



**Government Accounting Standards
(GASB) Statements 67 and 68
Crossover Testing Report for
Measurement Date June 30, 2022
based on June 30, 2021 Valuations**

Table of Contents

Introduction	1
Background.....	1
History.....	1
CalPERS Structure	1
Public Employees Retirement Fund	2
CalPERS Long-Term Expected Rate of Return.....	3
CalPERS Retirement Fund Discount Rates.....	3
CalPERS Amortization Methods and Actuarial Assumptions.....	4
Approach	5
Crossover Testing.....	5
Selection of Plans	6
Plan Characteristics (as of June 30, 2021).....	7
Crossover Testing Methodology.....	8
Crossover Testing Assumptions.....	8
Results.....	9
Crossover Testing Results	9
California Highway Patrol Crossover Test Results (PERF A)	10
State Miscellaneous (Tier 1 and 2) Crossover Test Results (PERF A)	11
State POFF Crossover Test Results (PERF A)	12
PA Miscellaneous Plan (PERF A)	13
PA Safety Plan (PERF A).....	14
Schools Crossover Test Results (PERF B)	15
Legislators' Retirement Fund (LRF).....	16
Judges' II Retirement Fund (JRF II).....	17
Conclusion	18
Appendix A	A-1
Plan Specific Projections and Calculations.....	A-1

Introduction

This report describes CalPERS approach for crossover testing to fulfill Government Accounting Standards Board Statements 67 and 68 reporting requirements on discount rates used for measuring Total Pension Liabilities as of the measurement date June 30, 2022 based on census information as of our last valuation date on June 30, 2021.

Background

History

The Government Accounting Standards Board adopted Statements 67 and 68 on June 25, 2012.

Statement 68 (Accounting and Financial Reporting for Pensions) paragraphs 26 to 31 contain requirements for determining the discount rate to be used in a pension plan. A 100-year cash flow projection for each agent plan is among the requirements.

CalPERS Structure

The California Public Employees' Retirement System (CalPERS) provides retirement benefit services to more than 2.3 million members.

Led by a 13-member Board of Administration ("CalPERS Board") consisting of member-elected, appointed, and ex officio members, CalPERS membership consists of 1,471,432 active and inactive members and 902,047 retirees, beneficiaries, and survivors as of June 30, 2021.

Public Employees Retirement Fund

The Public Employees Retirement Fund (PERF) provides retirement benefits to State of California, schools and other California public agency employees. The PERF benefits are funded by member and employer contributions and by earnings on investments.

The PERF is comprised of and reported as three separate entities for accounting purposes:

- PERF A is comprised of agent-multiple-employer plans, which includes State of California and most public agencies' rate plans with more than 100 active members.
- PERF B is a cost-sharing multiple-employer plan of Schools Pooled employers consisting of non-teaching and non-certified employees.
- PERF C is a cost-sharing multiple-employer plan of public agencies' plans with generally less than 100 active members.

In addition to the PERF, there are three other defined benefit plans:

- Legislators' Retirement Fund (LRF) provides retirement benefits to California Legislators elected to office before November 7, 1990, and to constitutional and statutory officers elected or appointed prior to January 1, 2013. The number of LRF members has been declining as eligible incumbent Legislators leave office and are replaced by those who are ineligible to participate in the LRF.
- Judges' Retirement Fund (JRF) provides retirement benefits to California Supreme and Appellate Court Justices and Superior Court Judges appointed or elected before November 9, 1994. The State of California does not pre-fund for this fund. The benefits are funded on a pay-as-you-go basis.
- Judges' Retirement Fund II (JRF II) provides retirement benefits to California Supreme and Appellate Court Justices and Superior Court Judges first appointed or elected on or after November 9, 1994.

CalPERS Long-Term Expected Rate of Return

CalPERS used the following methodology to set the long-term expected rate of return pertaining to the ACFR as of June 30, 2022.

The expected long-term rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class.

