

Schools Pool Actuarial Valuation

As of June 30, 2020



Required Contributions for Fiscal Year
July 1, 2021 through June 30, 2022



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Actuarial Certification



October 2021

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, 2020 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.

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Highlights and Executive Summary

Introduction

This is the actuarial valuation report as of June 30, 2020 for the Schools Pool. This actuarial valuation determines the funded status as of June 30, 2020 and sets forth the Schools Pool employer and employee contribution rates for fiscal year July 1, 2021 through June 30, 2022.

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 of Report

This actuarial valuation was performed by the CalPERS Actuarial Office using census data as of June 30, 2020. The purpose of the report is to:

- Set forth the assets and accrued liabilities of the Schools Pool as of June 30, 2020.
- Determine the required employer contribution rate for fiscal year July 1, 2021 through June 30, 2022.
- Determine the required employee contribution rate for fiscal year July 1, 2021 through June 30, 2022 for school employees subject to the California Public Employees' Pension Reform Act of 2013 (PEPRA).
- Provide actuarial information as of June 30, 2020 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 6.0% and 8.0%.
- 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, 2021 through June 30, 2022 is shown in the table below. For comparison purposes, the corresponding contribution rate for fiscal year July 1, 2020 through June 30, 2021 is also provided. The contribution amounts that these rates are expected to generate are also shown.

	Fiscal Year 2020-21	Fiscal Year 2021-22
1) Contribution as a Percentage of Payroll		
a) Total Normal Cost	16.47%	16.32%
b) Employee Contribution ¹	7.00%	7.00%
c) Employer Normal Cost [(1a) – (1b)]	9.47%	9.32%
d) Unfunded Accrued Liability Contribution Rate	14.13%	13.59%
e) Actuarially Determined Contribution Rate [(1c) + (1d)]	23.60%	22.91%
f) State Supplanting Payment (Gov. Code §20825.2) ²	(2.90%)	
g) Required Employer Contribution Rate [(1e) + (1f)]	20.70%	22.91%
Projected Annual Payroll for Contribution Year	\$14,844,455,960	\$15,294,555,487
2) Expected Contribution in Dollars		
a) Total Normal Cost	\$2,444,881,896	\$2,496,071,455
b) Employee Contribution ¹	1,039,111,917	1,070,618,884
c) Employer Normal Cost [(2a) – (2b)]	1,405,769,979	1,425,452,571
d) Unfunded Accrued Liability Contribution	2,097,873,789	2,077,777,206
e) Actuarially Determined Contribution [(2c) + (2d)]	\$3,503,643,768	\$3,503,229,777
f) State Supplanting Payment (Gov. Code §20825.2) ²	(430,000,000)	
g) Expected Employer Contribution [(2e) + (2f)]	\$3,073,643,768	\$3,503,229,777

(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 effect of the supplanting payment associated with the State's supplemental contribution under Gov. Code 20825.2 is incorporated in the Unfunded Accrued Liability Rate. It served to reduce the Actuarially Determined Contribution by \$330 million, or 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 2021-22 contributions are based on fiscal year 2019-20 reported payroll increased by 2.75% 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

PEPRA members are required to contribute at least 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, 2020 actuarial valuation did not change by more than 1% from when the rate was last changed. As a result, the PEPRA member contribution rate in fiscal year 2021-22 will remain 7.00%. See the "PEPRA Member Contribution Rate" section of this report for more information.

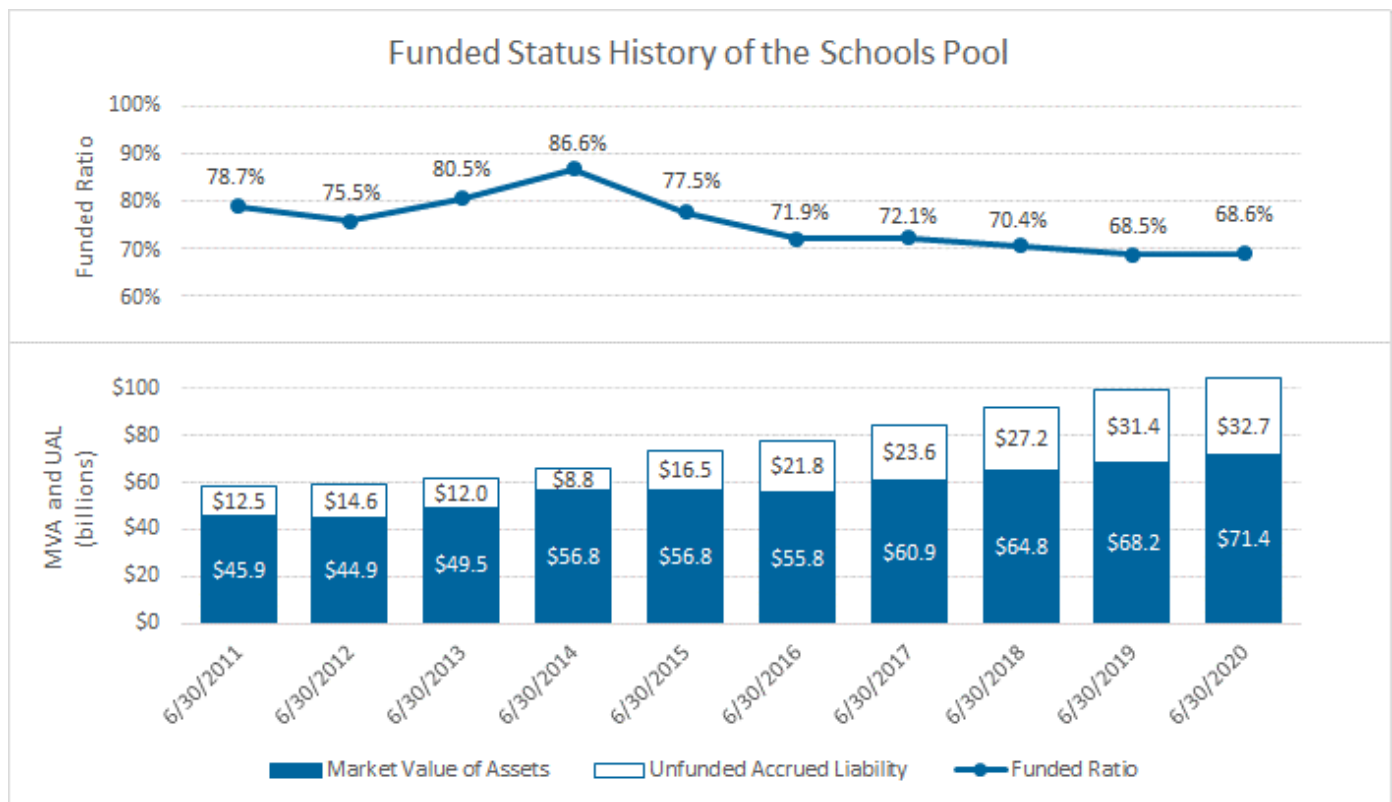
Highlights and Executive Summary

Funded Status

	June 30, 2019	June 30, 2020
1) Present Value of Projected Benefits	\$117,831,940,799	\$122,782,104,912
2) Entry Age Accrued Liability	99,528,448,210	104,062,327,717
3) Market Value of Assets (MVA)	68,177,143,705	71,400,466,343
4) Unfunded Accrued Liability (UAL) [(2) - (3)]	\$31,351,304,505	\$32,661,861,374
5) Funded Ratio [(3) / (2)]	68.5%	68.6%

The 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, 2019 to June 30, 2020 the funded ratio for the Schools Pool increased by 0.1%. This increase is primarily due to the additional State contribution in July 2019 offset partially by the lower than expected investment return in fiscal year 2019-20.

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.

Plan Experience

The return on assets for the year ending June 30, 2020 was approximately 4.7% reduced for administrative expenses, lower than the assumed return of 7.0%, leading to an investment experience loss. Overall demographic experience produced a nominal liability experience gain. The normal cost declined slightly as the PEPRA share of the active population continued to increase.

Actuarial Methods and Assumptions

A change was made to the way in which liability is categorized for certain transferred records. For members who have both an active record and one or more transfer records due to past changes in employment within the Schools Pool, the total liability is now categorized as active. In prior valuations, the liability for these members was split between active and transferred. This change merely shifted a portion of liability from one status category to another — it did not have a significant effect on total liability or the contribution requirements of the plan. See the "Accrued and Unfunded Liabilities" section of this report for more information.

