01%
Assumption Change	6/30/2011	10	1,483,916,351	169,495,146	1,409,659,454	171,946,851	1.19%
Assumption Change	6/30/2013	12	4,826,437,517	515,330,197	4,622,071,989	522,234,253	3.60%
(Gain)/Loss	6/30/2014	23	4,851,227,417	338,200,569	4,831,600,596	339,557,916	2.34%
(Gain)/Loss	6/30/2015	24	4,116,510,048	279,251,635	4,107,842,683	280,134,787	1.93%
(Gain)/Loss	6/30/2016	25	4,199,847,919	277,722,872	4,198,427,415	278,368,906	1.92%
(Gain)/Loss	6/30/2017	26	(3,055,082,962)	(159,793,312)	(3,097,691,666)	(200,044,589)	(1.38%)
(Gain)/Loss	6/30/2018	27	198,212,748	7,789,495	203,641,232	10,390,418	0.07%
Assumption Change	6/30/2018	17	3,447,071,888	187,675,305	3,487,521,449	252,533,782	1.74%
Method Change	6/30/2018	17	1,093,687,072	59,545,626	1,106,520,910	80,123,926	0.55%
Investment (Gain)/Loss	6/30/2019	18	536,685,350	22,406,452	550,024,211	33,071,049	0.23%
Non-Investment (Gain)/Loss	6/30/2019	18	547,844,857	51,242,488	532,142,227	50,453,324	0.35%
Investment (Gain)/Loss	6/30/2020	19	2,242,279,727	49,025,155	2,344,090,150	96,359,057	0.66%
Non-Investment (Gain)/Loss	6/30/2020	19	(117,885,951)	(436,844,378)	325,550,632	30,023,168	0.21%
Assumption Change	6/30/2021	20	256,156,048	(83,304,989)	359,665,438	32,342,395	0.22%
Net Investment (Gain)	6/30/2021	20	(10,480,474,787)	-	(11,193,147,073)	(240,593,273)	(1.66%)
Non-Investment (Gain)/Loss	6/30/2021	20	(756,159,760)	(16,340,457)	(790,691,728)	(71,101,811)	(0.49%)
Risk Mitigation	6/30/2021	1	2,871,462,211	(109,947,029)	3,180,345,393	3,286,698,861	22.67%
Risk Mitigation Offset	6/30/2021	1	(2,977,851,492)	-	(3,180,345,393)	(3,286,698,861)	(22.67%)
Total			\$26,342,447,764	\$3,499,804,023	\$24,516,893,749	\$2,924,631,242	20.17%

Liabilities and Employer Contributions

Schedule of Amortization Bases (continued)

State Industrial

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2021	Expected Payment in 2021-22	Balance on 6/30/2022	Scheduled Payment for Fiscal Year 2022-23	Payment as Percentage of Payroll
(Gain)/Loss	Various	22	98,283,030	6,660,110	98,083,446	6,681,402	0.83%
Payment (Gain)/Loss	Various	22	(1,484,182)	(100,575)	(1,481,168)	(100,897)	(0.01%)
Assumption Change	6/30/2003	1	34,420,760	35,571,820	-	-	-
Actuarial Equivalent Reduction Benefits	6/30/2004	3	5,584,022	3,437,650	2,411,128	862,486	0.11%
New Rate Stabilization Policies	6/30/2004	3	(3,074,281)	(843,981)	(2,411,128)	(862,486)	(0.11%)
(Gain)/Loss	6/30/2009	18	39,300,134	3,006,777	38,865,217	3,026,948	0.38%
Assumption Change	6/30/2009	8	54,416,550	34,113,852	22,862,227	3,362,620	0.42%
(Gain)/Loss	6/30/2010	19	5,424,936	401,309	5,379,103	403,640	0.05%
(Gain)/Loss	6/30/2011	20	(7,370,380)	(528,422)	(7,325,473)	(531,023)	(0.07%)
Assumption Change	6/30/2011	10	54,487,404	6,223,633	51,760,791	6,313,656	0.78%
Assumption Change	6/30/2013	12	149,199,254	15,930,359	142,881,719	16,143,783	2.00%
(Gain)/Loss	6/30/2014	23	151,747,528	10,578,993	151,133,596	10,621,451	1.32%
(Gain)/Loss	6/30/2015	24	173,065,624	11,740,250	172,701,232	11,777,380	1.46%
(Gain)/Loss	6/30/2016	25	263,560,151	17,428,413	263,471,007	17,468,954	2.16%
(Gain)/Loss	6/30/2017	26	(175,030,973)	(9,154,835)	(177,472,099)	(11,460,900)	(1.42%)
Assumption Change	6/30/2017	16	11,691,764	860,312	11,597,722	1,086,565	0.13%
(Gain)/Loss	6/30/2018	27	6,545,156	257,216	6,724,409	343,101	0.04%
Assumption Change	6/30/2018	17	153,737,964	8,370,240	155,541,998	11,262,901	1.40%
Method Change	6/30/2018	17	53,590,785	2,917,742	54,219,645	3,926,081	0.49%
Investment (Gain)/Loss	6/30/2019	18	24,263,762	1,013,005	24,866,817	1,495,155	0.19%
Non-Investment (Gain)/Loss	6/30/2019	18	13,266,874	1,240,913	12,886,611	1,221,802	0.15%
Investment (Gain)/Loss	6/30/2020	19	102,594,371	2,243,121	107,252,655	4,408,860	0.55%
Non-Investment (Gain)/Loss	6/30/2020	19	(46,361,009)	(45,896,874)	(2,081,853)	(191,994)	(0.02%)
Assumption Change	6/30/2021	20	(10,973,397)	(3,352,220)	(8,255,267)	(742,343)	(0.09%)
Net Investment (Gain)	6/30/2021	20	(494,819,527)	-	(528,467,255)	(11,359,242)	(1.41%)
Non-Investment (Gain)/Loss	6/30/2021	20	(51,315,615)	195,269	(55,006,876)	(4,946,414)	(0.61%)
Risk Mitigation	6/30/2021	1	136,259,540	(6,276,606)	152,011,690	157,095,091	19.47%
Risk Mitigation Offset	6/30/2021	1	(142,333,043)	-	(152,011,690)	(157,095,091)	(19.47%)
Total			\$598,677,202	\$96,037,471	\$540,138,204	\$70,211,486	8.70%

Liabilities and Employer Contributions

Schedule of Amortization Bases (continued)

State Safety

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2021	Expected Payment in 2021-22	Balance on 6/30/2022	Scheduled Payment for Fiscal Year 2022-23	Payment as Percentage of Payroll
(Gain)/Loss	Various	22	848,921,877	57,526,848	847,197,970	57,710,757	2.27%
Payment (Gain)/Loss	Various	22	(43,999,393)	(2,981,601)	(43,910,043)	(2,991,133)	(0.12%)
Benefit Change (Arnett)	6/30/2002	1	28,181,000	14,870,655	14,729,366	15,221,929	0.60%
Assumption Change	6/30/2003	2	(1,248,099)	(447,903)	(870,088)	(458,172)	(0.02%)
New Rate Stabilization Policies	6/30/2004	3	(3,468,466)	(952,196)	(2,720,283)	(973,074)	(0.04%)
(Gain)/Loss	6/30/2009	18	147,904,578	11,315,894	146,267,782	11,391,804	0.45%
Assumption Change	6/30/2009	8	210,394,017	143,796,010	76,096,139	11,192,365	0.44%
(Gain)/Loss	6/30/2010	19	(111,643,941)	(8,258,850)	(110,700,696)	(8,306,815)	(0.33%)
(Gain)/Loss	6/30/2011	20	(10,249,240)	(734,823)	(10,186,792)	(738,440)	(0.03%)
Assumption Change	6/30/2011	10	149,456,432	17,071,137	141,977,459	17,318,067	0.68%
Assumption Change	6/30/2013	12	472,746,945	50,476,314	452,729,452	51,152,563	2.01%
(Gain)/Loss	6/30/2014	23	190,976,638	13,313,828	190,203,996	13,367,262	0.53%
(Gain)/Loss	6/30/2015	24	476,941,905	32,354,301	475,937,698	32,456,624	1.28%
(Gain)/Loss	6/30/2016	25	483,017,172	31,940,422	482,853,803	32,014,722	1.26%
(Gain)/Loss	6/30/2017	26	(532,099,302)	(27,830,966)	(539,520,397)	(34,841,472)	(1.37%)
Assumption Change	6/30/2017	16	201,793,127	14,848,483	200,170,031	18,753,491	0.74%
Assumption Change	6/30/2018	17	448,661,240	24,427,293	453,926,042	32,869,091	1.29%
Method Change	6/30/2018	17	162,261,621	8,834,309	164,165,675	11,887,347	0.47%
Non-Investment (Gain)/Loss	6/30/2018	27	(98,505,556)	(3,871,136)	(101,203,344)	(5,163,714)	(0.20%)
Investment (Gain)/Loss	6/30/2019	18	70,682,901	2,950,990	72,439,665	4,355,546	0.17%
Non-Investment (Gain)/Loss	6/30/2019	18	(42,498,525)	(3,975,086)	(41,280,408)	(3,913,867)	(0.15%)
Investment (Gain)/Loss	6/30/2020	19	306,244,499	6,695,723	320,149,491	13,160,459	0.52%
Non-Investment (Gain)/Loss	6/30/2020	19	(202,854,808)	(111,172,273)	(101,758,966)	(9,384,490)	(0.37%)
Assumption Change	6/30/2021	20	(22,947,793)	(3,645,537)	(20,740,796)	(1,865,086)	(0.07%)
Net Investment (Gain)	6/30/2021	20	(1,515,941,066)	-	(1,619,025,058)	(34,800,449)	(1.37%)
Non-Investment (Gain)/Loss	6/30/2021	20	(144,638,642)	(1,189,024)	(153,245,284)	(13,780,361)	(0.54%)
Risk Mitigation	6/30/2021	1	389,628,199	(22,245,604)	439,112,433	453,796,728	17.85%
Risk Mitigation Offset	6/30/2021	1	(411,153,963)	-	(439,112,433)	(453,796,728)	(17.85%)
Total			\$1,446,563,357	\$243,117,208	\$1,293,682,414	\$205,634,954	8.09%

Liabilities and Employer Contributions

Schedule of Amortization Bases (continued)

State Peace Officers and Firefighters

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2021	Expected Payment in 2021-22	Balance on 6/30/2022	Scheduled Payment for Fiscal Year 2022-23	Payment as Percentage of Payroll
(Gain)/Loss	Various	22	4,716,068,353	319,582,464	4,706,491,426	320,604,146	8.18%
Payment (Gain)/Loss	Various	22	(2,611,375)	(176,959)	(2,606,072)	(177,524)	-
Assumption Change	6/30/2003	2	134,819,629	126,212,017	13,554,709	7,137,659	0.18%
Benefit Change (SB 183)	6/30/2004	2	8,372,057	2,298,377	6,566,120	3,457,597	0.09%
New Rate Stabilization Policies	6/30/2004	2	(25,654,834)	(7,043,009)	(20,120,829)	(10,595,256)	(0.27%)
Benefit Change (SB 65)	6/30/2006	1	174,163,239	179,987,407	-	-	-
(Gain)/Loss	6/30/2009	18	368,463,983	28,190,468	364,386,353	28,379,577	0.72%
Assumption Change	6/30/2009	1	545,698,462	563,947,085	-	-	-
(Gain)/Loss	6/30/2010	19	44,051,311	3,258,692	43,679,135	3,277,617	0.08%
(Gain)/Loss	6/30/2011	20	299,311,097	21,459,223	297,487,414	21,564,853	0.55%
Assumption Change	6/30/2011	10	629,176,772	233,798,507	430,343,864	52,492,304	1.34%
Assumption Change	6/30/2013	12	2,217,862,819	236,806,481	2,123,951,999	239,979,059	6.12%
(Gain)/Loss	6/30/2014	23	1,660,665,545	115,772,357	1,653,946,919	116,237,002	2.96%
(Gain)/Loss	6/30/2015	24	1,648,391,040	111,821,880	1,644,920,331	112,175,524	2.86%
(Gain)/Loss	6/30/2016	25	1,925,933,500	127,355,988	1,925,282,097	127,652,242	3.26%
(Gain)/Loss	6/30/2017	26	(996,801,177)	(52,136,771)	(1,010,703,388)	(65,269,809)	(1.66%)
Assumption Change	6/30/2017	16	162,204,870	11,935,472	160,900,197	15,074,386	0.38%
Assumption Change	6/30/2018	17	1,685,596,397	91,772,040	1,705,375,977	123,487,425	3.15%
Method Change	6/30/2018	17	476,964,551	25,968,263	482,561,477	34,942,602	0.89%
Non-Investment (Gain)/Loss	6/30/2018	27	(205,748,104)	(8,085,625)	(211,382,960)	(10,785,425)	(0.28%)
Investment (Gain)/Loss	6/30/2019	18	209,785,314	8,758,474	214,999,350	12,927,165	0.33%
Non-Investment (Gain)/Loss	6/30/2019	18	60,635,386	5,671,511	58,897,421	5,584,166	0.14%
Investment (Gain)/Loss	6/30/2020	19	932,589,240	20,390,111	974,933,335	40,076,811	1.02%
Non-Investment (Gain)/Loss	6/30/2020	19	(490,439,284)	(740,407,794)	241,378,508	22,260,585	0.57%
Assumption Change	6/30/2021	20	499,631,626	(45,528,184)	580,657,262	52,214,765	1.33%
Net Investment (Gain)	6/30/2021	20	(4,570,671,804)	-	(4,881,477,487)	(104,925,866)	(2.68%)
Non-Investment (Gain)/Loss	6/30/2021	20	(722,352,058)	(15,160,366)	(755,804,656)	(67,964,641)	(1.73%)
Risk Mitigation	6/30/2021	1	1,399,862,311	(52,601,648)	1,549,413,640	1,601,227,356	40.84%
Risk Mitigation Offset	6/30/2021	1	(1,450,761,835)	-	(1,549,413,640)	(1,601,227,356)	(40.84%)
Total			\$11,335,207,031	\$1,313,846,461	\$10,748,218,502	\$1,079,806,964	27.54%

Liabilities and Employer Contributions

Schedule of Amortization Bases (continued)

California Highway Patrol

Reason for Base	Date Established	Remaining Amortization Period	Balance on 6/30/2021	Expected Payment in 2021-22	Balance on 6/30/2022	Scheduled Payment for Fiscal Year 2022-23	Payment as Percentage of Payroll
(Gain)/Loss	Various	22	220,948,424	14,972,481	220,499,743	15,020,346	1.60%
(Gain)/Loss Prior to 2009	Various	16	1,515,821,695	125,077,593	1,489,637,276	126,147,675	13.45%
Payment (Gain)/Loss	Various	22	(21,280,629)	(1,442,073)	(21,237,415)	(1,446,683)	(0.15%)
Benefit Change (AB 2621)	6/30/2001	0	394,864	408,450	(394)	(407)	-
Benefit Change (Arnett)	6/30/2002	1	523,616	276,304	273,678	282,830	0.03%
Assumption Change	6/30/2003	2	22,144,060	7,946,796	15,437,312	8,129,003	0.87%
Benefit Change (SB 1801)	6/30/2003	2	3,508,252	1,259,000	2,445,711	1,287,866	0.14%
New Rate Stabilization Policies	6/30/2004	3	(8,748,701)	(2,401,777)	(6,861,518)	(2,454,436)	(0.26%)
Benefit Change (SB 439)	6/30/2005	4	93,487,934	20,939,591	78,205,285	21,376,348	2.28%
Benefit Change (AB 2936)	6/30/2008	7	(150,594,274)	(22,343,240)	(137,744,268)	(22,736,868)	(2.43%)
(Gain)/Loss	6/30/2009	18	298,307,560	22,822,936	295,006,320	22,976,038	2.45%
Assumption Change	6/30/2009	8	133,403,132	17,932,789	123,942,068	18,229,636	1.94%
(Gain)/Loss	6/30/2010	19	100,177,247	7,410,603	99,330,880	7,453,641	0.80%
(Gain)/Loss	6/30/2011	20	(44,623,858)	(3,199,325)	(44,351,967)	(3,215,073)	(0.34%)
Assumption Change	6/30/2011	10	163,146,016	18,634,782	154,982,000	18,904,329	2.02%
Assumption Change	6/30/2013	12	788,536,287	84,193,892	755,147,347	85,321,867	9.10%
(Gain)/Loss	6/30/2014	23	479,794,990	33,448,636	477,853,862	33,582,880	3.58%
(Gain)/Loss	6/30/2015	24	557,313,416	37,806,462	556,139,986	37,926,028	4.05%
(Gain)/Loss	6/30/2016	25	84,629,405	49,980,483	38,732,331	2,568,075	0.27%
(Gain)/Loss	6/30/2017	26	(240,534,829)	(12,580,954)	(243,889,526)	(15,750,044)	(1.68%)
(Gain)/Loss	6/30/2018	27	(76,853,788)	(3,020,251)	(78,958,595)	(4,028,717)	(0.43%)
Assumption Change	6/30/2018	17	463,021,199	25,209,119	468,454,507	33,921,107	3.62%
Method Change	6/30/2018	17	113,870,940	6,199,686	115,207,155	8,342,228	0.89%
Investment (Gain)/Loss	6/30/2019	18	56,314,051	2,351,095	57,713,689	3,470,124	0.37%
Non-Investment (Gain)/Loss	6/30/2019	18	87,457,127	8,180,274	84,950,382	8,054,293	0.86%
Investment (Gain)/Loss	6/30/2020	19	243,954,647	5,333,819	255,031,377	10,483,634	1.12%
Non-Investment (Gain)/Loss	6/30/2020	19	82,817,098	7,557,316	80,638,622	7,436,714	0.79%
Assumption Change	6/30/2021	20	225,216,241	(21,244,347)	262,485,722	23,603,649	2.52%
Net Investment (Gain)	6/30/2021	20	(1,144,141,063)	-	(1,221,942,655)	(26,265,284)	(2.80%)
Non-Investment (Gain)/Loss	6/30/2021	20	(136,612,056)	(26,500,844)	(118,514,621)	(10,657,256)	(1.14%)
Risk Mitigation	6/30/2021	1	389,122,456	(13,947,209)	429,996,399	444,375,846	47.40%
Risk Mitigation Offset	6/30/2021	1	(402,618,351)	-	(429,996,399)	(444,375,846)	(47.40%)
Total			\$3,897,903,108	\$391,262,087	\$3,758,614,294	\$407,963,543	43.51%

Liabilities and Employer Contributions

(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 Accrued Liability/(Surplus) as of June 30, 2020	\$37,647,704,280	\$1,142,733,042	\$3,102,342,146
b) Expected Payment on Unfunded Accrued Liability During 2020-21	2,758,803,022	58,840,524	162,304,881
c) Interest through June 30, 2021 $[.07 \times (1a) - ((1.07)^{1/2} - 1) \times (1b)]$	2,540,414,286	77,966,726	211,579,357
d) Expected Unfunded Accrued Liability as of June 30, 2021 $[(1a) - (1b) + (1c)]$	\$37,429,315,544	\$1,161,859,244	\$3,151,616,622
e) Change Due to Method Change	0	0	0
f) Change Due to Risk Mitigation	2,871,462,211	136,259,540	389,628,199
g) Change Due to Assumption Change	256,156,048	(10,973,397)	(22,947,793)
h) Expected Unfunded Accrued Liability After All Other Changes $[(1d) + (1e) + (1f) + (1g)]$	\$40,556,933,803	\$1,287,145,387	\$3,518,297,028
i) Actual Unfunded Accrued Liability as of June 30, 2021	26,342,447,764	598,677,202	1,446,563,357
j) Total (Gain)/Loss for 2020-21 $[(1i) - (1h)]$	\$(14,214,486,039)	\$(688,468,185)	\$(2,071,733,671)
2) Contribution (Gain)/Loss for the Year			
a) Expected Contributions for 2020-21	\$5,389,563,771	\$233,491,605	\$817,009,499
b) Interest on Expected Contributions for 2020-21	185,444,343	8,033,989	28,111,698
c) Actual Contributions for 2020-21	4,678,708,026	184,825,400	650,549,349
d) Interest on Actual Contributions for 2020-21	160,984,715	6,359,460	22,384,260
e) Expected Contributions with Interest for 2020-21 $[(2a) + (2b)]$	5,575,008,114	241,525,594	845,121,197
f) Actual Contributions with Interest for 2020-21 $[(2c) + (2d)]$	4,839,692,741	191,184,860	672,933,609
g) Contribution (Gain)/Loss for 2020-21 $[(2e) - (2f)]$	\$735,315,373	\$50,340,734	\$172,187,588
3) Investment (Gain)/Loss for the Year			
a) Market Value of Assets as of June 30, 2020	\$87,046,873,448	\$4,083,794,798	\$12,249,799,444
b) Receivables as of June 30, 2020	(201,747,207)	(12,515,269)	(12,900,845)
c) Receivables as of June 30, 2021	175,325,525	11,570,492	10,990,836
d) Contributions Received During 2020-21	4,678,694,261	184,824,819	650,553,112
e) Benefits and Refunds Paid During 2020-21	(6,854,829,019)	(238,491,624)	(734,596,340)
f) Transfers, SCP Payments and Interest, and Miscellaneous Adjustments During 2020-21	46,402,944	2,235,322	5,634,554
g) Expected Interest for 2020-21 $[0.07 \times (3a + 3b) + ((1.07)^{1/2} - 1) \times ((3d) + (3e) + (3f))]$	6,005,878,931	283,219,910	853,885,012
h) Expected Assets as of June 30, 2021 $[(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]$	90,896,598,884	4,314,638,448	13,023,365,774
i) Actual Market Value of Assets as of June 30, 2021	104,354,925,163	4,951,791,018	14,950,460,803
j) Investment (Gain)/Loss for 2020-21 $[(3h) - (3i)]$	\$(13,458,326,279)	\$(637,152,570)	\$(1,927,095,029)
4) Liability (Gain)/Loss for the Year			
a) Total (Gain)/Loss for 2020-21 (1j)	\$(14,214,486,039)	\$(688,468,185)	\$(2,071,733,671)
b) Contribution (Gain)/Loss for 2020-21 (2g)	735,315,373	50,340,734	172,187,588
c) Investment (Gain)/Loss for 2020-21 (3j)	(13,458,326,279)	(637,152,570)	(1,927,095,029)
d) Liability (Gain)/Loss for 2020-21 $[(4a) - (4b) - (4c)]$	\$(1,491,475,133)	\$(101,656,349)	\$(316,826,230)

Liabilities and Employer Contributions

(Gain)/Loss Analysis (continued)

	State Peace Officers and Firefighters	California Highway Patrol
1) Total (Gain)/Loss for the Year		
a) Unfunded Accrued Liability/(Surplus) as of June 30, 2020	\$15,774,406,442	\$5,284,505,480
b) Expected Payment on Unfunded Accrued Liability During 2020-21	675,861,046	390,454,791
c) Interest through June 30, 2021 $[.07 \times (1a) - ((1.07)^{1/2} - 1) \times (1b)]$	1,080,953,395	356,480,598
d) Expected Unfunded Accrued Liability as of June 30, 2021 $[(1a) - (1b) + (1c)]$	\$16,179,498,791	\$5,250,531,287
e) Change Due to Method Change	0	0
f) Change Due to Risk Mitigation	1,399,862,311	389,122,456
g) Change Due to Assumption Change	499,631,626	225,216,241
h) Expected Unfunded Accrued Liability After All Other Changes $[(1d) + (1e) + (1f) + (1g)]$	\$18,078,992,728	\$5,864,869,984
i) Actual Unfunded Accrued Liability as of June 30, 2021	11,335,207,031	3,897,903,108
j) Total (Gain)/Loss for 2020-21 $[(1i) - (1h)]$	\$(6,743,785,697)	\$(1,966,966,876)
2) Contribution (Gain)/Loss for the Year		
a) Expected Contributions for 2020-21	\$2,381,377,532	\$668,834,598
b) Interest on Expected Contributions for 2020-21	81,938,541	23,013,290
c) Actual Contributions for 2020-21	1,726,323,555	895,547,680
d) Interest on Actual Contributions for 2020-21	59,399,381	30,805,002
e) Expected Contributions with Interest for 2020-21 $[(2a) + (2b)]$	2,463,316,073	691,847,888
f) Actual Contributions with Interest for 2020-21 $[(2c) + (2d)]$	1,785,722,936	926,352,682
g) Contribution (Gain)/Loss for 2020-21 $[(2e) - (2f)]$	\$677,593,137	\$(234,504,794)
3) Investment (Gain)/Loss for the Year		
a) Market Value of Assets as of June 30, 2020	\$38,327,136,595	\$9,501,361,017
b) Receivables as of June 30, 2020	(60,743,140)	(9,100,933)
c) Receivables as of June 30, 2021	51,867,173	7,816,221
d) Contributions Received During 2020-21	1,726,322,538	895,284,918
e) Benefits and Refunds Paid During 2020-21	(2,561,721,696)	(695,179,255)
f) Transfers, SCP Payments and Interest, and Miscellaneous Adjustments During 2020-21	17,441,266	5,622,398
g) Expected Interest for 2020-21 $[0.07 \times (3a + 3b) + ((1.07)^{1/2} - 1) \times ((3d) + (3e) + (3f))]$	2,650,503,211	671,536,906
h) Expected Assets as of June 30, 2021 $[(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]$	40,150,805,947	10,377,341,272
i) Actual Market Value of Assets as of June 30, 2021	46,172,239,586	11,924,100,686
j) Investment (Gain)/Loss for 2020-21 $[(3h) - (3i)]$	\$(6,021,433,639)	\$(1,546,759,414)
4) Liability (Gain)/Loss for the Year		
a) Total (Gain)/Loss for 2020-21 (1j)	\$(6,743,785,697)	\$(1,966,966,876)
b) Contribution (Gain)/Loss for 2020-21 (2c)	677,593,137	(234,504,794)
c) Investment (Gain)/Loss for 2020-21 (3j)	(6,021,433,639)	(1,546,759,414)
d) Liability (Gain)/Loss for 2020-21 $[(4a) - (4b) - (4c)]$	\$(1,399,945,195)	\$(185,702,668)

Liabilities and Employer Contributions

Reconciliation of Actuarially Required Contributions

State Miscellaneous

	Percentage of Payroll	Dollars
2021-2022 Normal Cost	9.36%	\$1,337,295,940
Inclusion of GTLI in the Normal Cost Rate	0.03%	3,878,709
Effect of the Change in Payroll	0.00%	19,670,615
Effect of Changes in Demographics	(0.22%)	(31,423,971)
Effect of Risk Mitigation	0.78%	113,080,546
Effect of Change in Assumptions	0.60%	86,985,035
Effect of Change in Member Contribution Rates	(0.01%)	(1,449,751)
2022-2023 Normal Cost	10.54%	\$1,528,037,123
2021-2022 UAL Payment	19.74%	\$2,819,989,697
Effect of Elimination of Amortization Bases	0.00%	0
Effect of Progression of Amortization Bases	4.50%	660,024,063
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	(0.24%)	0
Effect of Net Investment (Gain) after Risk Mitigation	(1.66%)	(240,593,273)
Effect of Non-Investment (Gain)/Loss	(0.49%)	(71,101,811)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(0.32%)	(46,818,696)
Effect of Assumption Change	0.16%	23,575,887
Effect of SB 90 Additional Contribution	(1.52%)	(220,444,625)
2022-2023 UAL Payment	20.17%	\$2,924,631,242

