Schools Pool
Actuarial Valuation
As of June 30, 2021

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

CalPERS

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Actuarial Certification

October 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 Schools Pool. 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 this plan 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 this plan, 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 with regard to pensions.

Paul Tschida, FSA, EA, MAAA
Senior Actuary, CalPERS

May Yu, ASA, MAAA
Senior Actuary, CalPERS

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

Highlights and Executive Summary

Highlights and Executive Summary

Introduction

This is the actuarial valuation report as of June 30, 2021 for the Schools Pool. This actuarial valuation determines the funded status as of June 30, 2021 and sets forth the Schools Pool employer and employee contribution rates for fiscal year July 1, 2022, through June 30, 2023.

The Schools Pool provides retirement benefits to members employed by school districts and community college districts in California. It generally does not cover non-classified members as they are covered by the California State Teachers' Retirement System (CalSTRS), a separate retirement system.

Purpose

This report documents the results of the actuarial valuation performed by the CalPERS Actuarial Office using census data as of June 30, 2021. The purpose of the valuation is to:

- Set forth the assets and accrued liabilities of the Schools Pool as of June 30, 2021.
- Determine the required employer contribution rate for fiscal year July 1, 2022 through June 30, 2023.
- Determine the required employee contribution rate for fiscal year July 1, 2022 through June 30, 2023 for school employees subject to the California Public Employees' Pension Reform Act of 2013 (PEPRA).
- 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 a Cost-Sharing Multiple-Employer Defined Benefit Pension Plan.

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

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; changes in actuarial policies; and changes in plan provisions or applicable law.

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 scenarios.
- 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 the current mortality assumptions.
- Plan maturity measures indicating how sensitive the plan may be to the risks noted above.

Highlights and Executive Summary

Required Contribution Rates

Required Employer Contribution Rates

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

	Fiscal Year 2021-22	Fiscal Year 2022-23
1) Contribution as a Percentage of Payroll		
a) Total Normal Cost	16.32%	17.24%
b) Employee Contribution[1]	7.00%	7.42%
c) Employer Normal Cost [(1a) – (1b)]	9.32%	9.82%
d) Unfunded Liability Contribution Rate[2]	13.59%	15.55%
e) Required Employer Contribution Rate [(1c) + (1d)]	**22.91%**	**25.37%**
Projected Annual Payroll for Contribution Year	$15,294,555,487	$15,180,694,663
2) Expected Contribution in Dollars		
a) Total Normal Cost	$2,496,071,455	$2,617,151,760
b) Employee Contribution[1]	1,070,618,884	1,126,407,544
c) Employer Normal Cost [(2a) – (2b)]	1,425,452,571	1,490,744,216
d) Unfunded Liability Contribution[2]	2,077,777,206	2,360,951,245
e) Expected Employer Contribution [(2c) + (2d)]	**$3,503,229,777**	**$3,851,695,461**

1) For classic members, this is the percentage specified in the Public Employees' Retirement Law, net of any reduction from the use of a modified formula or other factors. For PEPRA members, the member contribution rate is based on 50% of the total normal cost. A development of PEPRA member contribution rates can be found in the Normal Cost Information chapter of this report.

2) For fiscal year 2021-22, the $330 million supplanting payment associated with the State's supplemental contribution under Gov. Code 20825.2 reduced the Unfunded Liability Contribution by 2.16% of payroll.

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.

PEPRA Member Contribution Rate

In accordance with the California Public Employees' Pension Reform Act of 2013 ("PEPRA"), new members hired on or after January 1, 2013 are required to contribute 50% of the total normal cost of their pension benefit. 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 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 total normal cost of PEPRA members' benefits as measured in the June 30, 2021 actuarial valuation changed by more than 1% from when the member rate was last changed. As a result, the PEPRA member contribution rate for fiscal year 2022-23 is 8.00%, up from 7.00% in fiscal year 2021-22. See the "PEPRA Member Contribution Rate" section of this report for more information.

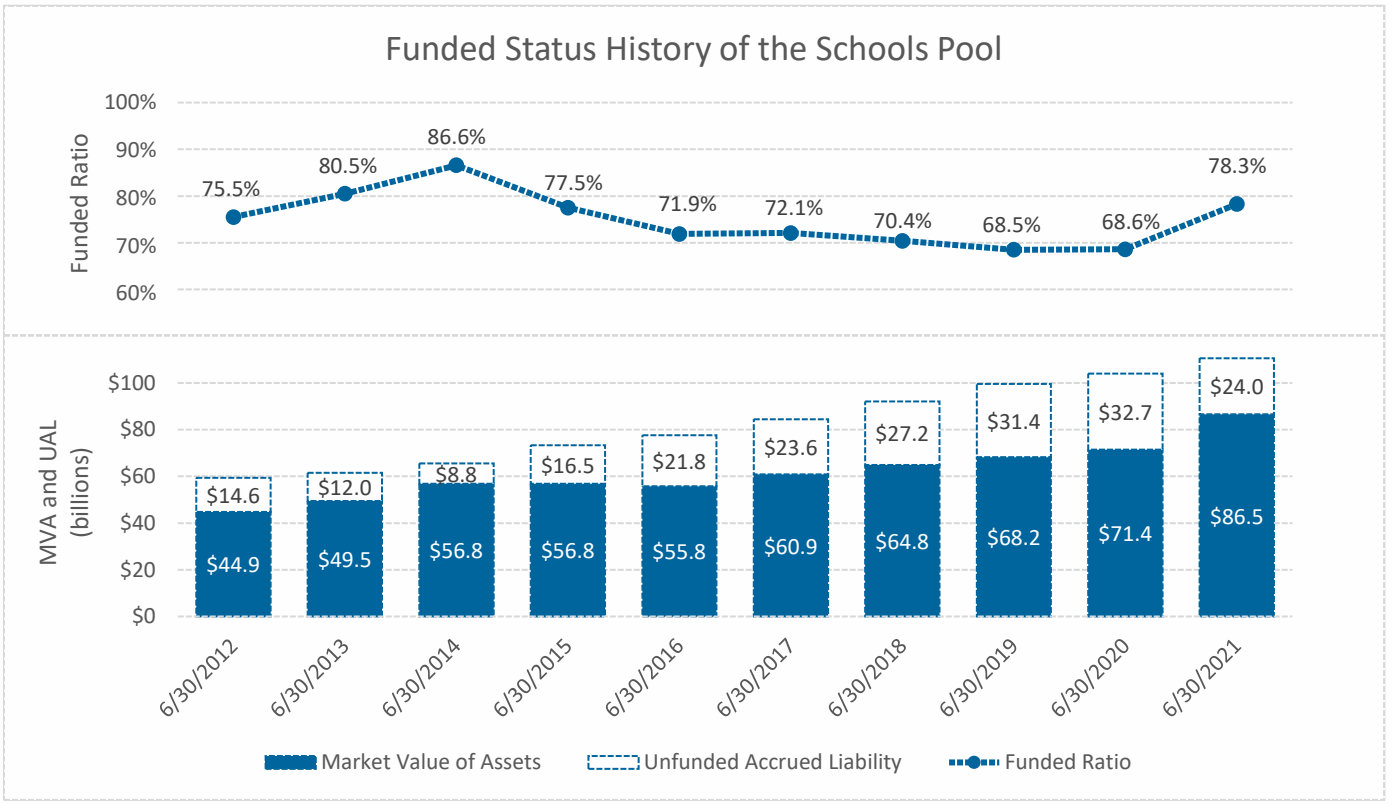
Highlights and Executive Summary

Funded Status

	June 30, 2020	June 30, 2021
1) Present Value of Projected Benefits	$122,782,104,912	$131,025,681,158
2) Entry Age Normal Accrued Liability	104,062,327,717	110,507,282,219
3) Market Value of Assets (MVA)	71,400,466,343	86,519,422,772
4) Unfunded Accrued Liability [(2) - (3)]	$32,661,861,374	$23,987,859,447
5) Funded Ratio [(3) / (2)]	**68.6%**	**78.3%**

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 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 Schools Pool increased by 9.7%. This was primarily due to investment return in 2020-21 being greater than expected, offset partially by the reduction in discount rate from 7.00% to 6.80%.

The graph below shows the funded status of the Schools Pool for the past ten years.



Highlights and Executive Summary

Changes Since the Prior Year's Valuation

Following is an explanation of the key changes from the prior valuation to the current valuation. See the "Reconciliation of Employer Contributions" section later in this report for more information.

Investment Return and Discount Rate

On July 12, 2021, CalPERS reported a preliminary 21.3% net return on investments for fiscal year 2020-21. Since the preliminary return sufficiently exceeded the 7.00% discount rate, the Funding Risk Mitigation Policy triggered a 0.20% reduction in the discount rate, from 7.00% to 6.80%.

Under the Actuarial Amortization Policy, a portion of the investment gain was used to fully offset the increase in unfunded liability resulting from the decrease in discount rate. The remaining (net) investment gain was amortized over 20 years with a five-year ramp. This net investment gain reduced the required employer contribution rate in fiscal year 2022-23 by 1.27% of pay. Due to the five-year ramp, this reduction will increase each year until it reaches an estimated 5.68% in fiscal year 2026-27.

The reduction in discount rate increased the required employer contribution rate by 0.48% of pay. It was also the primary driver of an increase in the PEPRA member contribution rate from 7.00% to 8.00%, which served to reduce the employer rate by 0.42% of pay. See "PEPRA Member Contribution Rates" for more information on the member rate change.