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.

Additional State Contribution to the Schools Pool

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 accrued liability contribution on behalf of school employers. This \$904 million was allocated among fiscal years in accordance with Government Code section 20825.2. Specifically, \$144 million paid part of the 2019-20 required employer contribution, \$430 million paid part of the 2020-21 required employer contribution, and \$330 million pays part of the 2021-22 required employer contribution.

For fiscal year 2020-21, the additional payment did not directly impact the actuarially determined contribution as it was not yet in the fund by the June 30, 2019 actuarial valuation date. The \$430 million allocated to fiscal year 2020-21 was treated as an advance payment toward the unfunded accrued liability contribution with the required employer contribution rate correspondingly reduced.

For fiscal year 2021-22, the impact of the additional payment is directly reflected in the actuarially determined contribution because the additional payment was in the fund — hence the unfunded accrued liability reduced — as of the June 30, 2020 actuarial valuation date. The \$330 million allocated to fiscal year 2021-22 served to reduce the required employer contribution rate by 2.16% of payroll.

Following are reconciliations of the actuarially determined contribution and required employer contribution.

Highlights and Executive Summary

Changes Since the Prior Year's Valuation (continued)

Reconciliation of Actuarially Determined Contribution

	Percentage of Payroll	Dollars
2020-21 Total Actuarially Determined Contribution	23.60%	\$3,503,643,768
Progression of Amortization Bases & Change in Payroll	1.45%	326,105,847
Experience (Gain)/Loss	0.02%	3,480,162
Change in Member Contribution Rates	0.00%	0
State Supplanting Payment (Gov. Code §20825.2)	<u>(2.16%)</u>	<u>(330,000,000)</u>
2021-22 Total Actuarially Determined Contribution	22.91%	\$3,503,229,777

Reconciliation of Required Employer Contribution

	Percentage of Payroll	Dollars
2020-21 Required Employer Contribution	20.70%	\$3,073,643,768
Progression of Amortization Bases & Change in Payroll	1.45%	326,105,847
Experience (Gain)/Loss	0.02%	3,480,162
Change in Member Contribution Rates	0.00%	0
Effect of Change in State Supplanting Payment (Gov. Code §20825.2)	<u>0.74%</u>	<u>100,000,000</u>
2021-22 Required Employer Contribution	22.91%	\$3,503,229,777

Subsequent Events

This actuarial valuation report reflects statutory and regulatory changes and fund investment return through June 2021 and board actions through September 2021. 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 Schools Pool contribution rate for fiscal year 2022-23 will be based on the June 30, 2021 actuarial valuation. At the time of publication of this report, key actuarial assumptions to be used in that valuation, particularly the discount rate, are not yet known. The discount rate is a key driver of pension plan cost and therefore meaningful estimates of the contribution rate for fiscal year 2022-23 and future years will be unavailable until the final discount rate is known.

The discount rate is presently undergoing review as part of the periodic Asset Liability Management (ALM) study currently in progress. Other economic assumptions and demographic assumptions are also currently undergoing review as part of the CalPERS Experience Study conducted every four years. Revised assumptions resulting from these studies will be incorporated into the June 30, 2021 actuarial valuation.

The CalPERS Funding Risk Mitigation Policy has recently triggered an automatic decrease of 0.20% in the discount rate assumption due to the investment return in fiscal year 2020-21. However, the Board of Administration may choose to further alter the discount rate as a result of the current ALM process.

It is currently anticipated that both economic and demographic assumptions will be finalized by the end of the 2021 calendar year.

Once assumptions are finalized, we will perform projections of employer contribution rates for the next five fiscal years reflecting both the new assumptions as well as actual fiscal year 2020-21 investment return (approximately 21.3% before reduction for administrative expenses). The projections will also reflect that, all other changes aside, the employer rate will increase in fiscal year 2022-23 due to the expiration of the State's supplanting payments under Government Code section 20825.2. See "Changes Since the Prior Year's Valuation" above for details on the supplanting payments. Results of the projections will be released in an addendum to this report.

Assets

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Assets

Reconciliation of Market Value of Assets

1) Market Value of Assets as of June 30, 2019 Including Receivables	\$68,177,143,705
2) Receivables for Service Buybacks as of June 30, 2019	106,026,754
3) Market Value of Assets as of June 30, 2019 [(1) - (2)]	\$68,071,116,951
4) Employer Contributions	3,770,144,046
5) Employee Contributions	1,017,353,542
6) Benefit Payments to Retirees and Beneficiaries	(4,549,796,693)
7) Refunds	(121,559,724)
8) Administrative Expenses	(52,523,750)
9) Transfers and Miscellaneous Adjustments	31,506,514
10) Investment Return (Net of Investment Expenses)	3,128,912,356
11) Market Value of Assets as of June 30, 2020 Excluding Receivables [(3) + (4) + (5) + (6) + (7) + (8) + (9) + (10)]	\$71,295,153,242
12) Receivables for Service Buybacks as of June 30, 2020	105,313,101
13) Market Value of Assets as of June 30, 2020 Including Receivables [(11) + (12)]	\$71,400,466,343

Assets

Asset Allocation

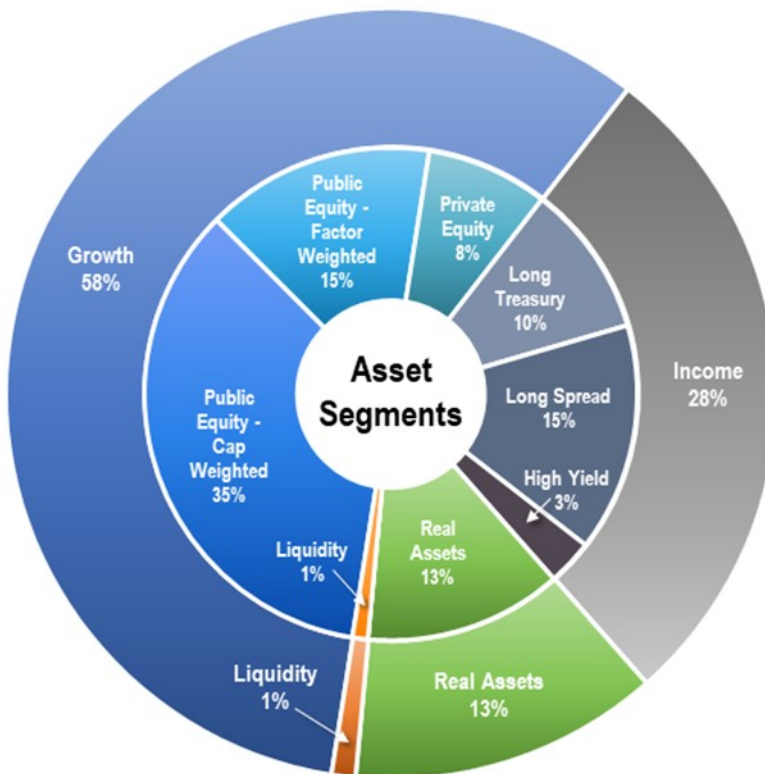
CalPERS adheres to an Asset Allocation Strategy which establishes asset class allocation policy targets and ranges and manages those asset class allocations within their policy ranges. CalPERS Investment Belief No. 6 recognizes that strategic asset allocation is the dominant determinant of portfolio risk and return. On December 19, 2017, the board adopted changes to the asset allocation as shown in the Policy Target Allocation below, expressed as a percentage of total assets.

The asset allocation shown below reflect the values of the Public Employees Retirement Fund (PERF) in its entirety as of June 30, 2020. The assets of the Schools Pool are part of the PERF and are invested accordingly.