State Industrial

	Percentage of Payroll	Dollars
2021-2022 Normal Cost	9.83%	\$79,432,169
Inclusion of GTLI in the Normal Cost Rate	0.03%	200,186
Effect of the Change in Payroll	0.00%	(110,326)
Effect of Changes in Demographics	(0.28%)	(1,969,168)
Effect of Risk Mitigation	0.80%	6,449,213
Effect of Change in Assumptions	0.43%	3,469,826
Effect of Change in Member Contribution Rates	0.00%	(242,081)
2022-2023 Normal Cost	10.81%	\$87,229,819
2021-2022 UAL Payment	6.63%	\$53,548,170
Effect of Elimination of Amortization Bases	0.00%	0
Effect of Progression of Amortization Bases	6.37%	52,881,898
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	0.19%	0
Effect of Net Investment (Gain) after Risk Mitigation	(1.41%)	(11,359,242)
Effect of Non-Investment (Gain)/Loss	(0.61%)	(4,946,414)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(0.18%)	(1,479,373)
Effect of Assumption Change	(0.13%)	(1,020,273)
Effect of SB 90 Additional Contribution	(2.16%)	(17,413,280)
2022-2023 UAL Payment	8.70%	\$70,211,486

Liabilities and Employer Contributions

Reconciliation of Actuarially Required Contributions (continued)

State Safety

	Percentage of Payroll	Dollars
2021-2022 Normal Cost	12.33%	\$321,252,471
Inclusion of GTLI in the Normal Cost Rate	0.03%	664,376
Effect of the Change in Payroll	0.00%	(7,801,821)
Effect of Changes in Demographics	(0.36%)	(9,031,315)
Effect of Risk Mitigation	0.90%	22,857,359
Effect of Change in Assumptions	0.15%	3,813,268
Effect of Change in Member Contribution Rates	(0.01%)	(254,218)
2022-2023 Normal Cost	13.04%	\$331,500,120
2021-2022 UAL Payment	5.94%	\$154,683,694
Effect of Elimination of Amortization Bases	0.00%	0
Effect of Progression of Amortization Bases	4.62%	123,684,038
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	0.38%	0
Effect of Net Investment (Gain) after Risk Mitigation	(1.37%)	(34,800,449)
Effect of Non-Investment (Gain)/Loss	(0.54%)	(13,780,361)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(0.15%)	(3,938,026)
Effect of Assumption Change	(0.10%)	(2,655,810)
Effect of SB 90 Additional Contribution	(0.69%)	(17,558,132)
2022-2023 UAL Payment	8.09%	\$205,634,954

State Peace Officers and Firefighters

	Percentage of Payroll	Dollars
2021-2022 Normal Cost	17.61%	\$712,926,869
Inclusion of GTLI in the Normal Cost Rate	0.03%	961,687
Effect of the Change in Payroll	0.00%	(22,553,506)
Effect of Changes in Demographics	(0.46%)	(17,766,572)
Effect of Risk Mitigation	1.38%	54,048,194
Effect of Change in Assumptions	1.20%	47,044,181
Effect of Change in Member Contribution Rates	(0.09%)	(3,528,314)
2022-2023 Normal Cost	19.67%	\$771,132,539
2021-2022 UAL Payment	13.58%	\$549,943,795
Effect of Elimination of Amortization Bases	0.00%	0
Effect of Progression of Amortization Bases	20.42%	849,486,771
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	1.70%	0
Effect of Net Investment (Gain) after Risk Mitigation	(2.68%)	(104,925,866)
Effect of Non-Investment (Gain)/Loss	(1.73%)	(67,964,641)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(0.54%)	(21,322,876)
Effect of Assumption Change	1.22%	48,019,604
Effect of SB 90 Additional Contribution	(4.43%)	(173,429,823)
2022-2023 UAL Payment	27.54%	\$1,079,806,964

Liabilities and Employer Contributions

Reconciliation of Actuarially Required Contributions (continued)

California Highway Patrol

	Percentage of Payroll	Dollars
2021-2022 Normal Cost	17.70%	\$173,028,842
Inclusion of GTLI in the Normal Cost Rate	0.03%	214,541
Effect of the Change in Payroll	0.00%	(7,080,267)
Effect of Changes in Demographics	(0.30%)	(2,732,008)
Effect of Risk Mitigation	1.53%	14,330,757
Effect of Change in Assumptions	2.35%	22,032,721
Effect of Change in Member Contribution Rates	(0.93%)	(8,719,332)
2022-2023 Normal Cost	20.38%	\$191,075,254
2021-2022 UAL Payment	43.71%	\$427,323,565
Effect of Elimination of Amortization Bases	(0.04%)	(408,450)
Effect of Progression of Amortization Bases	2.40%	24,096,759
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	2.04%	0
Effect of Net Investment (Gain) after Risk Mitigation	(2.80%)	(26,265,284)
Effect of Non-Investment (Gain)/Loss	(1.14%)	(10,657,256)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(0.71%)	(6,619,743)
Effect of Assumption Change	2.38%	22,332,079
Effect of SB 90 Additional Contribution	(2.33%)	(21,838,127)
2022-2023 UAL Payment	43.51%	\$407,963,543

Liabilities and Employer Contributions

Reconciliation of Employer Contribution Rates

Change in Normal Cost Rate from 2021-22 to 2022-23

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2021-2022 Normal Cost Rate	9.36%	9.83%	12.33%	17.61%	17.70%
Inclusion of GTLI in the NC Rate	0.03%	0.03%	0.03%	0.03%	0.03%
Effect of Changes in Demographic Results	(0.22%)	(0.28%)	(0.36%)	(0.46%)	(0.30%)
Effect of Risk Mitigation	0.78%	0.80%	0.90%	1.38%	1.53%
Effect of Change in Assumptions	0.60%	0.43%	0.15%	1.20%	2.35%
Effect of Change in Member Contribution Rates	(0.01%)	0.00%	(0.01%)	(0.09%)	(0.93%)
2022-2023 Normal Cost Rate	10.54%	10.81%	13.04%	19.67%	20.38%

Change in Unfunded Accrued Liability Amortization Rate from 2021-22 to 2022-23

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2021-2022 Rate to Amortize the UAL	19.74%	6.63%	5.94%	13.58%	43.71%
Effect of Elimination of Amortization Bases	0.00%	0.00%	0.00%	0.00%	(0.04%)
Effect of Progression of Amortization Bases	4.50%	6.37%	4.62%	20.42%	2.40%
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	(0.24%)	0.19%	0.38%	1.70%	2.04%
Effect of Investment (Gain)/Loss	(1.66%)	(1.41%)	(1.37%)	(2.68%)	(2.80%)
Effect of Non-Investment (Gain)/Loss	(0.49%)	(0.61%)	(0.54%)	(1.73%)	(1.14%)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(0.32%)	(0.18%)	(0.15%)	(0.54%)	(0.71%)
Effect of Assumption Change	0.16%	(0.13%)	(0.10%)	1.22%	2.38%
Effect of SB 90 Additional Contribution	(1.52%)	(2.16%)	(0.69%)	(4.43%)	(2.33%)
2022-2023 Rate to Amortize the UAL	20.17%	8.70%	8.09%	27.54%	43.51%

Change in Total Rate from 2021-22 to 2022-23

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2021-2022 Employer Rate ¹	29.13%	16.49%	18.30%	31.22%	61.44%
Effect of Progression of Amortization Bases and Change in Payroll	4.26%	6.56%	5.00%	22.12%	4.40%
Effect of (Gain)/Loss	(2.37%)	(2.30%)	(2.27%)	(4.87%)	(4.24%)
Effect of Risk Mitigation	0.46%	0.62%	0.75%	0.84%	0.82%
Effect of Change in Assumptions	0.76%	0.30%	0.05%	2.42%	4.73%
Effect of Change in Member Contribution Rates	(0.01%)	0.00%	(0.01%)	(0.09%)	(0.93%)
Effect of SB 90 Additional Contribution	(1.52%)	(2.16%)	(0.69%)	(4.43%)	(2.33%)
2022-2023 Employer Rate	30.71%	19.51%	21.13%	47.21%	63.89%

¹ Beginning July 1, 2021, Group Term Life Insurance Rate has been incorporated into the Normal Cost Rate.

Liabilities and Employer Contributions

Reconciliation of Employer Contributions

Change in Normal Cost Contribution from 2021-22 to 2022-23

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2021-2022 Normal Cost Contribution	\$1,337,295,940	\$79,432,169	\$321,252,471	\$712,926,869	\$173,028,842
Inclusion of GTLI in the NC Rate	3,878,709	200,186	664,376	961,687	214,541
Effect of Change in Payroll	19,670,615	(110,326)	(7,801,821)	(22,553,506)	(7,080,267)
Effect of Changes in Demographic Results	(31,423,971)	(1,969,168)	(9,031,315)	(17,766,572)	(2,732,008)
Effect of Risk Mitigation	113,080,546	6,449,213	22,857,359	54,048,194	14,330,757
Effect of Change in Assumptions	86,985,035	3,469,826	3,813,268	47,044,181	22,032,721
Effect of Change in Member Contribution Rates	(1,449,751)	(242,081)	(254,218)	(3,528,314)	(8,719,332)
2022-2023 Normal Cost Contribution	\$1,528,037,123	\$87,229,819	\$331,500,120	\$771,132,539	\$191,075,254

Change in Unfunded Accrued Liability Amortization Contribution from 2021-22 to 2022-23

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2021-2022 Amortization of the UAL	\$2,819,989,697	\$53,548,170	\$154,683,694	\$549,943,795	\$427,323,565
Effect of Elimination of Amortization Bases	0	0	0	0	(408,450)
Effect of Progression of Amortization Bases	660,024,063	52,881,898	123,684,038	849,486,771	24,096,759
Effect of Amortizing Prior Year's Bases over a (Larger)/Smaller than Expected Payroll	0	0	0	0	0
Effect of Investment (Gain)/Loss	(240,593,273)	(11,359,242)	(34,800,449)	(104,925,866)	(26,265,284)
Effect of Non-Investment (Gain)/Loss	(71,101,811)	(4,946,414)	(13,780,361)	(67,964,641)	(10,657,256)
Effect of Risk Mitigation (re-amortize existing bases at 6.8%)	(46,818,696)	(1,479,373)	(3,938,026)	(21,322,876)	(6,619,743)
Effect of Assumption Change	23,575,887	(1,020,273)	(2,655,810)	48,019,604	22,332,079
Effect of SB 90 Additional Contribution	(220,444,625)	(17,413,280)	(17,558,132)	(173,429,823)	(21,838,127)
2022-2023 Amortization of the UAL	\$2,924,631,242	\$70,211,486	\$205,634,954	\$1,079,806,964	\$407,963,543

Change in Total Contribution from 2021-22 to 2022-23

	State Miscellaneous	State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
2021-2022 Employer Contribution ¹	\$4,161,164,346	\$133,180,525	\$476,600,541	\$1,263,832,351	\$600,566,948
Effect of Change in Payroll and Progression of Amortization Bases	679,694,678	52,771,572	115,882,217	826,933,265	16,608,042
Effect of (Gain)/Loss	(343,119,055)	(18,274,824)	(57,612,125)	(190,657,079)	(39,654,548)
Effect of (Gain)/Loss	66,261,850	4,969,840	18,919,333	32,725,318	7,711,014
Effect of Risk Mitigation	110,560,922	2,449,553	1,157,458	95,063,785	44,364,800
Effect of Change in Member Contribution Rates	(1,449,751)	(242,081)	(254,218)	(3,528,314)	(8,719,332)
Effect of SB 90 Additional Contribution	(220,444,625)	(17,413,280)	(17,558,132)	(173,429,823)	(21,838,127)
2022-2023 Employer Contribution	\$4,452,668,365	\$157,441,305	\$537,135,074	\$1,850,939,503	\$599,038,797

¹ Beginning July 1, 2021, the Group Term Life Insurance Contribution has been incorporated into the Normal Cost Contribution.

Liabilities and Employer Contributions

History of Employer Contribution Rates

The table below provides a 30-year history of contribution rates. 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.

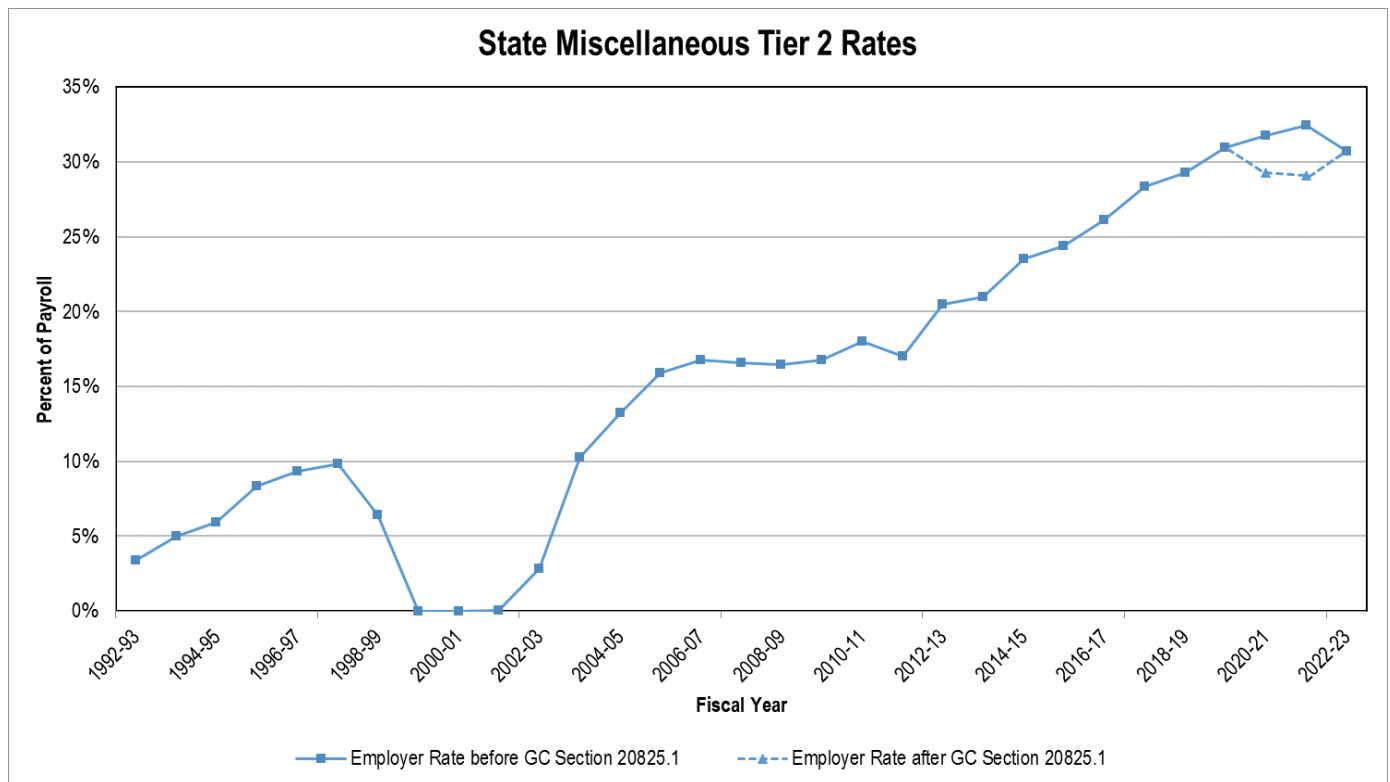
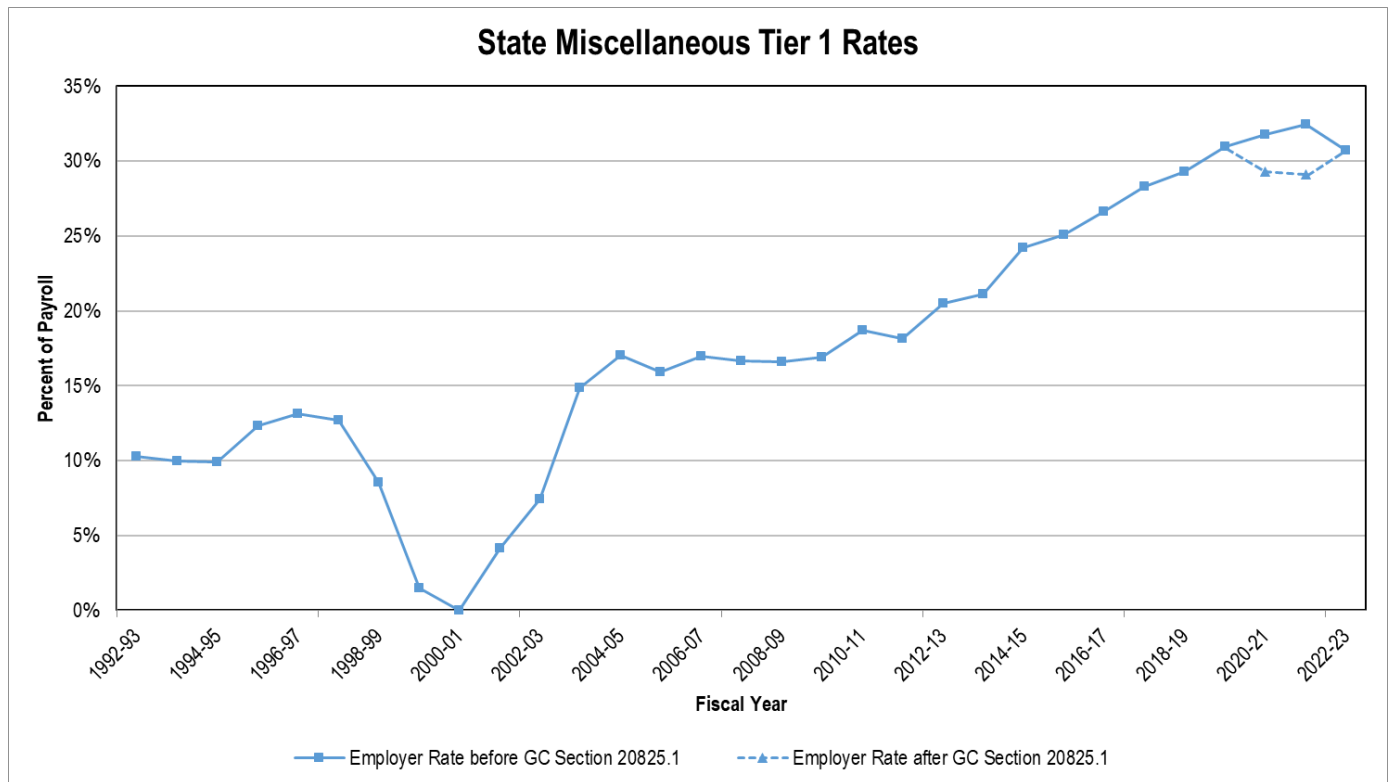
Fiscal Year	State Miscellaneous		State Industrial	State Safety	State Peace Officers and Firefighters	California Highway Patrol
	Tier 1	Tier 2				
2022-23	30.71%	30.71%	19.51%	21.13%	47.21%	63.89%
2021-22 ¹	29.12%	29.12%	16.46%	18.29%	31.19%	61.46%
2020-21 ²	31.76%	31.76%	21.62%	21.66%	48.93%	59.76%
2019-20	30.977%	30.977%	20.823%	21.526%	47.198%	57.811%
2018-19	29.298%	29.298%	19.550%	20.352%	43.724%	53.805%
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%

¹ Rates for fiscal year 2021-22 include reduction due to State contribution under Government Code section 20825.1.

² Rates for fiscal year 2020-21 are prior to reduction due to State contribution under Government Code section 20825.1.

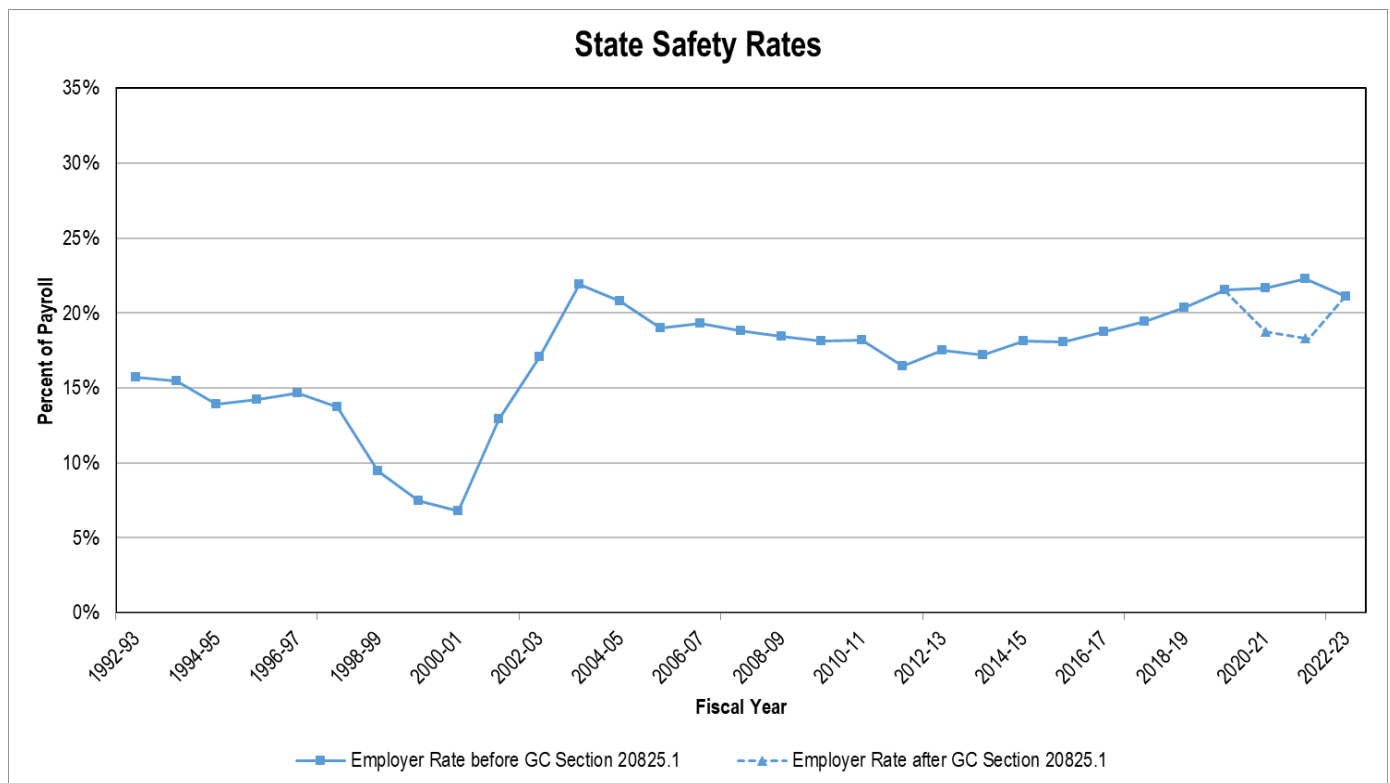
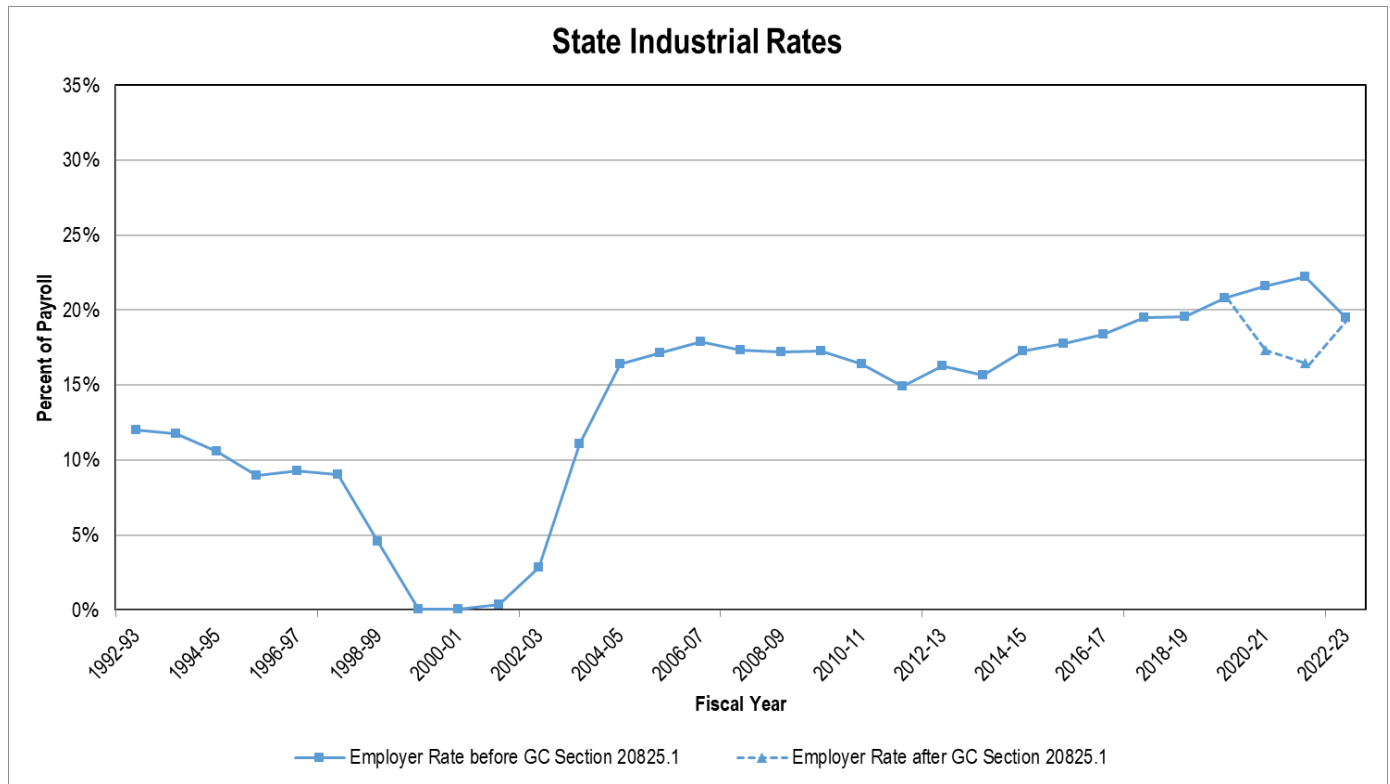
Liabilities and Employer Contributions

History of Employer Contribution Rates (continued)