In determining the long-term expected rate of return, CalPERS took into account both the short-term and long-term market return expectations as well as the expected pension fund cash flows. Using historical returns of all funds' asset classes, expected compound (geometric) returns were calculated over the short term (first 10 years) and the long term (11+ years) using a building-block approach. Using the expected nominal returns for both short term and long term, the present value of benefits was calculated for each fund. The expected rate of return was set by calculating the rounded single equivalent expected return that arrived at the same present value of benefits for cash flows as the one calculated using both short-term and long-term returns. The expected rate of return was then set equal to the single equivalent rate calculated above and adjusted to account for assumed administrative expenses.

CalPERS Retirement Fund Discount Rates

The discount rates used in the actuarial valuations used to measure the total pension liability as of June 30, 2022, reflect the long-term expected rates of return for the respective plans. This excludes the JRF I, which is funded on a pay-as-you-go basis and does not have assets accumulated to pay future benefits.

The discount rates used to measure the total pension liability as of June 30, 2022, for the PERF A, PERF B, LRF, and JRF II were 6.90 percent, 6.90 percent, 4.85 percent, and 6.15 percent, respectively. The financial reporting discount rates are consistent with the expected long-term investment rate of return used to determine Actuarially Determined Contributions after adjustments for administrative expense assumptions.

CalPERS Funding Policy

The CalPERS Board of Administration adopts these actuarial policies to ensure the proper funding of member benefits.

- [Actuarial Amortization Policy \(PDF\)](#)
- [Actuarial Assumptions Policy \(PDF\)](#)
- [Actuarial Cost Method Policy \(PDF\)](#)
- [Contribution Allocation Policy \(PDF\)](#)

CalPERS Amortization Methods and Actuarial Assumptions

Amortization Methods

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

The unfunded liability is amortized as a “level percent of pay”. All new 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. The 5-year ramp up means that the payments in the first four years of the amortization period are 20 percent, 40 percent, 60 percent and 80 percent of the “full” payment which begins in year five. The 5-year ramp down means that the reverse is true in the final four years of the amortization period.

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

Amortization payments established on or after June 30, 2019 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 fixed period of five years.

Actuarial Assumptions

The actuarial assumptions used in determining actuarial liabilities and required employer contributions include both economic and non-economic assumptions. These assumptions represent the actuary’s best estimate of anticipated future experiences and are reviewed in depth periodically.

Assumptions used in the crossover testing of individual plans are assumptions adopted by the Board in November of 2021 for the PERF defined benefit plans as well as for the LRF and JRS II plans. For more details, please refer to the 2021 experience study report which can be found on the CalPERS website.

Approach

Crossover Testing

CalPERS conducted cash flow projections to determine if assets would run out under the assumed discount rate. CalPERS refers to these projections as “crossover tests”.

Each crossover test requires running multiple valuations, completing additional calculations and verifying the results. CalPERS cannot currently support crossover testing for the approximately 4,000 public agency rate plans it administers. Instead, CalPERS chose representative plans that had a higher likelihood of a crossover event (see Selection of Plans for more details).

CalPERS performed crossover tests on the following plans within the PERF as of the measurement date on June 30, 2022:

- PERF A
 - California Highway Patrol
 - State Miscellaneous (Tiers 1 and 2)
 - State Peace Officers and Fire Fighters (POFF)
 - One Public Agency Miscellaneous Plan
 - One Public Agency Safety Plan
- PERF B
 - Schools Pool
- PERF C
 - No plans were selected (see Selection of Plans section)

CalPERS also performed crossover tests on the following additional defined benefit plans as of the measurement date on June 30, 2022:

- Legislators' Retirement Fund
- Judges' Retirement Fund II

Selection of Plans

For PERF A, CalPERS tested a combination of State and Public Agency agent multiple-employer plans with the lowest funded status and lowest active to retiree ratio.

Funded status is one of several indicators of the financial health of a plan. Active to retiree ratio indicates how many actives a plan has to fund for future benefits. Plans with low measures in these two areas tend to have a higher probability of a crossover event compared to other CalPERS agencies' plans.

For PERF B, CalPERS conducted a crossover test on the Schools Pool (a cost-sharing multiple-employer plan).