Asset Class	Actual Allocation	Policy Target Allocation
Public Equity	53.0%	50.0%
Private Equity	6.3%	8.0%
Global Fixed Income	28.3%	28.0%
Real Assets	11.3%	13.0%
Liquidity	0.9%	1.0%
Inflation Sensitive Assets	0.0%	0.0%
Trust Level ¹	0.2%	0.0%
Total Fund	100.0%	100.0%

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

Strategic Asset Allocation Policy Targets

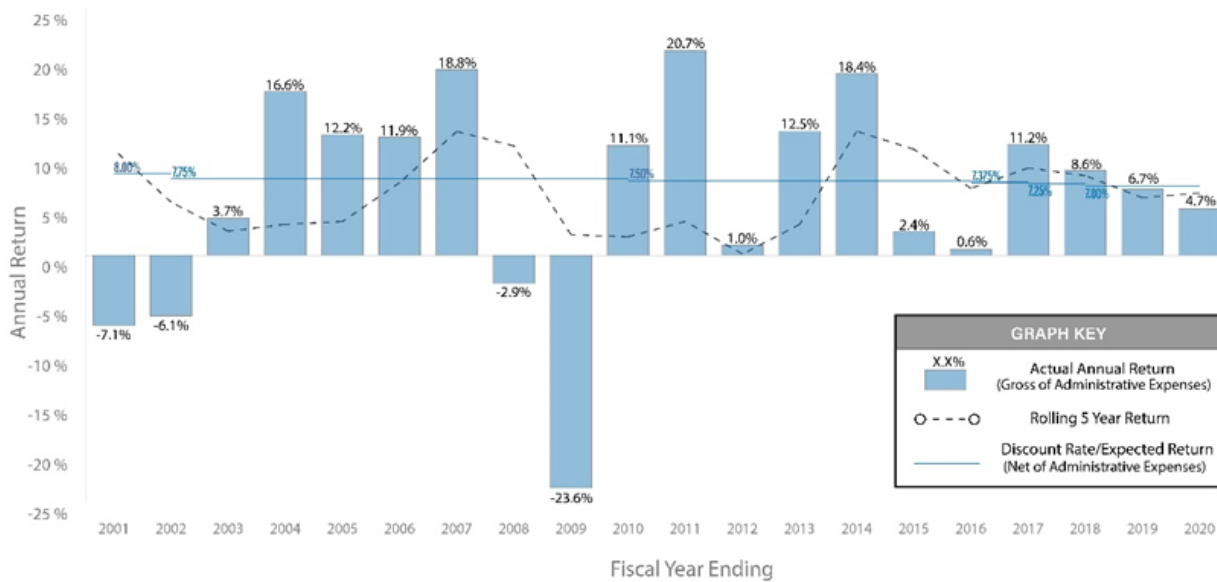


Assets

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 30th. Beginning in 2002, investment returns reported are net of investment expenses and gross of administrative expenses.

History of Investment Returns (2001 - 2020)



The table below shows historical compound annual returns of the PERF for various time periods ending on June 30, 2020 (figures reported are net of investment expenses and gross of administrative expenses). These returns are the annual rates that if compounded over the indicated number of years would equate to the actual 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 11.4% per year based on the most recent Asset Liability Management study. The volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund's total return distribution, expressed as a percentage. Consequently, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Rates of Return and Volatilities

	1 Year	5 Year	10 Year	20 Year	30 Year
Compound Annual Return	4.7%	6.3%	8.5%	5.5%	8.0%
Volatility	-	7.3%	9.1%	8.6%	8.6%

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Liabilities and Employer Contributions

Accrued and Unfunded Liabilities

Participant Information

	June 30, 2019	June 30, 2020
Members Included in the Valuation ¹		
Active Members	329,726	328,255
Transfers from Schools	19,894	19,832
Vested Terminations ²	194,708	206,608
Receiving Payments	241,057	246,960
Total	785,385	801,655
Average Entry Age of Active Members	36.0	35.9
Average Age of Active Members	46.2	46.3
Average Age of Retired Members	72.7	72.8
Average Pay	\$42,643	\$44,133
Covered Payroll in Fiscal Year	\$14,060,495,460	\$14,486,824,480
Projected Payroll for Contribution Rate	\$14,844,455,960	\$15,294,555,487
1) Present Value of Projected Benefits		
a) Active Members ³	\$57,398,302,952	\$64,630,620,236
b) Transferred Members ³	6,217,869,630	1,025,578,842
c) Terminated Members	3,026,709,219	3,186,791,275
d) Members and Beneficiaries Receiving Payments	51,189,058,998	53,939,114,559
e) Total	\$117,831,940,799	\$122,782,104,912
2) Present Value of Future Employer Normal Costs	\$10,105,260,707	\$10,239,950,577
3) Present Value of Future Employee Normal Costs	\$8,198,231,882	\$8,479,826,618
4) Entry Age Actuarial Accrued Liability		
a) Active Members ³ [(1a) – (2) – (3)]	\$39,094,810,363	\$45,910,843,041
b) Transferred Members ³ (1b)	6,217,869,630	1,025,578,842
c) Terminated Members (1c)	3,026,709,219	3,186,791,275
d) Members and Beneficiaries Receiving Payments (1d)	51,189,058,998	53,939,114,559
e) Total	\$99,528,448,210	\$104,062,327,717
5) Market Value of Assets (MVA)	\$68,177,143,705	\$71,400,466,343
6) Unfunded Accrued Liability/(Surplus) [(4e) – (5)]	\$31,351,304,505	\$32,661,861,374
7) Funded Ratio [(5) / (4e)]	68.5%	68.6%

(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.

(3) Reflects a change effective June 30, 2020 in categorizing the liability of members with both active and transfer records.

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 2021-22. 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, 2020).
- The required employer contributions determined by the valuation are for the fiscal year beginning one year after the valuation date (fiscal year 2021-22).

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 well in advance of the start of the fiscal year.

The Unfunded Accrued Liability (UAL) is used to determine the employer contribution and therefore must be rolled forward one year from the valuation date to the first day of the fiscal year for which the contribution is being determined. The UAL is rolled forward each year by subtracting the expected payment on the UAL for the fiscal year and adjusting for interest. The expected payment on the UAL for a fiscal year is equal to the expected employer contribution for the fiscal year, 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	Remaining Amortization Period	Balance 6/30/2020	Expected Payment 2020-21	Balance 6/30/2021	Required Payment 2021-22	Payment as Percentage of Payroll
(Gain)/Loss	Various	23	(\$337,376,160)	(\$22,287,349)	(\$337,938,278)	(\$22,900,251)	(0.15%)
Fresh Start	6/30/2004	14	2,665,335,123	240,396,478	2,603,240,531	247,007,381	1.62%
(Gain)/Loss	6/30/2009	19	856,384,064	63,350,933	850,800,234	65,093,084	0.43%
Assumption Change	6/30/2009	9	860,306,883	106,075,553	810,802,960	108,992,631	0.71%
(Gain)/Loss	6/30/2010	20	419,485,681	30,075,186	417,739,664	30,902,254	0.20%
(Gain)/Loss	6/30/2011	21	(923,815,716)	(64,329,745)	(921,939,610)	(66,098,812)	(0.43%)
Assumption Change	6/30/2011	11	1,207,923,477	128,860,101	1,159,184,195	132,403,753	0.87%
(Gain)/Loss	6/30/2014	24	4,353,137,032	295,303,697	4,352,392,105	303,424,548	1.98%
Assumption Change	6/30/2015	15	4,909,640,532	466,853,805	4,770,398,038	479,692,285	3.14%
(Gain)/Loss	6/30/2015	25	4,331,316,499	286,416,480	4,338,237,143	294,292,933	1.92%
(Gain)/Loss	6/30/2016	26	5,386,985,006	281,761,310	5,472,617,791	361,887,182	2.37%
(Gain)/Loss	6/30/2017	27	(405,369,276)	(15,930,469)	(417,266,520)	(21,824,743)	(0.14%)
Assumption Change	6/30/2017	17	1,562,896,543	85,091,665	1,584,279,798	116,575,581	0.76%
Assumption Change - Demog	6/30/2018	18	1,169,475,357	42,645,405	1,207,225,882	65,727,230	0.43%
Method Change	6/30/2018	18	1,388,479,127	50,631,468	1,433,299,068	78,035,750	0.51%
Assumption Change - Econ	6/30/2018	18	1,204,415,921	43,919,527	1,243,294,323	67,690,971	0.44%
(Gain)/Loss	6/30/2018	28	(526,449,446)	(13,993,905)	(548,825,499)	(21,568,106)	(0.14%)
Investment (Gain)/Loss	6/30/2019	19	566,131,054	12,377,877	592,956,452	24,755,754	0.16%
Assumption Change	6/30/2019	19	2,877,974,953	53,658,781	3,023,928,125	110,268,795	0.72%
Non-Investment (Gain)/Loss	6/30/2019	19	295,847,436	26,996,991	288,630,852	26,996,991	0.18%
Investment (Gain)/Loss	6/30/2020	20	1,693,669,848	-	1,812,226,737	39,622,486	0.26%
Non-Investment (Gain)/Loss ¹	6/30/2020	20	(894,532,564)	(402,265,494)	(541,043,181)	(343,200,491)	(2.24%)
Total			\$32,661,861,374	\$1,695,608,295	\$33,194,240,810	\$2,077,777,206	13.59%

(1) The non-investment (gain)/loss base established 6/30/2020 is composed of (\$108,382,451) attributable to liability sources and ongoing contribution (gain)/loss and a one-time contribution gain of (\$786,150,113) attributable to the State's supplemental contribution in July 2019. The payments on this base for 2020-21 and 2021-22 include the supplanting payments associated with this supplemental contribution as specified in Gov. Code §20825.2 (\$430 million and \$330 million, respectively).