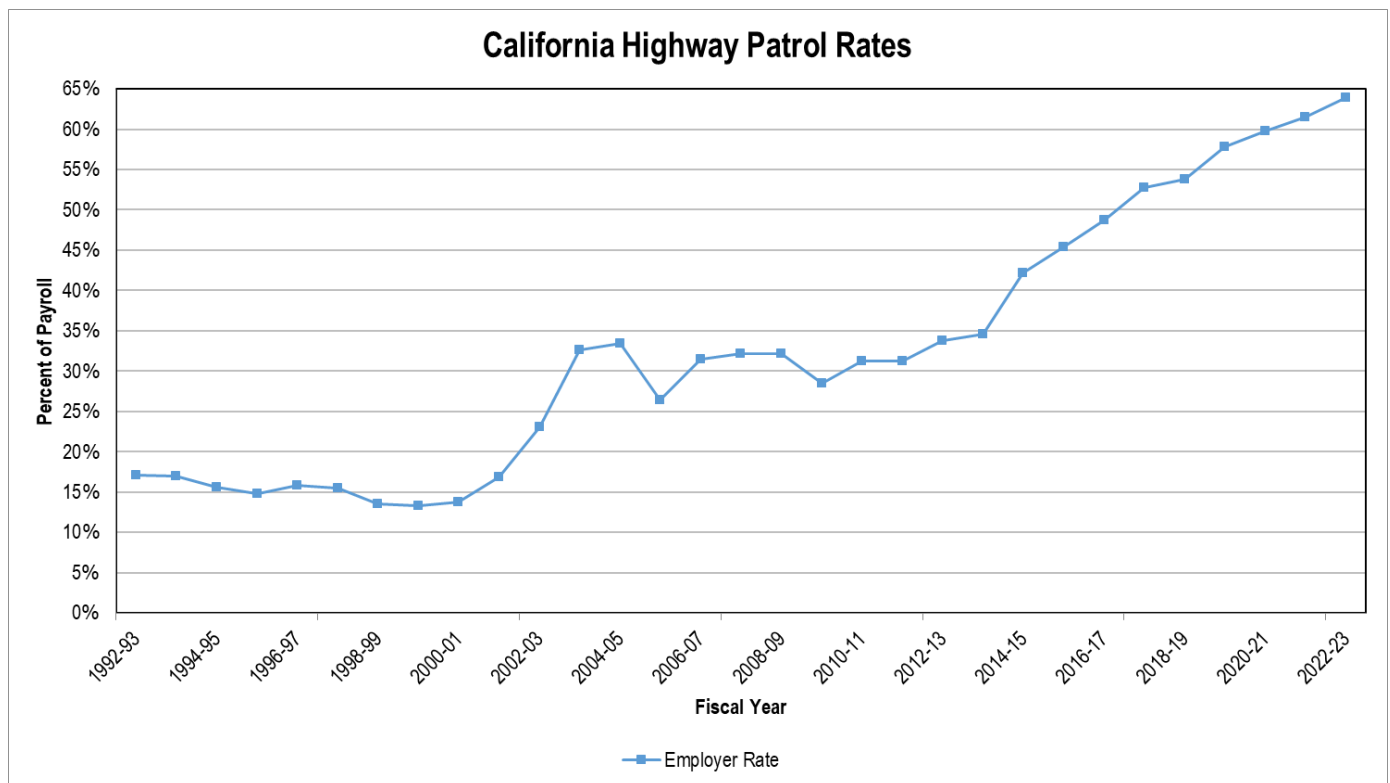
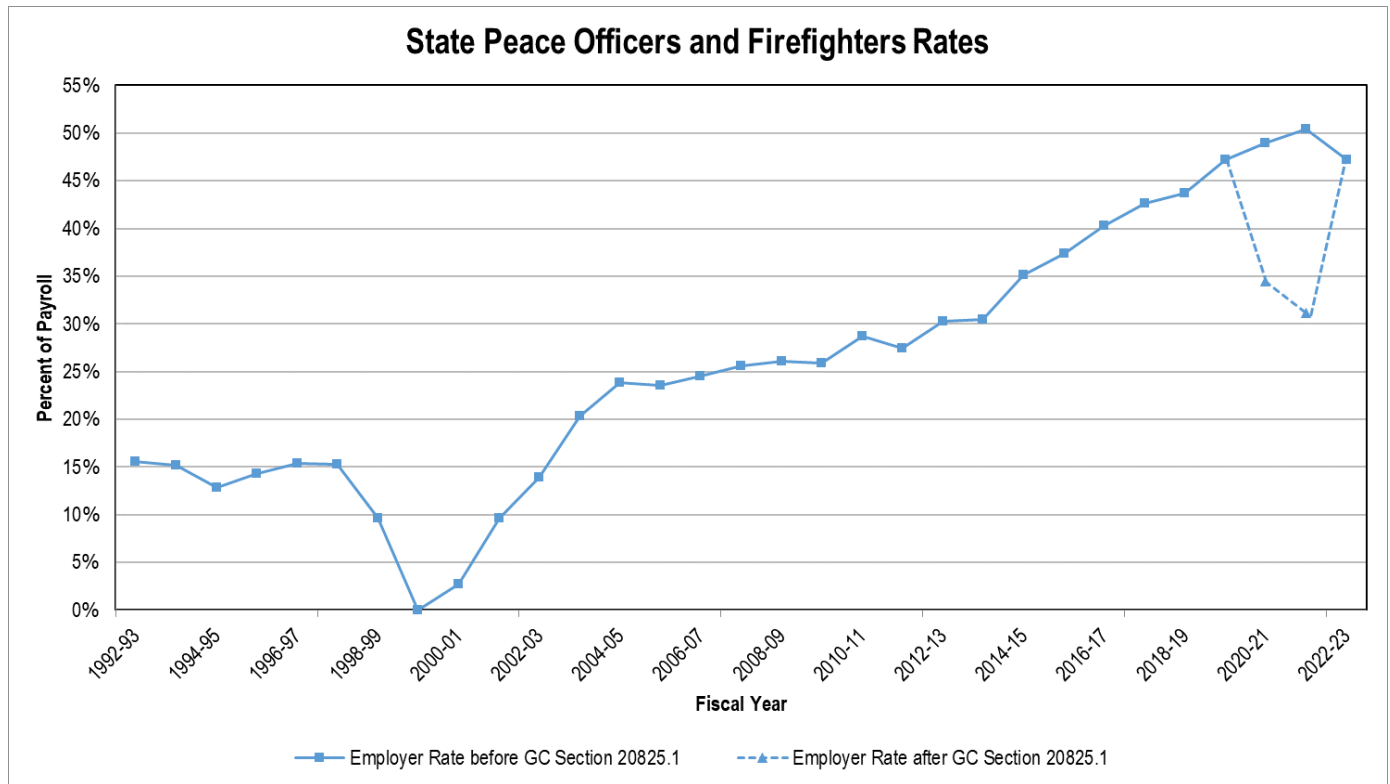
Liabilities and Employer Contributions

History of Employer Contribution Rates (continued)



Liabilities and Employer Contributions

History of Employer Contribution Rates (continued)



Liabilities and Employer Contributions

History of Funded Status and Funding Progress

Shown below is a 30-year history of funding progress for the plans on a market value of assets basis.

State Miscellaneous (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets	Funded Ratio	Unfunded Accrued Liability/(Surplus)	Projected Payroll for Contribution	UAL/(Surplus) as a % of Payroll
6/30/21	\$130,697	\$104,355	79.8%	\$26,342	\$14,498	181.7%
6/30/20	124,695	87,047	69.8%	37,648	14,287	263.5%
6/30/19	120,101	83,817	69.8%	36,285	13,617	266.5%
6/30/18	115,469	80,223	69.5%	35,246	12,935	272.5%
6/30/17	106,956	72,204	67.5%	34,752	12,396	280.4%
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%

Liabilities and Employer Contributions

History of Funded Status and Funding Progress (continued)

State Industrial (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets	Funded Ratio	Unfunded Accrued Liability/(Surplus)	Projected Payroll for Contribution	UAL/(Surplus) as a % of Payroll
6/30/21	\$5,550	\$4,952	89.2%	\$599	\$807	74.2%
6/30/20	5,227	4,084	78.1%	1,143	808	141.4%
6/30/19	4,946	3,822	77.3%	1,123	770	145.8%
6/30/18	4,670	3,590	76.9%	1,080	738	146.3%
6/30/17	4,210	3,215	76.4%	995	690	144.2%
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%)

Liabilities and Employer Contributions

History of Funded Status and Funding Progress (continued)

State Safety (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets	Funded Ratio	Unfunded Accrued Liability/(Surplus)	Projected Payroll for Contribution	UAL/(Surplus) as a % of Payroll
6/30/21	\$16,397	\$14,950	91.2%	\$1,447	\$2,542	56.9%
6/30/20	15,352	12,250	79.8%	3,102	2,605	119.1%
6/30/19	14,483	11,386	78.6%	3,097	2,554	121.2%
6/30/18	13,591	10,551	77.6%	3,039	2,445	124.3%
6/30/17	12,204	9,327	76.4%	2,877	2,293	125.5%
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%)

Liabilities and Employer Contributions

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	Funded Ratio	Unfunded Accrued Liability/(Surplus)	Projected Payroll for Contribution	UAL/(Surplus) as a % of Payroll
6/30/21	\$57,507	\$46,172	80.3%	\$11,335	\$3,920	289.1%
6/30/20	54,102	38,327	70.8%	15,774	4,048	389.6%
6/30/19	51,219	35,359	69.0%	15,860	3,825	414.6%
6/30/18	48,792	33,327	68.3%	15,466	3,719	415.9%
6/30/17	44,619	29,424	65.9%	15,194	3,616	420.2%
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%)

Liabilities and Employer Contributions

History of Funded Status and Funding Progress (continued)

California Highway Patrol (Dollars in Millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets	Funded Ratio	Unfunded Accrued Liability/(Surplus)	Projected Payroll for Contribution	UAL/(Surplus) as a % of Payroll
6/30/21	\$15,822	\$11,924	75.4%	\$3,898	\$938	415.7%
6/30/20	14,786	9,501	64.3%	5,285	978	540.6%
6/30/19	14,087	9,082	64.5%	5,005	961	520.6%
6/30/18	13,384	8,541	63.8%	4,843	921	526.2%
6/30/17	12,322	7,417	60.2%	4,904	900	545.1%
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%)

Normal Cost Information

44 Normal Cost by Group

45 PEPRA Member Contribution Rates

46 State Bargaining Units 5, 9, 16, and 18 - Member Contribution Rates

Normal Cost Information

Normal Cost by Group

The table below displays normal cost broken out by benefit group for FY 2022-23. The Total Normal Cost is the annual cost of service accrual for the fiscal year for active employees and can be viewed as the long-term contribution rate for the benefits contracted. Generally, the normal cost for a benefit group subject to more generous benefit provisions will exceed the normal cost for a group with less generous benefits. However, based on the characteristics of the members (particularly when the number of actives is small), this may not be the case. Future measurements of Total Normal Cost for each group may differ significantly from the current values due to such factors as: changes in demographics of the group, changes in economic and demographic assumptions, and changes in plan benefits or applicable law.

The employee contribution rate and breakpoint information shown here reflects membership data as stored in our system and is for informational purposes only. Please refer to the Public Employees' Retirement Law and/or applicable Memoranda of Understanding for the latest rate information. FAC means Final Average Compensation.

	State Plans	Total Normal Cost	Employee Contribution	Range of Breakpoints ²	Average Effective Member Rate ^{3,4}	Employer Normal Cost
P	State Miscellaneous (Including CSU) - 2% @ 62	16.2%	6% - 11%	\$0 - \$513	7.4%	8.8%
E	State Miscellaneous - 2nd Tier 2% @ 62 ⁴	12.0%	3.75%	\$0	3.8%	8.2%
P	State Industrial - 2% @ 62	16.7%	6% - 11%	\$317 - \$513	8.1%	8.6%
R	State Industrial - 2nd Tier 2% @ 62 ⁴	11.7%	3.75%	\$0	3.8%	7.9%
A	State Safety - 2% @ 57	21.0%	11% - 11.5%	\$0 - \$317	10.5%	10.5%
	State POFF - 2.5% @ 57	26.7%	12% - 13%	\$0 - \$863	11.3%	15.4%
	State POFF - 2.7% @ 57	26.6%	13%	\$863	10.5%	16.1%
	CHP - 2.7% @ 57	24.0%	12.5%	\$863	11.4%	12.6%
C	State Miscellaneous - 2% @ 60 & 3 Year FAC	18.0%	5% - 10%	\$317 - \$513	6.9%	11.1%
L	State Miscellaneous - 2% @ 55 ¹	18.9%	5% - 11%	\$317 - \$513	7.0%	11.9%
A	State Miscellaneous - 2nd Tier 2% @ 55 ⁴	14.7%	3.75%	\$0	3.8%	10.9%
S	State Industrial - 2% @ 60 & 3 Year FAC	19.0%	9%-11%	\$317 - \$513	8.4%	10.6%
S	State Industrial - 2% @ 55 ¹	20.7%	5% - 11%	\$317 - \$513	8.3%	12.4%
I	State Industrial - 2nd Tier 2% @ 55 ⁴	16.1%	3.75%	\$0	3.8%	12.3%
C	State Safety - 2% @ 55 ¹	21.9%	11% - 11.5%	\$0 - \$317	10.6%	11.3%
	State Safety - 2.5% @ 60 & 3 Year FAC	24.7%	11% - 11.5%	\$0 - \$317	10.9%	13.8%
	State Safety - 2.5% @ 55 ¹	26.3%	11% - 11.5%	\$0 - \$317	10.7%	15.6%
	State POFF - 2.5% @ 55 & 3 Year FAC	30.1%	8% - 13%	\$238 - \$863	11.5%	18.6%
	State POFF - 3% @ 55 ¹	33.7%	8% - 13%	\$238 - \$863	11.2%	22.5%
	State POFF - 3% @ 50 ¹	34.0%	8% - 13%	\$0 - \$863	11.7%	22.3%
	CHP - 3% @ 55 & 3 Year FAC	33.3%	12.5%	\$863	11.5%	21.8%
	CHP - 3% @ 50 ¹	35.5%	12.5%	\$863	11.6%	23.9%
B	State Miscellaneous	17.71%	3.75% - 11%	\$0 - \$513	7.17%	10.54%
L	State Industrial	19.00%	3.75% - 11%	\$0 - \$513	8.19%	10.81%
N	State Safety	23.69%	11% - 11.5%	\$0 - \$317	10.65%	13.04%
D	State POFF	31.36%	8% - 13%	\$0 - \$863	11.69%	19.67%
E	CHP	32.88%	12.5%	\$863	12.50%	20.38%

¹ Most Classic employees have benefits based on a final one-year compensation period while new hires' benefits are based on a final three-year compensation period.

² Employees make contributions to the pension plan based only on monthly compensation above the breakpoint.

³ The average effective member rate was calculated based on data as of June 30, 2021 and is reflective of the different breakpoints and contribution rates paid by members within the same plans. For example, a member earning \$6,000 a month with an 8% contribution rate and a breakpoint of \$513 will contribute \$438.96 and have an effective contribution rate of 7.316% of salary. This is calculated as $(\$6,000 - \$513) \times 8\%$ divided by \$6,000.

⁴ Reflects the Total Normal Cost assuming conversion to Tier 1 benefits for members with Tier 2 service.

Normal Cost Information

PEPRA Member Contribution Rates

PEPRA members are required to contribute at least 50% of the total normal cost of their pension benefit. According to 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 total normal cost of PEPRA members' benefits is remeasured annually as part of the actuarial valuation based on the active PEPRA population in the plan. If the total normal cost changes by more than 1% from the base total normal cost basis established for the plan, the member rate is revised to equal 50% of the new total normal cost rounded to the nearest quarter percent.

The table below shows the determination of the member contribution rates effective July 1, 2022, based on 50% of the total normal cost for each respective plan as of the June 30, 2021, valuation.

	Basis for Current Rate			Rates Effective July 1, 2022			
	Total Normal Cost	Actuarial Valuation Date	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
State Miscellaneous – CSU, Legislature and Judicial	14.61%	6/30/2017	7.25%	16.21%	1.60%	Yes	8.00%
State Safety – CSU, Legislature and Judicial	18.10%	1/1/2013	9.00%	20.97%	2.87%	Yes	10.50%
State POFF – CSU, Legislature and Judicial	24.09%	6/30/2018	12.00%	26.44%	2.35%	Yes	13.25%

Normal Cost Information

State Bargaining Units 5, 9, 16, and 18 - Member Contribution Rates

Pursuant to Government Code section 20683, members of State Bargaining Units 5, 9, 16, and 18 are required to contribute at least 50% of the total annual normal cost of their pension benefit. The total normal cost is remeasured annually as part of the actuarial valuation. Initially, if the total normal cost of the category changes¹ by more than 1% from the total normal cost determined as of June 30, 2015, the new member rate shall be 50% of the new normal cost rounded to the nearest quarter percent. Subsequently, if the total normal cost of the category changes¹ by more than 1% from the basis at that time, the member rate will be revised to equal 50% of the new total normal cost rounded to the nearest quarter percent.

The table below shows the determination of the member contribution rates effective July 1, 2022, based on 50% of the total normal cost for each respective plan as of the June 30, 2021 valuation.

	Basis for Current Rate			Rates Effective July 1, 2022			
	Total Normal Cost	Actuarial Valuation Date	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
BU 5							
State Miscellaneous ²	16.48%	6/30/2020	8.25%	17.71%	1.23%	Yes	8.75%
California Highway Patrol ³	29.26%	6/30/2020	12.50%	32.88%	3.62%	Yes	13.50%
BU 9⁴							
State Miscellaneous ²	16.88%	6/30/2018	8.50%	17.71%	0.83%	Yes	8.00%
State Industrial ²	18.02%	6/30/2015	9.00%	19.00%	0.98%	No	9.00%
State Safety	23.19%	6/30/2018	11.50%	23.69%	0.50%	Yes	11.00%
BU 16							
State Miscellaneous ²	15.48%	6/30/2015	10.00%	17.71%	2.23%	No	10.00%
State Industrial ²	18.02%	6/30/2015	10.00%	19.00%	0.98%	No	10.00%
State Safety	23.19%	6/30/2018	11.50%	23.69%	0.50%	No	11.50%
BU 18							
State Miscellaneous ²	15.48%	6/30/2015	10.00%	17.71%	2.23%	No	10.00%
State Industrial ²	18.02%	6/30/2015	10.00%	19.00%	0.98%	No	10.00%
State Safety	22.91%	6/30/2020	11.50%	23.69%	0.78%	No	11.50%

(1) Provisions by Bargaining Unit:

- BU 5: the member rate will initially be adjusted if the Total Normal Cost increases by 1% or more; subsequently, the member rate will be adjusted if the Total Normal Cost increases or decreases by 1% or more. The increase or decrease in member rate is limited to 1.00% per year.
- BU 9: the July 1, 2022, member rate reverts back to the rate in effect prior to the initial 50% of normal cost agreement.
- BU 16: the member rate will initially be adjusted if the Total Normal Cost increases by 1% or more; subsequently, the member rate will be adjusted if the Total Normal Cost increases or decreases by more than 1%.
- BU 18: the member rate will initially be adjusted if the Total Normal Cost increases by 1% or more; subsequently, the member rate will be adjusted if the Total Normal Cost increases or decreases by more than 1%.

(2) The member rate shown here is for a member who participates in Social Security. The member rate for members of these groups who do not participate in Social Security is currently 1% higher than the rate shown here.

(3) Assuming the total normal cost does not increase or decrease by more than 1% from 32.88% in the upcoming valuations, the member rate is scheduled to increase to 14.50% effective July 1, 2023, 15.50% effective July 1, 2024, and 16.50% effective July 1, 2025.

(4) The 50% of normal cost sharing expired June 30, 2020. Member rates reverted on July 1, 2020, to previous levels. The 50% of normal cost sharing was reinstated for one year effective July 1, 2021. Member rates reverted on July 1, 2022, to previous levels.

Risk Analysis

48 Projected Rates

48 Future Investment Return Scenarios

49 Discount Rate Sensitivity and Government Code Section 20229

60 Mortality Rate Sensitivity

61 Inflation Rate Sensitivity

62 Maturity Measures

63 Volatility Ratios

Risk Analysis

Projected Rates

The table below shows the required and projected employer contribution rates for the next five fiscal years. Projected results reflect an estimated investment return of -7.40% for FY 2021-22 based on preliminary market value and investment return information provided by the Investment Office. The actual investment loss will be based on final audited assets as of June 30, 2022, which are not yet available. Projected results also assume all actuarial assumptions will be met, including investment return of 6.80% for fiscal years beginning FY 2022-23 and no changes to all assumptions, methods or benefits will occur during the projection period. Projected rates further anticipate the decrease in normal cost due to new hires entering lower benefit formulas under PEPRA. Rates do not reflect additional contributions to offset increased member contributions pursuant to Government Code section 20683.2 or the State's Proposition 2 contribution strategy shown on page 7-8 of this report. However, Bargaining Unit 5 agreement to delay savings which expires June 30, 2023, is reflected in the rates for California Highway Patrol beginning in FY 2023-24.

Plan	Actual Contribution Rates	Projected Future Employer Contribution Rates ¹				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
State Miscellaneous	30.71%	32.0%	32.9%	33.7%	34.1%	36.0%
State Industrial	19.51%	20.3%	21.1%	21.7%	22.0%	23.6%
State Safety	21.13%	21.3%	21.9%	22.5%	22.8%	24.3%
State Peace Officers & Firefighters	47.21%	49.4%	50.7%	51.9%	52.4%	55.3%
California Highway Patrol	63.89%	65.4%	64.9%	65.3%	63.6%	66.4%

¹ Rates do not reflect additional contributions to offset increased member contributions pursuant to Government Code section 20683.2

Under the amortization policy in effect for this valuation, changes in the Unfunded Accrued Liability (UAL) due to investment gains or losses (return relative to the prevailing assumption, currently 6.80%) are amortized using a five-year ramp up. For more information, please see "Amortization of the Unfunded Actuarial Accrued Liability" under "Actuarial Methods" in Appendix A. This method attempts to mitigate employer cost volatility from year to year by phasing in the impact of investment experience over a five-year period. 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 when there is poor investment return, 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 investment loss is phased in.

Risk Analysis

Future Investment Return Scenarios

Analysis was performed to estimate the effects of various future investment returns on required employer contributions. Starting with the baseline projections and underlying inputs/assumptions described in “Projected Employer Contribution Rates” above, the projections below provide a range of results based on hypothetical investment return scenarios.

The tables below show projected contribution rates if the fund were to earn either 3.0% or 10.8% annually in each fiscal year beginning FY 2022-23. These alternate investment returns were chosen based on stochastic analysis of possible future investment returns over the 20-year period ending June 30, 2041. Using the expected returns and volatility of the asset classes in which the funds are invested, we produced five thousand stochastic outcomes for this period based on the Asset Liability Management process completed in 2021. We then selected annual returns that approximate the 5th and 95th percentiles for these outcomes. Of all the 20-year outcomes generated in the stochastic analysis, approximately 90% had an average annual return between 3.0% and 10.8%.

State Miscellaneous

Assumed Annual Return from fiscal years 2022-23 through 2041-42	Current Rate	Projected Future Employer Contribution Rates ¹				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3.0% (5 th percentile)	30.71%	32.0%	33.4%	35.2%	37.2%	41.0%
10.8% (95 th percentile)	30.71%	32.0%	32.6%	32.7%	32.0%	32.2%

State Industrial

Assumed Annual Return from fiscal years 2022-23 through 2041-42	Current Rate	Projected Future Employer Contribution Rates ¹				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3.0% (5 th percentile)	19.51%	20.3%	21.5%	23.1%	24.7%	28.0%
10.8% (95 th percentile)	19.51%	20.3%	20.9%	21.0%	20.3%	20.5%

State Safety

Assumed Annual Return from fiscal years 2022-23 through 2041-42	Current Rate	Projected Future Employer Contribution Rates ¹				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3.0% (5 th percentile)	21.13%	21.3%	22.4%	23.9%	25.4%	28.6%
10.8% (95 th percentile)	21.13%	21.3%	21.8%	21.9%	21.2%	21.3%

State Peace Officers & Firefighters

Assumed Annual Return from fiscal years 2022-23 through 2047-42	Current Rate	Projected Future Employer Contribution Rates ¹				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3.0% (5 th percentile)	47.21%	49.4%	51.6%	54.4%	57.5%	63.5%
10.8% (95 th percentile)	47.21%	49.4%	50.4%	50.4%	49.1%	49.3%

California Highway Patrol

Assumed Annual Return from fiscal years 2022-23 through 2041-42	Current Rate	Projected Future Employer Contribution Rates ¹				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3.0% (5 th percentile)	63.89%	65.4%	65.8%	68.2%	69.2%	75.7%
10.8% (95 th percentile)	63.89%	65.4%	64.4%	63.7%	59.9%	59.8%

¹ Rates do not reflect additional contributions to offset increased member contributions pursuant to Government Code section 20683.2

Required contributions outside of this range are also possible. In particular, whereas it is unlikely that investment returns will average less than 3.0% or more than 10.8% over 20 years, the possibility of a single investment return less than 3.0% or more than 10.8% in any given year is much greater. The following analysis illustrates the effect of an extreme, single year investment return.

Future Investment Return Scenarios (continued)

The portfolio has an expected volatility (or standard deviation) of 12.0% per year. Accordingly, in a given year there is a 16% probability that the annual return will be -5.2% or less and a 2.5% probability that the annual return will be -17.2% or less. These returns represent one and two standard deviations below the expected return of 6.8%.

The following tables show the effect of a one or two standard deviation investment loss in 2022-23 on the 2024-25 contribution requirements. Note that a single-year investment gain or loss impacts the contribution rates for each of the next five years, not just one, due to the five-year ramp in the amortization policy. However, the contribution rates beyond the first year are also impacted by investment returns beyond the first year. Historically, significant downturns in the market are often followed by higher than average returns. Such investment gains would offset the impact of these single year negative returns in years beyond 2024-25.