Other Assumption Changes

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 assessed various assumptions including retirement rates, termination rates, mortality rates, rates of salary increase, and inflation. New assumptions stemming from the study are incorporated in this actuarial valuation and affect required contributions for fiscal year 2022-23. 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 retention of the 6.80% discount rate (previously triggered under the Funding Risk Mitigation Policy) and a reduction in the price inflation assumption from 2.50% to 2.30%.

The net impact of these assumption changes on the required employer contribution rate in fiscal year 2022-23 is an increase of 0.54%, which accounts for the increase in normal cost and the increase in unfunded liability to be paid over 20 years.

Expiration of Supplanting Payments

In July 2019, the State made a contribution of $904 million from the General Fund to the Schools Pool to cover a portion of the required unfunded liability contribution on behalf of school employers. This contribution was spread among fiscal years 2019-20, 2020-21, and 2021-22 in the form of supplanting payments in accordance with Government Code section 20825.2. Due to the expiration of these supplanting payments, the required employer contribution rate for fiscal year 2022-23 increased by 2.16% relative to fiscal year 2021-22.

Noninvestment Experience

Noninvestment experience produced a net liability experience gain. Prior to adjustment for the new discount rate and other assumptions described above, the normal cost decreased as a result of demographic experience, primarily the increase in PEPRA membership as a share of total active membership.

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. A summary of the plan provisions used in this valuation can be found in Appendix B of this report.

Highlights and Executive Summary

Reconciliation of Required Employer Contribution

	Percentage of Payroll	Estimated Dollars (millions)
2021-22 required employer contribution	22.91%	$3,503
Progression of amortization bases and change in payroll	1.80%	244
State supplanting payment expiration (G.C. §20825.2)	2.16%	330
Discount rate change	0.48%	73
Other assumption changes	0.54%	84
Experience (gains)/losses	(2.10%)	(318)
Effect of change in member contribution rates	(0.42%)	(64)
2022-23 required employer contribution	25.37%	$3,852

Subsequent Events

This actuarial valuation report reflects statutory and regulatory changes and fund investment return through June 2022 and board actions through August 2022. Except as stated in this report, 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.

Projected Future Contribution Rates

The table below shows the required and projected employer contribution rates for the current and the next five fiscal years. Projected results reflect an investment loss for fiscal year 2021-22 based on preliminary investment return information released by the CalPERS Investment Office, adjusted to reflect final audited June 30, 2021 assets. Further, projected rates reflect the anticipated decrease in normal cost due to new hires entering lower cost benefit tiers.

It is assumed that all actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. Future contribution requirements may differ significantly from those shown below. The actual long-term cost of the plan will depend on the actual benefits and expenses paid and the actual investment experience of the fund.

	Actual	Projected				
Fiscal Year	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
Employer Contribution Rate	25.37%	27.0%	28.1%	28.8%	29.2%	30.7%

Under the CalPERS amortization policy, changes in the Unfunded Accrued Liability (UAL) due to investment gains or losses (actual return relative to assumed return for the year) are amortized using a five-year ramp up. For more information, 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.

Assets

Assets

Reconciliation of Market Value of Assets

1) Market Value of Assets as of June 30, 2020 Including Receivables	$71,400,466,343
2) Receivables for Service Buybacks as of June 30, 2020	105,313,101
3) Market Value of Assets as of June 30, 2020 [(1) - (2)]	$71,295,153,242
4) Employer Contributions	2,972,219,723
5) Employee Contributions	1,004,391,105
6) Benefit Payments to Retirees and Beneficiaries	(4,833,052,244)
7) Refunds	(99,342,376)
8) Administrative Expenses	(89,541,057)
9) Transfers and Miscellaneous Adjustments	27,771,744
10) Investment Return	16,149,518,255
11) Market Value of Assets as of June 30, 2021 Excluding Receivables [(3) + (4) + (5) + (6) + (7) + (8) + (9) + (10)]	$86,427,118,392
12) Receivables for Service Buybacks as of June 30, 2021	92,304,380
13) Market Value of Assets as of June 30, 2021 Including Receivables [(11) + (12)]	**$86,519,422,772**

Assets

Asset Allocation

CalPERS adheres to an Asset Allocation Strategy which establishes asset class allocation policy targets and ranges and manages those asset class allocations within their policy ranges. CalPERS Investment Belief No. 6 recognizes that strategic asset allocation is the dominant determinant of portfolio risk and return.

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 Schools Pool are part of the PERF and are invested accordingly.

Asset Class	Current Allocation as of 6/30/2021	Policy Target Allocation as of 6/30/2021
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%
Total Fund Level Portfolios	2.5%	0.0%
Trust Level Financing	(2.6%)	0.0%
Total Fund	**100.0%**	**100.0%**

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.

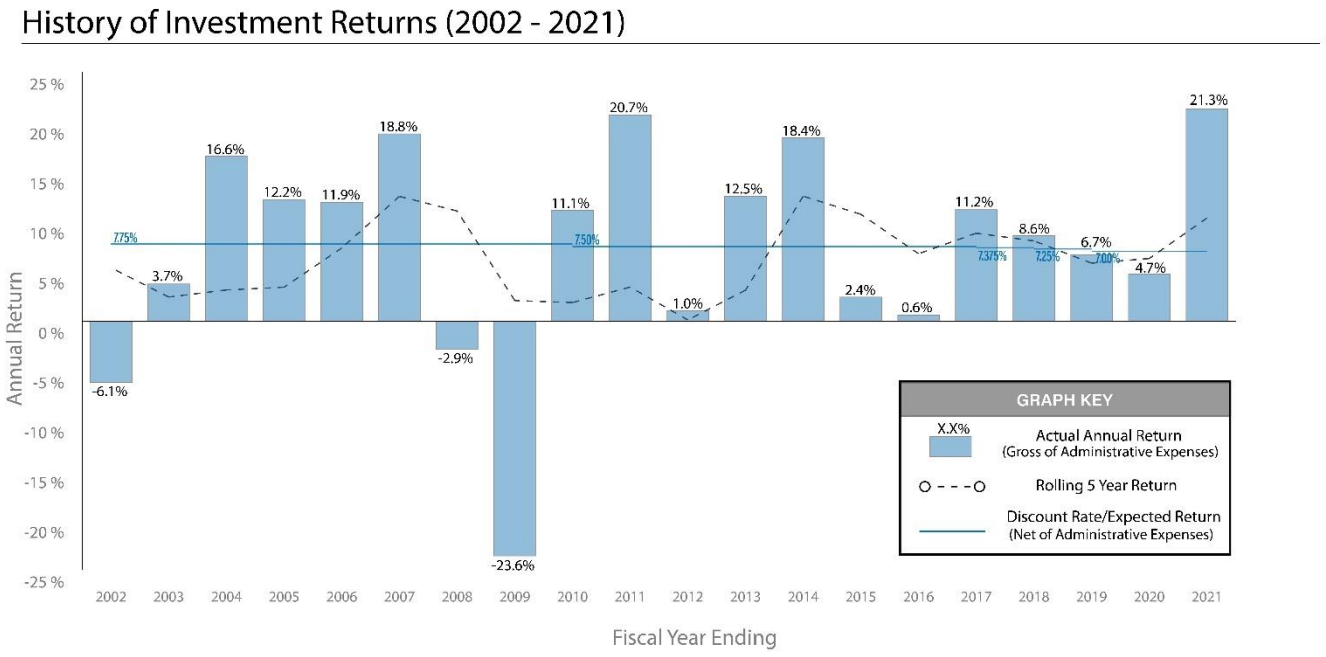
Strategic Asset Allocation Policy Targets

Asset Class	Policy Target Allocation effective 11/17/2021
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%**

Assets

CalPERS History of Investment Returns

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 3-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.



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 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 as 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 Compound Annual Rates of Return and Volatilities

	1 year	5 year	10 year	20 year	30 year
Compound Annual Return	21.3%	10.3%	8.5%	6.9%	8.4%
Realized Volatility	–	7.3%	7.2%	8.5%	8.5%

Liabilities and Employer Contributions

Liabilities and Employer Contributions

Accrued and Unfunded Liabilities

Participant Information

	June 30, 2020	June 30, 2021
Members Included in the Valuation[1]		
Active Members	328,255	316,847
Transfers from Schools	19,832	19,964
Vested Terminations[2]	206,608	218,322
Receiving Payments	246,960	253,988
Total	**801,655**	**809,121**
Average Entry Age of Active Members	35.9	35.8
Average Age of Active Members	46.3	46.5
Average Age of Retired Members	72.8	72.9
Average Pay	$44,133	$45,337
Covered Payroll in Fiscal Year	$14,486,824,480	$14,364,992,906
Projected Payroll for Contribution Rate	$15,294,555,487	$15,180,694,663
1) Present Value of Projected Benefits		
a) Active Members	$64,630,620,236	$68,819,284,788
b) Transferred Members	1,025,578,842	987,593,458
c) Terminated Members	3,186,791,275	3,586,340,389
d) Members and Beneficiaries Receiving Payments	53,939,114,559	57,632,462,523
e) Total	**$122,782,104,912**	**$131,025,681,158**
2) Present Value of Future Employer Normal Costs	$10,239,950,577	$11,785,756,193
3) Present Value of Future Employee Normal Costs	$8,479,826,618	$8,732,642,746
4) Entry Age Normal Accrued Liability		
a) Active Members [(1a) – (2) – (3)]	$45,910,843,041	$48,300,885,849
b) Transferred Members (1b)	1,025,578,842	987,593,458
c) Terminated Members (1c)	3,186,791,275	3,586,340,389
d) Members and Beneficiaries Receiving Payments (1d)	53,939,114,559	57,632,462,523
e) Total	**$104,062,327,717**	**$110,507,282,219**
5) Market Value of Assets (MVA)	$71,400,466,343	$86,519,422,772
6) Unfunded Liability/(Surplus) [(4e) – (5)]	$32,661,861,374	$23,987,859,447
7) Funded Status [(5) / (4e)]	**68.6%**	**78.3%**

(1) Counts are of unique members included in the valuation. Multiple records may exist for members with service in more than one benefit group. This does not result in double counting liabilities.