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, 2019	\$31,351,304,505
b) Expected Payment on the UAL during 2019-20	1,627,183,528
c) Interest through June 30, 2020 $[.07 \times (1a) - ((1.07)^{1/2} - 1) \times (1b)]$	2,138,603,113
d) Expected UAL before Other Changes $[(1a) - (1b) + (1c)]$	\$31,862,724,090
e) Change due to Plan Changes	0
f) Change due to Assumptions Changes	0
g) Change due to Method Changes	0
h) Expected UAL After All Other Changes $[(1d) + (1e) + (1f) + (1g)]$	\$31,862,724,090
i) Actual Unfunded Accrued Liability as of June 30, 2020	32,661,861,374
j) Total (Gain)/Loss for 2019-20 $[(1i) - (1h)]$	\$799,137,284
2) Contribution (Gain)/Loss for the Year	
a) Expected Contribution with Interest (Employer and Employee)	\$4,144,490,949
b) Actual Contributions with Interest	4,952,226,012
c) Contribution (Gain)/Loss for 2019-20 $[(2a) - (2b)]$	(\$807,735,063)
3) Asset (Gain)/Loss for the Year	
a) Market Value of Assets as of June 30, 2019	\$68,177,143,705
b) Prior Fiscal Year Receivables	(106,026,754)
c) Current Fiscal Year Receivables	105,313,101
d) Contributions Received	4,787,497,588
e) Benefits and Refunds Paid	(4,671,356,417)
f) Transfers and Miscellaneous Adjustments	31,506,514
g) Expected Interest $[0.07 \times (3a + 3b) + ((1.07)^{1/2} - 1) \times ((3d) + (3e) + (3f))]$	4,770,058,454
h) Expected Assets as of June 30, 2018 $[(3a) + (3b) + (3c) + (3d) + (3e) + (3f) + (3g)]$	73,094,136,191
i) Market Value of Assets as of June 30, 2019	71,400,466,343
j) Asset (Gain)/Loss for 2019-20 $[(3h) - (3i)]$	\$1,693,669,848
4) Liability (Gain)/Loss for the Year	
a) Total (Gain)/Loss (1j)	\$799,137,284
b) Contribution (Gain)/Loss (2c)	(807,735,063)
c) Asset (Gain)/Loss (3j)	1,693,669,848
d) Liability (Gain)/Loss for 2019-20 $[(4a) - (4b) - (4c)]$	(\$86,797,501)

Liabilities and Employer Contributions

Reconciliation of Employer Contributions

Reconciliations of both the actuarially determined contribution and the required employer contribution are shown below.

The actuarially determined contribution and required employer contribution are typically the same. However, for fiscal year 2020-21, a revision to the employer contribution rate was necessitated by the State's supplemental contribution made after the June 30, 2019 actuarial valuation date. The \$430 million supplanting payment under Government Code section 20825.2 associated with this supplemental contribution reduced the fiscal year 2020-21 required employer contribution rate from 23.60% to 20.70%.

For fiscal year 2021-22, because the State's supplemental contribution is reflected in assets as of the actuarial valuation date, the \$330 million supplanting payment under Government Code section 20825.2 is directly reflected in the actuarially determined contribution.

Reconciliation of Actuarially Determined Contribution

	Percentage of Payroll	Dollars
Employer Normal Cost		
2020-21 Employer Normal Cost Contribution	9.47%	\$1,405,769,979
Change in Payroll	0.00%	42,624,425
Demographic Experience	(0.15%)	(22,941,833)
Change in Member Contribution Rates	0.00%	0
2021-22 Employer Normal Cost Contribution	9.32%	\$1,425,452,571
Unfunded Accrued Liability Contribution		
2020-21 Unfunded Accrued Liability Contribution	14.13%	\$2,097,873,789
Progression of Amortization Bases & Change in Payroll	1.45%	283,481,422
Investment (Gain)/Loss	0.26%	39,622,486
Non-Investment (Gain)/Loss	(0.09%)	(13,200,491)
State Supplanting Payment (Gov. Code §20825.2)	(2.16%)	(330,000,000)
2021-22 Unfunded Accrued Liability Contribution	13.59%	\$2,077,777,206
Total Actuarially Determined Contribution		
2020-21 Total Actuarially Determined Contribution	23.60%	\$3,503,643,768
Progression of Amortization Bases & Change in Payroll	1.45%	326,105,847
Experience (Gain)/Loss	0.02%	3,480,162
Change in Member Contribution Rates	0.00%	0
State Supplanting Payment (Gov. Code §20825.2)	(2.16%)	(330,000,000)
2021-22 Total Actuarially Determined Contribution	22.91%	\$3,503,229,777

Reconciliation of Required Employer Contribution

	Percentage of Payroll	Dollars
2020-21 Required Employer Contribution	20.70%	\$3,073,643,768
Progression of Amortization Bases & Change in Payroll	1.45%	326,105,847
Experience (Gain)/Loss	0.02%	3,480,162
Change in Member Contribution Rates	0.00%	0
Effect of Change in State Supplanting Payment (Gov. Code §20825.2)	0.74%	100,000,000
2021-22 Required Employer Contribution	22.91%	\$3,503,229,777

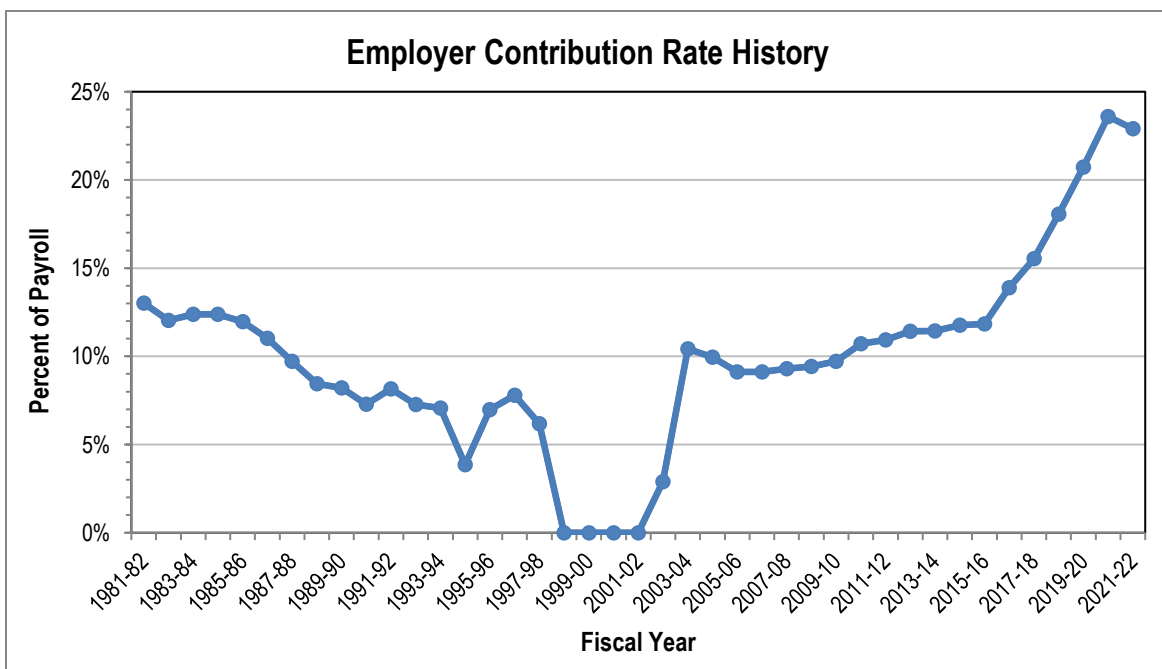
Liabilities and Employer Contributions

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 Accrued Liability Contribution/(Credit)	Total Employer Contribution
2021 - 2022	6/30/2020	9.32%	13.59%	22.91%
2020 - 2021 ¹	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%
1997 - 1998	6/30/1996	7.582%	(1.410%)	6.172%

(1) For fiscal year 2020-2021, the State's supplanting payment under Gov. Code §20825.2 reduced the total contribution rate ultimately paid by school employers by 2.90% to 20.70%.