State Miscellaneous

Assumed Annual Return for fiscal year 2022-23	Current Rate	Projected Future Employer Contribution Rates ¹	
	2022-23	2023-24	2024-25
-17.2% (2 standard deviation loss)	30.71%	32.0%	36.3%
-5.2% (1 standard deviation loss)	30.71%	32.0%	34.6%

State Industrial

Assumed Annual Return for fiscal year 2022-23	Current Rate	Projected Future Employer Contribution Rates ¹	
	2022-23	2023-24	2024-25
-17.2% (2 standard deviation loss)	19.51%	20.3%	24.0%
-5.2% (1 standard deviation loss)	19.51%	20.3%	22.5%

State Safety

Assumed Annual Return for fiscal year 2022-23	Current Rate	Projected Future Employer Contribution Rates ¹	
	2022-23	2023-24	2024-25
-17.2% (2 standard deviation loss)	21.13%	21.3%	24.8%
-5.2% (1 standard deviation loss)	21.13%	21.3%	23.4%

State Peace Officers & Firefighters

Assumed Annual Return for fiscal year 2022-23	Current Rate	Projected Future Employer Contribution Rates ¹	
	2022-23	2023-24	2024-25
-17.2% (2 standard deviation loss)	47.21%	49.4%	56.3%
-5.2% (1 standard deviation loss)	47.21%	49.4%	53.5%

California Highway Patrol

Assumed Annual Return for fiscal year 2022-23	Current Rate	Projected Future Employer Contribution Rates ¹	
	2022-23	2023-24	2024-25
-17.2% (2 standard deviation loss)	63.89%	65.4%	71.0%
-5.2% (1 standard deviation loss)	63.89%	65.4%	67.9%

¹ Rates do not reflect additional contributions to offset increased member contributions pursuant to Government Code section 20683.2

- Without investment gains (returns higher than 6.8%) in year 2023-24 or later, projected contributions rates would continue to rise over the next 4 years due to the continued phase-in of the impact of the illustrated investment loss in fiscal year 2022-23.
- The Pension Outlook Tool can be used to model projected contributions for these scenarios beyond year 2024-25 as well as to model alternate investment returns for years 2023-24 and beyond.

Discount Rate Sensitivity and Government Code Section 20229

This section illustrates the sensitivity of employer contribution rates to a change in the discount rate assumption. The discount rate reflects expectations of what the markets will deliver in the future. It is calculated based on two components: expected price inflation and real rate of return. A change in either component over the long term would necessitate further evaluation of the discount rate.

For purposes of this analysis, the discount rate is changed by varying the real rate of return assumption while keeping the price inflation assumption unchanged. For information on sensitivity to changes in the underlying price inflation assumption, see the Inflation Rate Sensitivity section.

Government Code section 20229 requires the board to annually disclose contribution rates and liabilities calculated under specified scenarios, including:

- Investment return and discount rate assumptions that are 2% above and 2% below the current investment return and discount rate assumptions set by the board
- An amortization period equal to the estimated average remaining service periods (EARSP) of the employees covered by the contributions

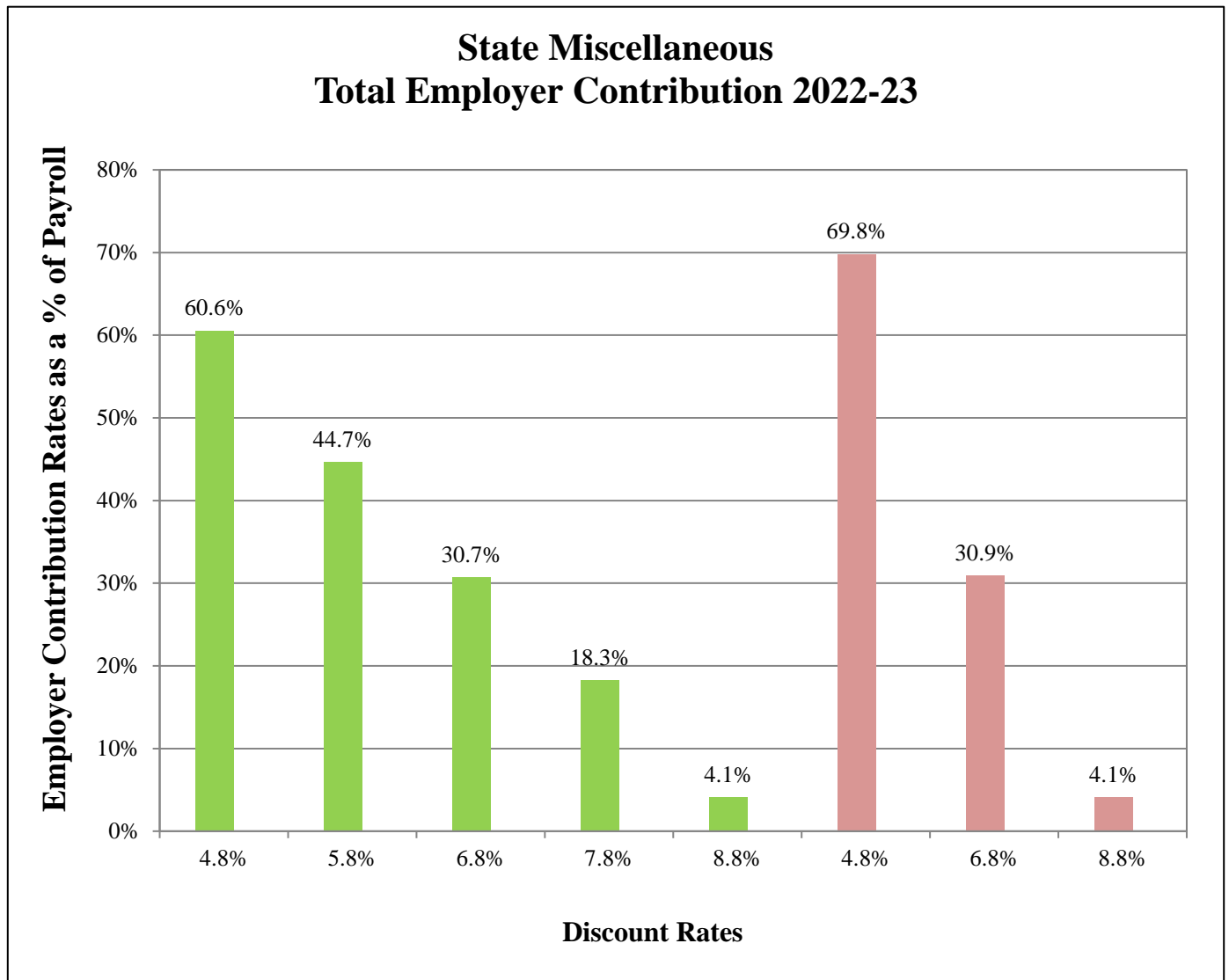
On the following pages, contribution rates and other key results are shown for the following discount rates:

- 4.8% (current discount rate -2%)
- 5.8% (current discount rate -1%)
- 6.8% (current discount rate)
- 7.8% (current discount rate +1%)
- 8.8% (current discount rate +2%)

The discount rates of 5.8% and 7.8% were selected as they reflect a 1% decrease or increase to the current rate of 6.8%. This shows the potential plan impacts if the PERF were to realize investment returns of 5.8% or 6.8% over the long term. The discount rates of 4.8% and 8.8% are shown in order to meet the requirements G.C. 20229. To further satisfy G.C. 20229, in the 4.8% and 8.8% discount rate scenarios, contribution rates for the current fiscal year are shown using both the current amortization method and amortization over the EARSP of the employees covered by the contributions.

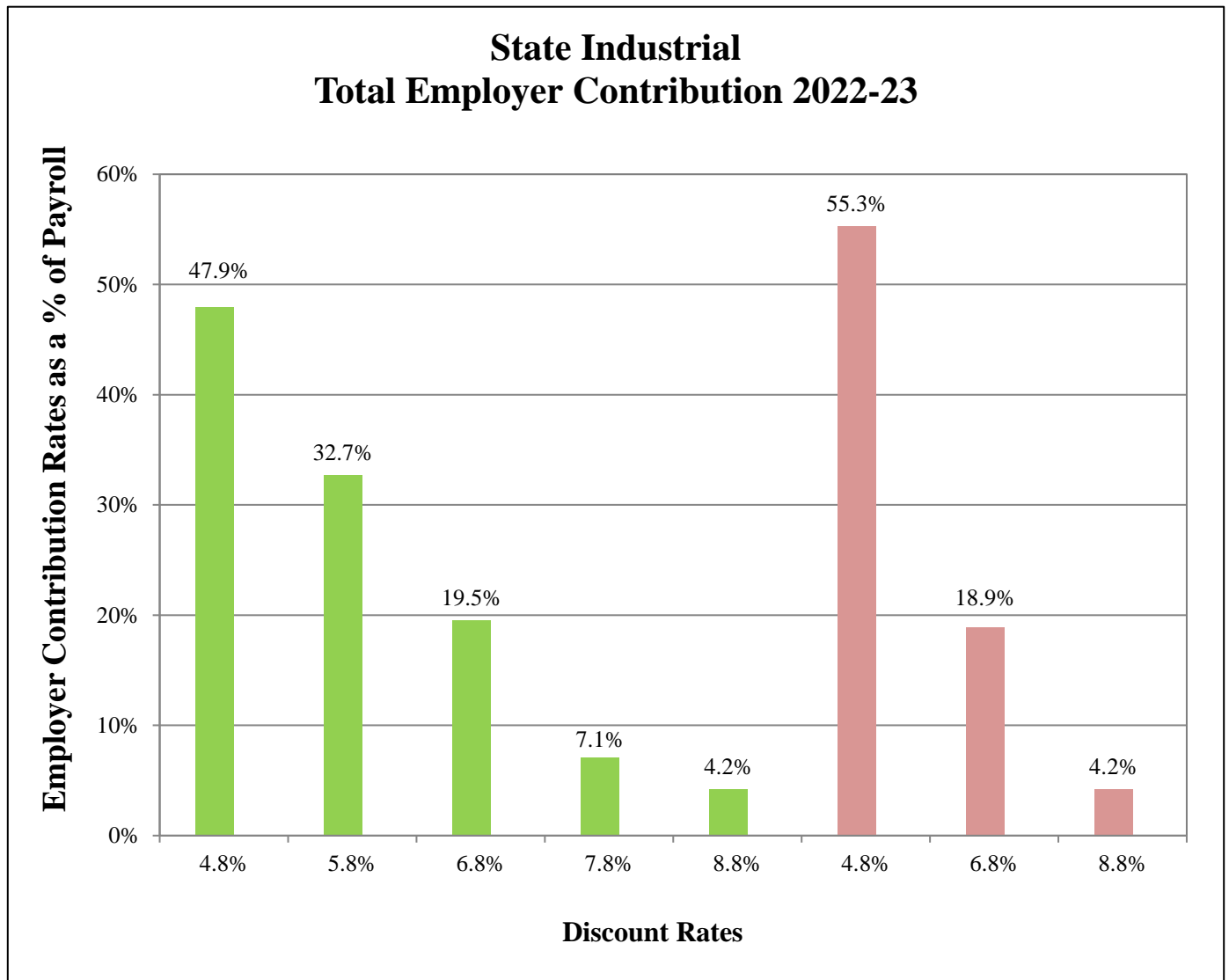
The results of the analysis are displayed in both graphical and tabular form. The reader may interpolate between the data points to estimate other data points of interest.

Discount Rate Sensitivity and Government Code Section 20229 (continued)



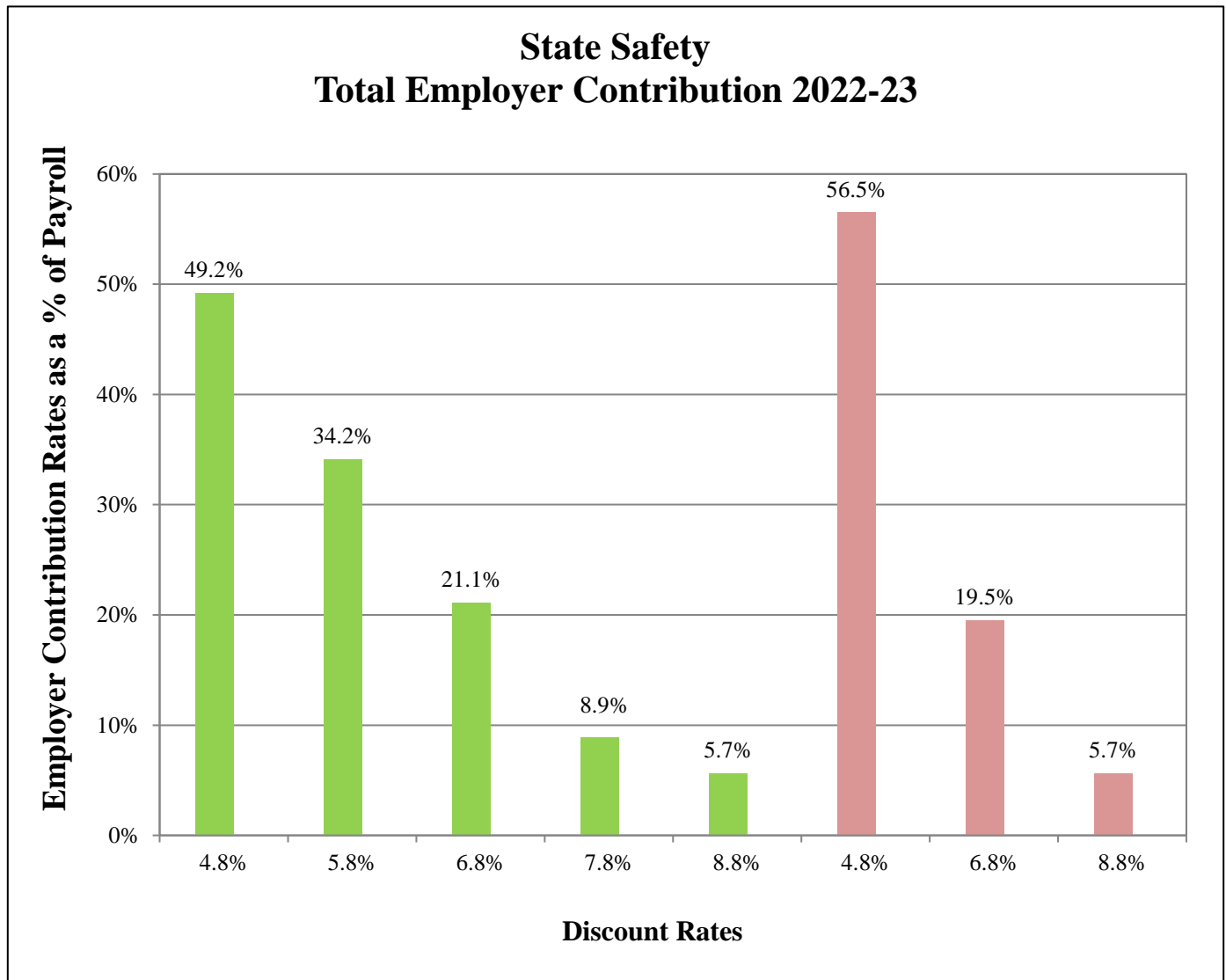
	Analysis of discount rate sensitivity based on current amortization method (varies from 2 to 27 years) or normal cost if in a surplus position
	Analysis of discount rate sensitivity based on amortization of UAL over EARSP (12 years)
*	Required by Government Code section 20229

Discount Rate Sensitivity and Government Code Section 20229 (continued)



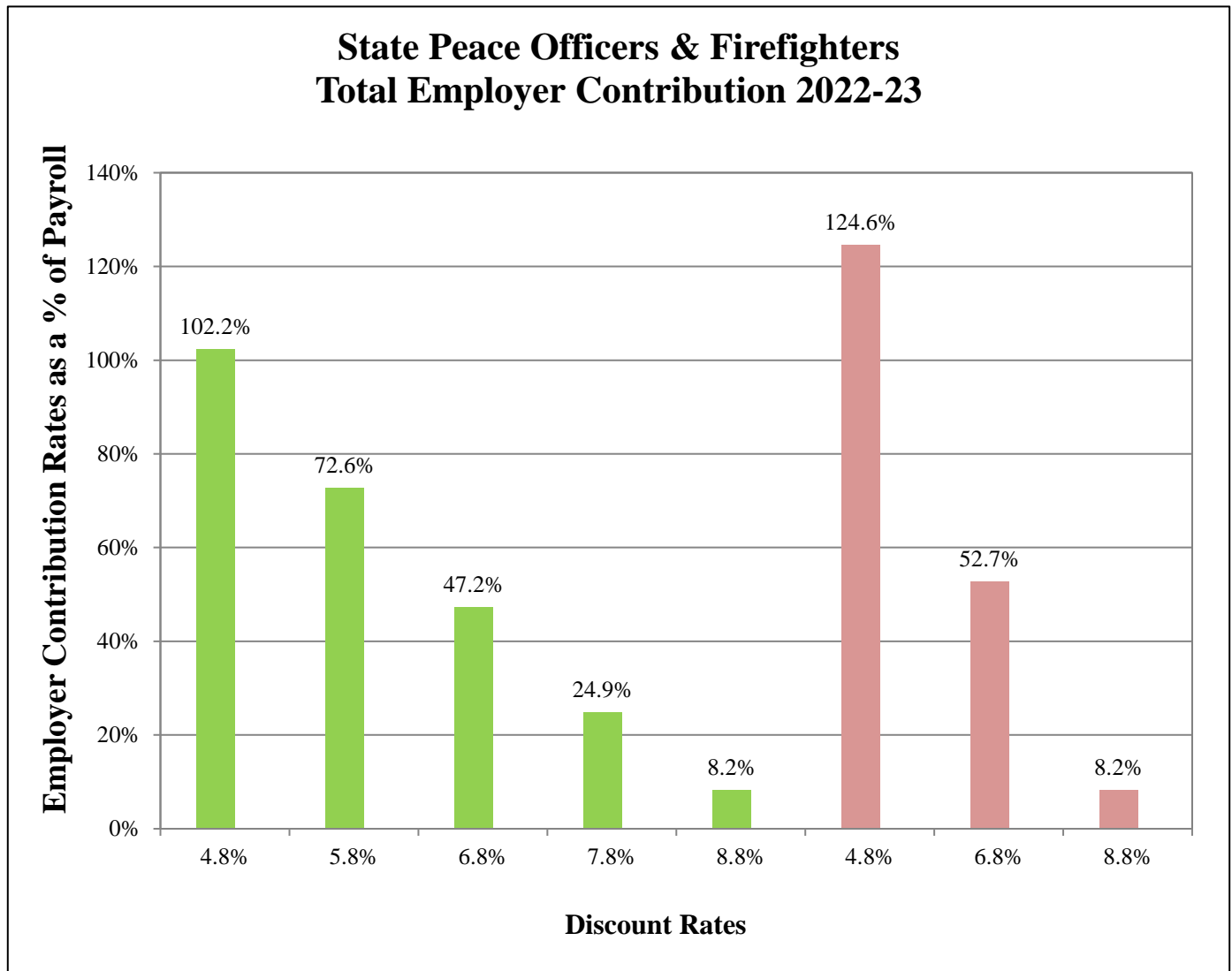
	Analysis of discount rate sensitivity based on current amortization method (varies from 3 to 28 years) or normal cost if in a surplus position
	Analysis of discount rate sensitivity based on amortization of UAL over EARSP (12 years)
*	Required by Government Code section 20229

Discount Rate Sensitivity and Government Code Section 20229 (continued)



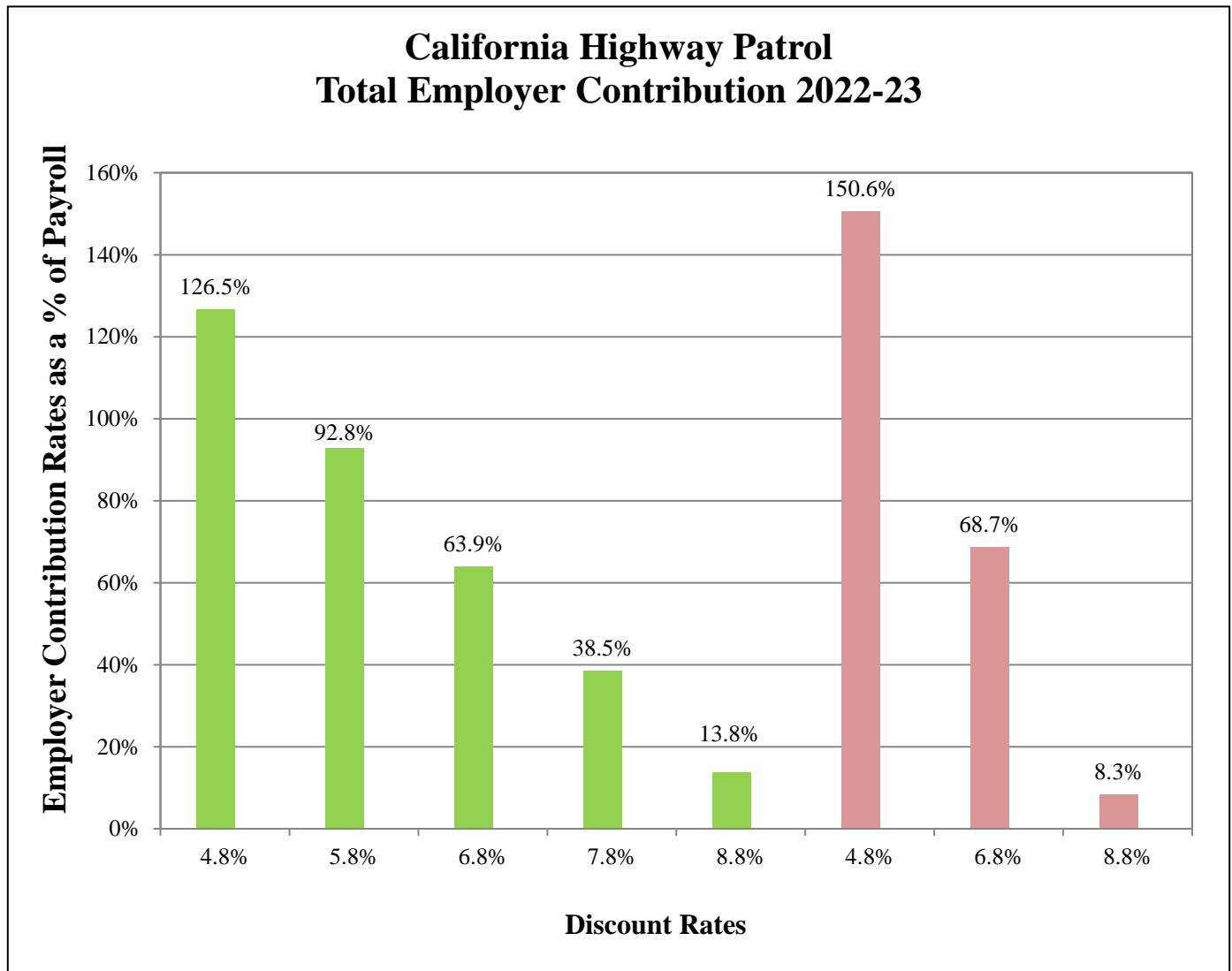
	Analysis of discount rate sensitivity based on current amortization method (varies from 1 to 27 years) or normal cost if in a surplus position, excludes Section 20825.1 contribution
	Analysis of discount rate sensitivity based on amortization of UAL over EARSP (11 years)
*	Required by Government Code section 20229

Discount Rate Sensitivity and Government Code Section 20229 (continued)



	Analysis of discount rate sensitivity based on current amortization method (varies from 2 to 28 years) or normal cost if in a surplus position
	Analysis of discount rate sensitivity based on amortization of UAL over EARSP (12 years)
*	Required by Government Code section 20229

Discount Rate Sensitivity and Government Code Section 20229 (continued)



	Analysis of discount rate sensitivity based on current amortization method (varies from 1 to 28 years) or normal cost if in a surplus position
	Analysis of discount rate sensitivity based on amortization of UAL over EARSP (12 years)
*	Required by Government Code section 20229

Risk Analysis

Discount Rate Sensitivity and Government Code Section 20229 (continued)

State Miscellaneous

Discount Rate Sensitivity (+/- 1% Change in Discount Rate)

Sensitivity Analysis						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
5.8%	15.5%	29.2%	44.7%	147,089,618,093	42,734,692,930	70.9%
6.8% (current discount rate)	10.5%	20.2%	30.7%	130,697,372,927	26,342,447,764	79.8%
7.8%	6.9%	11.4%	18.3%	117,022,806,217	12,667,881,054	89.2%

Government Code Section 20229 (+/- 2% Change in Discount Rate)

Current Amortization Method						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	22.0%	38.6%	60.6%	166,898,515,642	62,543,590,479	62.5%
6.8% (current discount rate)	10.5%	20.2%	30.7%	130,697,372,927	26,342,447,764	79.8%
8.8%	4.1%	0.0%	4.1%	105,527,152,849	1,172,227,686	98.9%

Amortization of Unfunded Accrued Liability over EARSP (12 Years)						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	22.0%	47.8%	69.8%	166,898,515,642	63,614,860,300	62.5%
6.8% (current discount rate)	10.5%	20.4%	30.9%	130,697,372,927	24,516,893,749	79.8%
8.8%	4.1%	0.0%	4.1%	105,527,152,849	(3,328,779,675)	98.9%

- To illustrate the sensitivity of employer contribution rates due to different discount rate scenarios, the unfunded accrued liability rates do not include the effect of the State contribution under Section 20825.1.
- The change in accrued liability due to the change in discount rate of +/-1% or +/-2% was amortized over 20 years as a level dollar amount (except for the "Amortization of Unfunded Accrued 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.

Risk Analysis

Discount Rate Sensitivity and Government Code Section 20229 (continued)

State Industrial

Discount Rate Sensitivity (+/- 1% Change in Discount Rate)

Sensitivity Analysis						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
5.8%	15.7%	17.0%	32.7%	6,330,839,926	1,379,048,908	78.2%
6.8% (current discount rate)	10.8%	8.7%	19.5%	5,550,468,220	598,677,202	89.2%
7.8%	7.1%	0.0%	7.1%	4,910,783,305	(41,007,713)	100.8%

Government Code Section 20229 (+/- 2% Change in Discount Rate)

Current Amortization Method						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	22.2%	25.7%	47.9%	7,292,620,132	2,340,829,114	67.9%
6.8% (current discount rate)	10.8%	8.7%	19.5%	5,550,468,220	598,677,202	89.2%
8.8%	4.2%	0.0%	4.2%	4,381,366,510	(570,424,508)	113.0%

Amortization of Unfunded Accrued Liability over EARSP (12 Years)						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	22.3%	33.0%	55.3%	7,292,620,132	2,446,581,454	67.9%
6.8% (current discount rate)	10.8%	8.1%	18.9%	5,550,468,220	540,138,204	89.2%
8.8%	4.2%	0.0%	4.2%	4,381,366,510	(774,937,290)	113.0%

- To illustrate the sensitivity of employer contribution rates due to different discount rate scenarios, the unfunded accrued liability rates do not include the effect of the State contribution under Section 20825.1.
- The change in accrued liability due to the change in discount rate of +/-1% or +/-2% was amortized over 20 years as a level dollar amount (except for the "Amortization of Unfunded Accrued 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.