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

Liabilities and Employer Contributions

Schedule of Amortization Bases

The following schedule shows the development of payments on the amortization bases used to determine the employer contribution rate. Each row of the schedule gives a brief description of a base (or portion of the Unfunded Actuarial Liability), the date the base was established, the balance of the base on the valuation date, and the number of years remaining in the amortization period. The schedule also shows the expected payment for the year immediately following the valuation date, the balance on the date a year after the valuation date, and the required payment for fiscal year 2022-23. Please refer to Appendix A for an explanation of how amortization periods are determined.

There is a one-year lag between the valuation date and the start of the contribution 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 needed to extract and test the membership and financial data, and the need to provide employers with their required employer contribution rate before 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, plus any additional discretionary payments made during the 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. Expected dollar amounts are determined by multiplying the rate by the expected payroll for the applicable fiscal year, based on payroll as of the valuation date.

Liabilities and Employer Contributions

Schedule of Amortization Bases (continued)

Reason for Base	Date Established	Ramp Level 2022-23	Ramp Shape	Payment Type	Remaining Amort. Period	Balance 6/30/2021	Expected Payment 2021-22	Balance 6/30/2022	Expected Payment 2022-23	Payment as Percentage of Payroll
(Gain)/Loss	Various	No Ramp		Level %	22	($337,938,278)	($22,900,251)	($337,252,026)	($22,973,461)	(0.15%)
Fresh Start	6/30/2004	No Ramp		Level %	13	2,603,240,531	247,007,381	2,524,993,368	249,833,482	1.65%
(Gain)/Loss	6/30/2009	No Ramp		Level %	18	850,800,234	65,093,084	841,384,798	65,529,745	0.43%
Assumption Change	6/30/2009	No Ramp		Level %	8	810,802,960	108,992,631	753,300,124	110,796,819	0.73%
(Gain)/Loss	6/30/2010	No Ramp		Level %	19	417,739,664	30,902,254	414,210,309	31,081,724	0.20%
(Gain)/Loss	6/30/2011	No Ramp		Level %	20	(921,939,610)	(66,098,812)	(916,322,291)	(66,424,172)	(0.44%)
Assumption Change	6/30/2011	No Ramp		Level %	10	1,159,184,195	132,403,753	1,101,177,273	134,318,940	0.88%
(Gain)/Loss	6/30/2014	100%	Up/Down	Level %	23	4,352,392,105	303,424,548	4,334,783,444	304,642,324	2.01%
(Gain)/Loss	6/30/2015	100%	Up/Down	Level %	24	4,338,237,143	294,292,933	4,329,102,929	295,223,655	1.94%
Assumption Change	6/30/2015	100%	Up/Down	Level %	14	4,770,398,038	479,692,285	4,599,051,500	485,600,812	3.20%
(Gain)/Loss	6/30/2016	100%	Up/Down	Level %	25	5,472,617,791	361,887,182	5,470,766,802	362,728,998	2.39%
(Gain)/Loss	6/30/2017	100%	Up/Down	Level %	26	(417,266,520)	(21,824,743)	(423,086,062)	(27,322,305)	(0.18%)
Assumption Change	6/30/2017	100%	Up/Down	Level %	16	1,584,279,798	116,575,581	1,571,536,856	147,233,841	0.97%
(Gain)/Loss	6/30/2018	80%	Up/Down	Level %	27	(548,825,499)	(21,568,106)	(563,856,271)	(28,769,725)	(0.19%)
Assumption Change - Demo	6/30/2018	80%	Up/Down	Level %	17	1,207,225,882	65,727,230	1,221,392,037	88,441,822	0.58%
Method Change	6/30/2018	80%	Up/Down	Level %	17	1,433,299,068	78,035,750	1,450,118,072	105,004,028	0.69%
Assumption Change - Econ	6/30/2018	80%	Up/Down	Level %	17	$1,243,294,323	$67,690,971	$1,257,883,722	$91,084,209	0.60%
Assumption Change	6/30/2019	60%	Up/Down	Level %	18	3,023,928,125	110,268,795	3,115,598,960	166,685,437	1.10%
Investment (Gain)/Loss	6/30/2019	60%	Up Only	Level $	18	592,956,452	24,755,754	607,693,883	36,538,526	0.24%
Non-Investment (Gain)/Loss	6/30/2019	No Ramp		Level $	18	288,630,852	26,996,991	280,357,956	26,581,222	0.18%
Investment (Gain)/Loss	6/30/2020	40%	Up Only	Level $	19	1,812,226,737	39,622,486	1,894,510,659	77,878,089	0.51%
Non-Investment (Gain)/Loss[1]	6/30/2020	No Ramp		Level $	19	(541,043,181)	(343,200,491)	(223,156,709)	(20,580,121)	(0.14%)
Assumption Change	6/30/2021	No Ramp		Level $	20	260,003,851	(59,606,102)	339,283,494	30,509,578	0.20%
Net Investment (Gain)	6/30/2021	20%	Up Only	Level $	20	(8,384,656,901)	0	(8,954,813,570)	(192,480,979)	(1.27%)
Non-Investment (Gain)/Loss	6/30/2021	No Ramp		Level $	20	(974,610,208)	(36,465,028)	(1,003,199,252)	(90,211,243)	(0.59%)
Risk Mitigation	6/30/2021	No Ramp		Level $	1	2,609,472,545	(110,700,226)	2,901,318,814	2,998,341,395	19.75%
Risk Mitigation Offset	6/30/2021	No Ramp		Level $	1	(2,716,590,650)	0	(2,901,318,814)	(2,998,341,395)	(19.75%)
Total						**$23,987,859,447**	**$1,871,005,850**	**$23,685,460,005**	**$2,360,951,245**	**15.55%**

(1) The non-investment (gain)/loss base established 6/30/2020 reflected, in addition to the usual sources, a one-time contribution gain attributable to the State's supplemental contribution in July 2019. The payment on this base for fiscal year 2021-22 includes the $330 million supplanting payment associated with this supplemental contribution as specified in Gov. Code §20825.2.

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.

1) Total (Gain)/Loss for the Year	
a) Unfunded Accrued Liability (UAL) as of June 30, 2020	$32,661,861,374
b) Expected Payment on the UAL during 2020-21	1,695,608,295
c) Interest through June 30, 2021 [.07 x (1a) – ((1.07)$^{1/2}$ – 1) x (1b)]	2,227,987,731
d) Expected UAL before Other Changes [(1a) – (1b) + (1c)]	$33,194,240,810
e) Change due to Risk Mitigation (Discount Rate Change)	2,609,472,545
f) Change due to Other Assumption Changes	260,003,851
g) Change due to Method Changes	0
h) Expected UAL After All Other Changes [(1d) + (1e) + (1f) + (1g)]	$36,063,717,206
i) Actual UAL as of June 30, 2021	23,987,859,447
j) Total (Gain)/Loss for 2020-21 [(1i) – (1h)]	**($12,075,857,759)**
2) Contribution (Gain)/Loss for the Year	
a) Expected Contribution with interest (Employer and Employee)	$4,265,075,140
b) Actual Contributions with interest	4,113,438,225
c) Contribution (Gain)/Loss for 2020-21 [(2a) – (2b)]	**$151,636,915**
3) Asset (Gain)/Loss for the Year	
a) Market Value of Assets as of June 30, 2020	$71,400,466,343
b) Prior Fiscal Year Receivables	(105,313,101)
c) Current Fiscal Year Receivables	92,304,380
d) Contributions Received	3,976,610,828
e) Benefits and Refunds Paid	(4,932,394,620)
f) Transfers and Miscellaneous Adjustments	27,771,744
g) Expected Interest [0.07 x (3a + 3b) + ((1.07)$^{1/2}$ – 1) x ((3d) + (3e) + (3f))]	4,958,729,648
h) Expected Assets as of June 30, 2021 [(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]	75,418,175,221
i) Market Value of Assets as of June 30, 2021	86,519,422,772
j) Asset (Gain)/Loss for 2020-21 [(3h) – (3i)]	**($11,101,247,551)**
4) Liability (Gain)/Loss for the Year	
a) Total (Gain)/Loss(1j)	($12,075,857,759)
b) Contribution (Gain)/Loss (2c)	151,636,915
c) Asset (Gain)/Loss (3j)	(11,101,247,551)
d) Liability (Gain)/Loss for 2020-21 [(4a) – (4b) – (4c)]	**($1,126,247,123)**

Liabilities and Employer Contributions

Reconciliation of Employer Contributions

	Rate (% of Payroll)	Estimated Dollars (millions)
Employer Normal Cost		
2021-22 employer normal cost contribution	9.32%	$1,425
Change in payroll	0.00%	(10)
Demographic experience	(0.24%)	(36)
Discount rate change	0.75%	114
Other assumption changes	0.41%	62
Effect of change in member contribution rates	(0.42%)	(64)
2022-23 employer normal cost contribution	9.82%	$1,491
Unfunded Liability Contribution		
2021-22 unfunded liability contribution	13.59%	$2,078
Progression of amortization bases and change in payroll	1.80%	254
State supplanting payment expiration (G.C. §20825.2)	2.16%	330
Re-amortization of existing bases at 6.8% discount rate	(0.27%)	(41)
Net investment gain[1]	(1.27%)	(192)
Non-investment (gain)/loss	(0.59%)	(90)
Other assumption changes	0.13%	22
2022-23 unfunded liability contribution	15.55%	$2,361
Total Required Employer Contribution		
2021-22 total required employer contribution	22.91%	$3,503
Progression of amortization bases and change in payroll	1.80%	244
State supplanting payment expiration (G.C. §20825.2)	2.16%	330
Discount rate change	0.48%	73
Other assumption changes	0.54%	84
Experience (gains)/losses	(2.10%)	(318)
Effect of change in member contribution rates	(0.42%)	(64)
2022-23 total required employer contribution	25.37%	$3,852