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 Accrued Liability/(Surplus)	Funded Ratio	Projected Payroll for Contribution	UAL/(Surplus) as a % of Payroll
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%)
6/30/1991	12,022	13,301	(1,298)	110.8%	4,850	(26.8%)

Normal Cost Information

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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	Range of Breakpoints	Average Effective Employee Rate	Employer Normal Cost
Schools 2% @ 62 – 3 Year FAC	14.87%	7.00%	-	7.00%	7.87%
Schools 2% @ 55 – 1 Year FAC	17.26%	7.00%	-	7.00%	10.26%
Plan Total	16.32%			7.00%	9.32%

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

PEPRA Member Contribution Rate

Pursuant to the California Public Employees' Pension Reform Act of 2013 ("PEPRA"), new members hired on or after January 1, 2013 are required under PEPRA to contribute 50% of the total normal cost of their pension benefit as determined by the actuary. PEPRA school members currently contribute 7.00% of salary. The contribution rate for the school members not subject to this requirement of PEPRA (i.e., classic members) is set by statute and is also currently 7.00% of salary.

The total normal cost of PEPRA members' benefits is remeasured annually as part of the actuarial valuation based on the active PEPRA population in the plan. If the total normal cost changes by more than 1% from the base total normal cost basis established for the plan, the member rate is revised to equal 50% of the new total normal cost rounded to the nearest quarter percent. The current PEPRA member contribution rate of 7.00% is based on a total normal cost of 14.07% of payroll. In this valuation, the total normal cost for PEPRA members is 14.87% of payroll. As the total normal cost has not changed by more than 1% since the last time the member contribution rate was established, the PEPRA member contribution rate will remain at 7.00% through the 2021-22 fiscal year.

As of June 30, 2020, there are 157,312 active PEPRA members in the Schools Pool, which represents 48% of the total active population of the Schools Pool. The total payroll for active PEPRA members is \$5,663 million, which represents 39% of the total Schools Pool payroll.

The table below shows the determination of the PEPRA member contribution rate effective July 1, 2021 based on 50% of the Total Normal Cost as of the June 30, 2020 valuation.

	Basis for Current Rate			Rate Effective July 1, 2021			
	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%	14.87%	0.80%	No	7.00%

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Future Investment Return Scenarios

The Schools Pool contribution rate for fiscal year 2022-23 will be based on the June 30, 2021 actuarial valuation. At the time of publication of this report, key actuarial assumptions to be used in that valuation, particularly the discount rate, are not yet known. The discount rate is a key driver of pension plan cost and therefore meaningful estimates of the contribution rate for fiscal year 2022-23 and future years will be unavailable until the final discount rate is known.

The discount rate is presently undergoing review as part of the periodic Asset Liability Management (ALM) study currently in progress. Other economic assumptions and demographic assumptions are also currently undergoing review as part of the CalPERS Experience Study conducted every four years. Revised assumptions resulting from these studies will be incorporated into the June 30, 2021 actuarial valuation.

The CalPERS Funding Risk Mitigation Policy has recently triggered an automatic decrease of 0.20% in the discount rate assumption due to the investment return in fiscal year 2020-21. However, the Board of Administration may choose to further alter the discount rate as a result of the current ALM process.

It is currently anticipated that both economic and demographic assumptions will be finalized by the end of the 2021 calendar year.

Once assumptions are finalized, we will perform projections of employer contribution rates for the next four fiscal years reflecting both the new assumptions as well as fiscal year 2020-21 investment return (approximately 21.3% before reduction for administrative expenses). The projections will also reflect that, all other changes aside, the employer rate will increase in fiscal year 2022-23 due to expiration of the State's supplanting payments under Government Code section 20825.2. See "Changes Since the Prior Year's Valuation" in the Highlights and Executive Summary for details on the supplanting payments. As in prior years, projected employer contribution rates will be developed under various scenarios of investment return over the projection period. Results of the projections will be released in an addendum to this report.

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 2.5%, 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, 2020 assuming alternate discount rates by changing the two components independently. Results are shown using the current discount rate of 7.0% as well as alternate discount rates of 6.0% and 8.0%. The rates of 6.0% and 8.0% were selected since they illustrate the impact of a 1.0% increase or decrease to the current assumption of 7.0%.

As of June 30, 2020	Sensitivity to the Real Rate of Return Assumption		
	1% Lower Real Return Rate	Current Assumptions	1% Higher Real Return Rate
Discount Rate	6.0%	7.0%	8.0%
Inflation	2.5%	2.5%	2.5%
Real Rate of Return	3.5%	4.5%	5.5%
a) Total Normal Cost Rate	20.55%	16.32%	13.14%
b) Accrued Liability	\$117,791,483,443	\$104,062,327,717	\$92,675,616,609
c) Market Value of Assets	\$71,400,466,343	\$71,400,466,343	\$71,400,466,343
d) Unfunded Accrued Liability/(Surplus) [(b) – (c)]	\$46,391,017,100	\$32,661,861,374	\$21,275,150,266
e) Funded Ratio	60.6%	68.6%	77.0%

As of June 30, 2020	Sensitivity to the Price Inflation Assumption		
	1% Lower Inflation Rate	Current Assumptions	1% Higher Inflation Rate
Discount Rate	6.0%	7.0%	8.0%
Inflation	1.5%	2.5%	3.5%
Real Rate of Return	4.5%	4.5%	4.5%
a) Total Normal Cost Rate	17.44%	16.32%	14.87%
b) Accrued Liability	\$109,369,763,055	\$104,062,327,717	\$95,992,976,148
c) Market Value of Assets	\$71,400,466,343	\$71,400,466,343	\$71,400,466,343
d) Unfunded Accrued Liability/(Surplus) [(b) – (c)]	\$37,969,296,712	\$32,661,861,374	\$24,592,509,805
e) Funded Ratio	65.3%	68.6%	74.4%

Risk Analysis

Mortality Rate Sensitivity

The following table shows how June 30, 2020 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.

As of June 30, 2020	Sensitivity to the Mortality Assumption		
	10% Lower Mortality Rates	Current Assumptions	10% Higher Mortality Rates
a) Total Normal Cost Rate	16.60%	16.32%	16.07%
b) Accrued Liability	\$106,353,133,138	\$104,062,327,717	\$101,958,569,376
c) Market Value of Assets	\$71,400,466,343	\$71,400,466,343	\$71,400,466,343
d) Unfunded Accrued Liability/(Surplus) [(b) – (c)]	\$34,952,666,795	\$32,661,861,374	\$30,558,103,033
e) Funded Ratio	67.1%	68.6%	70.0%

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, 2019			June 30, 2020		
	Retiree Accrued Liability	Total Accrued Liability	Ratio	Retiree Accrued Liability	Total Accrued Liability	Ratio
Schools Pool	51,189,058,998	99,528,448,210	51%	53,939,114,559	104,062,327,717	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

Plan	June 30, 2019			June 30, 2020		
	Number of Actives	Number of Retirees	Support Ratio	Number of Actives	Number of Retirees	Support Ratio
Schools Pool	329,726	241,057	1.37	328,255	246,960	1.33

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

Risk Analysis

Maturity Measures (continued)

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 year-to-year differences between actual experience and the assumptions are called actuarial gains and losses and serve to lower or raise required employer contributions from one year to the next. Therefore, employer contributions will inevitably fluctuate, especially due to fluctuations in investment return.