Risk Analysis

Discount Rate Sensitivity and Government Code Section 20229 (continued)

State Safety

Discount Rate Sensitivity (+/- 1% Change in Discount Rate)

Sensitivity Analysis						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
5.8%	18.5%	15.7%	34.2%	18,622,309,003	3,671,848,200	80.3%
6.8% (current discount rate)	13.0%	8.1%	21.1%	16,397,024,160	1,446,563,357	91.2%
7.8%	8.9%	0.0%	8.9%	14,564,717,505	-385,743,298	102.6%

Government Code Section 20229 (+/- 2% Change in Discount Rate)

Current Amortization Method						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	25.5%	23.7%	49.2%	21,351,657,022	6,401,196,219	70.0%
6.8% (current discount rate)	13.0%	8.1%	21.1%	16,397,024,160	1,446,563,357	91.2%
8.8%	5.7%	0.0%	5.7%	13,041,919,141	-1,908,541,662	114.6%

Amortization of Unfunded Accrued Liability over EARSP (11 Years)						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	25.5%	31.0%	56.5%	21,351,657,022	6,775,045,219	70.0%
6.8% (current discount rate)	13.0%	6.5%	19.5%	16,397,024,160	1,293,682,414	91.2%
8.8%	5.7%	0.0%	5.7%	13,041,919,141	-2,520,487,414	114.6%

- To illustrate the sensitivity of employer contribution rates due to different discount rate scenarios, the unfunded accrued liability rates do not include the effect of the State contribution under Section 20825.1.
- The change in accrued liability due to the change in discount rate of +/-1% or +/-2% was amortized over 20 years as a level dollar amount (except for the "Amortization of Unfunded Accrued 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.

Risk Analysis

Discount Rate Sensitivity and Government Code Section 20229 (continued)

State Peace Officers and Firefighters

Discount Rate Sensitivity (+/- 1% Change in Discount Rate)

Sensitivity Analysis						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
5.8%	28.4%	44.2%	72.6%	65,620,170,788	19,447,931,202	70.4%
6.8% (current discount rate)	19.7%	27.5%	47.2%	57,507,446,617	11,335,207,031	80.3%
7.8%	13.2%	11.7%	24.9%	50,885,792,662	4,713,553,076	90.7%

Government Code Section 20229 (+/- 2% Change in Discount Rate)

Current Amortization Method						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	40.1%	62.1%	102.2%	75,674,706,057	29,502,466,471	61.0%
6.8% (current discount rate)	19.7%	27.5%	47.2%	57,507,446,617	11,335,207,031	80.3%
8.8%	8.2%	0.0%	8.2%	45,422,260,897	(749,978,689)	101.7%

Amortization of Unfunded Accrued Liability over EARSP (12 Years)						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	40.2%	84.4%	124.6%	75,674,706,057	30,373,393,468	61.0%
6.8% (current discount rate)	19.7%	33.0%	52.7%	57,507,446,617	10,748,218,502	80.3%
8.8%	8.2%	0.0%	8.2%	45,422,260,897	(2,642,557,079)	101.7%

- To illustrate the sensitivity of employer contribution rates due to different discount rate scenarios, the unfunded accrued liability rates do not include the effect of the State contribution under Section 20825.1.
- The change in accrued liability due to the change in discount rate of +/-1% or +/-2% was amortized over 20 years as a level dollar amount (except for the "Amortization of Unfunded Accrued 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.

Risk Analysis

Discount Rate Sensitivity and Government Code Section 20229 (continued)

California Highway Patrol

Discount Rate Sensitivity (+/- 1% Change in Discount Rate)

Sensitivity Analysis						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
5.8%	30.3%	62.5%	92.8%	18,081,117,616	6,157,016,930	65.9%
6.8% (current discount rate)	20.4%	43.5%	63.9%	15,822,003,794	3,897,903,108	75.4%
7.8%	13.0%	25.5%	38.5%	13,981,041,648	2,056,940,962	85.3%

Government Code Section 20229 (+/- 2% Change in Discount Rate)

Current Amortization Method						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	43.6%	82.9%	126.5%	20,886,438,503	8,962,337,817	57.1%
6.8% (current discount rate)	20.4%	43.5%	63.9%	15,822,003,794	3,897,903,108	75.4%
8.8%	7.5%	6.3%	13.8%	12,464,065,936	539,965,250	95.7%

Amortization of Unfunded Accrued Liability over EARSP (12 Years)						
As of June 30, 2021	Employer Normal Cost	UAL Rate	Total Employer Rate	Accrued Liability	Unfunded Accrued Liability	Funded Ratio
4.8%	43.6%	107.0%	150.6%	20,886,438,503	10,239,649,457	57.1%
6.8% (current discount rate)	20.4%	48.3%	68.7%	15,822,003,794	5,250,531,287	75.4%
8.8%	7.5%	0.8%	8.3%	12,464,065,936	1,843,882,785	95.7%

- The change in accrued liability due to the change in discount rate of +/-1% or +/-2% was amortized over 20 years as a level dollar amount (except for the "Amortization of Unfunded Accrued 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.

Risk Analysis

Mortality Rate Sensitivity

The following tables show key valuation results under two alternate longevity scenarios, namely assuming rates of mortality are 10% lower or 10% higher than the current mortality assumption. This type of analysis highlights the impact on the plans of improving or worsening mortality over the long term.

State Miscellaneous

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
10% lower mortality rates	\$133,748,994,761	\$104,354,925,163	\$29,394,069,598	78.00%	18.02%
Current mortality rates	130,697,372,927	104,354,925,163	26,342,447,764	79.80%	17.71%
10% higher mortality rates	127,905,170,710	104,354,925,163	23,550,245,547	81.60%	17.43%

State Industrial

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
10% lower mortality rates	\$5,664,648,128	\$4,951,791,018	\$712,857,110	87.40%	19.31%
Current mortality rates	5,550,468,220	4,951,791,018	598,677,202	89.20%	19.00%
10% higher mortality rates	5,445,504,170	4,951,791,018	493,713,152	90.90%	18.71%

State Safety

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
10% lower mortality rates	\$16,728,794,255	\$14,950,460,803	\$1,778,333,452	89.40%	24.05%
Current mortality rates	16,397,024,160	14,950,460,803	1,446,563,357	91.20%	23.69%
10% higher mortality rates	16,091,951,335	14,950,460,803	1,141,490,532	92.90%	23.36%

State Peace Officers & Firefighters

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
10% lower mortality rates	\$58,434,135,830	\$46,172,239,586	\$12,261,896,244	79.00%	31.72%
Current mortality rates	57,507,446,617	46,172,239,586	11,335,207,031	80.30%	31.36%
10% higher mortality rates	56,650,008,943	46,172,239,586	10,477,769,357	81.50%	31.03%

California Highway Patrol

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
10% lower mortality rates	\$16,077,566,592	\$11,924,100,686	\$4,153,465,906	74.20%	33.25%
Current mortality rates	15,822,003,794	11,924,100,686	3,897,903,108	75.40%	32.88%
10% higher mortality rates	15,585,856,329	11,924,100,686	3,661,755,643	76.50%	32.53%

Risk Analysis

Inflation Rate Sensitivity

The following tables show key valuation results under two alternate inflation rate scenarios, namely assuming the price inflation rate is 1% lower or 1% higher than the current assumption of 2.5%. For this analysis, the real rate of return is held constant at the current assumption of 4.5%. This type of analysis highlights the impact on the plans of higher or lower inflation over the long term.

State Miscellaneous

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
-1% inflation rate	\$134,763,853,691	\$104,354,925,163	\$30,408,928,528	77.4%	18.62%
Current inflation rate	130,697,372,927	104,354,925,163	26,342,447,764	79.8%	17.71%
+1% inflation rate	120,011,362,761	104,354,925,163	15,656,437,598	87.0%	15.97%

State Industrial

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
-1% inflation rate	\$5,742,220,672	\$4,951,791,018	\$790,429,654	86.2%	19.98%
Current inflation rate	5,550,468,220	4,951,791,018	598,677,202	89.2%	19.00%
+1% inflation rate	5,070,225,377	4,951,791,018	118,434,359	97.7%	17.09%

State Safety

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
-1% inflation rate	\$16,962,926,481	\$14,950,460,803	\$2,012,465,678	88.1%	24.92%
Current inflation rate	16,397,024,160	14,950,460,803	1,446,563,357	91.2%	23.69%
+1% inflation rate	14,971,550,775	14,950,460,803	21,089,972	99.9%	21.30%

State Peace Officers & Firefighters

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
-1% inflation rate	\$59,563,026,813	\$46,172,239,586	\$13,390,787,227	77.5%	33.03%
Current inflation rate	57,507,446,617	46,172,239,586	11,335,207,031	80.3%	31.36%
+1% inflation rate	52,191,321,169	46,172,239,586	6,019,081,583	88.5%	28.03%

California Highway Patrol

As of June 30, 2021	Accrued Liability	Market Value of Assets	Unfunded Accrued Liability/(Surplus)	Funded Ratio	Total Normal Cost
-1% inflation rate	\$16,390,226,026	\$11,924,100,686	\$4,466,125,340	72.8%	34.53%
Current inflation rate	15,822,003,794	11,924,100,686	3,897,903,108	75.4%	32.88%
+1% inflation rate	14,366,226,948	11,924,100,686	2,442,126,262	83.0%	29.41%

Risk Analysis

Maturity Measures

As pension plans mature they become more sensitive to risks. To understand plan maturity and how it affects the ability of a pension plan sponsor to tolerate risk, it is important to understand how a plan is impacted by investment return volatility, other economic variables and changes in longevity or other demographic assumptions.

One measure of a plan's maturity is the ratio of retiree liability to total liability. A pension plan in its infancy will have a very low ratio of retiree liability to total liability. As the plan matures, the ratio increases. A mature plan will often have a ratio above 60-65 percent. For both CalPERS and many other retirement systems in the United States, these ratios have been steadily increasing in recent years.

Ratio of Retiree Accrued Liability to Total Accrued Liability

Plan	June 30, 2020			June 30, 2021		
	Retiree Accrued Liability	Total Accrued Liability	Ratio	Retiree Accrued Liability	Total Accrued Liability	Ratio
State Miscellaneous	\$75,276,504,570	\$124,694,577,728	60.4%	\$79,303,321,894	130,697,372,927	61.0%
State Industrial	2,730,544,718	5,226,527,840	52.2%	2,972,406,302	5,550,468,220	54.0%
State Safety	8,591,498,117	15,352,141,590	56.0%	9,314,695,160	16,397,024,160	57.0%
State Peace Officers & Firefighters	34,060,130,310	54,101,543,037	63.0%	37,338,743,628	57,507,446,617	65.0%
California Highway Patrol	9,169,257,200	14,785,866,497	62.0%	9,897,522,083	15,822,003,794	63.0%

Another measure of maturity is the ratio of actives to retirees, also called the Support Ratio. A pension plan in its infancy will have a very high ratio of active to retired members. As the plan matures, and members retire, the ratio declines. A mature plan will often have a ratio near or below one.

Support Ratio

Plan	June 30, 2020			June 30, 2021		
	Number of Actives	Number of Retirees	Support Ratio	Number of Actives	Number of Retirees	Support Ratio
State Miscellaneous	178,628	202,078	88.4%	178,955	206,393	86.7%
State Industrial	11,899	16,050	74.1%	11,525	16,788	68.7%
State Safety	29,307	27,905	105.0%	28,451	29,168	97.5%
State Peace Officers & Firefighters	41,787	43,525	96.0%	41,242	45,937	89.8%
California Highway Patrol	7,027	9,519	73.8%	6,662	9,786	68.1%

Volatility ratios, presented in the following section, are another measure for assessing plan maturity.

Risk Analysis

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 (e.g., 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 fluctuations in investment return.

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 current measure. 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 12 is expected to have twice the contribution volatility of a plan with a liability-to-payroll ratio of 6. 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. The asset volatility ratio, described above, will tend to move closer to the liability volatility ratio as the plan matures.

Rate Volatility

	Market Value of Assets without Receivables	Annual Covered Payroll	Asset Volatility Ratio	Accrued Liability	Liability Volatility Ratio
Plan	(1)	(2)	(1)÷(2)	(3)	(3)÷(2)
State Miscellaneous	\$104,180,006,184	\$13,718,513,822	7.6	\$130,697,372,927	9.5
State Industrial	4,939,448,264	763,577,368	6.5	5,550,468,220	7.3
State Safety	14,939,420,856	2,405,580,360	6.2	16,397,024,160	6.8
State Peace Officers & Firefighters	46,119,378,001	3,709,697,013	12.4	57,507,446,617	15.5
California Highway Patrol	11,916,250,912	887,184,683	13.4	15,822,003,794	17.8

Appendices

A-1 Appendix A – Statement of Actuarial Methods and Assumptions

B-1 Appendix B – Principal Plan Provisions

C-1 Appendix C – Participant Data

D-1 Appendix D – Supplemental Pension Payments and Budget Act for Fiscal Year 2022-23

E-1 Appendix E – Glossary of Actuarial Terms

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 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 Actuarial 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 percentage of pay in each year from the member's 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.

CalPERS uses an in-house proprietary actuarial model for calculating plan costs. We believe this model is fit for its intended purpose and meets all applicable Actuarial Standards of Practice. Furthermore, the actuarial results of our model are independently confirmed periodically by outside auditing actuaries. The actuarial assumptions used are internally consistent and the generated results reasonable. A further refinement to the actuarial model will be the introduction of generational mortality in the June 30, 2021, actuarial valuation.

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 a payment toward the UAL. The UAL payment is equal to the sum of individual amortization payments, each representing a different source of UAL for a given measurement period.

Amortization payments are determined according to the CalPERS amortization policy. The board adopted a new policy effective for the June 30, 2019, actuarial valuation. The new policy applies prospectively only; amortization bases (sources of UAL) established prior to the June 30, 2019 valuation will continue to be amortized according to the prior policy.

Appendix A – Statement of Actuarial Methods and Assumptions

Actuarial Methods (continued)

Prior Policy (Bases Established prior to June 30, 2019)

Amortization payments are determined as a level percentage of payroll whereby the payment increases each year at an escalation rate. Gains or losses are 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) are amortized over a 20-year period with no ramp. Changes in actuarial assumptions or changes in actuarial methodology are amortized 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 five years. Bases established prior to June 30, 2013, may be amortized differently. A summary is provided in the following table:

	Source				
	(Gain)/Loss		Assumption/ Method Change	Benefit Change	Golden Handshake
	Investment	Non- investment			
Amortization Period	30 Years	30 Years	20 Years	20 Years	5 Years
Escalation Rate					
- Active Plans	2.75%	2.75%	2.75%	2.75%	2.75%
- Inactive Plans	0%	0%	0%	0%	0%
Ramp Up	5	5	5	0	0
Ramp Down	5	5	5	0	0

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.

Current Policy (Bases Established on or after June 30, 2019)

Amortization payments are determined as a level dollar amount. Investment gains or losses are amortized over a fixed 20-year period with a 5-year ramp up at the beginning of the amortization period. Non-investment gains or losses are amortized over a fixed 20-year period with no ramps. All changes in liability due to plan amendments (other than golden handshakes) are amortized over a 20-year period with no ramps. Changes in actuarial assumptions or changes in actuarial methodology are amortized over a 20-year period with no ramps. Changes in unfunded accrued liability due to a Golden Handshake are amortized over a period of five years. A summary is provided in the table below:

	Source				
	(Gain)/Loss		Assumption/ Method Change	Benefit Change	Golden Handshake
	Investment	Non- investment			
Amortization Period	20 Years	20 Years	20 Years	20 Years	5 Years
Escalation Rate	0%	0%	0%	0%	0%
Ramp Up	5	0	0	0	0
Ramp Down	0	0	0	0	0

Appendix A – Statement of Actuarial Methods and Assumptions

Actuarial Methods (continued)

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 accrued liability is projected and amortized over a set number of years. For example, a fresh start is needed in the following situations:

- When a negative payment would be required on a positive unfunded accrued liability; or
- When the payment would completely amortize the total unfunded accrued liability in a very short time period, and results in a large change in the employer contribution requirement.

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 20 years.

By State statute for California Highway Patrol only, a portion of the assets in excess of the Entry Age Actuarial 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 2.3 percent compounded annually, the 1.1 percent appears to remain more than sufficient in the foreseeable future.

Internal Revenue Code Section 415

The valuation reflects the limitations on benefits imposed by Internal Revenue Code section 415. The current valuation is based on the IRC 415(b) dollar limit for 2021 of \$230,000.

Internal Revenue Code Section 401(a)(17)

The valuation reflects the limitations on pensionable compensation imposed by Internal Revenue Code section 401(a)(17). The current valuation is based on the IRC 401(a)(17) limit for 2021 of \$290,000,

Appendix A – Statement of Actuarial Methods and Assumptions

Actuarial Methods (continued)

PEPRA Assumptions

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

Asset Valuation Method

Market value of assets plus accounts receivable.

It is the policy of the board 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. As stated in the "Amortization of Unfunded Actuarial Accrued Liability" section above, CalPERS' policy in effect for this valuation amortizes all actuarial investment gains and losses over a fixed 20-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." 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 15-year amortization period for gains and losses.

Accounts Receivable

In preparing valuations and setting employer contribution rates, asset values 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

On July 12, 2021, CalPERS reported a preliminary 21.3% net return on investments for FY 2020-21. Since the return exceeded the 7.00% discount rate sufficiently, the CalPERS Funding Risk Mitigation policy allows CalPERS to use a portion of the investment gain to offset the cost of reducing the expected volatility of future investment returns. Based on the thresholds specified in the policy, the excess return of 14.3% prescribes a reduction in investment volatility that corresponds to a reduction in the discount rate of 0.20%, from 7.00% to 6.80%.

On November 17, 2021, the board adopted new actuarial assumptions based on the recommendations in the November 2021 CalPERS Experience Study and Review of Actuarial Assumptions. This study reviewed the retirement rates, termination rates, mortality rates, rates of salary increases, and inflation assumption for public agencies. These new assumptions are incorporated in this actuarial valuation and will impact the required contribution for FY 2023-24. In addition, the board adopted a new strategic asset allocation as part of its Asset Liability Management process. The new asset allocation, along with the new capital market assumptions and economic assumptions, support a discount rate of 6.80%. This includes a reduction in the price inflation assumption from 2.50% to 2.30%.

All actuarial assumptions used in this valuation represent estimates of future experience rather than observations of estimates inherent in market data.

Appendix A – Statement of Actuarial Methods and Assumptions

Actuarial Assumptions (continued)

Economic Assumptions

Discount Rate

The discount rate assumption adopted by the board is 6.8% compounded annually (net of investment and administrative expenses).

Salary Growth

Annual increases vary by entry age and duration of service. A sample of assumed increases is shown below. Wage inflation assumption in the valuation year (2.8% for 2021) is added to these factors for total salary growth.

State Miscellaneous Tier 1 & Tier 2

Duration of Service	Entry Age		
	20	30	40
0	6.3%	4.1%	3.6%
3	5.3%	3.4%	2.6%
5	4.7%	3.1%	2.2%
10	2.7%	1.6%	1.0%
15	1.9%	1.2%	0.8%
20	1.3%	0.9%	0.7%
25	0.9%	0.7%	0.6%
30	0.7%	0.5%	0.4%

State Industrial

Duration of Service	Entry Age		
	20	30	40
0	5.9%	5.7%	5.7%
3	4.8%	4.0%	4.0%
5	4.2%	3.2%	3.2%
10	2.8%	1.6%	1.6%
15	1.8%	1.2%	1.2%
20	1.2%	0.9%	0.9%
25	0.8%	0.6%	0.6%
30	0.5%	0.5%	0.5%

State Safety, POFF and CHP

Duration of Service	State Safety	POFF	CHP
0	5.2%	11.8%	12.3%
3	3.4%	6.8%	5.3%
5	2.4%	4.4%	2.6%
10	1.1%	1.4%	1.2%
15	1.0%	1.2%	1.4%
20	0.9%	1.2%	2.3%
25	0.8%	1.3%	2.3%
30	0.8%	1.4%	1.5%

Appendix A – Statement of Actuarial Methods and Assumptions

Economic Assumptions (continued)

Overall Payroll Growth

2.80% compounded annually (used in projecting the payroll over which unfunded accrued liability is amortized for amortization bases established prior to June 30, 2019). For the State Miscellaneous plan, the payroll of Tier 2 members is assumed to decrease in accordance with actuarial assumptions based on the assumption that all new State Miscellaneous entrants will elect Tier 1. The payroll of Tier 1 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 2.80%.

Inflation

2.30% compounded annually.

Appendix A – Statement of Actuarial Methods and Assumptions

Demographic Assumptions

Post-Retirement Mortality

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

Age	Healthy Recipients		Non-Industrial Disabled (Not Job-Related)		Industrial Disabled (Job-Related)	
	Male	Female	Male	Female	Male	Female
50	0.00266	0.00199	0.01701	0.01439	0.0043	0.00311
55	0.0039	0.00325	0.0221	0.01734	0.00621	0.00549
60	0.00578	0.00455	0.02708	0.01962	0.00944	0.00868
65	0.00857	0.00612	0.03334	0.02276	0.01394	0.0119
70	0.01333	0.00996	0.04001	0.0291	0.02163	0.01858
75	0.02391	0.01783	0.05376	0.0416	0.03446	0.03134
80	0.04371	0.03403	0.07936	0.06111	0.05853	0.05183
85	0.08274	0.06166	0.11561	0.09385	0.10137	0.08045
90	0.14539	0.11086	0.16608	0.14396	0.16584	0.12434
95	0.24664	0.20364	0.24664	0.20364	0.24664	0.20364
100	0.36198	0.31582	0.36198	0.31582	0.36198	0.31582
105	0.52229	0.44679	0.52229	0.44679	0.52229	0.44679
110	1	1	1	1	1	1

The post-retirement mortality rates above include 15 years of projected ongoing mortality improvement using 90% of Scale MP-2016 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	70%
State Industrial	70%
State Safety	70%
State Peace Officers & Firefighters	80%
California Highway Patrol	85%

Age of Spouse

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

Terminated Members

Terminated members who are not vested are assumed to refund immediately. Terminated members who are vested are assumed to retire at age 59 (State Miscellaneous and Industrial) or age 54 (State Safety, State Peace Officers and Firefighters, and California Highway Patrol).

Appendix A – Statement of Actuarial Methods and Assumptions

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1% for employees in plans with the Credit for Unused Sick Leave provision.

Norris Decision (Best Factors)

Projected benefit amounts for employees hired prior to July 1, 1982, are increased 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

In general, 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 they make up the shortfall in their accumulated contributions with interest. In this valuation, we have assumed that all Tier 2 members eligible to convert their Tier 2 service to Tier 1 service will elect to do so.

Appendix A – Statement of Actuarial Methods and Assumptions

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.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.014	0.011	0.010	0.013	0.014	0.014	0.015
52	0.019	0.013	0.012	0.015	0.015	0.015	0.016
54	0.014	0.014	0.015	0.021	0.024	0.027	0.030
56	0.029	0.033	0.031	0.056	0.079	0.105	0.157
58	0.026	0.035	0.034	0.061	0.085	0.115	0.169
60	0.017	0.036	0.063	0.113	0.126	0.162	0.189
62	0.076	0.115	0.118	0.188	0.197	0.238	0.284
65	0.141	0.164	0.155	0.232	0.218	0.232	0.251
70	0.151	0.226	0.246	0.300	0.278	0.255	0.266
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	0.009	0.008	0.009	0.013	0.014	0.016	0.022
54	0.008	0.012	0.014	0.021	0.025	0.027	0.034
56	0.016	0.025	0.030	0.043	0.058	0.074	0.116
58	0.020	0.032	0.035	0.056	0.067	0.091	0.128
60	0.030	0.050	0.060	0.095	0.113	0.140	0.197
62	0.070	0.102	0.122	0.177	0.210	0.248	0.285
65	0.081	0.142	0.158	0.221	0.224	0.271	0.310
70	0.140	0.176	0.184	0.223	0.276	0.299	0.299
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									
	Male					Female				
	20	25	30	35	40	20	25	30	35	40
0	0.1699	0.1594	0.1419	0.1244	0.1183	0.1694	0.1570	0.1363	0.1155	0.1129
1	0.1494	0.1395	0.1230	0.1065	0.0974	0.1566	0.1450	0.1255	0.1061	0.0978
2	0.1226	0.1141	0.0998	0.0855	0.0761	0.1319	0.1221	0.1058	0.0895	0.0798
3	0.0939	0.0870	0.0755	0.0639	0.0561	0.1018	0.0943	0.0819	0.0694	0.0610
4	0.0669	0.0616	0.0529	0.0441	0.0385	0.0719	0.0666	0.0579	0.0492	0.0433
5	0.0442	0.0404	0.0340	0.0276	0.0243	0.0465	0.0430	0.0373	0.0316	0.0284
10	0.0073	0.0065	0.0053	0.0040	0.0032	0.0081	0.0076	0.0067	0.0058	0.0045
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Miscellaneous Tier 1 (continued)

Termination with Vested Benefits

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

Duration of Service	Entry Age									
	Male					Female				
	20	25	30	35	40	20	25	30	35	40
5	0.0466	0.0466	0.0395	0.0325	0.0265	0.0526	0.0526	0.0456	0.0385	0.0316
6	0.0410	0.0410	0.0356	0.0302	0.0244	0.0485	0.0485	0.0418	0.0351	0.0290
7	0.0357	0.0357	0.0317	0.0277	0.0221	0.0435	0.0435	0.0376	0.0317	0.0258
8	0.0309	0.0309	0.0280	0.0251	0.0197	0.0385	0.0385	0.0334	0.0282	0.0225
9	0.0271	0.0271	0.0248	0.0224	0.0172	0.0340	0.0340	0.0294	0.0249	0.0192
10	0.0242	0.0242	0.0220	0.0198	0.0149	0.0303	0.0303	0.0260	0.0217	0.0164
14	0.0169	0.0169	0.0141	0.0114	0.0081	0.0202	0.0202	0.0162	0.0122	0.0097
15	0.0153	0.0153	0.0126	0.0099	0.0071	0.0182	0.0182	0.0145	0.0109	0.0090
19	0.0109	0.0109	0.0083	0.0057	0.0000	0.0124	0.0124	0.0095	0.0065	0.0000
20	0.0100	0.0100	0.0076	0.0051	0.0000	0.0113	0.0113	0.0084	0.0054	0.0000
24	0.0060	0.0060	0.0048	0.0000	0.0000	0.0068	0.0068	0.0051	0.0000	0.0000
25	0.0053	0.0053	0.0043	0.0000	0.0000	0.0060	0.0060	0.0046	0.0000	0.0000
29	0.0029	0.0029	0.0000	0.0000	0.0000	0.0041	0.0041	0.0000	0.0000	0.0000
30	0.0025	0.0025	0.0000	0.0000	0.0000	0.0038	0.0038	0.0000	0.0000	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 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	0.000140	0.000390	0.000303	0.000190
25	0.000130	0.000330	0.000307	0.000190
30	0.000190	0.000440	0.000438	0.000190
35	0.000290	0.000580	0.000790	0.000360
40	0.000390	0.000750	0.001495	0.001030
45	0.000540	0.000930	0.002911	0.002040
50	0.000810	0.001340	0.004032	0.002740
55	0.001230	0.001980	0.002923	0.002380
60	0.001790	0.002870	0.002383	0.002000