For PERF C, by demonstrating crossover event does not occur for plans which have a lower funded status and active to retiree ratio within the PERF C risk pools, is sufficient to validate crossover event has a very low probability to occur for the entire PERF C risk pools. As of June 30, 2021, the funded status and active to retiree ratio for the PERF C Miscellaneous pool are 86.9 percent and 75.6 percent, respectively; and for the PERF C Safety pool are 82.8 percent and 55.8 percent.

CalPERS conducted crossover tests on LRS and JRS II.

CalPERS did not perform a crossover test on the Judges' Retirement Fund I (JRF) because the State adopted a pay-as-you-go funding policy. Under the pay-as-you-go method, the pension plan's fiduciary net position, if any, was projected not to be sufficient to cover the projected future benefit payments of current active and inactive employees. Therefore, the discount rate used to measure Total Pension Liability was based on a yield rate or index for the 20-year tax-exempt General Obligation Municipal Bonds with an average rating of AA/Aa or higher (Fidelity Index's "20-Year Municipal GO AA Index" was used).

The table below shows the funded status and active to retiree ratios for the plans tested for a crossover event.

Plan Characteristics (as of June 30, 2021)

Plan	Funded Status (based on 06/30/2021 funding valuation results)	Active to Retiree Ratio
PERF A - Agency		
California Highway Patrol	75.4%	0.68
State Miscellaneous (Tiers 1 and 2)	79.8%	0.87
State POFF	80.3%	0.90
PA Miscellaneous Plan	65.1%	0.52
PA Safety Plan	68.7%	0.46
PERF B – Cost-Sharing Schools		
Schools	78.3%	1.25
PERF C – Cost-Sharing Agency		
Pooled Miscellaneous Plan	86.9%	0.76
Pooled Safety Plan	82.8%	0.56
Other Defined Benefit Plans		
Legislators' Retirement Fund	129.3%	NA
Judges' II Retirement Fund	122.3%	4.37

Crossover Testing Methodology

This report was prepared in accordance with generally accepted actuarial principles and practices and based on the following testing methodologies:

- Benefit provisions provided by CalPERS's Retirement Benefit Service Division, as administered by the Board.
- Census information of covered active, transfer, vested, retired and beneficiaries members are as of June 30, 2021 provided by Retirement Benefit Service Division of CalPERS;
- The fair value of assets of the Plan as of June 30, 2021, provided by Financial Reporting & Accounting Services of CalPERS;
- Economic assumptions regarding inflation, future salary increases, and investment returns adopted by the Board for the June 30, 2021 actuarial valuations;
- Other actuarial assumptions, regarding employee terminations, retirements, disabilities, deaths, etc. adopted by the Board for the June 30, 2021 valuations; and
- Fiduciary Net Position (FNP) measured as of June 30, 2022 and thereafter are determined by rolling forward the FNP as of June 30, 2021, plus reported contributions and estimated investment earnings and then subtracted by reported benefit payments and administrative expenses provided by finance division of CalPERS.

Crossover Testing Assumptions

The following assumptions are used in performing the crossover tests.

- Plan's projected fiduciary net position amounts shown have not been adjusted for the time value of money.
- Projected total contributions include employee and employer normal cost contributions based on closed group projections (based on covered active members as of June 30, 2021); plus, annual employer contributions to the unfunded actuarial accrued liability; plus, any additional discretionary payments to the unfunded liability in FY21/22, if exist. Contributions and benefit payments are assumed to occur middle of the year.
- Projected benefit payments have been determined in accordance with paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, transfers, inactive vested, retired members, and beneficiaries as of June 30, 2021.
- Benefit payments are assumed to occur halfway through the year, on average in accordance with paragraph 31.b.(1)(e) of GASB Statement No. 67.
- The long-term expected rate of return on Plan investments of 6.90% per annum for PERF A & B (LRF, and JRF II's long-term expected rate of return are 4.85% and 6.15%, respectively) was applied to all periods of projected benefit payments to determine the discount rate to the extend Plan's beginning of the year's FNP was projected to be available to make projected future benefit payments and administrative expenses in that year. Otherwise, yield rate of 3.69% for the 20-year tax-exempt General Obligation Municipal Bonds was used.