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 contributions (as a percentage of payroll) 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. The AVR is projected to increase 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 contributions (as a percentage of payroll) 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 ratio approaches 100%.

Contribution Volatility as of June 30, 2020

Market Value of Assets without Receivables	Annual Covered Payroll	Asset Volatility Ratio	Accrued Liability	Liability Volatility Ratio
(1)	(2)	(1) ÷ (2)	(3)	(3) ÷ (2)
\$71,295,153,241	\$14,486,824,480	4.9	\$104,062,327,717	7.2

Maturity Measures History

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

Appendices

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

B-1 Appendix B – Principal Plan Provisions

C-1 Appendix C – Participant Data

D-1 Appendix D – Glossary of Actuarial Terms

Appendix A – Statement of 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 CalPERS Board adopted a new policy effective for the June 30, 2019 actuarial valuation. The new policy applies prospectively only; amortization bases (sources of UAL) established prior to the June 30, 2019 valuation will continue to be amortized according to the prior policy. 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.

Appendix A - Statement of 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		Assumption or Method Change	Benefit Change	Golden Handshake
	Investment	Non-Investment			
Amortization Period	30 Years	30 Years	20 Years	20 Years	5 Years
Escalation Rate - Active Plans - Inactive Plans	2.75% 0%	2.75% 0%	2.75% 0%	2.75% 0%	2.75% 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		Assumption or Method Change	Benefit Change	Golden Handshake
	Investment	Non-Investment			
Amortization Period	20 Years	20 Years	20 Years	20 Years	5 Years
Escalation Rate	0%	0%	0%	0%	0%
Ramp Up	5	0	0	0	0
Ramp Down	0	0	0	0	0

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 - Statement of Actuarial Methods and Assumptions

Actuarial Methods (continued)

Exceptions for Inconsistencies

An exception to the amortization rules above is used whenever their application results in inconsistencies. In these cases, a “fresh start” approach is used. This means that the current 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.

Appendix A - Statement of Actuarial Methods and Assumptions

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 2.5% compounded annually, the 1.1% appears to remain more than sufficient in the foreseeable future.

Internal Revenue Code Section 415

The valuation reflects the limitations on benefits imposed by Internal Revenue Code section 415. The current valuation is based on the IRC 415(b) dollar limit for 2020 of \$230,000, up from the 2019 limit of \$225,000 used in the prior valuation.

Internal Revenue Code Section 401(a)(17)

The valuation reflects the limitations on pensionable compensation imposed by Internal Revenue Code section 401(a)(17). The current valuation is based on the IRC 401(a)(17) limit for 2020 of \$285,000, up from the 2019 limit of \$280,000 used in the prior valuation.

Appendix A - Statement of Actuarial Methods and Assumptions

Actuarial Assumptions

In 2017, CalPERS completed its most recent asset liability management study incorporating actuarial assumptions and strategic asset allocation. In December 2017, the board adopted relatively modest changes to the asset allocation that reduced 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 7.00%. The board also approved several changes to the demographic assumptions that more closely aligned with actual experience. These new actuarial assumptions were first used in the June 30, 2018 valuation to set the fiscal year 2019-20 contribution for the Schools Pool.

On December 21, 2016, the board lowered the discount rate from 7.50% to 7.00% using a three-year phase-in beginning with the June 30, 2017 actuarial valuations for the Schools Pool. The minimum employer contributions for fiscal year 2020-21 determined in the June 30, 2019 valuation were calculated using a discount rate of 7.00%. The decision to reduce the discount rate was primarily based on reduced capital market assumptions provided by external investment consultants and CalPERS investment staff. The specific decision adopted by the board reflected recommendations from CalPERS staff and additional input from employer and employee stakeholder groups. Based on the investment allocation adopted by the board and capital market assumptions, the reduced discount rate schedule provides a more realistic assumption for the long-term investment return of the fund.

Notwithstanding the board's decision to phase into a 7.00% discount rate, subsequent analysis of the expected investment return of CalPERS assets or changes to the investment allocation may result in a further change to the discount rate.

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 December 2017 that can be found on the CalPERS website under: "Forms and Publications." Click on "View All" and search for "Experience Study."

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

Appendix A - Statement of Actuarial Methods and Assumptions

Economic Assumptions

Discount Rate

The discount rate is 7.00% 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 (2.75% for 2020) is added to these factors for total salary growth.

Duration of Service	Entry Age		
	20	30	40
0	4.28%	4.19%	3.80%
3	3.54%	3.32%	2.80%
5	2.62%	2.34%	1.80%
10	1.71%	1.54%	1.13%
15	1.52%	1.34%	0.98%
20	1.35%	1.17%	0.86%
25	1.20%	1.03%	0.76%
30	0.87%	0.71%	0.48%

Overall Payroll Growth

2.75% compounded annually (used in projecting the payroll over which unfunded accrued liability is amortized for amortization bases established prior to June 30, 2019).

Inflation

2.50% compounded annually.

Demographic Assumptions

Post-Retirement Mortality

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

Age	Healthy Recipients		Non-Industrial Disabled (Not Job-Related)		Industrial Disabled (Job-Related)	
	Male	Female	Male	Female	Male	Female
50	0.00372	0.00346	0.01183	0.01083	0.00372	0.00346
55	0.00437	0.00410	0.01613	0.01178	0.00437	0.00410
60	0.00671	0.00476	0.02166	0.01404	0.00671	0.00476
65	0.00928	0.00637	0.02733	0.01757	0.01113	0.00765
70	0.01339	0.00926	0.03358	0.02184	0.01607	0.01112
75	0.02316	0.01635	0.04277	0.02969	0.02779	0.01962
80	0.03977	0.03007	0.06272	0.04641	0.04773	0.03609
85	0.07122	0.05418	0.09793	0.07847	0.08547	0.06501
90	0.13044	0.10089	0.14616	0.13220	0.14348	0.11098
95	0.21658	0.17698	0.21658	0.21015	0.21658	0.17698
100	0.32222	0.28151	0.32222	0.32226	0.32222	0.28151

The post-retirement mortality rates above include 15 years of projected ongoing mortality improvement using 90% of Scale MP-2016 published by the Society of Actuaries.

Appendix A - Statement of 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 and service. See sample rates in the table below.

Duration of Service	Entry Age				
	20	25	30	35	40
5	0.0808	0.0808	0.0634	0.0461	0.0409
6	0.0618	0.0618	0.0482	0.0345	0.0305
7	0.0462	0.0462	0.0359	0.0255	0.0223
8	0.0343	0.0343	0.0266	0.0189	0.0161
9	0.0258	0.0258	0.0200	0.0143	0.0117
10	0.0202	0.0202	0.0157	0.0112	0.0087
14	0.0117	0.0117	0.0087	0.0056	0.0040
15	0.0107	0.0107	0.0077	0.0048	0.0034
19	0.0065	0.0065	0.0043	0.0021	0.0019
20	0.0056	0.0056	0.0037	0.0017	0.0016
24	0.0030	0.0030	0.0020	0.0009	0.0012
25	0.0026	0.0026	0.0018	0.0009	0.0012
29	0.0015	0.0015	0.0012	0.0009	0.0012
30	0.0013	0.0013	0.0011	0.0009	0.0012

Appendix A - Statement of Actuarial Methods and Assumptions

Demographic Assumptions (continued)

Termination with Vested Deferred Benefits

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

Duration of Service	Entry Age				
	20	25	30	35	40
5	0.0405	0.0405	0.0346	0.0288	0.0264
6	0.0404	0.0404	0.0343	0.0281	0.0261
7	0.0395	0.0395	0.0333	0.0272	0.0253
8	0.0377	0.0377	0.0319	0.0261	0.0241
9	0.0353	0.0353	0.0301	0.0249	0.0227
10	0.0324	0.0324	0.0280	0.0235	0.0211
14	0.0219	0.0219	0.0196	0.0172	0.0141
15	0.0202	0.0202	0.0179	0.0155	0.0126
19	0.0154	0.0154	0.0125	0.0095	0.0057
20	0.0144	0.0144	0.0114	0.0083	0.0042
24	0.0102	0.0102	0.0059	0.0017	0.0008
25	0.0091	0.0091	0.0046	—	—
29	0.0029	0.0029	0.0015	—	—
30	0.0015	0.0015	0.0007	—	—

- 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.