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Miscellaneous 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	0.014	0.011	0.010	0.013	0.014	0.014	0.015
52	0.019	0.013	0.012	0.015	0.015	0.015	0.016
54	0.014	0.014	0.015	0.021	0.024	0.027	0.030
56	0.029	0.033	0.031	0.056	0.079	0.105	0.157
58	0.026	0.035	0.034	0.061	0.085	0.115	0.169
60	0.017	0.036	0.063	0.113	0.126	0.162	0.189
62	0.076	0.115	0.118	0.188	0.197	0.238	0.284
65	0.141	0.164	0.155	0.232	0.218	0.232	0.251
70	0.151	0.226	0.246	0.300	0.278	0.255	0.266
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	0.009	0.008	0.009	0.013	0.014	0.016	0.022
54	0.008	0.012	0.014	0.021	0.025	0.027	0.034
56	0.016	0.025	0.030	0.043	0.058	0.074	0.116
58	0.020	0.032	0.035	0.056	0.067	0.091	0.128
60	0.030	0.050	0.060	0.095	0.113	0.140	0.197
62	0.070	0.102	0.122	0.177	0.210	0.248	0.285
65	0.081	0.142	0.158	0.221	0.224	0.271	0.310
70	0.140	0.176	0.184	0.223	0.276	0.299	0.299
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									
	Male					Female				
	20	25	30	35	40	20	25	30	35	40
0	0.1387	0.1387	0.1387	0.1387	0.1387	0.1400	0.1400	0.1400	0.1400	0.1400
1	0.1168	0.1168	0.1168	0.1168	0.1168	0.1157	0.1157	0.1157	0.1157	0.1157
2	0.0954	0.0954	0.0954	0.0954	0.0954	0.1013	0.1013	0.1013	0.1013	0.1013
3	0.0747	0.0747	0.0747	0.0747	0.0747	0.0827	0.0827	0.0827	0.0827	0.0827
4	0.0552	0.0552	0.0552	0.0552	0.0552	0.0625	0.0625	0.0625	0.0625	0.0625
5	0.0378	0.0378	0.0378	0.0378	0.0378	0.0429	0.0429	0.0429	0.0429	0.0429
6	0.0234	0.0234	0.0234	0.0234	0.0234	0.0262	0.0262	0.0262	0.0262	0.0262
7	0.0130	0.0130	0.0130	0.0130	0.0130	0.0139	0.0139	0.0139	0.0139	0.0139
8	0.0066	0.0066	0.0066	0.0066	0.0066	0.0063	0.0063	0.0063	0.0063	0.0063
9	0.0037	0.0037	0.0037	0.0037	0.0037	0.0028	0.0028	0.0028	0.0028	0.0028

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Miscellaneous 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									
	Male					Female				
	20	25	30	35	40	20	25	30	35	40
10	0.0306	0.0306	0.0306	0.0306	0.0306	0.0365	0.0365	0.0365	0.0365	0.0365
14	0.0220	0.0220	0.0220	0.0220	0.0220	0.0273	0.0273	0.0273	0.0273	0.0273
15	0.0202	0.0202	0.0202	0.0202	0.0202	0.0253	0.0253	0.0253	0.0253	0.0253
19	0.0145	0.0145	0.0145	0.0145	0.0000	0.0189	0.0189	0.0189	0.0189	0.0000
20	0.0134	0.0134	0.0134	0.0134	0.0000	0.0176	0.0176	0.0176	0.0176	0.0000
24	0.0096	0.0096	0.0096	0.0000	0.0000	0.0131	0.0131	0.0131	0.0000	0.0000
25	0.0080	0.0080	0.0080	0.0000	0.0000	0.0112	0.0112	0.0112	0.0000	0.0000
29	0.0048	0.0048	0.0000	0.0000	0.0000	0.0067	0.0067	0.0000	0.0000	0.0000
30	0.0040	0.0040	0.0000	0.0000	0.0000	0.0056	0.0056	0.0000	0.0000	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 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	0.000140	0.000390	0.000303	0.000190
25	0.000130	0.000330	0.000307	0.000190
30	0.000190	0.000440	0.000438	0.000190
35	0.000290	0.000580	0.000790	0.000360
40	0.000390	0.000750	0.001495	0.001030
45	0.000540	0.000930	0.002911	0.002040
50	0.000810	0.001340	0.004032	0.002740
55	0.001230	0.001980	0.002923	0.002380
60	0.001790	0.002870	0.002383	0.002000

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Industrial

Service Retirement - Classic Members

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.001	0.009	0.013	0.016	0.023	0.022	0.024
52	0.004	0.013	0.016	0.018	0.024	0.023	0.025
54	0.009	0.025	0.032	0.037	0.049	0.047	0.051
56	0.001	0.028	0.063	0.142	0.157	0.181	0.201
58	0.107	0.038	0.048	0.116	0.133	0.156	0.174
60	0.015	0.065	0.084	0.187	0.196	0.216	0.240
62	0.034	0.190	0.212	0.374	0.321	0.332	0.361
65	0.297	0.261	0.205	0.214	0.243	0.243	0.243
70	0.227	0.227	0.227	0.227	0.227	0.227	0.227
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

Rates vary by age and years of 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	0.005	0.006	0.011	0.016	0.022	0.024	0.030
54	0.010	0.014	0.021	0.032	0.043	0.048	0.060
56	0.020	0.028	0.043	0.066	0.088	0.098	0.122
58	0.022	0.031	0.048	0.074	0.098	0.109	0.136
60	0.034	0.048	0.074	0.114	0.153	0.169	0.210
62	0.063	0.090	0.141	0.213	0.286	0.318	0.394
65	0.073	0.105	0.164	0.248	0.334	0.372	0.460
70	0.097	0.139	0.217	0.329	0.443	0.493	0.611
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

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

Duration of Service									
0	5	10	15	20	25	30	35	40	45
0.0723	0.0280	0.0036	0.0030	0.0013	0.0009	0.0003	0.0008	0.0008	0.0000

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Industrial (continued)

Termination with Vested Deferred Benefits

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

Duration of Service	Entry Age				
	20	25	30	35	40
5	0.0261	0.0261	0.0261	0.0261	0.0261
6	0.0249	0.0249	0.0249	0.0249	0.0249
7	0.0237	0.0237	0.0237	0.0237	0.0237
8	0.0226	0.0226	0.0226	0.0226	0.0226
9	0.0215	0.0215	0.0215	0.0215	0.0215
10	0.0205	0.0205	0.0205	0.0205	0.0205
14	0.0169	0.0169	0.0169	0.0169	0.0000
15	0.0161	0.0161	0.0161	0.0161	0.0000
19	0.0133	0.0133	0.0133	0.0000	0.0000
20	0.0127	0.0127	0.0127	0.0000	0.0000
24	0.0104	0.0104	0.0000	0.0000	0.0000
25	0.0073	0.0073	0.0000	0.0000	0.0000
29	0.0044	0.0000	0.0000	0.0000	0.0000
30	0.0037	0.0000	0.0000	0.0000	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 and 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	Female	Male and Female
20	0.000380	0.000140	0.000349	0.000040	0.000020	0.000060
25	0.000340	0.000180	0.000349	0.000040	0.000020	0.000060
30	0.000420	0.000250	0.000860	0.000050	0.000030	0.000060
35	0.000480	0.000340	0.001493	0.000050	0.000040	0.000116
40	0.000550	0.000420	0.002394	0.000060	0.000050	0.000116
45	0.000660	0.000530	0.003635	0.000070	0.000060	0.000176
50	0.000920	0.000730	0.004877	0.000100	0.000080	0.000176
55	0.001380	0.001060	0.006256	0.000150	0.000120	0.000232
60	0.002210	0.001510	0.006256	0.000250	0.000170	0.000232

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Safety

Service Retirement - Classic Members

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.009	0.014	0.018	0.028	0.022	0.024	0.024
52	0.017	0.019	0.019	0.026	0.018	0.019	0.019
54	0.012	0.018	0.024	0.038	0.034	0.042	0.042
56	0.019	0.042	0.058	0.122	0.161	0.196	0.214
58	0.055	0.050	0.057	0.112	0.127	0.166	0.205
60	0.062	0.057	0.070	0.136	0.170	0.205	0.222
62	0.088	0.104	0.151	0.224	0.212	0.245	0.245
65	0.197	0.163	0.213	0.281	0.229	0.250	0.250
70	0.128	0.223	0.253	0.260	0.260	0.260	0.260
75	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.007	0.011	0.017	0.026	0.027	0.033	0.038
52	0.007	0.014	0.014	0.026	0.026	0.030	0.037
54	0.012	0.017	0.017	0.026	0.031	0.041	0.074
56	0.024	0.029	0.044	0.082	0.104	0.128	0.173
58	0.028	0.038	0.055	0.087	0.106	0.143	0.205
60	0.043	0.050	0.081	0.139	0.142	0.181	0.231
62	0.067	0.076	0.112	0.191	0.202	0.246	0.285
65	0.100	0.124	0.155	0.224	0.231	0.280	0.323
70	0.137	0.167	0.214	0.281	0.309	0.373	0.401
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	Male	Female
0	0.115597	0.142910
1	0.088659	0.113490
2	0.065577	0.086528
3	0.046482	0.063061
4	0.031408	0.043763
5	0.020269	0.028887
6	0.012828	0.018409
7	0.008499	0.011850
8	0.006400	0.008315
9	0.005599	0.006739

Appendix A – Statement of Actuarial Methods and Assumptions

Termination with Vested Deferred Benefits

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

Duration of Service	Male	Female
5	0.022843	0.030058
6	0.021483	0.028376
7	0.020204	0.026788
8	0.019001	0.025288
9	0.017869	0.023873
10	0.016805	0.022537
15	0.012363	0.016897
20	0.009095	0.012669
25	0.006691	0.009499
30	0.004922	0.007122
35	0.000000	0.000000

- 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.

Appendix A – Statement of Actuarial Methods and Assumptions

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 and 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	Female	Male and Female
20	0.000380	0.000140	0.000360	0.000040	0.000020	0.000004
25	0.000340	0.000180	0.000540	0.000040	0.000020	0.000182
30	0.000420	0.000250	0.000630	0.000050	0.000030	0.001205
35	0.000480	0.000340	0.000720	0.000050	0.000040	0.002065
40	0.000550	0.000420	0.000720	0.000060	0.000050	0.002964
45	0.000660	0.000530	0.001080	0.000070	0.000060	0.004204
50	0.000920	0.000730	0.002010	0.000100	0.000080	0.005783
55	0.001380	0.001060	0.002400	0.000150	0.000120	0.007741
60	0.002210	0.001510	0.003200	0.000250	0.000170	0.009629

State Peace Officers and Firefighters

Service Retirement - Classic Members

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.089	0.029	0.048	0.149	0.29	0.386	0.386
52	0.010	0.023	0.040	0.100	0.174	0.225	0.225
54	0.149	0.026	0.043	0.111	0.214	0.228	0.246
56	0.026	0.034	0.059	0.148	0.217	0.282	0.316
58	0.031	0.041	0.068	0.172	0.233	0.255	0.257
60	0.061	0.075	0.111	0.207	0.319	0.311	0.325
62	0.080	0.113	0.171	0.262	0.337	0.330	0.359
65	0.235	0.181	0.217	0.293	0.347	0.321	0.341
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 years of service. See sample rates in the table below.

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.008	0.021	0.031	0.076	0.157	0.314	0.327
52	0.008	0.018	0.029	0.067	0.102	0.179	0.180
54	0.016	0.032	0.040	0.089	0.122	0.219	0.230
56	0.025	0.035	0.046	0.108	0.170	0.268	0.276
58	0.018	0.059	0.063	0.142	0.202	0.319	0.319
60	0.033	0.063	0.089	0.170	0.262	0.342	0.349
62	0.067	0.104	0.130	0.221	0.324	0.415	0.440
65	0.065	0.081	0.127	0.231	0.342	0.427	0.453
70	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

State Peace Officers and Firefighters (continued)

Service Retirement - PEPRA Members – 2.7% @ 57

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.008	0.021	0.031	0.076	0.157	0.314	0.327
52	0.009	0.020	0.031	0.072	0.109	0.191	0.193
54	0.017	0.034	0.042	0.094	0.130	0.234	0.245
56	0.026	0.037	0.048	0.115	0.181	0.285	0.293
58	0.020	0.065	0.070	0.158	0.224	0.354	0.354
60	0.035	0.066	0.094	0.179	0.276	0.360	0.367
62	0.067	0.104	0.130	0.221	0.324	0.415	0.440
65	0.065	0.081	0.127	0.231	0.342	0.427	0.453
70	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Termination with Refund

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

Duration of Service	Male	Female
0	0.101387	0.103278
1	0.071846	0.078576
2	0.052633	0.060471
3	0.039579	0.046931
4	0.029611	0.036241
5	0.021328	0.027318
6	0.014593	0.019779
7	0.009631	0.013655
8	0.006424	0.009035
9	0.004624	0.005888

Termination with Vested Deferred Benefits

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

Duration of Service	Male	Female
5	0.011093	0.022953
6	0.010650	0.021294
7	0.010215	0.019755
8	0.009787	0.018327
9	0.009366	0.017002
10	0.008953	0.015773
15	0.006994	0.010840
20	0.005218	0.007449
25	0.003624	0.005119
30	0.002212	0.003518
35	0.000000	0.000000

- 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.

Appendix A – Statement of Actuarial Methods and Assumptions

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 and 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	Female	Male and Female
20	0.000380	0.000140	0.000300	0.000040	0.000020	0.000390
25	0.000340	0.000180	0.000300	0.000040	0.000020	0.000870
30	0.000420	0.000250	0.000300	0.000050	0.000030	0.001670
35	0.000480	0.000340	0.000300	0.000050	0.000040	0.002890
40	0.000550	0.000420	0.000400	0.000060	0.000050	0.004640
45	0.000660	0.000530	0.000600	0.000070	0.000060	0.007060
50	0.000920	0.000730	0.000980	0.000100	0.000080	0.010270
55	0.001380	0.001060	0.001430	0.000150	0.000120	0.014420
60	0.002210	0.001510	0.001880	0.000250	0.000170	0.019660

Appendix A – Statement of Actuarial Methods and Assumptions

PLAN SPECIFIC ACTUARIAL ASSUMPTIONS (continued)

California Highway Patrol

Service Retirement - Classic Members

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.043	0.043	0.046	0.087	0.211	0.374	0.423
52	0.030	0.030	0.032	0.061	0.148	0.263	0.297
54	0.032	0.032	0.034	0.064	0.155	0.275	0.311
56	0.091	0.091	0.091	0.135	0.221	0.308	0.351
58	0.095	0.095	0.095	0.140	0.230	0.320	0.365
60	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement - PEPRA Members

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

Attained Age	Years of Service						
	5	10	15	20	25	30	35
50	0.027	0.027	0.027	0.034	0.075	0.293	0.317
52	0.020	0.020	0.020	0.020	0.070	0.236	0.287
54	0.030	0.030	0.030	0.030	0.099	0.247	0.323
56	0.043	0.043	0.043	0.071	0.118	0.298	0.323
58	0.044	0.044	0.044	0.044	0.154	0.304	0.315
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	Male	Female
0	0.033097	0.08
1	0.02324	0.022078
2	0.01553	0.014754
3	0.009754	0.009266
4	0.005665	0.005382
5	0.00301	0.002859
6	0.002408	0.002287
7	0.001806	0.001716
8	0.001204	0.001144
9	0.000602	0.000572

Appendix A – Statement of Actuarial Methods and Assumptions

Termination with Vested Deferred Benefits

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

Duration of Service	Male	Female
5	0.008752	0.017504
6	0.008109	0.016217
7	0.007513	0.015025
8	0.00696	0.013921
9	0.006449	0.012897
10	0.005975	0.01195
15	0.004079	0.008158
20	0.002785	0.005569
25	0.001901	0.003802
30	0	0
35	0	0

- 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 and 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	Female	Male and Female
20	0.000380	0.000140	0.000084	0.000040	0.000020	0.000160
25	0.000340	0.000180	0.000084	0.000040	0.000020	0.000350
30	0.000420	0.000250	0.000084	0.000050	0.000030	0.000680
35	0.000480	0.000340	0.000084	0.000050	0.000040	0.001220
40	0.000550	0.000420	0.000084	0.000060	0.000050	0.002020
45	0.000660	0.000530	0.000167	0.000070	0.000060	0.003160
50	0.000920	0.000730	0.000167	0.000100	0.000080	0.012140
55	0.001380	0.001060	0.000167	0.000150	0.000120	0.054070
60	0.002210	0.001510	0.000167	0.000250	0.000170	0.204310

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 intended to provide a summary of the complex Public Employees' Retirement Law. The law itself governs in all situations.

RETIREMENT PROGRAM

Service Retirement

Eligibility

Classic 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 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% @ 55 Factor	2% @ 60 Factor	2% @ 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, 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.

Appendix B – Principal Plan Provisions

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 used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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

Classic members become eligible to receive a deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of age 50. PEPRA 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, 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% of Final Compensation.

Appendix B – Principal Plan Provisions

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 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% 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% 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% 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. 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% of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount will not be paid if the member is eligible for service retirement or the Alternate Death Benefit.

Appendix B – Principal Plan Provisions

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 credited at the greater of 6% or the prevailing discount rate. 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.

Appendix B – Principal Plan Provisions

State Miscellaneous Tier 1 (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%. Annual adjustments are calculated by first determining the lesser of 1) 2% 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% (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% (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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% target would be proportionately reduced.

Appendix B – Principal Plan Provisions

State Miscellaneous Tier 1 (continued)

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%.
- The percent contributed above the monthly compensation breakpoint ranges from 5% to 10%.

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%.
- The percent contributed above the monthly compensation breakpoint is 1% greater than the contribution paid by 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%.
- The percent contributed above the monthly compensation breakpoint is half of the total normal cost. See the “PEPRA Member Contribution Rates” section of this report for more information.

Refund of Employee Contributions

If the member’s service with the employer ends and 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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

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 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

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

Service Retirement

Eligibility

A 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).

Appendix B – Principal Plan Provisions

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% @ 65 Tier 2 Factor	1.25% @ 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 used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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 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).

Appendix B – Principal Plan Provisions

State Miscellaneous Tier 2 (continued)

Eligibility to Start Receiving Benefits

The member becomes eligible to receive a 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, 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 CalPERS 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% 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% 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 who are eligible to retire and have attained the normal retirement age determined by their service retirement benefit formula will receive the same dollar amount for disability retirement that is 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 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.

Appendix B – Principal Plan Provisions

State Miscellaneous Tier 2 (continued)

For retirement allowances with respect to service earned by employment in this group, 25% 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% 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% 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. 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% of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount will 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 the greater of 6% or the prevailing discount rate. 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.

Appendix B – Principal Plan Provisions

State Miscellaneous 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 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.

Appendix B – Principal Plan Provisions

State Miscellaneous 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%.

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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% 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%.
- The monthly compensation breakpoint is \$0.
- The percent contributed below the monthly compensation breakpoint is 0%.

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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

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 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

Classic 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 members become eligible for Service Retirement upon attainment of age 52 with at least five years of service.

Appendix B – Principal Plan Provisions

State Industrial Tier 1 (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% 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% @ 55 Factor	2% @ 60 Factor	2% @ 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.
- 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 used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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.

Appendix B – Principal Plan Provisions

State Industrial Tier 1 (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

Classic members become eligible to receive the deferred 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, 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 CalPERS 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% 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% 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.

Appendix B – Principal Plan Provisions

State Industrial Tier 1 (continued)

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% 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 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% 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% 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% 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*.

Appendix B – Principal Plan Provisions

State Industrial Tier 1 (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 will 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 the greater of 6% or the prevailing discount rate. 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% of final compensation. The allowance will be increased whenever the compensation paid to active employees is increased but ceases 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.

Appendix B – Principal Plan Provisions

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% 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 members and age 52 for PEPRAs 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.

Appendix B – Principal Plan Provisions

State Industrial 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%. Annual adjustments are calculated by first determining the lesser of 1) 2% 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% (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% (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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% 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%.
- The percent contributed above the monthly compensation breakpoint ranges from 5% to 10%.

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

Appendix B – Principal Plan Provisions

State Industrial Tier 1 (continued)

Refund of Employee Contributions

If the member's service with the employer ends and 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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

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

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.

Appendix B – Principal Plan Provisions

State Industrial 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. PEPRAs members 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% @ 65 Tier 2 Factor	1.25% @ 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. PEPRAs members have a cap on the annual salary used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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.

Appendix B – Principal Plan Provisions

State Industrial Tier 2 (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 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, 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% 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% 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 who are eligible to retire and 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.

Appendix B – Principal Plan Provisions

State Industrial Tier 2 (continued)

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% 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 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% 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% 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% 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*.

Appendix B – Principal Plan Provisions

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% of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount will 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 the greater of 6% or the prevailing discount rate. 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% of final compensation. The allowance will be increased whenever the compensation paid to active employees is increased but ceases 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.

Appendix B – Principal Plan Provisions

State Industrial Tier 2 (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% 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.

Appendix B – Principal Plan Provisions

State Industrial Tier 2 (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 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%.

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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% 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%.
- The monthly compensation breakpoint is \$0.
- The percent contributed below the monthly compensation breakpoint is 0%.

Refund of Employee Contributions

If the member's service with the employer ends and 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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

Appendix B – Principal Plan Provisions

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 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

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).

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. 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. PEPRAs 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% @ 55 Factor	2.5% @ 60 Factor	2% @ 55 Factor	2% @ 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, 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. PEPRAs have a cap on the annual salary used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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 for Classic members is capped at 80% of final compensation.

Appendix B – Principal Plan Provisions

State Safety (continued)

Vested Deferred Retirement

Eligibility for Deferred Status

A 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

A member becomes eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of 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, 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 CalPERS employers, and with certain other Retirement Systems with which CalPERS 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% 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% 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 who are eligible to retire and 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.

Appendix B – Principal Plan Provisions

State Safety (continued)

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% of final compensation. However, if a member is eligible for Service Retirement and the Service Retirement benefit is greater 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 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% 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% 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% 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. 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*.

Appendix B – Principal Plan Provisions

State Safety (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% of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount will 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 the greater of 6% or the prevailing discount rate. 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% of final compensation. The allowance will be increased whenever the compensation paid to active employees is increased but ceases 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.

Appendix B – Principal Plan Provisions

State Safety (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% 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, 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.

Appendix B – Principal Plan Provisions

State Safety (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, 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%. Annual adjustments are calculated by first determining the lesser of 1) 2% 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% (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% (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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% 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%.
- The monthly compensation breakpoint is \$317.
- The percent contributed above the monthly compensation breakpoint is 11%, or half of the normal cost, depending on bargaining unit.

Appendix B – Principal Plan Provisions

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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

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 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

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).

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. PEPRA members 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% @ 50 Factor	3% @ 55 Factor	2.5% @ 55 Factor	2.5% @ 57 Factor	2.7% @ 57 Factor
50	3.000%	2.400%	2.000%	2.000%	2.000%
51	3.000%	2.520%	2.100%	2.071%	2.100%
52	3.000%	2.640%	2.200%	2.143%	2.200%
53	3.000%	2.760%	2.300%	2.214%	2.300%
54	3.000%	2.880%	2.400%	2.286%	2.400%
55	3.000%	3.000%	2.500%	2.357%	2.500%
56	3.000%	3.000%	2.500%	2.429%	2.600%
57 & Up	3.000%	3.000%	2.500%	2.500%	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). 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, 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.

Appendix B – Principal Plan Provisions

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. PEPRAs members have a cap on the annual salary used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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 for Classic members is capped at 90% 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

Members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of 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, 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 CalPERS employers, and with certain other Retirement Systems with which CalPERS 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% 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% of Final Compensation.

Appendix B – Principal Plan Provisions

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 who are eligible to retire and 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% 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 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% 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% 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% 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. 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*.

Appendix B – Principal Plan Provisions

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% of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount will 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 the greater of 6% or the prevailing discount rate. 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% of final compensation. The allowance will be increased whenever the compensation paid to active employees is increased but ceases 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.

Appendix B – Principal Plan Provisions

State Peace Officers and Firefighters (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% 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, 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.

Appendix B – Principal Plan Provisions

State Peace Officers and Firefighters (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, 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%. Annual adjustments are calculated by first determining the lesser of 1) 2% 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% (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% (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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% 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.

Most of the active population has a monthly compensation breakpoint of \$238, \$513, or \$863 and is subject to the following schedule:

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

A small portion of the Classic members have a monthly compensation breakpoint of \$238 and are subject to the following schedule:

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

Appendix B – Principal Plan Provisions

State Peace Officers and Firefighters (continued)

A small portion of the PEPRA members have a monthly compensation breakpoint of \$0 and are subject to the following schedule:

- The percent contributed below the monthly compensation breakpoint is 0%.
- The percent contributed above the monthly compensation breakpoint is half of the total normal cost. See the “PEPRA Member Contribution Rates” section of this report for more information.

Refund of Employee Contributions

If the member’s service with the employer ends and 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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

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 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

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).

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**. Classic members hired on or after October 31, 2010, are subject to the **3% at 55** benefit factor table. PEPRA members are subject to the **2.7% at 57** benefit factor table.

Retirement Age	3% @ 50 Factor	3% @ 55 Factor	2.7% @ 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.

Appendix B – Principal Plan Provisions

California Highway Patrol (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). 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 used to calculate final compensation based on the Social Security Contribution and Benefit Base. For employees who participate in Social Security this cap is \$126,291 for 2020 and for those employees who do not participate in Social Security the cap for 2020 is \$151,549. 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 for Classic members is capped at 90% of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A 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

Members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for Deferred Status and upon attainment of 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, then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A 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 CalPERS employers, and with certain other Retirement Systems with which CalPERS 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% 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% of Final Compensation.

Appendix B – Principal Plan Provisions

California Highway Patrol (continued)

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members who are eligible to retire and 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% 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% of final compensation, or, 3% 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 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% 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% 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% 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. 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.

Appendix B – Principal Plan Provisions

California Highway Patrol (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% of the annual compensation earned by the deceased member during the 12 months immediately preceding the member's death. The additional amount will 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 the greater of 6% or the prevailing discount rate. 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% of final compensation. It will be increased whenever the compensation paid to active employees is increased but ceases 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.

Appendix B – Principal Plan Provisions

California Highway Patrol (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% 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, 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.

Appendix B – Principal Plan Provisions

California Highway Patrol (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, 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%. Annual adjustments are calculated by first determining the lesser of 1) 2% 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% (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% (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% 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% of accumulated member contributions. If this amount of member contributions were insufficient to provide for PPPA payments, the 75% 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%.
- The monthly compensation breakpoint is \$863.
- The percent contributed above the monthly compensation breakpoint is 11.5%. This rate was originally scheduled to increase 1%/year until it reached 50% of normal cost, but this gradual increase has been temporarily suspended.

Refund of Employee Contributions

If the member's service with the employer ends and 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% interest.

1959 Survivor Benefits Program

For these benefits, please refer to the 1959 Survivor Benefit Program Actuarial Valuation Report available on our website.

Appendix C – Participant Data

Source of Participant Information

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

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,
- Comparison of pension amounts for each retiree and beneficiary receiving payments with those 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, such as dates of hire and dates of entry being adjusted to be consistent with the service fields, the date of birth and each other.