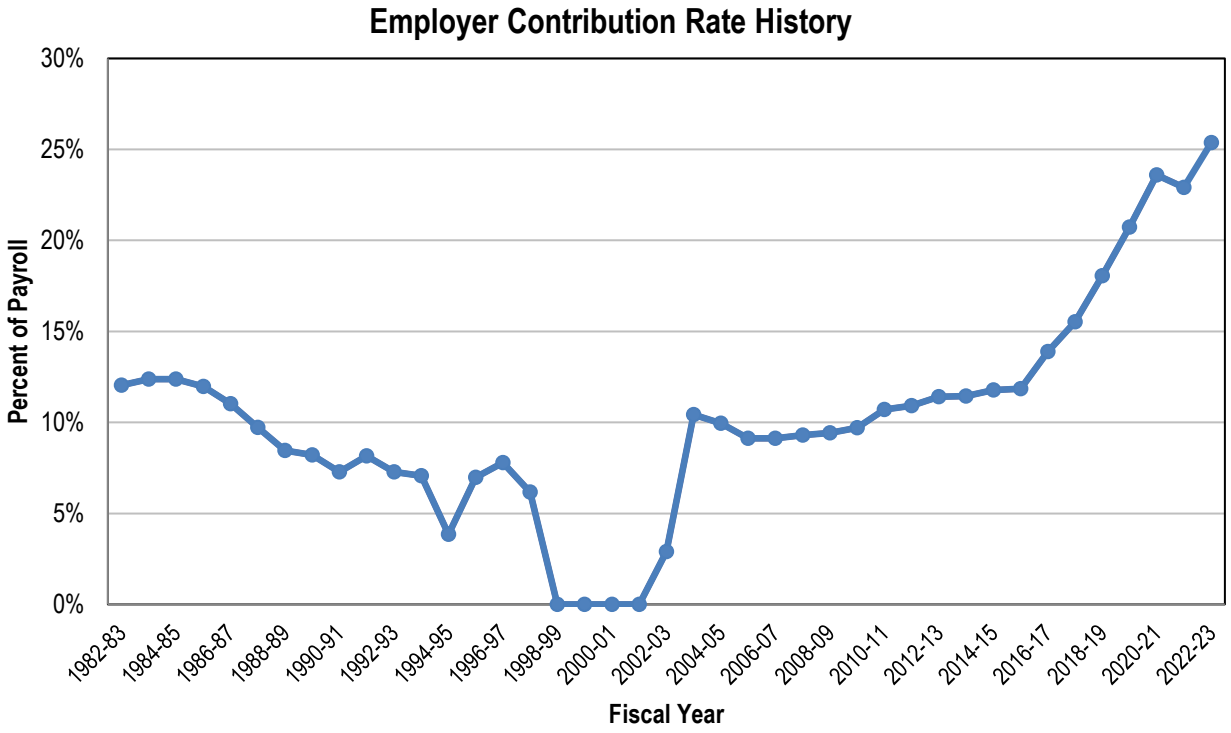
(1) Pursuant to the Funding Risk Mitigation Policy and Actuarial Amortization Policy, a portion of the FY 2020-21 investment gain was used to fully offset the increase in unfunded accrued liability resulting from the reduction in discount rate from 7.0% to 6.8%. The remaining (net) investment gain was amortized over 20 years with a five-year ramp.

Liabilities and Employer Contributions

History of Employer Contribution Rates

The table below provides a 25-year history of contribution rates for the Schools Pool. In cases where the contribution rate changed during a fiscal year, the entry shown is the weighted average of the rates effective during the fiscal year.

Fiscal Year	Valuation Date	Employer Normal Cost	Unfunded Liability Contribution/(Credit)	Total Employer Contribution
2022 - 2023	6/30/2021	9.82%	15.55%	25.37%
2021 - 2022	6/30/2020	9.32%	13.59%	22.91%
2020 - 2021	6/30/2019	9.47%	14.13%	23.60%
2019 - 2020	6/30/2018	8.992%	11.741%	20.733%
2018 - 2019	6/30/2017	8.739%	9.323%	18.062%
2017 - 2018	6/30/2016	8.103%	7.428%	15.531%
2016 - 2017	6/30/2015	8.242%	5.646%	13.888%
2015 - 2016	6/30/2014	7.621%	4.226%	11.847%
2014 - 2015	6/30/2013	7.814%	3.957%	11.771%
2013 - 2014	6/30/2012	7.313%	4.129%	11.442%
2012 - 2013	6/30/2011	7.415%	4.002%	11.417%
2011 - 2012	6/30/2010	7.132%	3.791%	10.923%
2010 - 2011	6/30/2009	7.173%	3.534%	10.707%
2009 - 2010	6/30/2008	7.410%	2.299%	9.709%
2008 - 2009	6/30/2007	7.414%	2.014%	9.428%
2007 - 2008	6/30/2006	7.421%	1.885%	9.306%
2006 - 2007	6/30/2005	7.398%	1.726%	9.124%
2005 - 2006	6/30/2004	7.399%	1.717%	9.116%
2004 - 2005	6/30/2003	7.393%	2.559%	9.952%
2003 - 2004	6/30/2002	9.396%	1.024%	10.420%
2002 - 2003	6/30/2001	9.329%	(6.435%)	2.894%
2001 - 2002	6/30/2000	9.082%	(9.082%)	0.000%
2000 - 2001	6/30/1999	6.914%	(6.914%)	0.000%
1999 - 2000	6/30/1998	6.867%	(6.867%)	0.000%
1998 - 1999	6/30/1997	6.829%	(6.829%)	0.000%



Liabilities and Employer Contributions

History of Funded Status and Funding Progress

Shown below is a 30-year history of funding status for the Schools Pool. (Dollars in millions)

Valuation Date	Actuarial Accrued Liabilities	Market Value of Assets	Unfunded Liabilities/(Surplus)	Funded Ratio	Projected Payroll for Contribution	Unfunded/(Surplus) as a % of Payroll
6/30/2021	$110,507	$86,519	$23,988	78.3%	$15,181	158.0%
6/30/2020	104,062	71,400	32,662	68.6%	15,295	213.6%
6/30/2019	99,528	68,177	31,351	68.5%	14,844	211.2%
6/30/2018	92,071	64,846	27,225	70.4%	14,234	191.3%
6/30/2017	84,416	60,865	23,551	72.1%	13,683	172.1%
6/30/2016	77,544	55,785	21,759	71.9%	13,022	167.1%
6/30/2015	73,325	56,814	16,511	77.5%	12,098	136.5%
6/30/2014	65,600	56,838	8,761	86.6%	11,294	77.6%
6/30/2013	61,487	49,482	12,005	80.5%	10,424	115.2%
6/30/2012	59,439	44,854	14,585	75.5%	10,242	142.4%
6/30/2011	58,358	45,901	12,457	78.7%	10,540	118.2%
6/30/2010	55,307	38,435	16,872	69.5%	11,283	149.5%
6/30/2009	52,493	34,146	18,347	65.0%	11,110	165.1%
6/30/2008	48,538	45,548	2,990	93.8%	11,138	26.8%
6/30/2007	44,810	48,293	(3,483)	107.8%	10,250	(34.0%)
6/30/2006	41,409	40,852	556	98.7%	9,881	5.6%
6/30/2005	38,368	36,898	1,469	96.2%	9,223	15.9%
6/30/2004	35,933	32,828	3,104	91.4%	9,069	34.2%
6/30/2003	33,793	28,182	5,611	83.4%	9,079	61.8%
6/30/2002	31,271	27,690	3,581	88.5%	8,344	42.9%
6/30/2001	27,946	30,308	(2,361)	108.4%	7,912	(29.8%)
6/30/2000	25,474	33,295	(7,821)	130.7%	7,053	(110.9%)
6/30/1999	21,216	30,918	(9,702)	145.7%	5,961	(162.8%)
6/30/1998	19,499	27,874	(8,374)	142.9%	5,445	(153.8%)
6/30/1997	17,583	23,499	(5,916)	133.6%	4,907	(120.5%)
6/30/1996	17,572	19,706	(2,135)	112.1%	5,146	(41.5%)
6/30/1995	16,422	17,314	(892)	105.4%	5,351	(16.7%)
6/30/1994	15,136	15,373	(238)	101.6%	5,140	(4.6%)
6/30/1993	13,575	14,956	(1,381)	110.2%	4,853	(28.4%)
6/30/1992	12,856	13,816	(960)	107.5%	4,883	(19.7%)

Normal Cost Information

Normal Cost Information

Normal Cost by Group

The normal cost is determined using the Entry Age cost method. Some important features of this method are that costs are dependent upon a member's entry age in the plan and benefit level of the plan. In general, the lower the entry age the lower the total normal cost. Note that future costs may vary as the entry age of the members change.

Employer Normal Cost rates shown below for individual benefit groups are illustrative only; employers pay the same normal cost rate for all active members (as shown in the Plan Total line). FAC means Final Average Compensation.