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

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

Attained Age	Non-Industrial Death (Not Job-Related)		Non-Industrial Disability (Not Job-Related)	
	Male	Female	Male	Female
20	0.00022	0.00007	0.00010	0.00011
25	0.00029	0.00011	0.00010	0.00011
30	0.00038	0.00016	0.00011	0.00016
35	0.00049	0.00027	0.00053	0.00043
40	0.00064	0.00037	0.00119	0.00081
45	0.00080	0.00054	0.00195	0.00168
50	0.00116	0.00079	0.00261	0.00224
55	0.00172	0.00120	0.00246	0.00180
60	0.00255	0.00166	0.00221	0.00109

Appendix A - Statement of 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	0.0040	0.0070	0.0110	0.0120	0.0130	0.0150	0.0180
52	0.0050	0.0100	0.0140	0.0160	0.0180	0.0210	0.0240
54	0.0080	0.0170	0.0230	0.0270	0.0310	0.0340	0.0400
56	0.0190	0.0370	0.0530	0.0620	0.0690	0.0780	0.0910
58	0.0220	0.0450	0.0620	0.0740	0.0820	0.0920	0.1080
60	0.0330	0.0660	0.0920	0.1090	0.1210	0.1350	0.1580
62	0.0660	0.1310	0.1840	0.2180	0.2420	0.2710	0.3180
65	0.0800	0.1580	0.2210	0.2610	0.2910	0.3260	0.3830
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

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

Service Retirement

Eligibility

A classic CalPERS school member becomes 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). PEPRAs 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. PEPRAs 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% @ 55 Factor	2% @ 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.

Appendix B – Principal Plan Provisions

Service Retirement (continued)

- The *final compensation* is the monthly average of the member's highest 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). For 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 \$126,291 for 2020; for employees who do not participate in Social Security the cap for 2020 is \$151,549. Adjustments to the caps are permitted annually based on changes to the Consumer Price Index for All Urban Consumers (CPI-U).
- Employees in this plan may or may not be covered by Social Security. For 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.

Appendix B – Principal Plan Provisions

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% or 50% of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried children until they attain age 18; or, if no eligible children, to a qualifying dependent parent) for the rest of his or her lifetime. This benefit will not be discontinued in the event the spouse remarries.

The remaining 75% or 50% of the retirement allowance, which may be referred to as the option portion of the benefit, is paid to the retiree as an annuity for as long as he or she is alive. The retiree may choose to provide for some of this option portion to be paid to any designated beneficiary after the retiree's death. Benefit options applicable to the option portion are the same as those offered with the standard form. The reduction is calculated in the same manner but is applied only to the option portion.

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.

Appendix B – Principal Plan Provisions

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 both classic and PEPRA members.
- The monthly compensation breakpoint is \$0.

The PEPRA member contribution rate is tied to normal cost and can change annually. See the "PEPRA Member Contribution Rate" section for details.

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, a number of adjustments were determined to be necessary. These included:

- Dates of hire and dates of entry were adjusted where necessary to be consistent with the service fields, the date of birth and each other, and
- 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, 2019	329,726	19,894	194,708	241,057	785,385
First Year in Status ¹	28,877	297	2,923	262	32,359
Rehires	3677	(170)	(3,472)	(35)	0
Transfers	(1,425)	2,392	(952)	(15)	0
Terminations ²	(20,635)	(1,365)	22,006	(6)	0
Retirements	(8,569)	(986)	(1,735)	11,277	(13)
Ordinary Disabilities	(103)	(12)	(41)	166	10
Industrial Disabilities	(1)	(40)	0	44	3
Deaths with Beneficiary	(76)	(6)	(5)	146	59
Refunds of Contributions	(2,318)	(93)	(5,667)	(1)	(8,079)
Death w/o Beneficiary	(345)	(22)	(695)	(5,886)	(6,948)
Data Corrections ³	(553)	(57)	(462)	(49)	(1,121)
As of June 30, 2020	328,255	19,832	206,608	246,960	801,655

(1) Includes redeposits.

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

(3) May include the combining of data records into a single record.

Appendix C - Participant Data

Active Members

Distribution of Active Members by Age and Service

Attained Age	Years of Service at Valuation Date						Total	Payroll
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25+		
15 - 24	11,163	74	0	0	0	0	11,237	\$299,636,814
25 - 29	26,257	2,495	15	0	0	0	28,767	949,670,572
30 - 34	23,487	8,025	1,700	45	0	0	33,257	1,325,965,104
35 - 39	19,764	8,878	5,659	1,771	78	0	36,150	1,614,941,946
40 - 44	17,403	8,040	6,561	4,670	1,604	43	38,321	1,785,937,913
45 - 49	15,725	8,400	6,678	5,515	3,612	868	40,798	1,914,919,011
50 - 54	13,556	9,059	7,922	6,375	4,571	3,096	44,579	2,122,441,936
55 - 59	10,451	8,587	8,836	7,557	5,421	5,190	46,042	2,223,210,893
60 - 64	6,083	5,788	6,600	6,069	4,475	4,002	33,017	1,561,841,041
65 and Over	3,074	2,930	3,256	2,829	2,027	1,971	16,087	688,259,250
Total	146,963	62,276	47,227	34,831	21,788	15,170	328,255	\$14,486,824,480

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 of 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	\$26,541	\$45,411	\$0	\$0	\$0	\$0	\$26,665
25 - 29	31,782	45,813	58,338	0	0	0	33,012
30 - 34	35,673	48,737	55,470	60,087	0	0	39,870
35 - 39	36,513	50,350	57,478	65,058	74,464	0	44,673
40 - 44	35,407	48,118	55,442	64,753	70,478	85,476	46,605
45 - 49	34,082	44,720	52,948	61,365	68,533	73,467	46,937
50 - 54	33,302	42,217	49,243	57,617	66,418	73,497	47,611
55 - 59	32,733	39,272	46,121	54,887	64,000	72,186	48,287
60 - 64	31,848	37,551	44,287	52,323	60,442	67,578	47,304
65 and Over	26,498	32,961	41,310	49,595	56,040	61,810	42,784
Average	\$33,417	\$44,189	\$50,018	\$57,382	\$64,302	\$70,001	\$44,133

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	158	0	0	0	0	0	158	\$44,019
25 – 29	1,070	24	0	0	0	0	1,094	51,806
30 – 34	2,000	158	14	0	0	0	2,172	56,979
35 – 39	2,284	306	69	9	1	0	2,669	65,387
40 – 44	2,365	398	133	30	2	0	2,928	73,534
45 – 49	2,258	438	162	60	12	1	2,931	78,248
50 – 54	1,968	448	182	72	19	8	2,697	77,557
55 – 59	1,890	476	181	70	31	9	2,657	72,189
60 – 64	1,263	288	117	42	14	5	1,729	68,956
65 and Over	598	139	38	20	1	1	797	65,173
Total	15,854	2,675	896	303	80	24	19,832	\$69,519

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	4,447	5	0	0	0	0	4,452	\$30,618
25 – 29	18,604	148	0	0	0	0	18,752	31,990
30 – 34	25,129	1,220	70	0	0	0	26,419	33,092
35 – 39	26,259	2,567	450	36	0	0	29,312	33,816
40 – 44	23,637	2,629	846	196	24	0	27,332	33,888
45 – 49	20,409	2,722	934	333	83	10	24,490	33,792
50 – 54	18,287	2,923	1,080	446	133	55	22,922	33,962
55 – 59	17,364	2,958	1,040	362	123	48	21,887	32,714
60 – 64	14,639	2,178	713	228	87	47	17,887	31,416
65 and Over	11,375	1,222	346	115	55	44	13,155	30,441
Total	180,150	18,572	5,479	1,716	505	204	206,608	\$32,972

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

Number of Retirees and Beneficiaries – 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	3	1	212	216
30 – 34	0	3	0	0	0	169	172
35 – 39	0	24	18	3	0	225	270
40 – 44	0	83	41	2	0	274	400
45 – 49	0	231	60	8	1	313	613
50 – 54	1,235	621	104	43	0	547	2,550
55 – 59	9,684	1,233	144	86	2	960	12,109
60 – 64	28,464	1,775	161	185	4	1,515	32,104
65 – 69	48,645	2,006	191	196	0	2,481	53,519
70 – 74	47,538	1,825	161	188	2	3,573	53,287
75 – 79	31,447	1,515	87	112	1	3,865	37,027
80 – 84	20,139	924	35	68	3	3,958	25,127
85 and Over	21,607	774	14	47	3	7,121	29,566
Total	208,759	11,014	1,016	941	17	25,213	246,960

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.