Appendix C – Participant Data

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% 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 Miscellaneous¹

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2020	178,628	30,130	64,394	202,078	475,230
Retirements	(7,374)	(1,760)	(650)	9,784	-
Industrial Disabilities	(2)	(64)	-	66	-
Non-Industrial Disabilities	(118)	(33)	(27)	178	-
Deaths ²	(316)	(48)	(600)	(7,339)	(8,303)
New Survivors	n/a	n/a	n/a	1,713	1,713
Non-Vested Terminations ³	(3,969)	(343)	4,312	-	-
Vested Terminations	(1,882)	(427)	2,309	-	-
Refunds of Contributions	(815)	(89)	(1,139)	-	(2,043)
Transfers	(1,175)	1,909	(712)	(22)	-
Redeposits/Rehires	1,492	(396)	(1,046)	(50)	-
First Year in Status	14,123	150	739	16	15,028
Data Corrections ⁴	363	302	690	(31)	1,324
As of June 30, 2021	178,955	29,331	68,270	206,393	482,949

¹ Includes State Miscellaneous Tier 1 and Tier 2.

² Includes both deaths without survivors and deaths with survivors receiving a benefit.

³ Includes non-vested terminated participants with employee contributions left in the plan.

⁴ May include the combining of data records into a single record.

Appendix C – Participant Data

Reconciliation of Participants (continued)

State Industrial

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2020	11,899	7,840	3,705	16,050	39,494
Retirements	(475)	(461)	(44)	976	(4)
Industrial Disabilities	(1)	(13)	-	16	2
Non-Industrial Disabilities	(22)	(6)	(4)	34	2
Deaths ¹	(20)	(14)	(21)	(381)	(436)
New Survivors	n/a	n/a	n/a	88	88
Non-Vested Terminations ²	(217)	(45)	262	-	-
Vested Terminations	(163)	(110)	274	(1)	-
Refunds of Contributions	(83)	(19)	(70)	-	(172)
Transfers	(483)	571	(80)	(8)	-
Redeposits/Rehires	154	(97)	(54)	(3)	-
First Year in Status	1,013	66	81	48	1,208
Data Corrections ³	(77)	(2)	(6)	(31)	(116)
As of June 30, 2021	11,525	7,710	4,043	16,788	40,066

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

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2020	29,307	5,449	8,095	27,905	70,756
Retirements	(1,151)	(303)	(102)	1,543	(13)
Industrial Disabilities	(136)	(19)	(16)	183	12
Non-Industrial Disabilities	(21)	(10)	(4)	36	1
Deaths ¹	(63)	(8)	(44)	(810)	(925)
New Survivors	n/a	n/a	n/a	213	213
Non-Vested Terminations ²	(678)	(50)	728	-	-
Vested Terminations	(464)	(84)	549	(1)	-
Refunds of Contributions	(336)	(15)	(260)	(1)	(612)
Transfers	(498)	604	(101)	(5)	-
Redeposits/Rehires	255	(78)	(170)	(7)	-
First Year in Status	2,314	105	313	121	2,853
Data Corrections ³	(78)	(46)	(17)	(9)	(150)
As of June 30, 2021	28,451	5,545	8,971	29,168	72,135

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.

Appendix C – Participant Data

Reconciliation of Participants (continued)

State Peace Officers and Firefighters

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2020	41,787	5,322	7,408	43,525	98,042
Retirements	(1999)	(194)	(127)	2,285	(35)
Industrial Disabilities	(325)	(28)	(19)	406	34
Non-Industrial Disabilities	(20)	(3)	0	24	1
Deaths ¹	(72)	(2)	(19)	(775)	(868)
New Survivors	n/a	n/a	n/a	380	380
Non-Vested Terminations ²	(523)	(45)	568	0	0
Vested Terminations	(316)	(65)	383	(2)	0
Refunds of Contributions	(102)	(14)	(146)	0	(262)
Transfers	(193)	316	(120)	(3)	0
Redeposits/Rehires	186	(39)	(140)	(7)	0
First Year in Status	3027	123	319	157	3626
Data Corrections ³	(208)	(86)	(22)	(53)	(369)
As of June 30, 2021	41,242	5,285	8,085	45,937	100,549

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

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2020	7,027	261	532	9,519	17,339
Retirements	(284)	(14)	(20)	313	(5)
Industrial Disabilities	(79)	(5)	(1)	91	6
Non-Industrial Disabilities	(3)	-	-	2	(1)
Deaths ¹	(3)	-	(2)	(263)	(268)
New Survivors	n/a	n/a	n/a	117	117
Non-Vested Terminations ²	(13)	(2)	15	-	-
Vested Terminations	(44)	(5)	50	(1)	-
Refunds of Contributions	(7)	-	(9)	-	(16)
Transfers	(4)	14	(10)	-	-
Redeposits/Rehires	12	(2)	(9)	(1)	-
First Year in Status	62	3	19	13	97
Data Corrections ³	(2)	-	(3)	(4)	(9)
As of June 30, 2021	6,662	250	562	9,786	17,260

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.

Appendix C – Participant Data

Active Members

Distribution of Active Members by Age and Years of Service

State Miscellaneous – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	2,799	6	0	0	0	0	2,805	\$119,605,585
25 - 29	11,202	1,477	5	0	0	0	12,684	669,562,691
30 - 34	12,510	6,832	930	18	1	0	20,291	1,279,924,639
35 - 39	9,995	7,927	4,431	798	85	2	23,238	1,694,417,692
40 - 44	7,511	6,299	4,951	2,903	1,266	86	23,016	1,798,787,106
45 - 49	5,742	4,733	4,357	3,512	3,622	823	22,789	1,875,155,205
50 - 54	4,781	4,290	4,036	3,932	4,757	3,765	25,561	2,165,406,488
55 - 59	3,770	3,563	3,473	3,070	4,217	5,516	23,609	2,021,018,438
60 - 64	2,318	2,710	2,546	2,203	2,806	3,507	16,090	1,351,196,648
65 and over	1,254	1,601	1,567	1,257	1,374	1,819	8,872	743,439,330
Total	61,882	39,438	26,296	17,693	18,128	15,518	178,955	\$13,718,513,822

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. However, this does not result in double counting of liabilities.

Distribution of Average Annual Salaries by Age and Years of Service

State Miscellaneous – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15 - 24	\$42,627	\$48,596	\$0	\$0	\$0	\$0	\$42,640
25 - 29	51,640	61,404	79,175	0	0	0	52,788
30 - 34	58,582	69,319	77,584	67,622	107,988	0	63,078
35 - 39	64,216	76,006	83,990	87,300	95,527	66,486	72,916
40 - 44	64,931	78,959	87,251	87,292	93,917	109,703	78,154
45 - 49	64,631	77,668	87,847	90,833	96,720	102,512	82,283
50 - 54	64,264	75,864	84,765	89,266	95,959	101,758	84,715
55 - 59	62,626	74,301	81,500	87,511	94,656	103,211	85,604
60 - 64	63,042	72,750	79,149	84,715	93,951	101,553	83,977
65 and over	57,462	71,488	80,031	87,429	95,525	104,658	83,796
Average	\$59,675	\$74,391	\$84,101	\$88,141	\$95,320	\$102,647	\$76,659

Appendix C – Participant Data

Active Members (continued)

Distribution of Active Members by Age and Years of Service

State Industrial – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	210	0	0	0	0	0	210	\$8,127,212
25 - 29	839	134	0	0	0	0	973	44,298,977
30 - 34	902	449	115	1	0	0	1,467	83,605,681
35 - 39	720	518	384	39	2	0	1,663	106,742,863
40 - 44	496	373	438	140	61	0	1,508	105,004,930
45 - 49	445	353	388	191	139	46	1,562	115,156,053
50 - 54	348	322	389	202	213	163	1,637	121,586,455
55 - 59	258	273	326	182	164	156	1,359	98,028,926
60 - 64	139	177	204	101	111	72	804	55,982,884
65 and over	41	90	96	40	45	30	342	25,043,387
Total	4,398	2,689	2,340	896	735	467	11,525	\$763,577,368

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. However, this does not result in double counting of liabilities.

Distribution of Average Annual Salaries by Age and Years of Service

State Industrial – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15 - 24	\$38,701	\$0	\$0	\$0	\$0	\$0	\$38,701
25 - 29	44,129	54,289	0	0	0	0	45,528
30 - 34	51,778	63,498	72,250	82,568	0	0	56,991
35 - 39	57,848	67,742	69,993	75,061	98,566	0	64,187
40 - 44	60,758	74,572	73,588	72,434	76,742	0	69,632
45 - 49	69,905	74,672	73,456	77,580	76,168	82,243	73,723
50 - 54	71,977	76,522	72,852	74,362	75,756	76,084	74,274
55 - 59	67,230	76,174	71,908	68,589	72,344	77,554	72,133
60 - 64	69,105	70,495	69,149	68,964	68,970	71,837	69,630
65 and over	64,594	74,603	74,842	74,399	68,415	81,377	73,226
Average	\$56,707	\$70,538	\$72,218	\$73,007	\$73,742	\$76,867	\$66,254

Appendix C – Participant Data

Active Members (continued)

Distribution of Active Members by Age and Years of Service

State Safety – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	388	3	0	0	0	0	391	\$17,107,126
25 - 29	1,449	192	1	0	0	0	1,642	95,791,806
30 - 34	2,041	977	133	2	0	0	3,153	221,750,117
35 - 39	1,880	1,311	561	98	0	0	3,850	301,125,035
40 - 44	1,431	1,190	941	340	46	0	3,948	325,009,448
45 - 49	1,278	1,058	1,032	589	164	8	4,129	377,378,438
50 - 54	1,075	1,011	969	665	315	108	4,143	380,059,316
55 - 59	833	849	814	543	251	79	3,369	302,454,888
60 - 64	451	612	663	432	218	75	2,451	229,433,183
65 and over	162	319	401	255	162	76	1,375	155,471,003
Total	10,988	7,522	5,515	2,924	1,156	346	28,451	\$2,405,580,360

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. However, this does not result in double counting of liabilities.

Distribution of Average Annual Salaries by Age and Years of Service

State Safety – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15 - 24	\$43,660	\$55,627	\$0	\$0	\$0	\$0	\$43,752
25 - 29	57,591	63,975	59,174	0	0	0	58,338
30 - 34	67,302	76,009	74,506	108,285	0	0	70,330
35 - 39	72,822	83,643	84,302	74,190	0	0	78,214
40 - 44	73,021	84,108	92,474	87,789	77,431	0	82,323
45 - 49	76,038	88,375	109,640	97,019	95,532	92,667	91,397
50 - 54	76,502	86,726	106,550	97,683	98,809	100,080	91,735
55 - 59	73,245	88,675	102,125	93,132	100,049	92,965	89,776
60 - 64	77,890	87,822	105,432	94,446	99,732	108,190	93,608
65 and over	98,781	97,636	128,372	114,292	118,370	112,168	113,070
Average	\$70,141	\$84,793	\$102,481	\$95,744	\$100,678	\$102,697	\$84,552

Appendix C – Participant Data

Active Members (continued)

Distribution of Active Members by Age and Years of Service

State Peace Officers and Firefighters – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	1,621	0	0	0	0	0	1,621	\$76,973,755
25 - 29	3,956	1,054	0	0	0	0	5,010	329,727,735
30 - 34	2,976	2,990	283	2	0	0	6,251	487,377,041
35 - 39	1,581	1,917	2,540	620	3	0	6,661	598,243,969
40 - 44	702	1,025	2,018	2,375	678	3	6,801	664,926,264
45 - 49	380	544	1,416	1,958	2,169	645	7,112	741,970,616
50 - 54	228	306	873	1,149	1,190	788	4,534	478,240,340
55 - 59	115	151	440	619	467	377	2,169	223,156,827
60 - 64	44	66	152	245	190	160	857	86,515,594
65 and over	8	18	49	65	34	52	226	22,564,872
Total	11,611	8,071	7,771	7,033	4,731	2,025	41,242	\$3,709,697,013

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. However, this does not result in double counting of liabilities.

Distribution of Average Annual Salaries by Age and Years of Service

State Peace Officers and Firefighters – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15 - 24	\$47,485	\$0	\$0	\$0	\$0	\$0	\$47,485
25 - 29	60,849	84,450	0	0	0	0	65,814
30 - 34	66,635	87,250	98,888	103,990	0	0	77,968
35 - 39	69,732	88,751	99,905	102,822	117,915	0	89,813
40 - 44	72,621	89,676	98,715	103,630	112,565	127,183	97,769
45 - 49	77,944	90,890	100,025	102,642	112,258	119,087	104,327
50 - 54	84,524	96,486	100,535	102,189	111,119	116,790	105,479
55 - 59	91,655	97,862	99,397	100,719	107,339	110,430	102,885
60 - 64	83,058	94,502	99,908	99,300	105,013	107,230	100,952
65 and over	67,586	100,099	101,452	95,427	99,794	108,759	99,845
Average	\$63,806	\$88,431	\$99,633	\$102,565	\$111,153	\$115,391	\$89,949

Appendix C – Participant Data

Active Members (continued)

Distribution of Active Members by Age and Years of Service

California Highway Patrol – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	47	0	0	0	0	0	47	\$4,774,698
25 - 29	458	97	0	0	0	0	555	64,002,497
30 - 34	409	315	136	0	0	0	860	104,368,156
35 - 39	204	288	712	105	0	0	1,309	167,378,616
40 - 44	45	140	550	402	258	0	1,395	186,800,470
45 - 49	1	35	291	375	610	274	1,586	225,084,100
50 - 54	0	1	24	154	349	257	785	115,922,407
55 - 59	0	1	1	9	25	89	125	18,853,739
60 - 64	0	0	0	0	0	0	0	0
65 and over	0	0	0	0	0	0	0	0
Total	1,164	877	1,714	1,045	1,242	620	6,662	\$887,184,683

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. However, this does not result in double counting of liabilities.

Distribution of Average Annual Salaries by Age and Years of Service

California Highway Patrol – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15 - 24	\$101,589	\$0	\$0	\$0	\$0	\$0	\$101,589
25 - 29	112,993	126,307	0	0	0	0	115,320
30 - 34	114,461	126,762	129,586	0	0	0	121,358
35 - 39	115,463	127,111	130,217	138,108	0	0	127,868
40 - 44	116,180	128,198	129,938	136,697	144,211	0	133,907
45 - 49	72,407	125,590	130,168	135,485	145,284	158,053	141,919
50 - 54	0	125,163	133,472	135,288	144,136	161,308	147,672
55 - 59	0	89,904	137,058	139,447	145,605	154,288	150,830
60 - 64	0	0	0	0	0	0	0
65 and over	0	0	0	0	0	0	0
Average	\$113,569	\$126,965	\$130,119	\$136,220	\$144,745	\$158,862	\$133,171

Appendix C – Participant Data

Transferred and Terminated Participants

Distribution by Age and Years of Service – Transfers to Other CalPERS Plans

State Miscellaneous – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	160	0	0	0	0	0	160	\$58,539
25 - 29	1,467	20	0	0	0	0	1,487	73,385
30 - 34	2,349	266	10	0	0	0	2,625	76,325
35 - 39	2,408	587	158	16	1	0	3,170	79,209
40 - 44	2,718	734	327	126	11	1	3,917	85,532
45 - 49	3,004	937	375	255	72	9	4,652	90,477
50 - 54	2,951	1,281	562	342	204	97	5,437	89,516
55 - 59	2,196	888	548	311	177	122	4,242	85,728
60 - 64	1,421	464	266	187	119	99	2,556	83,023
65 and over	663	204	88	58	34	38	1,085	83,185
Total	19,337	5,381	2,334	1,295	618	366	29,331	\$84,507

Distribution by Age and Years of Service – Terminated Participants with Funds on Deposit

State Miscellaneous – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	695	0	0	0	0	0	695	\$33,552
25 - 29	4,310	75	0	0	0	0	4,385	38,752
30 - 34	7,020	641	28	0	0	0	7,689	43,079
35 - 39	8,144	1,330	234	19	1	0	9,728	46,349
40 - 44	8,048	1,613	497	129	11	1	10,299	48,898
45 - 49	6,459	1,669	665	252	66	6	9,117	52,832
50 - 54	5,656	1,726	838	280	137	48	8,685	53,930
55 - 59	4,888	1,347	687	222	73	38	7,255	50,376
60 - 64	4,064	857	458	165	48	26	5,618	46,956
65 and over	3,852	517	281	90	36	23	4,799	43,171
Total	53,136	9,775	3,688	1,157	372	142	68,270	\$47,832

Appendix C – Participant Data

Transferred and Terminated Participants (continued)

Distribution by Age and Years of Service – Transfers to Other CalPERS Plans

State Industrial – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	27	0	0	0	0	0	27	\$39,673
25 - 29	246	4	0	0	0	0	250	48,467
30 - 34	671	73	7	0	0	0	751	59,914
35 - 39	785	178	38	3	0	0	1,004	72,586
40 - 44	779	223	63	18	2	0	1,085	79,553
45 - 49	833	241	98	33	11	2	1,218	84,029
50 - 54	982	290	153	44	26	16	1,511	84,196
55 - 59	699	206	96	24	23	8	1,056	83,873
60 - 64	417	105	39	13	10	0	584	81,387
65 and over	169	31	17	4	3	0	224	81,274
Total	5,608	1,351	511	139	75	26	7,710	\$77,983

Distribution by Age and Years of Service – Terminated Participants with Funds on Deposit

State Industrial – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	38	0	0	0	0	0	38	\$33,648
25 - 29	222	6	0	0	0	0	228	38,385
30 - 34	361	35	1	0	0	0	397	40,798
35 - 39	388	67	23	1	0	0	479	45,037
40 - 44	394	79	25	8	0	0	506	46,258
45 - 49	383	92	30	24	5	1	535	45,554
50 - 54	465	111	38	16	7	6	643	45,825
55 - 59	360	71	23	5	4	1	464	40,982
60 - 64	293	50	9	1	0	0	353	38,324
65 and over	343	52	4	1	0	0	400	36,645
Total	3,247	563	153	56	16	8	4,043	\$42,603

Appendix C – Participant Data

Transferred and Terminated Participants (continued)

Distribution by Age and Years of Service – Transfers to Other CalPERS Plans

State Safety – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	38	0	0	0	0	0	38	\$47,388
25 - 29	287	5	0	0	0	0	292	56,215
30 - 34	487	63	5	0	0	0	555	69,413
35 - 39	618	155	36	3	0	0	812	79,166
40 - 44	624	176	53	6	1	0	860	85,078
45 - 49	622	174	84	16	3	0	899	89,924
50 - 54	577	173	82	32	10	0	874	93,459
55 - 59	427	133	61	27	4	0	652	93,818
60 - 64	257	85	36	10	3	4	395	89,525
65 and over	111	38	11	3	5	0	168	88,487
Total	4,048	1,002	368	97	26	4	5,545	\$84,421

Distribution by Age and Years of Service – Terminated Participants with Funds on Deposit

State Safety – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	93	0	0	0	0	0	93	\$35,434
25 - 29	488	8	0	0	0	0	496	47,085
30 - 34	860	96	6	0	0	0	962	56,404
35 - 39	1,023	211	34	3	0	0	1,271	63,338
40 - 44	977	215	61	7	0	0	1,260	67,062
45 - 49	992	226	71	21	3	0	1,313	73,443
50 - 54	945	218	71	20	4	0	1,258	70,351
55 - 59	752	116	28	6	1	1	904	64,476
60 - 64	676	67	17	2	0	0	762	61,721
65 and over	607	32	10	2	0	1	652	64,698
Total	7,413	1,189	298	61	8	2	8,971	\$64,468

Appendix C – Participant Data

Transferred and Terminated Participants (continued)

Distribution by Age and Years of Service – Transfers to Other CalPERS Plans

State Peace Officers and Firefighters – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	65	0	0	0	0	0	65	\$51,211
25 - 29	399	4	0	0	0	0	403	72,129
30 - 34	739	68	2	0	0	0	809	82,353
35 - 39	786	153	30	0	0	0	969	92,007
40 - 44	843	105	43	10	1	0	1,002	107,372
45 - 49	695	110	41	14	4	0	864	112,134
50 - 54	539	116	24	8	1	1	689	108,854
55 - 59	249	56	20	4	1	2	332	99,756
60 - 64	77	23	6	2	0	1	109	91,682
65 and over	32	7	1	3	0	0	43	82,992
Total	4,424	642	167	41	7	4	5,285	\$97,318

Distribution by Age and Years of Service – Terminated Participants with Funds on Deposit

State Peace Officers and Firefighters – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	279	0	0	0	0	0	279	\$41,575
25 - 29	732	18	0	0	0	0	750	45,692
30 - 34	918	70	0	0	0	0	988	44,802
35 - 39	1,078	164	53	3	0	0	1,298	45,671
40 - 44	1,011	207	89	40	10	0	1,357	49,779
45 - 49	908	197	118	66	36	3	1,328	52,154
50 - 54	774	128	44	13	7	2	968	42,740
55 - 59	502	80	26	6	3	4	621	40,048
60 - 64	257	33	10	4	1	1	306	38,149
65 and over	161	18	6	3	1	1	190	39,460
Total	6,620	915	346	135	58	11	8,085	\$45,966

Appendix C – Participant Data

Transferred and Terminated Participants (continued)

Distribution by Age and Years of Service – Transfers to Other CalPERS Plans

California Highway Patrol – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	0	0	0	0	0	0	0	\$0
25 - 29	7	0	0	0	0	0	7	74,137
30 - 34	20	4	0	0	0	0	24	89,065
35 - 39	21	7	1	0	0	0	29	96,401
40 - 44	28	6	4	2	0	0	40	112,588
45 - 49	51	16	10	1	2	0	80	120,228
50 - 54	32	4	3	2	0	0	41	109,219
55 - 59	18	3	0	1	0	0	22	95,737
60 - 64	3	0	1	1	0	0	5	107,025
65 and over	2	0	0	0	0	0	2	97,107
Total	182	40	19	7	2	0	250	\$107,550

Distribution by Age and Years of Service – Terminated Participants with Funds on Deposit

California Highway Patrol – As of June 30, 2021

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20-24	25+		
15 - 24	0	0	0	0	0	0	0	\$0
25 - 29	18	4	0	0	0	0	22	80,403
30 - 34	35	12	0	0	0	0	47	88,750
35 - 39	32	24	20	1	0	0	77	97,786
40 - 44	42	36	23	17	2	0	120	101,214
45 - 49	64	54	37	15	14	3	187	97,942
50 - 54	42	16	6	0	1	0	65	72,077
55 - 59	17	8	1	0	0	1	27	70,013
60 - 64	7	4	2	0	0	0	13	56,371
65 and over	4	0	0	0	0	0	4	39,516
Total	261	158	89	33	17	4	562	\$91,453

Appendix C – Participant Data

Retired Members and Beneficiaries

Number of Retirees and Beneficiaries - by Age and Retirement Type

State Miscellaneous – As of June 30, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	1	0	11	2	239	253
30-34	0	5	3	0	0	154	162
35-39	0	23	15	3	1	225	267
40-44	1	84	30	8	4	315	442
45-49	0	213	46	31	4	336	630
50-54	1,396	610	144	72	8	541	2,771
55-59	9,682	1,211	337	165	14	898	12,307
60-64	23,617	2,033	509	290	15	1,578	28,042
65-69	36,152	2,279	485	344	12	2,554	41,826
70-74	37,481	2,116	452	383	5	3,782	44,219
75-79	24,311	1,343	217	269	7	4,057	30,204
80-84	15,416	799	154	221	6	4,234	20,830
85 and Over	15,526	552	88	270	6	7,998	24,440
Total	163,582	11,269	2,480	2,067	84	26,911	206,393

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 – Annual Amounts Including PPPA Payments – As of June 30, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	\$0	\$4,631	\$0	\$97,252	\$577	\$2,220,426	\$2,322,886
30-34	0	37,554	436	0	0	1,484,783	1,522,773
35-39	0	224,660	7,578	68,955	168	2,175,279	2,476,640
40-44	20,712	1,068,806	42,048	152,995	28,538	3,853,363	5,166,461
45-49	0	3,268,140	116,385	731,636	32,280	4,777,092	8,925,534
50-54	18,412,426	9,881,710	487,066	1,561,716	28,188	8,838,097	39,209,203
55-59	306,034,755	20,092,401	1,550,987	4,422,997	144,331	14,992,602	347,238,073
60-64	881,709,339	35,463,219	2,883,398	8,099,192	264,627	30,957,925	959,377,699
65-69	1,345,977,357	41,247,527	2,222,158	9,423,800	102,219	59,409,133	1,458,382,193
70-74	1,377,396,636	37,582,032	2,387,942	11,592,698	82,158	98,494,267	1,527,535,733
75-79	912,663,620	24,979,143	1,280,482	7,877,787	24,029	117,859,817	1,064,684,878
80-84	585,146,512	14,884,240	884,016	6,822,226	12,630	132,629,264	740,378,888
85 and Over	538,528,317	8,818,158	446,721	7,808,916	6,723	237,511,334	793,120,168
Total	\$5,965,889,674	\$197,552,220	\$12,309,217	\$58,660,170	\$726,468	\$715,203,382	\$6,950,341,130

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

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

State Miscellaneous – As of June 30, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	42,272	1,279	298	321	12	9,039	53,221
5 - 9	36,361	1,779	341	366	5	6,443	45,295
10 - 14	31,635	1,422	274	363	19	4,362	38,075
15 - 19	24,732	1,808	423	288	6	3,059	30,316
20 - 24	14,494	2,225	413	259	10	1,799	19,200
25 - 29	8,697	1,463	370	162	10	1,176	11,878
30 and over	5,391	1,293	361	308	22	1,033	8,408
Total	163,582	11,269	2,480	2,067	84	26,911	206,393

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 – Annual Amounts Including PPPA Payments – As of June 30, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	\$1,650,101,379	\$21,016,256	\$1,457,811	\$9,259,698	\$221,455	\$266,538,281	\$1,948,594,880
5 - 9	1,284,921,274	30,225,231	2,048,142	10,147,482	65,513	177,373,438	1,504,781,080
10 - 14	1,210,050,756	24,981,207	1,801,643	10,868,244	256,656	114,670,486	1,362,628,992
15 - 19	937,219,141	34,885,829	2,707,124	8,069,776	92,461	74,069,456	1,057,043,786
20 - 24	504,213,938	41,833,849	2,428,914	7,644,164	52,717	42,108,962	598,282,544
25 - 29	272,682,882	27,130,457	1,385,583	4,911,545	22,428	24,229,112	330,362,007
30 and over	106,700,305	17,479,390	480,001	7,759,260	15,238	16,213,647	148,647,841
Total	\$5,965,889,674	\$197,552,220	\$12,309,217	\$58,660,170	\$726,468	\$715,203,382	\$6,950,341,130