- Projected administrative expenses are calculated as approximately 0.10% for the PERF (0.15% for JRF II, 0.35% for LRF) of the beginning year Fiduciary Net Position amount. Administrative expenses are assumed to occur halfway through the year, on average.

Results

Crossover Testing Results

Projected cash flows are used to develop the projected Fiduciary Net Position for each pension plan. The pension plan's projected Fiduciary Net Position is compared to the projected benefit payments in each period. A crossover event occurs if the projected benefit payments exceed the projected beginning of year Fiduciary Net Position in any given year.

There is no crossover event that is projected to occur for any CalPERS plan tested (plans include in PERF A, PERF B, LRF and JRF II). This report summarizes the findings for each plan tested by displaying the year in which the projected Fiduciary Net Position is at its lowest value and above zero. Therefore, no crossover event is expected to occur. It also presents the projected Fiduciary Net Position, projected benefit payments, and "funded" portion and "unfunded" portion of benefit payments for the periods within two years of that point, in addition to the first five (5) years and the 100th year of the crossover testing data. Detailed projections and calculations used to identify a potential crossover event for each plan are shown in Appendix A of this report

Crossover testing results are very sensitive to the long-term expected rate of return. Initially, Fiduciary Net Position increases as contributions plus investment earnings exceed projected benefit payments. When active payroll decreases, Fiduciary Net Position decreases as contributions plus investment earnings not enough to cover projected benefit payments. As time progress, retiree population decreases lead to projected benefit payments of the closed group decrease. At a certain point, expected investment earnings will exceed benefit payments plus administration expenses and the Trust will be cashflow positive. Therefore, no crossover event is expected to occur thereafter.

California Highway Patrol Crossover Test Results (PERF A)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-4, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2022, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$11,924,803,853	\$739,443,383	\$739,443,383	\$0
2	11,053,861,413	769,751,657	769,751,657	0
3	11,771,706,150	812,602,854	812,602,854	0
4	12,530,163,636	858,451,503	858,451,503	0
5	13,308,130,831	907,295,245	907,295,245	0
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45	19,790,528,440	1,358,117,189	1,358,117,189	0
46	19,732,750,585	1,303,201,941	1,303,201,941	0
47	19,727,795,497	1,246,486,491	1,246,486,491	0
48	19,781,115,527	1,188,189,890	1,188,189,890	0
49	19,898,307,407	1,128,564,899	1,128,564,899	0
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100	343,948,863,066	8,477	8,477	0

State Miscellaneous (Tier 1 and 2) Crossover Test Results (PERF A)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-7, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$104,318,730,569	\$7,174,816,780	\$7,174,816,780	\$0
2	95,784,715,417	7,584,930,852	7,584,930,852	0
3	99,962,540,237	7,917,752,927	7,917,752,927	0
4	104,286,861,591	8,247,631,891	8,247,631,891	0
5	108,734,031,392	8,579,277,533	8,579,277,533	0
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61	37,238,817,061	2,976,628,175	2,976,628,175	0
62	36,694,887,457	2,630,565,074	2,630,565,074	0
63	36,471,606,386	2,304,458,836	2,304,458,836	0
64	36,570,153,711	2,000,002,739	2,000,002,739	0
65	36,990,039,624	1,718,552,942	1,718,552,942	0
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100	298,214,520,262	88,254	88,254	0

State POFF Crossover Test Results (PERF A)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-10, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$46,175,075,965	\$2,735,399,765	\$2,735,399,765	\$0
2	42,692,692,558	2,892,696,486	2,892,696,486	0
3	45,072,299,119	3,061,631,051	3,061,631,051	0
4	47,551,705,641	3,234,204,929	3,234,204,929	0
5	50,096,008,987	3,412,349,567	3,412,349,567	0
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41	81,819,223,067	5,675,789,545	5,675,789,545	0
42	81,517,769,568	5,516,172,374	5,516,172,374	0
43	81,360,579,597	5,350,731,763	5,350,731,763	0
44	81,363,563,341	5,180,028,207	5,180,028,207	0
45	81,543,100,534	5,004,569,853	5,004,569,853	0
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100	1,487,017,012,560	53,869	53,869	0