Annual Allowance Amounts for Retirees and Beneficiaries – by Age and Retirement Type

Annual 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	\$13,798	\$4	\$1,202,138	\$1,215,940
30 – 34	0	11,253	0	0	0	957,519	968,772
35 – 39	0	250,394	6,462	28,725	0	1,690,548	1,976,129
40 – 44	0	908,206	38,351	66,972	0	2,249,013	3,262,541
45 – 49	0	2,851,428	39,380	57,277	2,489	3,165,774	6,116,347
50 – 54	11,952,148	8,143,219	160,941	496,943	0	5,020,928	25,774,178
55 – 59	192,307,388	15,638,329	409,319	883,339	1,179	10,670,753	219,910,308
60 – 64	653,551,088	23,387,559	343,424	2,121,395	4,637	19,049,983	698,458,085
65 – 69	1,080,500,891	26,284,583	579,374	1,744,350	0	31,977,531	1,141,086,729
70 – 74	1,001,397,142	22,965,881	463,380	1,791,960	1,325	48,301,249	1,074,920,936
75 – 79	620,381,268	18,160,544	300,617	968,849	3,757	50,525,126	690,340,160
80 – 84	353,151,443	10,265,139	64,620	486,957	2,168	47,872,639	411,842,966
85 and Over	304,856,858	7,585,073	43,105	433,275	2,802	75,441,216	388,362,330
Total	\$4,218,098,225	\$136,451,608	\$2,448,973	\$9,093,840	\$18,359	\$298,124,416	\$4,664,235,422

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	59,246	928	205	250	1	8,894	69,524
5 – 9	48,160	1,748	185	218	1	6,343	56,655
10 – 14	37,683	1,524	142	224	1	4,222	43,796
15 – 19	29,401	2,161	206	149	2	2,729	34,648
20 – 24	16,716	2,152	98	52	1	1,565	20,584
25 – 29	10,134	1,457	85	26	2	881	12,585
30 and Over	7,419	1,044	95	22	9	579	9,168
Total	208,759	11,014	1,016	941	17	25,213	246,960

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.

Annual Allowance Amounts for Retirees and Beneficiaries – by Years Retired and Retirement Type

Annual 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	\$1,405,561,673	\$12,879,926	\$580,349	\$2,837,187	\$2,489	\$116,941,270	\$1,538,802,893
5 – 9	1,005,793,582	23,067,911	567,061	2,150,965	4	76,661,599	1,108,241,122
10 – 14	779,792,378	20,424,817	492,134	2,178,083	896	47,670,570	850,558,878
15 – 19	585,425,493	29,679,607	566,925	1,136,562	909	29,718,813	646,528,308
20 – 24	242,066,337	24,820,579	102,269	375,996	3,757	14,970,780	282,339,718
25 – 29	134,782,001	16,601,887	64,831	205,953	3,254	8,007,977	159,665,904
30 and Over	64,676,761	8,976,881	75,404	209,094	7,051	4,153,408	78,098,599
Total	\$4,218,098,225	\$136,451,608	\$2,448,973	\$9,093,840	\$18,359	\$298,124,416	\$4,664,235,422

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
2020 ¹	6,150	\$124,847,272	\$20,300
2019	14,678	327,401,990	22,306
2018	14,329	315,405,372	22,012
2017	14,667	336,388,151	22,935
2016	12,686	270,674,625	21,336
2015	12,537	258,685,517	20,634
2014	11,579	229,838,629	19,850
2013	11,086	209,113,097	18,863
2012	11,051	212,180,273	19,200
2011	10,675	208,069,226	19,491
2010	11,208	230,899,573	20,601
2009	10,155	211,287,734	20,806
2008	8,349	166,672,975	19,963
2007	7,974	154,070,993	19,322
2006	8,090	147,299,944	18,208
2005	8,069	146,318,351	18,133
2004	8,151	150,276,128	18,437
2003	8,252	161,612,965	19,585
2002	6,330	121,391,561	19,177
2001	5,505	103,453,914	18,793
2000	6,510	116,567,108	17,906
1999	3,682	47,612,576	12,931
1998	4,297	57,867,580	13,467
1997	3,756	47,561,115	12,663
1996	3,465	44,318,329	12,790
1995	3,362	43,014,110	12,794
1994	2,946	37,773,173	12,822
1993	2,729	35,455,334	12,992
1992	2,493	32,660,191	13,101
1991 and Earlier	12,199	115,517,617	9,469
Total	246,960	\$4,664,235,422	\$18,887

(1) The numbers for 2020 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 of Actuarial Terms

Accrued Liability (*also called Actuarial Accrued Liability or Entry Age Actuarial Accrued Liability*): The total dollars needed as of the valuation date to fund all benefits earned in the past for current members.

Actuarial Assumptions: Assumptions made about certain events that will affect pension costs. Assumptions generally can be broken down into two categories: demographic and economic. Demographic assumptions include such things as mortality, disability and retirement rates. Economic assumptions include discount rate, salary growth and inflation.

Actuarial Methods: Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include cost method, amortization policy, and determination of asset value on which funding requirements are based.

Actuarial Valuation: The determination as of a valuation date of the Normal Cost, Accrued Liability, and related actuarial present values for a pension plan. These valuations are performed annually or when an employer is contemplating a change to their plan provisions.

Amortization Bases: Separate payment schedules for different portions of the Unfunded Accrued Liability. The total Unfunded Accrued Liability of a plan can be segregated by cause, creating “bases,” and each such base will be separately amortized and paid for over a specific period of time. However, all bases are amortized using investment and payroll assumptions from the current valuation. This can be likened to a home having a first mortgage of 24 years remaining payments and a second mortgage that has 10 years remaining payments. Each base or each mortgage note has its own terms (payment period, principal, etc.).

Generally, in an actuarial valuation, the separate bases consist of changes in unfunded liability due to contract amendments, actuarial assumption changes, actuarial methodology changes, and/or gains and losses. Amortization methodology is determined by board policy.

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

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

Discount Rate: The assumed long-term rate of return on plan assets. This is the rate at which projected future cash flows are discounted to the valuation date to determine Accrued Liability. This assumption is called “investment return” in earlier CalPERS reports or “actuarial interest rate” in Section 20014 of the California Public Employees’ Retirement Law (PERL).

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

Appendix D - Glossary of Actuarial Terms

Entry Age Actuarial Cost Method: An actuarial cost method designed to fund a member's total plan benefit over the course of his or her career. The method as employed in this valuation yields a funding rate expressed as a level percentage of payroll.

The assumed retirement age less the entry age is the amount of time required to fund a member's total benefit. Generally, the older a member on the date of hire, the greater the entry age normal cost. This is mainly because there is less time to earn investment income to fund the future benefits.

Fresh Start: A Fresh Start is when multiple Amortization Bases are collapsed to one base and amortized together over a new Amortization Period.

Funded Ratio: Defined as Market Value of Assets divided by Accrued Liability. It is a measure of how well funded a rate plan is. A ratio greater than 100% means the rate plan has more assets than liabilities and the employer need only contribute the Normal Cost, and a ratio less than 100% means liabilities are greater than assets 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. GASB 68 replaced GASB 27 effective the first fiscal year beginning after June 15, 2014.

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

Normal Cost: The annual cost of service accrual for a given fiscal year for active employees. The normal cost as a percentage of payroll can be viewed as the long-term contribution rate.

Pension Actuary: A business professional who is authorized by the Society of Actuaries and the American Academy of Actuaries to perform the calculations necessary to properly fund a pension plan.

PEPRA: The California Public Employees' Pension Reform Act of 2013.

Present Value of Benefits (PVB): The total dollars needed as of the valuation date to fund all benefits earned in the past and expected to be earned in the future for current members.

Unfunded Accrued Liability (UAL): When a plan or pool's Market Value of Assets is less than its Accrued Liability, the difference is the plan or pool's Unfunded Accrued Liability. When Unfunded Accrued Liability exists, the employer will have to pay contributions exceeding the Normal Cost.

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