Benefit Group	Total Normal Cost	Employee Contribution[1]	Employer Normal Cost	Number of Actives	Payroll on June 30, 2021
Schools 2% @ 62 – 3 Year FAC	14.87%	7.00%	7.87%	160,817	$8,328,376,779
Schools 2% @ 55 – 1 Year FAC	17.26%	7.00%	10.26%	156,030	$6,036,616,127
Plan Total	**16.32%**	**7.00%**	**9.32%**	**316,847**	**$14,364,992,906**

(1) Employee contribution rates are those in effect on the valuation date.

PEPRA Member Contribution Rate

In accordance with the California Public Employees' Pension Reform Act of 2013 ("PEPRA"), new members hired on or after January 1, 2013 ("PEPRA members") are required under PEPRA to contribute 50% of the total normal cost of their pension benefit.

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 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 PEPRA member contribution rate for fiscal year 2021-22 of 7.00% was based on a total normal cost of 14.07% of payroll established by the June 30, 2017 actuarial valuation. In this valuation, the total normal cost for PEPRA members is 15.91% of payroll. Since the total normal cost changed by more than 1% from when the member contribution rate was last changed, the PEPRA member contribution rate increased to 8.00% effective July 1, 2022.

The table below shows the determination of the PEPRA member contribution rate effective July 1, 2022 based on 50% of the total normal cost on June 30, 2021.

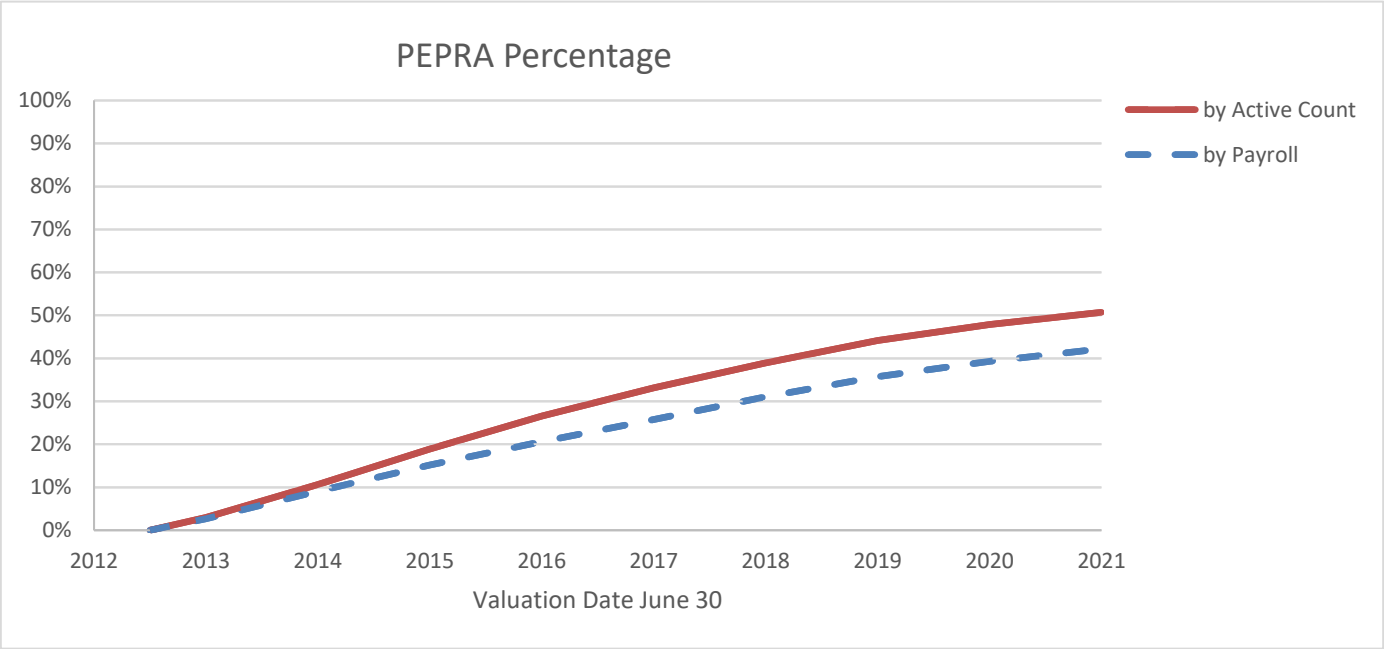
	Basis for Current Rate			Rate Effective July 1, 2022			
	Total Normal Cost	Actuarial Valuation Date	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
Schools Pool	14.07%	6/30/2017	7.00%	15.91%	1.84%	Yes	8.00%

Normal Cost Information

PEPRA Transition

As of June 30, 2021, there are 160,817 active PEPRA members in the Schools Pool, which represents 51% of the total active population of the Schools Pool. The total payroll for active PEPRA members is $6,037 million, which represents 42% of the total Schools Pool payroll.

The following graph shows the share of Schools Pool active headcount and payroll attributable to PEPRA members since PEPRA became effective.



Risk Analysis

Risk Analysis

Future Investment Return Scenarios

Analysis was performed to determine the effects of various future investment returns on required employer contributions. The projections below reflect the impact of the CalPERS Funding Risk Mitigation policy. Projected results reflect an investment loss for fiscal year 2021-22 based on preliminary investment return information released by the CalPERS Investment Office, adjusted to reflect final audited June 30, 2021 assets. The projected normal cost rates reflect that rates are anticipated to decline over time as new employees are hired into lower-cost benefit tiers. The projections also assume that all other actuarial assumptions will be realized and that no further changes in assumptions, contributions, benefits, or funding will occur.

The first table shows projected contribution requirements if the fund were to earn either 3.0% or 10.8% annually starting in 2022-23. These alternate investment returns were chosen based on stochastic analysis of possible future investment returns over a 20-year period. 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%.

Assumed Annual Return from 2022-23 through 2040-41	Current Rate	Projected Employer Contribution Rate				
	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
3.0% (5th percentile)	25.37%	27.0%	28.6%	30.1%	31.7%	34.8%
10.8% (95th percentile)	25.37%	27.0%	28.0%	28.1%	27.6%	27.7%

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 a 20-year period, the likelihood 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.

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 table shows the effect of a one or two standard deviation investment loss in 2022-23 on the 2024-25 required contribution. 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.

Assumed Annual Return for Fiscal Year 2022-23	Current Rate	Projected Employer Contribution Rate	
	2022-23	2023-24	2024-25
−17.2% (2 standard deviation loss)	25.37%	27.0%	30.9%
−5.2% (1 standard deviation loss)	25.37%	27.0%	29.5%

- Without investment gains (returns higher than 6.8%) in year 2023-24 or later, projected contributions rates would continue to rise over the next four 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 2022-23 and beyond.

Risk Analysis

Discount Rate Sensitivity

The discount rate assumption is calculated as the sum of the assumed real rate of return and the assumed annual price inflation, currently 4.5% and 2.3%, respectively. Changing either the price inflation assumption or the real rate of return assumption will change the discount rate. The sensitivity of the valuation results to the discount rate assumption depends on which component of the discount rate is changed. Shown below are various valuation results as of June 30, 2021 assuming alternate discount rates by changing the two components independently. Results are shown using the current discount rate of 6.8% as well as alternate discount rates of 5.8% and 7.8%. The rates of 5.8% and 7.8% were selected since they illustrate the impact of a 1.0% increase or decrease to the current assumption of 6.8%.

	Sensitivity to the Real Rate of Return Assumption		
As of June 30, 2021	1% Lower Real Return Rate	Current Assumptions	1% Higher Real Return Rate
Discount Rate	**5.8%**	**6.8%**	**7.8%**
Inflation	2.3%	2.3%	2.3%
Real Rate of Return	**5.8%**	**6.8%**	**7.8%**
a) Total Normal Cost Rate	21.86%	17.24%	13.79%
b) Accrued Liability	$125,466,719,226	$110,507,282,219	$98,152,275,372
c) Market Value of Assets	$86,519,422,772	$86,519,422,772	$86,519,422,772
d) Unfunded Accrued Liability/(Surplus) [(b) – (c)]	$38,947,296,454	$23,987,859,447	$11,632,852,600
e) Funded Status	69.0%	78.3%	88.1%

	Sensitivity to the Price Inflation Assumption		
As of June 30, 2021	1% Lower Inflation Rate	Current Assumptions	1% Higher Inflation Rate
Discount Rate	**5.8%**	**6.8%**	**7.8%**
Inflation	**1.3%**	**2.3%**	**3.3%**
Real Rate of Return	4.5%	4.5%	4.5%
a) Total Normal Cost Rate	18.16%	17.24%	15.57%
b) Accrued Liability	$114,169,341,341	$110,507,282,219	$101,268,463,820
c) Market Value of Assets	$86,519,422,772	$86,519,422,772	$86,519,422,772
d) Unfunded Accrued Liability/(Surplus) [(b) – (c)]	$27,649,918,569	$23,987,859,447	$14,749,041,048
e) Funded Status	75.8%	78.3%	85.4%

Risk Analysis

Mortality Rate Sensitivity

The following table shows how June 30, 2021 valuation results would differ under two alternate longevity scenarios, namely assuming rates of mortality are 10% lower or 10% higher than our current mortality assumptions. This type of analysis highlights the impact on the plan of improving or worsening mortality over the long term.

	Sensitivity to the Mortality Assumption		
As of June 30, 2021	10% Lower Mortality Rates	Current Assumptions	10% Higher Mortality Rates
a) Total Normal Cost Rate	17.52%	17.24%	16.98%
b) Accrued Liability	$112,960,824,906	$110,507,282,219	$108,258,282,865
c) Market Value of Assets	$86,519,422,772	$86,519,422,772	$86,519,422,772
d) Unfunded Accrued Liability/(Surplus) [(b) – (c)]	$26,441,402,134	$23,987,859,447	$21,738,860,093
e) Funded Status	76.6%	78.3%	79.9%

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%. For CalPERS and other retirement systems in the United States, these ratios have been increasing in recent years.