PA Miscellaneous Plan (PERF A)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-13, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$126,888,613	\$11,567,406	\$11,567,406	\$0
2	114,032,862	11,898,035	11,898,035	0
3	118,504,986	12,380,017	12,380,017	0
4	122,415,884	12,857,851	12,857,851	0
5	126,547,210	13,337,944	13,337,944	0
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60	25,064,939	1,897,748	1,897,748	0
61	24,808,144	1,691,630	1,691,630	0
62	24,746,899	1,492,532	1,492,532	0
63	24,887,245	1,301,532	1,301,532	0
64	25,234,520	1,120,021	1,120,021	0
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100	221,826,997	0	0	0

PA Safety Plan (PERF A)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-16, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$332,552,929	\$26,018,808	\$26,018,808	\$0
2	302,357,782	26,954,682	26,954,682	0
3	317,563,059	28,200,514	28,200,514	0
4	332,896,471	29,459,420	29,459,420	0
5	348,908,597	30,801,446	30,801,446	0
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62	111,576,042	9,059,895	9,059,895	0
63	109,800,348	8,000,749	8,000,749	0
64	108,998,470	7,006,028	7,006,028	0
65	109,170,051	6,078,595	6,078,595	0
66	110,311,746	5,220,198	5,220,198	0
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100	832,476,178	0	0	0

Schools Crossover Test Results (PERF B)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-19, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$86,523,055,855	\$5,298,757,535	\$5,298,757,535	\$0
2	79,677,331,972	5,725,106,296	5,725,106,296	0
3	84,060,976,283	6,046,990,886	6,046,990,886	0
4	88,637,267,957	6,372,283,393	6,372,283,393	0
5	93,359,980,547	6,707,474,230	6,707,474,230	0
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57	57,954,414,187	4,366,875,728	4,366,875,728	0
58	57,382,406,568	3,980,583,116	3,980,583,116	0
59	57,170,712,997	3,606,389,212	3,606,389,212	0
60	57,331,331,531	3,246,169,626	3,246,169,626	0
61	57,875,137,763	2,901,681,237	2,901,681,237	0
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100	567,425,349,027	109,924	109,924	0

Legislators' Retirement Fund (LRF)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-22, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$122,048,318	\$6,935,519	\$6,935,519	\$0
2	102,124,784	6,893,267	6,893,267	0
3	99,735,966	6,818,205	6,818,205	0
4	97,254,158	6,717,242	6,717,242	0
5	94,763,878	6,598,155	6,598,155	0
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27	57,733,192	2,780,937	2,780,937	0
28	57,488,366	2,610,793	2,610,793	0
29	57,406,453	2,447,858	2,447,858	0
30	57,487,415	2,292,571	2,292,571	0
31	57,730,763	2,144,798	2,144,798	0
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100	690,282,658	0	0	0

Judges' II Retirement Fund (JRF II)

A crossover event did not occur.

As illustrated in the following Exhibit and Appendix A-25, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members plus administrative expenses. There is no projected "cross-over date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.90% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2020, pursuant to paragraph 44 of GASB Statement No. 67.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	\$2,398,028,581	\$66,739,181	\$66,739,181	\$0
2	2,134,309,481	77,055,888	77,055,888	0
3	2,297,860,942	90,430,301	90,430,301	0
4	2,453,414,861	103,211,502	103,211,502	0
5	2,600,529,408	116,570,781	116,570,781	0
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53	269,731,889	22,516,469	22,516,469	
54	262,733,679	18,220,466	18,220,466	
55	259,738,582	14,523,093	14,523,093	
56	260,370,458	11,387,412	11,387,412	
57	264,268,627	8,771,995	8,771,995	
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100	2,908,164,344	0	0	0

Conclusion

Public Employees Retirement Fund

CalPERS selected plans from the PERF that were the likeliest candidates for a crossover event. As no crossover event occurred on any of the tested plans, CalPERS has determined that using the 6.90% long-term expected rate of return gross of administrative expenses to determine the total pension liability as of June 30, 2022 for all plans in the PERF is appropriate, pursuant to paragraph 44 of GASB Statement no. 67.