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

Number of Retirees and Beneficiaries - by Age and Retirement Type

State Industrial – As of June 30, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	0	0	16	16
30-34	0	1	1	0	0	17	19
35-39	0	7	1	0	0	13	21
40-44	0	15	9	0	0	34	58
45-49	0	46	17	7	0	26	96
50-54	255	124	48	3	1	33	464
55-59	1,412	238	87	14	0	72	1,823
60-64	2,636	283	110	22	2	117	3,170
65-69	3,262	283	116	18	1	158	3,838
70-74	2,762	238	87	17	0	228	3,332
75-79	1,613	126	42	16	1	198	1,996
80-84	760	73	21	12	2	166	1,034
85 and Over	598	33	18	7	3	262	921
Total	13,298	1,467	557	116	10	1,340	16,788

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, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	\$0	\$0	\$0	\$0	\$0	\$67,018	\$67,018
30-34	0	1,685	38	0	0	80,153	81,875
35-39	0	58,014	360	0	0	51,278	109,652
40-44	0	127,959	4,845	0	0	217,423	350,228
45-49	0	354,928	162,665	73,704	0	308,273	899,570
50-54	1,874,455	1,321,939	334,635	12,443	6,269	270,591	3,820,331
55-59	21,412,942	2,741,850	465,848	207,815	0	431,025	25,259,480
60-64	42,673,733	2,913,623	722,122	221,177	1,696	907,315	47,439,667
65-69	49,297,755	2,900,667	902,117	146,126	71	1,450,686	54,697,422
70-74	41,283,529	2,463,119	673,606	106,060	0	2,733,323	47,259,637
75-79	25,749,934	1,294,395	361,838	284,648	20,361	2,206,803	29,917,980
80-84	12,724,818	853,529	96,575	200,358	25,438	2,391,274	16,291,993
85 and Over	10,825,351	516,373	143,153	318,781	83,637	4,379,873	16,267,168
Total	\$205,842,518	\$15,548,082	\$3,867,802	\$1,571,112	\$137,472	\$15,495,035	\$242,462,020

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

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

State Industrial – As of June 30, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	4,133	229	92	32	0	489	4,975
5 - 9	3,355	340	112	21	3	342	4,173
10 - 14	2,772	199	71	17	1	228	3,288
15 - 19	1,727	273	115	19	0	136	2,270
20 - 24	801	240	75	14	0	66	1,196
25 - 29	344	116	57	7	0	53	577
30 and over	166	70	35	6	6	26	309
Total	13,298	1,467	557	116	10	1,340	16,788

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, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	\$70,506,511	\$2,700,954	\$685,271	\$314,346	\$0	\$6,295,054	\$80,502,136
5 - 9	49,746,414	3,538,113	778,908	315,891	6,818	4,132,310	58,518,454
10 - 14	41,905,611	2,121,941	690,435	292,512	1,218	2,017,421	47,029,140
15 - 19	26,408,377	2,985,245	752,732	325,283	0	1,663,321	32,134,958
20 - 24	10,986,438	2,413,756	480,498	104,451	0	738,235	14,723,379
25 - 29	4,416,509	1,135,439	333,551	90,101	0	393,798	6,369,398
30 and over	1,872,657	652,633	146,406	128,527	129,436	254,897	3,184,555
Total	\$205,842,518	\$15,548,082	\$3,867,802	\$1,571,112	\$137,472	\$15,495,035	\$242,462,020

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

Number of Retirees and Beneficiaries - by Age and Retirement Type

State Safety – As of June 30, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	1	3	1	39	44
30-34	0	0	17	0	0	16	33
35-39	0	6	58	1	1	32	98
40-44	0	16	108	4	1	37	166
45-49	0	24	169	1	1	44	239
50-54	340	63	301	14	2	61	781
55-59	1,818	107	529	27	4	129	2,614
60-64	3,716	147	777	59	11	290	5,000
65-69	4,914	201	893	65	19	417	6,509
70-74	4,594	159	904	67	12	579	6,315
75-79	2,589	90	488	29	8	567	3,771
80-84	1,276	34	235	24	9	419	1,997
85 and Over	715	22	166	16	15	667	1,601
Total	19,962	869	4,646	310	84	3,297	29,168

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, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	\$0	\$0	\$29,307	\$35,643	\$28,732	\$329,878	\$423,559
30-34	0	0	555,772	0	0	169,268	725,040
35-39	0	49,328	1,999,646	36,867	34,644	347,382	2,467,867
40-44	0	317,560	3,411,090	149,686	20,364	395,048	4,293,749
45-49	0	334,842	5,577,910	27,681	31,430	537,466	6,509,329
50-54	5,477,733	844,090	10,173,926	419,352	81,979	650,442	17,647,521
55-59	48,579,282	1,315,467	16,890,934	705,105	150,533	2,094,527	69,735,848
60-64	97,440,021	2,302,581	23,884,963	1,085,704	513,504	4,979,194	130,205,967
65-69	128,993,853	3,073,909	28,099,181	1,263,802	499,936	8,127,280	170,057,963
70-74	119,390,193	2,422,308	26,838,315	1,267,348	392,089	11,399,368	161,709,621
75-79	64,553,300	1,412,269	14,704,826	696,048	287,142	10,869,497	92,523,083
80-84	30,680,051	631,878	7,192,929	448,749	316,697	7,177,051	46,447,355
85 and Over	15,215,644	427,037	5,264,226	334,526	438,652	11,842,980	33,523,065
Total	\$510,330,078	\$13,131,269	\$144,623,026	\$6,470,512	\$2,795,702	\$58,919,380	\$736,269,967

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

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

State Safety – As of June 30, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	6,273	218	891	64	7	1,221	8,674
5 - 9	5,220	246	1,011	62	3	886	7,428
10 - 14	4,385	125	619	63	10	492	5,694
15 - 19	2,504	107	703	68	7	309	3,698
20 - 24	1,025	90	484	30	14	189	1,832
25 - 29	369	49	271	6	5	111	811
30 and over	186	34	667	17	38	89	1,031
Total	19,962	869	4,646	310	84	3,297	29,168

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, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	\$191,363,028	\$4,275,305	\$33,452,530	\$1,832,175	\$345,423	\$23,962,317	\$255,230,777
5 - 9	135,726,988	4,377,233	35,766,798	1,435,534	195,252	15,745,023	193,246,828
10 - 14	113,913,781	1,953,057	21,026,491	1,148,828	466,306	8,420,561	146,929,025
15 - 19	45,963,276	1,058,210	19,750,934	1,159,419	273,081	5,379,685	73,584,605
20 - 24	15,334,929	809,781	12,727,683	512,610	352,343	2,513,204	32,250,550
25 - 29	4,844,700	397,359	6,567,181	95,837	189,531	1,536,125	13,630,733
30 and over	3,183,376	260,325	15,331,409	286,108	973,765	1,362,465	21,397,449
Total	\$510,330,078	\$13,131,269	\$144,623,026	\$6,470,512	\$2,795,702	\$58,919,380	\$736,269,967

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

Number of Retirees and Beneficiaries - by Age and Retirement Type

State Peace Officers and Firefighters – As of June 30, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	4	1	7	48	60
30-34	0	1	28	1	2	32	64
35-39	0	5	137	2	10	34	188
40-44	0	18	385	4	7	57	471
45-49	0	27	655	11	24	58	775
50-54	3,325	67	1,327	33	25	114	4,891
55-59	6,116	95	1,986	39	32	250	8,518
60-64	6,519	115	2,001	51	27	415	9,128
65-69	5,638	88	1,636	48	21	610	8,041
70-74	4,693	85	1,367	50	22	726	6,943
75-79	2,387	33	680	31	12	626	3,769
80-84	1,178	16	259	7	8	465	1,933
85 and Over	601	7	117	10	6	415	1,156
Total	30,457	557	10,582	288	203	3,850	45,937

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, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	\$0	\$0	\$145,392	\$27,542	\$105,785	\$512,156	\$790,876
30-34	0	14,642	856,304	10,745	61,538	552,406	1,495,636
35-39	0	55,193	5,109,519	120,047	394,924	653,138	6,332,821
40-44	0	391,933	14,857,891	185,346	319,912	1,385,601	17,140,683
45-49	0	648,790	26,073,509	562,507	1,232,680	1,768,908	30,286,394
50-54	232,669,000	2,098,143	61,343,914	2,053,931	1,236,472	3,641,191	303,042,652
55-59	411,439,145	2,583,120	94,673,968	1,902,953	1,404,576	10,492,897	522,496,659
60-64	431,476,578	3,312,529	91,705,377	2,609,201	1,231,630	17,926,933	548,262,248
65-69	359,289,474	2,450,295	77,189,904	2,100,837	818,327	26,169,364	468,018,201
70-74	288,919,404	2,713,118	65,571,845	2,238,072	897,829	33,147,646	393,487,913
75-79	135,262,318	1,005,029	31,895,167	1,540,412	489,098	27,810,189	198,002,213
80-84	60,970,402	500,015	11,845,208	330,687	300,459	19,322,514	93,269,284
85 and Over	28,208,846	207,577	4,872,757	271,628	209,110	16,354,427	50,124,344
Total	\$1,948,235,166	\$15,980,384	\$486,140,756	\$13,953,909	\$8,702,339	\$159,737,370	\$2,632,749,924

Appendix C – Participant Data

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, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	8,593	107	1,792	56	46	1,560	12,154
5 - 9	7,899	123	2,125	60	21	989	11,217
10 - 14	7,259	85	1,290	49	36	594	9,313
15 - 19	3,785	80	1,895	51	41	369	6,221
20 - 24	1,794	98	1,574	40	25	186	3,717
25 - 29	816	45	1,113	21	9	105	2,109
30 and over	311	19	793	11	25	47	1,206
Total	30,457	557	10,582	288	203	3,850	45,937

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, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	\$554,421,479	\$4,378,999	\$97,675,923	\$3,202,425	\$2,088,934	\$69,734,912	\$731,502,672
5 - 9	497,941,802	3,550,473	103,295,590	2,995,397	1,018,837	42,990,882	651,792,981
10 - 14	507,493,584	2,781,738	68,596,327	2,508,858	1,797,231	22,831,840	606,009,579
15 - 19	236,159,297	1,831,961	85,725,490	2,447,659	1,704,603	13,441,072	341,310,082
20 - 24	96,710,073	2,209,954	62,982,022	1,479,434	904,305	6,350,342	170,636,129
25 - 29	41,755,856	881,265	43,482,158	986,789	396,221	3,063,285	90,565,574
30 and over	13,753,075	345,995	24,383,246	333,348	792,207	1,325,036	40,932,907
Total	\$1,948,235,166	\$15,980,384	\$486,140,756	\$13,953,909	\$8,702,339	\$159,737,370	\$2,632,749,924

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

Number of Retirees and Beneficiaries - by Age and Retirement Type

California Highway Patrol – As of June 30, 2021

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	12	17
30-34	0	0	4	0	1	2	7
35-39	0	1	20	0	9	8	38
40-44	0	3	43	0	4	4	54
45-49	0	2	78	0	11	10	101
50-54	624	1	205	6	21	14	871
55-59	979	3	347	2	18	46	1,395
60-64	980	7	459	7	15	79	1,547
65-69	653	5	396	5	6	122	1,187
70-74	484	5	499	9	14	228	1,239
75-79	515	4	674	5	9	319	1,526
80-84	280	3	420	2	17	297	1,019
85 and Over	177	3	247	2	12	344	785
Total	4,692	37	3,392	38	142	1,485	9,786

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, 2021

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	\$0	\$0	\$0	\$0	\$247,653	\$243,512	\$491,165
30-34	0	0	240,787	0	64,971	21,742	327,501
35-39	0	40,655	1,183,826	0	683,699	116,927	2,025,107
40-44	0	84,068	2,354,263	0	361,715	79,468	2,879,514
45-49	0	44,899	4,181,943	0	791,630	89,578	5,108,050
50-54	63,367,482	135,818	16,171,687	458,946	1,571,332	721,367	82,426,632
55-59	103,735,956	53,869	27,231,132	191,361	1,166,599	3,136,038	135,514,956
60-64	100,874,776	128,623	33,949,703	594,544	945,504	4,595,260	141,088,410
65-69	62,348,007	56,253	28,996,662	401,746	276,811	5,991,557	98,071,038
70-74	36,599,460	309,784	36,313,302	615,061	420,615	9,616,518	83,874,740
75-79	32,434,380	188,205	40,282,215	265,772	257,237	12,768,983	86,196,792
80-84	14,406,546	43,608	20,721,941	71,958	524,581	10,960,243	46,728,877
85 and Over	8,077,966	108,125	10,899,712	41,978	343,031	10,725,564	30,196,376
Total	\$421,844,574	\$1,193,908	\$222,527,173	\$2,641,366	\$7,655,376	\$59,066,758	\$714,929,156

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

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

California Highway Patrol – As of June 30, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	1,250	4	330	3	37	502	2,126
5 - 9	933	5	283	4	14	325	1,564
10 - 14	1,007	1	347	5	20	236	1,616
15 - 19	584	5	587	7	10	158	1,351
20 - 24	529	6	481	9	6	112	1,143
25 - 29	237	8	497	4	5	62	813
30 and over	152	8	867	6	50	90	1,173
Total	4,692	37	3,392	38	142	1,485	9,786

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, 2021

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	\$131,494,702	\$281,367	\$30,792,300	\$309,321	\$2,793,631	\$23,189,201	\$188,860,522
5 - 9	92,823,562	61,721	24,954,189	345,327	952,045	14,247,471	133,384,315
10 - 14	101,306,104	172,182	33,393,837	382,586	1,331,006	9,430,282	146,015,997
15 - 19	45,031,662	250,754	49,802,148	629,955	614,859	5,238,934	101,568,312
20 - 24	32,775,657	163,656	31,240,986	580,920	301,062	3,372,140	68,434,421
25 - 29	12,040,455	112,722	24,377,385	222,926	215,351	1,504,999	38,473,838
30 and over	6,372,433	151,506	27,966,329	170,330	1,447,423	2,083,731	38,191,752
Total	\$421,844,574	\$1,193,908	\$222,527,173	\$2,641,366	\$7,655,376	\$59,066,758	\$714,929,156

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

Number Counts and Benefits - by Year of Retirement – As of June 30, 2021

State Miscellaneous

Year Retired	Total Retirement	Total Benefits	Average Benefits
2021 ¹	3,871	\$129,484,431	\$33,450
2020	11,562	444,342,478	38,431
2019	10,708	393,093,800	36,710
2018	10,633	380,034,886	35,741
2017	10,051	363,850,721	36,200
2016	9,663	332,589,113	34,419
2015	9,593	326,984,895	34,086
2014	9,549	321,666,208	33,686
2013	8,293	262,861,555	31,697
2012	8,970	302,131,465	33,682
2011	8,857	295,420,028	33,354
2010	9,418	346,761,419	36,819
2009	8,099	311,434,782	38,453
2008	6,906	250,154,915	36,223
2007	6,524	224,215,514	34,368
2006	6,145	195,070,805	31,745
2005	6,843	235,615,340	34,432
2004	7,654	280,564,722	36,656
2003	5,366	178,739,576	33,310
2002	5,125	176,565,412	34,452
2001	5,062	192,707,252	38,069
2000	6,247	238,411,796	38,164
1999	2,578	60,638,632	23,522
1998	3,403	90,716,449	26,658
1997	3,224	85,603,257	26,552
1996	2,902	80,041,682	27,582
1995	2,468	70,196,286	28,443
1994	2,339	62,826,549	26,860
1993	1,719	36,945,395	21,492
1992 and Earlier	12,621	280,671,767	22,237
Total	206,393	\$6,950,341,130	\$33,675

State Industrial

Year Retired	Total Retirement	Total Benefits	Average Benefits
2021 ¹	388	\$6,238,049	\$16,077
2020	1,085	19,691,723	18,149
2019	1,037	16,497,029	15,908
2018	947	14,627,215	15,446
2017	900	13,556,203	15,062
2016	921	13,683,993	14,858
2015	906	12,891,104	14,229
2014	847	11,281,558	13,319
2013	756	10,018,876	13,252
2012	874	13,148,283	15,044
2011	776	10,758,000	13,863
2010	899	13,742,764	15,287
2009	751	10,854,567	14,453
2008	583	8,302,183	14,240
2007	475	6,771,127	14,255
2006	503	6,609,251	13,140
2005	490	7,555,080	15,419
2004	573	8,468,176	14,779
2003	397	4,906,934	12,360
2002	376	5,051,276	13,434
2001	349	5,210,332	14,929
2000	429	6,460,336	15,059
1999	155	1,564,737	10,095
1998	217	2,137,610	9,851
1997	187	2,072,432	11,083
1996	146	1,430,830	9,800
1995	142	1,436,700	10,118
1994	114	1,067,558	9,365
1993	91	848,263	9,322
1992 and Earlier	474	5,579,830	11,772
Total	16,788	\$242,462,019	\$14,443

¹ The numbers for 2021 represent 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 C – Participant Data

Retired Members and Beneficiaries (continued)

Number Counts and Benefits - by Year of Retirement – As of June 30, 2021 (continued)

State Safety

Year Retired	Total Retirement	Total Benefits	Average Benefits
2021 ¹	733	\$21,685,887	\$29,585
2020	2,020	61,994,772	30,690
2019	1,695	49,358,688	29,120
2018	1,697	49,232,863	29,012
2017	1,550	43,871,425	28,304
2016	1,563	44,096,175	28,213
2015	1,523	40,818,417	26,801
2014	1,527	38,624,551	25,294
2013	1,403	36,707,353	26,163
2012	1,530	39,090,035	25,549
2011	1,410	37,603,557	26,669
2010	1,521	45,218,693	29,730
2009	1,261	34,337,274	27,230
2008	975	24,000,909	24,616
2007	903	19,923,088	22,063
2006	842	15,872,631	18,851
2005	870	17,476,336	20,088
2004	872	17,955,733	20,591
2003	647	12,709,032	19,643
2002	597	11,432,616	19,150
2001	576	11,221,679	19,482
2000	623	12,317,364	19,771
1999	303	5,060,190	16,700
1998	315	4,587,428	14,563
1997	260	4,437,546	17,067
1996	209	3,286,885	15,727
1995	169	2,470,908	14,621
1994	179	2,874,443	16,058
1993	113	2,070,499	18,323
1992 and Earlier	1,282	25,932,989	20,229
Total	29,168	\$736,269,966	\$25,242

State Peace Officers and Firefighters

Year Retired	Total Retirement	Total Benefits	Average Benefits
2021 ¹	977	\$56,565,971	\$57,898
2020	3,254	212,306,339	65,245
2019	2,219	127,769,298	57,580
2018	2,313	136,919,901	59,196
2017	2,162	126,292,800	58,415
2016	2,079	118,219,875	56,864
2015	2,286	136,453,602	59,691
2014	2,231	126,774,700	56,824
2013	2,128	118,502,697	55,687
2012	2,424	145,074,646	59,849
2011	2,137	124,470,272	58,245
2010	2,315	145,739,623	62,954
2009	2,073	140,302,033	67,681
2008	1,476	98,195,821	66,528
2007	1,649	111,214,280	67,443
2006	1,840	120,154,164	65,301
2005	1,152	64,770,460	56,224
2004	1,308	69,255,787	52,948
2003	1,068	54,788,484	51,300
2002	1,171	62,359,788	53,253
2001	1,050	53,727,389	51,169
2000	1,332	74,143,963	55,664
1999	517	18,606,720	35,990
1998	589	21,702,903	36,847
1997	571	23,093,133	40,443
1996	513	22,502,934	43,865
1995	429	18,671,592	43,524
1994	401	15,888,038	39,621
1993	375	15,271,758	40,725
1992 and Earlier	1,898	73,010,952	38,467
Total	45,937	\$2,632,749,923	\$57,312

¹ The numbers for 2021 represent 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 C – Participant Data

Retired Members and Beneficiaries (continued)

Number Counts and Benefits - by Year of Retirement – As of June 30, 2021 (continued)

California Highway Patrol

Year Retired	Total Retirement	Total Benefits	Average Benefits
2021 ¹	175	\$12,721,674	\$72,695
2020	483	43,541,595	90,148
2019	437	39,444,445	90,262
2018	381	31,530,615	82,758
2017	399	38,201,548	95,743
2016	346	29,481,908	85,208
2015	391	35,202,491	90,032
2014	291	25,194,864	86,580
2013	297	24,437,539	82,281
2012	359	31,961,627	89,030
2011	354	32,239,261	91,071
2010	366	34,006,144	92,913
2009	343	32,629,605	95,130
2008	260	23,030,120	88,577
2007	265	21,366,419	80,628
2006	294	23,169,433	78,808
2005	334	27,794,386	83,217
2004	250	18,775,634	75,103
2003	181	11,783,249	65,101
2002	266	18,660,144	70,151
2001	277	20,674,601	74,638
2000	385	26,616,891	69,135
1999	139	7,052,683	50,739
1998	174	8,905,414	51,181
1997	199	10,385,392	52,188
1996	221	12,663,851	57,302
1995	180	9,379,472	52,108
1994	154	6,908,875	44,863
1993	178	8,364,937	46,994
1992 and Earlier	1,407	48,804,340	34,687
Total	9,786	\$714,929,157	\$73,056

¹ The numbers for 20211 represent 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 – Supplemental Pension Payments and Budget Act for FY 2022-23

Supplemental Pension Payments Pursuant to Proposition 2

In 2014, California voters passed Proposition 2, which amended the State Constitution to require certain funds be appropriated to repay specific State debts, including unfunded liabilities for state-level pension plans. The July 28, 2021, Supplemental Pension Payments (SPP) shown below were the first payments made to these rate plans under Proposition 2.

Plan	Supplemental Pension Payments Made on July 28, 2021
State Miscellaneous	\$865,017,000
State Industrial	50,499,000
State Safety	112,346,000
State Peace Officers & Firefighters	853,138,000
California Highway Patrol	0
Total	\$1,881,000,000

On July 29, 2022, the State contributed the second payments of \$2.925 billion listed below. These payments are not yet reflected in this valuation report.

Plan	Supplemental Pension Payments Made on July 29, 2022
State Miscellaneous	\$1,333,958,000
State Industrial	81,612,000
State Safety	171,392,000
State Peace Officers & Firefighters	1,338,038,000
California Highway Patrol	0
Total	\$2,925,000,000

The Constitution does not allow these payments to supplant funding that would have otherwise been used to pay for the unfunded liability in the fiscal year the payment was appropriated or the subsequent fiscal year. The supplemental payments, however, do reduce the actuarially required contribution rates in FY 2022-23 and later. The objective of the supplemental payments is to generate long-term savings rather than short-term savings, and to pay off the unfunded liability sooner than if the payments had not been made, which can be accomplished by budgeting and appropriating a contribution rate that is higher than the actuarially required rate.

Budgeted State Employer Contribution Rates for FY 2022-23

The additional contribution rates shown here were selected by the State Department of Finance, with assistance from the Actuarial Office, and are intended to achieve long-term savings, shorten the time until the plans achieve a 100% funded ratio, and achieve a more stable and predictable contribution rate. This adjustment, referred to as the Contribution Stabilization adjustment, affords the State some budget flexibility and allows the contribution rates in the Budget Act to closely align with the State's own budget projections.

Appendix D – Supplemental Pension Payments and Budget Act for Fiscal Year 2022-23

The table below shows the actuarially required contribution rates along with adjustments needed to determine the budgeted contribution rates, which should be appropriated in the annual Budget Act.

Plan	Actuarially Required Employer Contribution Rate FY 2022-23	Additional Employer Contribution Rate Under Section 20683.2	Contribution Stabilization Adjustment	Budget Act Contribution Rate FY 2022-23
State Miscellaneous	30.71%	0.10%	1.19%	32.00%
State Industrial	19.51%	0.88%	0.61%	21.00%
State Safety	21.13%	1.18%	0.44%	22.75%
State Peace Officers & Firefighters	47.21%	1.65%	1.14%	50.00%
California Highway Patrol	63.89%	1.32%	2.33% ¹	67.54%

¹Includes Bargaining Unit 5 adjustment for FY22-23.

Appendix E – Glossary of Actuarial Terms

Accrued Liability (*Actuarial Accrued Liability*): The portion of the Present Value of Benefits allocated to prior years. Based on CalPERS funding policies, the accrued liability is the target level of assets on any valuation date.

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 cost method, amortization policy and asset valuation method.

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 Accrued Liability. The total Unfunded Accrued Liability of a rate plan can be segregated by cause. The impact of such individual causes on the UAL are quantified at the time of their occurrence, resulting in new amortization bases. Each base is separately amortized and paid for over a specific period of time. Generally, in an actuarial valuation, the separate bases consist of changes in UAL due to contract amendments, actuarial assumption changes, method changes, and/or gains and losses.

Amortization Period: The number of years required to pay off an Amortization Base.

Classic Member (under PEPR A): A classic member is a member who joined CalPERS prior to January 1, 2013, and who is not defined as a new member under PEPR A. (See definition of new member below.)

Discount Rate: This is the rate used to discount the expected future benefit payments to the valuation date to determine the Projected Value of Benefits. The discount rate is based on the assumed long-term rate of return on plan assets, net of investment and administrative expenses. This rate is called the “actuarial interest rate” in Section 20014 of the California Public Employees’ Retirement Law.

Entry Age: The earliest age at which a plan member begins to accrue benefits under a defined benefit pension plan. In most cases, this is the age of the member on their date of hire.

Appendix E – Glossary of Actuarial Terms

Glossary of Actuarial Terms (continued)

Entry Age Actuarial Cost Method: An actuarial cost method designed to fund a member's total plan benefit in a level manner over the course of his or her career. This method yields a total normal cost rate, expressed as a percentage of payroll, which is designed to remain level throughout the member's career.

Fresh Start: A Fresh Start is when multiple Amortization Bases are combined into a single base and amortized over a new Amortization Period.

Funded Ratio: Defined as Market Value of Assets divided by Accrued Liability. It is a measure of how well funded a rate plan is. A ratio greater than 100% means the rate plan has more assets than the target established by CalPERS funding policies on the valuation date and the employer need only contribute the Normal Cost. A ratio less than 100% means assets are less than the funding target and contributions in addition to Normal Cost are required.

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.

New Member (under PEPPRA): A new member is an individual who becomes a member of a public retirement system in the State of California for the first time on or after January 1, 2013, was not a member of another public retirement system prior to that date and is not subject to reciprocity with another public retirement system.

Normal Cost: The portion of the Present Value of Benefits allocated to the upcoming fiscal year for active employees. The normal cost plus the required amortization of the UAL, if any, make up the required contributions.

Pension Actuary: A business professional proficient in mathematics and statistics who performs the calculations necessary to properly fund a pension plan and allow the plan sponsor to disclose its liabilities. A pension actuary must satisfy the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States regarding pensions.

PEPPRA: 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 and expected to be earned in the future for *current* members.

Unfunded Accrued Liability (UAL): The Accrued Liability minus the Market Value of Assets. If the UAL for a rate plan is positive, the employer is required to make contributions in excess of the Normal Cost. A UAL that is negative is also called the surplus.

Actuarial Office
400 Q Street
Sacramento, CA 95811
TTY - (877) 249-7442
(888) 225-7377
FAX (916) 795-2744

Available online on the [CalPERS Website](#)



California Public Employees' Retirement System
A Component Unit of the State of California