Ratio of Retiree Accrued Liability to Total Accrued Liability

	June 30, 2020			June 30, 2021		
	Retiree Accrued Liability	Total Accrued Liability	Ratio	Retiree Accrued Liability	Total Accrued Liability	Ratio
Schools Pool	53,939,114,559	104,062,327,717	52%	57,632,462,523	110,507,282,219	52%

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 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

	June 30, 2020			June 30, 2021		
Plan	Number of Actives	Number of Retirees	Support Ratio	Number of Actives	Number of Retirees	Support Ratio
Schools Pool	328,255	246,960	1.33	316,847	253,988	1.25

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

Asset Volatility Ratio

Shown in the table below is the asset volatility ratio (AVR), which is the ratio of market value of assets to payroll. Plans that have a higher AVR experience more volatile employer rates due to investment return. For example, a plan with an AVR of 8 may experience twice the contribution volatility due to investment return than a plan with an AVR of 4. It should be noted that this ratio is a measure of the current situation. It increases over time but generally tends to stabilize as the plan matures.

Liability Volatility Ratio

Also shown in the table below is the liability volatility ratio (LVR), which is the ratio of accrued liability to payroll. Plans that have a higher LVR experience more volatile employer rates due to changes in liability. For example, a plan with an LVR of 12 is expected to have twice the contribution volatility of a plan with an LVR of 6 when there is a change in liability, such as when there is a change in actuarial assumptions. It should be noted that this ratio indicates a longer-term potential for contribution volatility, since the AVR, described above, will tend to move closer to the LVR as the funded status approaches 100%.

Contribution Volatility as of the Valuation Date

Market Value of Assets without Receivables	Annual Covered Payroll	Asset Volatility Ratio	Accrued Liability	Liability Volatility Ratio
(1)	(2)	(1) ÷ (2)	(3)	(3) ÷ (2)
$86,427,118,392	$14,364,992,906	6.0	$110,507,282,219	7.7

Maturity Measures History

Valuation Date	Ratio of Retiree Accrued Liability to Total Accrued Liability	Support Ratio	Asset Volatility Ratio	Liability Volatility Ratio
06/30/2017	50%	1.41	4.7	6.5
06/30/2018	51%	1.38	4.8	6.8
06/30/2019	51%	1.37	4.8	7.1
06/30/2020	52%	1.33	4.9	7.2
06/30/2021	52%	1.25	6.0	7.7

Appendices

Appendix A – Actuarial Methods and Assumptions

Actuarial Data

As stated in the Actuarial Certification, the data that 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 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 generally do not have a material impact on the employer contribution rates.

Actuarial Methods

Actuarial Cost Method

The actuarial cost method 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 into the plan 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; there is no normal cost associated with these members.

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 current policy was adopted effective with the June 30, 2019 actuarial valuation and applies only to bases established on/after that date. Amortization bases (sources of UAL) established prior to the June 30, 2019 valuation will continue to be amortized according to the prior policy. There is one exception to the new policy for the Schools Pool wherein the impact of the discount rate change from 7.25% to 7.00% in the June 30, 2019 valuation was amortized under the prior policy in order to be consistent with the treatment of the corresponding base in the State and public agency plans.

Appendix A – Actuarial Methods and Assumptions

Actuarial Methods (continued)

Prior Policy (Bases Established prior to June 30, 2019)[1]

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				
	Investment	Non-investment	Assumption or Method Change	Benefit Change	Golden Handshake
Amortization Period	30 Years	30 Years	20 Years	20 Years	5 Years
Escalation Rate - Active Plans - Inactive Plans	 2.80% 0%	 2.80% 0%	 2.80% 0%	 2.80% 0%	 2.80% 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%, 40%, 60%, and 80% of the "full" payment that 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)[1]

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				
	Investment	Non-investment	Assumption or Method Change	Benefit Change	Golden Handshake
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

[1] An exception for the Schools Pool is that the impact of the discount rate change from 7.25% to 7.00% in the June 30, 2019 valuation is amortized under the prior policy.

Appendix A – Actuarial Methods and Assumptions

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 amortization bases are combined and the total unfunded actuarial liability is 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 actuarial liability; or
- When the payment would completely amortize the total unfunded liability in a very short time period, resulting 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 fresh start, the period is set by the actuary at what is deemed appropriate; however, the period will not be greater than 20 years.

Asset Valuation Method

The Actuarial Value of Assets is set equal to the Market Value of Assets. The direct rate smoothing technique described under "Amortization of Unfunded Actuarial Accrued Liability" is used to determine employer contribution rates.

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.

PEPRA Normal Cost Rate Methodology

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

Actuarial Methods (continued)

Purchasing Power Protection Act (PPPA) Method

PPPA benefits are cost-of-living adjustments intended to maintain the individual's current retirement benefit at 75% 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 Schools Pool 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.

For the Schools Pool, the total annual outlay for PPPA benefits is limited by State statute to earnings of up to 1.1% of accumulated member contributions. If this annual outlay is insufficient to provide the PPPA benefits in a given fiscal year, the 75% maintenance target would be proportionately reduced. Since the inception of the PPPA benefit program, 1.1% has proved more than sufficient to provide the 75% maintenance. Under the inflation assumption of 2.3% compounded annually, the 1.1% appears to remain more than sufficient in the foreseeable future.

Internal Revenue Code Section 415

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. This results in lower contributions for those employers contributing to the Replacement Benefit Fund and protects CalPERS from prefunding expected benefits in excess of limits imposed by federal tax law. The Section 415(b) dollar limit for the 2021 calendar year is $230,000.

Internal Revenue Code Section 401(a)(17)

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. The compensation limit for classic members for the 2021 calendar year is $290,000.

Appendix A – Actuarial Methods and Assumptions

Actuarial Assumptions

In 2021, CalPERS completed its most recent asset liability management study incorporating actuarial assumptions and strategic asset allocation. In November 2021, the board adopted changes to the asset allocation that increased the expected volatility of returns. The adopted asset allocation was expected to have a long-term blended return that continued to support a discount rate assumption of 6.80%. The board also approved several changes to the demographic assumptions to take into account recent experience.

For more details and additional rationale for the selection of the actuarial assumptions, please refer to the CalPERS Experience Study and Review of Actuarial Assumptions report from November 2021 that can be found on the CalPERS website under Forms and Publications. Click on “View All” and search for Experience Study.

All actuarial assumptions (except the discount rates used for the hypothetical termination liability) represent an estimate of future experience rather than observations of the estimates inherent in market data.

Appendix A – Actuarial Methods and Assumptions

Economic Assumptions

Discount Rate

6.80% 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 (2.80% for 2021) is added to these factors for total salary growth.

Duration of Service	Entry Age		
	20	30	40
0	2.75%	2.75%	2.00%
3	4.22%	3.73%	2.98%
5	3.08%	2.39%	1.79%
10	2.36%	1.60%	1.21%
15	1.82%	1.35%	1.03%
20	1.45%	1.09%	0.85%
25	1.24%	1.02%	0.58%
30	0.75%	0.53%	0.19%

Overall Payroll Growth

2.80% compounded annually. This is used in projecting the payroll over which unfunded accrued liability is amortized for amortization bases with a level percentage payment type (generally those bases established prior to June 30, 2019).

Inflation

2.30% compounded annually.

Demographic Assumptions

Post-Retirement Mortality

Rates vary by age, type of retirement, and gender. See sample rates in table below.

	Healthy Recipients		Non-Industrial Disabled (Not Job-Related)		Industrial Disabled (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
50	0.00267	0.00199	0.01701	0.01439	0.00430	0.00311
55	0.00390	0.00325	0.02210	0.01734	0.00621	0.00550
60	0.00578	0.00455	0.02708	0.01962	0.00944	0.00868
65	0.00857	0.00612	0.03334	0.02276	0.01394	0.01190
70	0.01333	0.00996	0.04001	0.02910	0.02163	0.01858
75	0.02391	0.01783	0.05376	0.04160	0.03446	0.03134
80	0.04371	0.03403	0.07936	0.06112	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	0.24665	0.20364	0.24665	0.20364	0.24665	0.20364
100	0.36198	0.31582	0.36198	0.31582	0.36198	0.31582

Appendix A – Actuarial Methods and Assumptions

Demographic Assumptions (continued)

Marital Status

For active members, 70% are assumed to be married upon retirement.

Age of Spouse

Female spouses are assumed to be 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.