Legislators' Retirement Fund

As no crossover event occurred on the Legislators' Retirement Fund, CalPERS has determined that using the 4.85% long-term expected rate of return gross of administrative expenses to determine the total pension liability as of June 30, 2022 for the plan in the LRF is appropriate, pursuant to paragraph 44 of GASB Statement no. 67.

Judges' Retirement Fund

CalPERS did not perform a crossover test on the Judges' Retirement Fund because the State adopted a pay-as-you-go funding policy for the Plan. Therefore, the discount rate used to determine total pension liability as of June 30, 2022 was based on the yields of 20-year tax-exempt General Obligation Municipal Bonds with an average rating of AA (as reported in Fidelity Index's "20-Year Municipal GO AA Index" for the month of June, 2022).

Judges' II Retirement Fund

As no crossover event occurred on the Judges' II Retirement Fund, CalPERS has determined that using the 6.15% long-term expected rate of return gross of administrative expenses to determine the total pension liability as of June 30, 2022 for the plan in the JRF II is appropriate, pursuant to paragraph 44 of GASB Statement no. 67.

Appendix A

Plan Specific Projections and Calculations

- **California Highway Patrol (PERF A)**
- **State Miscellaneous (Tier 1 and 2) (PERF A)**
- **State POFF (PERF A)**
- **PA Miscellaneous Plan (PERF A)**
- **PA Safety Plan (PERF A)**
- **Schools (PERF B)**
- **Legislators' Retirement Fund**
- **Judges' II Retirement Fund**

The tables in this Appendix show the projections and calculations to identify a crossover event and to determine the discount rate according to the Government Accounting Standards Board Statements 67 and 68. The tables for each plan include:

- Projection of Contributions (Table 1)
- Projection of the Pension Plan's Fiduciary Net Position (Table 2)
- Actuarial Present Values of Projected Benefit Payments (Table 3)

Projected values in the tables are displayed for each plan as following:

- The first five (5) years of crossover testing data
- The two (2) years preceding the closest point to a crossover event
- The closest point to a crossover event
- The two (2) years after the closest point to a crossover event
- The 100th year of the crossover test

California Highway Patrol (PERF A)

Table 1. Projection of Contributions for California Highway Patrol (PERF A)

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Unfunded Actuarial Contribution as a % of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$908,114,111	\$912,025,854	\$289,018,675	43.710%	\$398,646,501	\$49,974,250	\$737,639,426
2	901,800,793	937,562,578	296,512,101	43.335%	440,516,021	0	737,028,121
3	890,122,598	963,814,330	291,310,423	46.218%	480,633,566	0	771,943,989
4	874,144,420	990,801,131	284,901,149	47.002%	501,863,685	0	786,764,834
5	854,928,860	1,018,543,563	277,356,021	48.839%	534,625,997	0	811,982,018
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45	0	3,074,002,348	0	0.000%	0	0	0
46	0	3,160,074,414	0	0.000%	0	0	0
47	0	3,248,556,497	0	0.000%	0	0	0
48	0	3,339,516,079	0	0.000%	0	0	0
49	0	3,433,022,530	0	0.000%	0	0	0
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100	0	14,038,654,993	0	0.000%	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for California Highway Patrol (PERF A)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$11,924,803,853	\$737,639,426	\$739,443,383	\$7,774,660	(\$861,363,823)	\$11,053,861,413	(\$1,608,581,866)
2	11,053,861,413	737,028,121	769,751,657	11,038,033	761,606,306	11,771,706,150	(19,183,384)
3	11,771,706,150	771,943,989	812,602,854	11,752,039	810,868,390	12,530,163,636	(13,486,503)
4	12,530,163,636	786,764,834	858,451,503	12,495,488	862,149,352	13,308,130,831	(8,797,639)
5	13,308,130,831	811,982,018	907,295,245	13,262,027	915,027,568	14,114,583,144	(5,529,705)
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45	19,790,528,440	0	1,358,117,189	19,133,597	1,319,472,932	19,732,750,585	(57,777,855)
46	19,732,750,585	0	1,303,201,941	19,102,382	1,317,349,235	19,727,795,497	(4,955,088)
47	19,727,795,497	0	1,246,486,491	19,124,861	1,318,931,381	19,781,115,527	53,320,029
48	19,781,115,527	0	1,188,189,890	19,206,379	1,324,588,150	19,898,307,407	117,191,880
49	19,898,307,407	0	1,128,564,899	19,352,412	1,334,697,141	20,085,087,236	186,779,830
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100	343,948,863,066	0	8,477	343,948,859	23,732,471,264	367,337,376,995	23,388,513,928

Table 3. Actuarial Present Values of Projected Benefit Payments for California Highway Patrol (PERF A)

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.90%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) ^(a)
1	\$11,924,803,853	\$739,443,383	\$739,443,383	\$0	\$715,181,175	\$0	\$715,181,175
2	11,053,861,413	769,751,657	769,751,657	0	696,440,590	0	696,440,590
3	11,771,706,150	812,602,854	812,602,854	0	687,755,513	0	687,755,513
4	12,530,163,636	858,451,503	858,451,503	0	679,663,264	0	679,663,264
5	13,308,130,831	907,295,245	907,295,245	0	671,968,572	0	671,968,572
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45	19,790,528,440	1,358,117,189	1,358,117,189	0	69,731,557	0	69,731,557
46	19,732,750,585	1,303,201,941	1,303,201,941	0	62,593,052	0	62,593,052
47	19,727,795,497	1,246,486,491	1,246,486,491	0	56,004,675	0	56,004,675
48	19,781,115,527	1,188,189,890	1,188,189,890	0	49,939,577	0	49,939,577
49	19,898,307,407	1,128,564,899	1,128,564,899	0	44,371,881	0	44,371,881
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100	343,948,863,066	8,477	8,477	0	11	0	11
Total					\$18,177,910,347	\$0	\$18,177,910,347

State Miscellaneous (Tier 1 and 2) (PERF A)

Table 1. Projection of Contributions for State Miscellaneous (Tier 1 and 2) (PERF A)

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Unfunded Actuarial Contribution as a % of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$13,812,938,607	\$14,102,632,209	\$2,513,482,717	19.740%	\$2,786,643,458	\$889,406,801	\$6,189,532,975
2	13,340,548,063	14,497,505,911	2,362,611,062	20.173%	2,962,358,983	0	5,324,970,045
3	12,926,396,686	14,903,436,076	2,270,780,106	21.811%	3,253,868,880	0	5,524,648,986
4	12,529,214,870	15,320,732,287	2,192,111,434	22.801%	3,496,751,104	0	5,688,862,537
5	12,137,142,737	15,749,712,791	2,113,683,408	23.666%	3,731,083,305	0	5,844,766,713
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61	0	73,941,296,174	0	0.000%	0	0	0
62	0	76,011,652,467	0	0.000%	0	0	0
63	0	78,139,978,736	0	0.000%	0	0	0
64	0	80,327,898,140	0	0.000%	0	0	0
65	0	82,577,079,288	0	0.000%	0	0	0
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100	0	217,079,359,294	0	0.000%	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for State Miscellaneous (Tier 1 and 2) (PERF A)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$104,318,730,569	\$6,189,532,975	\$7,174,816,780	\$68,013,081	(\$7,480,718,267)	\$95,784,715,417	(\$14,723,548,127)
2	95,784,715,417	5,324,970,045	7,584,930,852	94,691,556	6,532,477,183	99,962,540,237	(1,147,145,225)
3	99,962,540,237	5,524,648,986	7,917,752,927	98,804,978	6,816,230,273	104,286,861,591	(1,200,327,632)
4	104,286,861,591	5,688,862,537	8,247,631,891	103,049,166	7,108,988,320	108,734,031,392	(1,241,692,737)
5	108,734,031,392	5,844,766,713	8,579,277,533	107,411,328	7,409,881,084	113,301,990,328	(1,276,807,777)
.
61	37,238,817,061	-	2,976,628,175	35,799,000	2,468,497,570	36,694,887,457	(543,929,604)
62	36,694,887,457	-	2,630,565,074	35,422,464	2,442,706,466	36,471,606,386	(223,281,071)
63	36,471,606,386	-	2,304,458,836	35,356,923	2,438,363,084	36,570,153,711	98,547,325
64	36,570,153,711	-	2,000,002,739	35,602,738	2,455,491,389	36,990,039,624	419,885,912
65	36,990,039,624	-	1,718,552,942	36,158,763	2,494,011,578	37,729,339,497	739,299,873
.
100	298,214,520,262	-	88,254	298,214,478	20,576,798,904	318,493,016,434	20,278,496,173