Termination with Refund

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

Duration of Service	Entry Age									
	20		25		30		35		40	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	0.2054	0.2120	0.1933	0.1952	0.1730	0.1672	0.1527	0.1392	0.1423	0.1212
1	0.1922	0.2069	0.1778	0.1883	0.1539	0.1573	0.1300	0.1264	0.1191	0.1087
2	0.1678	0.1859	0.1536	0.1681	0.1298	0.1383	0.1060	0.1086	0.0957	0.0934
3	0.1384	0.1575	0.1256	0.1417	0.1042	0.1155	0.0829	0.0893	0.0736	0.0774
4	0.1085	0.1274	0.0978	0.1143	0.0800	0.0925	0.0622	0.0707	0.0542	0.0620
5	0.0816	0.0991	0.0732	0.0887	0.0590	0.0713	0.0449	0.0539	0.0383	0.0476
10	0.0222	0.0248	0.0200	0.0221	0.0163	0.0174	0.0125	0.0128	0.0094	0.0100
15	0.0106	0.0132	0.0095	0.0113	0.0077	0.0083	0.0058	0.0052	0.0040	0.0039
20	0.0059	0.0065	0.0050	0.0054	0.0035	0.0036	0.0021	0.0019	0.0010	0.0009
25	0.0029	0.0034	0.0025	0.0029	0.0018	0.0020	0.0010	0.0012	0.0005	0.0006
30	0.0012	0.0015	0.0011	0.0013	0.0011	0.0011	0.0010	0.0009	0.0005	0.0005
35	0.0006	0.0007	0.0006	0.0007	0.0005	0.0006	0.0005	0.0005	0.0003	0.0002

Appendix A – Actuarial Methods and Assumptions

Demographic Assumptions (continued)

Termination with Vested Deferred Benefits

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

Duration of Service	Entry Age									
	20		25		30		35		40	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
5	0.0359	0.0501	0.0359	0.0501	0.0332	0.0402	0.0305	0.0304	0.0266	0.0272
10	0.0311	0.0417	0.0311	0.0417	0.0269	0.0341	0.0228	0.0265	0.0193	0.0233
15	0.0193	0.0264	0.0193	0.0264	0.0172	0.0220	0.0151	0.0175	0.0123	0.0142
20	0.0145	0.0185	0.0145	0.0185	0.0113	0.0141	0.0080	0.0097	0.0000	0.0000
25	0.0089	0.0123	0.0089	0.0123	0.0074	0.0093	0.0000	0.0000	0.0000	0.0000
30	0.0057	0.0064	0.0057	0.0064	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0040	0.0049	0.0000	0.0000	0.0000	0.0000	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 member is assumed to retire at age 59.

Pre-Retirement Mortality and Disability

Rates vary by age and gender. See sample rates in the table below. Mortality rates represent healthy mortality. Disability rates represent non-industrial (not job-related) disability; no industrial disability is assumed.

	Mortality		Disability	
Attained Age	Male	Female	Male	Female
20	0.00039	0.00014	0.00004	0.00015
25	0.00033	0.00013	0.00004	0.00015
30	0.00044	0.00019	0.00018	0.00017
35	0.00058	0.00029	0.00047	0.00038
40	0.00075	0.00039	0.00098	0.00077
45	0.00093	0.00054	0.00191	0.00153
50	0.00134	0.00081	0.00273	0.00214
55	0.00198	0.00123	0.00235	0.00169
60	0.00287	0.00179	0.00198	0.00102

Appendix A – Actuarial Methods and Assumptions

Demographic Assumptions (continued)

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	0.0030	0.0040	0.0060	0.0070	0.0100	0.0100	0.0110
52	0.0050	0.0070	0.0080	0.0090	0.0120	0.0120	0.0130
54	0.0060	0.0090	0.0120	0.0150	0.0200	0.0210	0.0230
56	0.0120	0.0270	0.0360	0.0560	0.0730	0.0950	0.1080
58	0.0190	0.0300	0.0400	0.0620	0.0780	0.1030	0.1220
60	0.0220	0.0430	0.0620	0.0950	0.1130	0.1410	0.1660
62	0.0650	0.0980	0.1280	0.1880	0.2160	0.2480	0.2560
65	0.1630	0.1640	0.1970	0.2320	0.2500	0.2710	0.2890
70	0.1910	0.1900	0.2370	0.2500	0.2460	0.2540	0.2580
75	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
52	0.0040	0.0070	0.0100	0.0110	0.0130	0.0150	0.0170
54	0.0050	0.0110	0.0150	0.0180	0.0200	0.0220	0.0260
56	0.0130	0.0260	0.0370	0.0430	0.0480	0.0550	0.0640
58	0.0170	0.0340	0.0470	0.0560	0.0620	0.0690	0.0810
60	0.0260	0.0530	0.0740	0.0870	0.0970	0.1080	0.1260
62	0.0530	0.1050	0.1470	0.1740	0.1940	0.2170	0.2540
65	0.0720	0.1420	0.1990	0.2350	0.2620	0.2930	0.3450
70	0.0710	0.1400	0.1960	0.2310	0.2580	0.2890	0.3380
75	0.0670	0.1320	0.1840	0.2180	0.2430	0.2720	0.3200

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 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.

Appendix B – Principal Plan Provisions

The following is a description of the principal plan provisions used in calculating costs and liabilities. Many of the statements in this summary are general in nature but are intended to provide an easy to understand summary of the Public Employees' Retirement Law. The law itself governs in all situations.

Service Retirement

Eligibility

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

Benefit

The Service Retirement benefit is a monthly allowance equal to the product of the benefit factor, years of service, and final compensation.

- The *benefit factor* for classic members comes from the **2% at 55** benefit factor table. PEPRA members are subject to the **2% at 62** benefit factor table. The factor depends on the member's age at retirement. Listed below are the factors for retirement at whole year ages:

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

Service Retirement (continued)

- The *final compensation* for classic members 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 PEPRA members, 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 $128,059 for 2021; for employees who do not participate in Social Security the cap for 2021 is $153,671. Adjustments to the caps are permitted annually based on changes to the Consumer Price Index for All Urban Consumers (CPI-U).
- Employees in this plan may or may not be covered by Social Security. For employees with service prior to January 1, 2001 covered by Social Security, monthly final compensation is offset by $133.33 (or by one-third if final compensation is less than $400). For 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 5 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 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 5 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.

Non-Industrial (Non-Job-Related) Disability Retirement (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 under their service retirement benefit formula will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Post-Retirement Death Benefit

Lump Sum Payment

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

Form of Payment for Retirement Allowance

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

For retirement allowances with respect to service earned by employment in this group, 25% 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 (50% for service not covered by Social Security). 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 (or 50% for service not covered by Social Security), 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. This benefit will not be discontinued in the event the spouse remarries.

The remaining 75% of the retirement allowance (or 50% for service not covered by Social Security), 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

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 annually at the greater of 6% or the prevailing discount rate. In addition, a lump sum in the amount of six months' salary is paid. 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.

Pre-Retirement Death Benefits (continued)

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

Benefit

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

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 further 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. The employer may choose to "pick up" these contributions for the employees.

- The percentage contributed below the monthly compensation breakpoint is 0%.
- The percentage contributed above the monthly compensation breakpoint is 7% for classic members.
- The PEPRA member contribution rate is tied to normal cost and can change annually. See the PEPRA Member Contribution Rate section for details.
- The monthly compensation breakpoint is $0.

Refund of Employee Contributions

If a 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 the Participant Data

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

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

Data Validation Test and Adjustments

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

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 the plan with those from the prior valuation,
- Pension amounts for each retiree and beneficiary receiving payments were compared with the pension amounts from the prior valuation,
- Checks for invalid ages and dates, and
- Reasonableness checks on various key data elements such as service and salary.

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

- Dates of hire and dates of entry were adjusted where necessary to be consistent with the service fields, the date of birth and each other, and
- The annual earnings rate for most school members were overwritten with the annualized earnings based on their yearly contributions.

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 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 3% 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.

Appendix C – Participant Data

Reconciliation of Participants

	Active	Transfer	Terminated	Receiving	Total
As of June 30, 2020	**328,255**	**19,832**	**206,608**	**246,960**	**801,655**
First Year in Status[1]	20,509	172	1,858	173	22,712
Rehire	3,320	(166)	(3,136)	(18)	0
Transfer	(996)	1,990	(984)	(10)	0
Terminations[2]	(20,050)	(697)	20,750	(3)	0
Retired	(10,912)	(1,034)	(1,521)	13,452	(15)
Ordinary Disabilities	(71)	(12)	(47)	143	13
Industrial Disabilities	(1)	(27)	(4)	34	2
Death with Beneficiary	(112)	(7)	(4)	199	76
Refunds of Contributions	(2,324)	(83)	(4,181)	0	(6,588)
Death w/o Beneficiary	(508)	(16)	(962)	(7,018)	(8,504)
Data Corrections[3]	(263)	12	(55)	76	(230)
As of June 30, 2021	**316,847**	**19,964**	**218,322**	**253,988**	**809,121**

(1) Includes non-vested terminated participants with employee contributions left in the plan.
(2) May include the combining of data records into a single record.

Appendix C – Participant Data

Active Members

Distribution by Age and Service

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15 – 24	9,539	60	0	0	0	0	9,599	$265,057,320
25 – 29	23,568	2,967	9	0	0	0	26,544	$893,639,099
30 – 34	21,872	9,354	1,462	61	0	0	32,749	$1,333,160,130
35 – 39	17,864	10,110	5,223	1,857	82	1	35,137	$1,609,550,713
40 – 44	15,982	9,075	6,225	4,689	1,722	55	37,748	$1,813,757,304
45 – 49	14,265	8,862	6,179	5,527	4,031	905	39,769	$1,923,309,495
50 – 54	12,667	9,476	7,491	6,185	4,979	3,120	43,918	$2,140,487,727
55 – 59	9,446	8,591	8,110	7,154	5,577	5,068	43,946	$2,164,441,825
60 – 64	5,731	5,939	6,040	5,889	4,558	3,893	32,050	$1,544,070,823
65 and Over	2,914	2,821	3,021	2,738	2,032	1,861	15,387	$677,518,470
Total	**133,848**	**67,255**	**43,760**	**34,100**	**22,981**	**14,903**	**316,847**	**$14,364,992,906**

Counts are of unique members included in the valuation. Multiple records may exist for members with service in more than one benefit group. This does not result in double counting liabilities.

Average Annual Salaries by Age and Service

Attained Age	Years of Service at Valuation Date						Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+	
15 – 24	$27,503	$45,104	$0	$0	$0	$0	$27,613
25 – 29	32,066	46,319	53,715	0	0	0	33,666
30 – 34	35,724	49,721	56,724	62,061	0	0	40,708
35 – 39	36,914	51,545	57,741	65,200	75,376	164,916	45,808
40 – 44	35,750	50,461	55,790	65,521	72,811	83,151	48,049
45 – 49	34,151	46,779	53,195	61,764	70,383	74,940	48,362
50 – 54	33,398	44,484	49,801	57,186	67,575	74,580	48,738
55 – 59	32,993	41,060	46,362	54,767	64,597	73,399	49,252
60 – 64	31,538	39,647	44,266	52,548	61,731	69,272	48,177
65 and Over	27,295	35,546	41,827	50,645	57,625	62,112	44,032
Average	**$33,713**	**$46,225**	**$50,360**	**$57,686**	**$65,726**	**$71,294**	**$45,337**

Appendix C – Participant Data

Transferred and Terminated Participants

Distribution by Age and Service – Transfers to Other CalPERS Plans

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15 – 24	137	0	0	0	0	0	137	$44,517
25 – 29	1,072	27	0	0	0	0	1,099	52,781
30 – 34	2,020	154	9	0	0	0	2,183	58,278
35 – 39	2,321	307	62	5	0	0	2,695	65,203
40 – 44	2,521	407	135	38	4	0	3,105	74,040
45 – 49	2,277	452	159	56	12	1	2,957	79,874
50 – 54	2,079	468	190	69	25	8	2,839	78,229
55 – 59	1,762	429	177	71	33	9	2,481	73,478
60 – 64	1,239	283	119	48	18	5	1,712	68,598
65 and Over	571	129	36	16	3	1	756	64,242
Total	**15,999**	**2,656**	**887**	**303**	**95**	**24**	**19,964**	**$70,303**

Counts are of unique members included in the valuation. Multiple records may exist for members with service in more than one benefit group. This does not result in double counting liabilities.

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

Attained Age	Years of Service at Valuation Date						Total	Average Salary
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15 – 24	4,345	0	0	0	0	0	4,345	$31,231
25 – 29	18,889	195	1	0	0	0	19,085	32,579
30 – 34	26,516	1,243	67	1	0	0	27,827	33,511
35 – 39	27,217	2,720	445	49	3	0	30,434	34,378
40 – 44	25,763	2,893	900	196	36	1	29,789	34,428
45 – 49	21,326	2,832	972	349	85	9	25,572	34,321
50 – 54	19,579	3,086	1,170	471	162	50	24,516	34,448
55 – 59	17,679	3,090	1,026	376	117	61	22,341	33,044
60 – 64	15,340	2,372	780	263	96	44	18,891	32,000
65 and Over	13,419	1,465	395	150	58	37	15,522	30,608
Total	**190,073**	**19,896**	**5,756**	**1,855**	**557**	**202**	**218,322**	**$33,445**

Counts are of unique members included in the valuation. Multiple records may exist for members with service in more than one benefit group. This does not result in double counting liabilities.

Appendix C – Participant Data

Retired Members and Beneficiaries

Distribution by Age and Retirement Type

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	4	6	201	211
30 – 34	0	1	3	0	0	184	188
35 – 39	0	18	17	2	0	239	276
40 – 44	0	82	36	4	0	293	415
45 – 49	0	191	64	12	1	332	600
50 – 54	1,260	562	114	48	0	546	2,530
55 – 59	9,591	1,114	135	99	3	969	11,911
60 – 64	28,651	1,697	167	183	2	1,548	32,248
65 – 69	49,805	1,963	176	204	2	2,517	54,667
70 – 74	50,472	1,822	179	206	1	3,804	56,484
75 – 79	33,094	1,440	94	109	2	4,010	38,749
80 – 84	20,934	1,013	39	78	3	4,030	26,097
85 and Over	21,757	747	15	50	3	7,040	29,612
Total	**215,564**	**10,650**	**1,039**	**999**	**23**	**25,713**	**253,988**

Counts are of unique members included in the valuation. Multiple records may exist for members with service in more than one benefit group. This does not result in double counting liabilities.

Average Annual Allowance Amounts by Age and Retirement Type

Amounts Including PPPA Payments

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$0	$0	$24,838	$0	$1,117,454	$1,143,324
30 – 34	0	2,532	117	0	0	1,166,556	1,169,205
35 – 39	0	153,840	5,625	20,355	0	1,804,318	1,984,138
40 – 44	0	1,013,750	30,241	80,295	0	2,308,038	3,432,324
45 – 49	0	2,202,943	38,640	116,466	0	3,288,959	5,649,528
50 – 54	11,762,255	7,635,924	194,796	577,342	0	5,272,676	25,442,993
55 – 59	197,516,231	14,491,245	384,766	1,105,352	0	10,635,210	224,134,258
60 – 64	679,180,288	22,325,783	463,749	2,043,987	0	20,093,434	724,108,362
65 – 69	1,141,074,417	26,241,211	408,558	2,051,584	0	33,682,437	1,203,461,808
70 – 74	1,088,793,965	23,301,667	546,557	1,899,653	0	52,259,692	1,166,802,880
75 – 79	673,990,804	17,914,414	394,323	954,741	0	53,929,538	747,187,656
80 – 84	385,642,401	11,721,214	86,618	609,189	0	50,903,512	448,965,146
85 and Over	320,986,330	7,579,568	45,040	466,605	0	77,389,751	406,470,150
Total	**$4,498,946,690**	**$134,584,092**	**$2,599,030**	**$9,950,406**	**$0**	**$313,851,575**	**$4,959,951,772**

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

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

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	61,617	793	198	278	7	9,175	72,068
5 – 9	48,243	1,619	199	235	1	6,371	56,668
10 – 14	39,624	1,507	142	213	1	4,298	45,785
15 – 19	30,844	1,988	192	156	2	2,805	35,987
20 – 24	17,251	2,099	114	64	1	1,587	21,116
25 – 29	10,521	1,520	90	23	1	870	13,025
30 and Over	7,464	1,124	104	30	10	607	9,339
Total	**215,564**	**10,650**	**1,039**	**999**	**23**	**25,713**	**253,988**

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

Average Annual Allowance Amounts by Years Retired and Retirement Type

Amounts Including PPPA Payments

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Years	$1,505,497,477	$11,319,678	$613,290	$3,305,410	$3,801	$124,334,391	$1,645,074,047
5 – 9	1,031,027,366	21,507,014	621,322	2,368,314	4	79,578,874	1,135,102,895
10 – 14	851,017,906	20,541,419	468,731	2,024,091	907	50,086,230	924,139,285
15 – 19	622,522,500	27,771,366	574,357	1,327,436	926	31,415,488	683,612,072
20 – 24	277,336,016	25,331,427	169,722	477,736	3,832	15,710,188	319,028,921
25 – 29	142,496,821	17,705,531	65,628	160,226	2,715	8,068,921	168,499,842
30 and Over	69,048,604	10,407,657	85,979	287,192	7,795	4,657,482	84,494,710
Total	**$4,498,946,690**	**$134,584,092**	**$2,599,030**	**$9,950,406**	**$19,979**	**$313,851,575**	**$4,959,951,772**

Appendix C – Participant Data

Retired Members and Beneficiaries (continued)

Number Counts and Benefits – by Year of Retirement

Year Retired	Total Retirements	Total Benefits	Average Benefits
2021*	7,090	$149,440,171	$21,078
2020	14,976	343,896,643	22,963
2019	14,500	328,389,092	22,648
2018	14,094	315,829,113	22,409
2017	14,447	337,536,692	23,364
2016	12,456	270,936,519	21,751
2015	12,312	257,870,062	20,945
2014	11,362	229,074,113	20,161
2013	10,831	207,258,527	19,136
2012	10,817	211,228,526	19,527
2011	10,422	206,159,019	19,781
2010	10,939	228,438,002	20,883
2009	9,883	209,111,160	21,159
2008	8,100	164,087,753	20,258
2007	7,753	151,963,046	19,601
2006	7,835	144,918,229	18,496
2005	7,799	143,279,822	18,372
2004	7,853	147,504,554	18,783
2003	7,919	158,448,362	20,009
2002	6,069	118,815,449	19,577
2001	5,275	101,000,453	19,147
2000	6,170	112,695,343	18,265
1999	3,484	45,831,792	13,155
1998	4,030	55,047,672	13,659
1997	3,524	45,365,504	12,873
1996	3,217	41,666,160	12,952
1995	3,091	40,224,493	13,013
1994	2,712	35,005,076	12,907
1993	2,456	32,056,374	13,052
1992 and Earlier	12,572	126,874,053	10,092
Total	**253,988**	**$4,959,951,774**	**$19,528**

* The numbers for 2021 are for the first 6 months of the calendar year only.

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

Appendix D – Glossary

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 an actuarial cost method, an amortization policy, and an 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 in plan provisions.

Amortization Bases

Separate payment schedules for different portions of the Unfunded Accrued Liability (UAL). The total UAL 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 PEPRA)

A member who joined a public retirement system prior to January 1, 2013 and who is not defined as a new member under PEPRA. (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.

Entry Age Actuarial Cost Method

An actuarial cost method designed to fund a member's total plan benefit evenly 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.

Appendix D – Glossary

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 the Market Value of Assets divided by the 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 PEPRA)

A new member includes an individual who becomes a member of a public retirement system for the first time on or after January 1, 2013, and who was not a member of another public retirement system prior to that date, and who is not subject to reciprocity with another public retirement system.

Normal Cost

The 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 with regard to pensions.

PEPRA

The California Public Employees' Pension Reform Act of 2013.

Present Value of Benefits (PVB)

The total dollars needed as of the valuation date to fund all benefits earned in the past or expected to be earned in the future for current members.

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.

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