January 6, 2023

Table 3. Actuarial Present Values of Projected Benefit Payments for State Miscellaneous (Tier 1 and 2) (PERF A)

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.90%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) ^(a)
1	\$104,318,730,569	\$7,174,816,780	\$7,174,816,780	\$0	\$6,939,400,652	\$0	\$6,939,400,652
2	95,784,715,417	7,584,930,852	7,584,930,852	0	6,862,542,832	0	6,862,542,832
3	99,962,540,237	7,917,752,927	7,917,752,927	0	6,701,278,735	0	6,701,278,735
4	104,286,861,591	8,247,631,891	8,247,631,891	0	6,529,911,585	0	6,529,911,585
5	108,734,031,392	8,579,277,533	8,579,277,533	0	6,354,056,082	0	6,354,056,082
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61	37,238,817,061	2,976,628,175	2,976,628,175	0	52,550,085	0	52,550,085
62	36,694,887,457	2,630,565,074	2,630,565,074	0	43,443,037	0	43,443,037
63	36,471,606,386	2,304,458,836	2,304,458,836	0	35,601,015	0	35,601,015
64	36,570,153,711	2,000,002,739	2,000,002,739	0	28,903,225	0	28,903,225
65	36,990,039,624	1,718,552,942	1,718,552,942	0	23,232,767	0	23,232,767
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100	298,214,520,262	88,254	88,254	0	115	0	115
Total					\$150,325,686,824	\$0	\$150,325,686,824

State POFF (PERF A)

Table 1. Projection of Contributions for State POFF (PERF A)

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Unfunded Actuarial Contribution as a % of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$3,783,811,231	\$3,813,568,529	\$1,255,022,159	13.580%	\$517,882,606	\$877,192,864	\$2,650,097,629
2	3,709,311,112	3,920,348,448	1,163,239,965	27.544%	1,222,899,682	0	2,386,139,647
3	3,628,041,360	4,030,118,205	1,129,445,556	30.235%	1,365,622,042	0	2,495,067,598
4	3,540,314,251	4,142,961,514	1,094,842,182	31.891%	1,472,452,168	0	2,567,294,351
5	3,444,500,147	4,258,964,437	1,057,978,220	33.355%	1,576,020,685	0	2,633,998,905
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41	1,775,646	11,509,491,629	418,147	0.000%	0	0	418,147
42	987,847	11,831,757,394	231,838	0.000%	0	0	231,838
43	534,264	12,163,046,602	124,959	0.000%	0	0	124,959
44	280,870	12,503,611,906	65,474	0.000%	0	0	65,474
45	143,605	12,853,713,040	33,351	0.000%	0	0	33,351
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100	0	58,701,595,611	0	0.000%	0	0	0

January 6, 2023

Table 2. Projection of the Pension Plan's Fiduciary Net Position for State POFF (PERF A)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$46,175,075,965	\$2,650,097,629	\$2,735,399,765	\$30,104,940	(\$3,366,976,331)	\$42,692,692,558	(\$6,132,481,036)
2	42,692,692,558	2,386,139,647	2,892,696,486	42,447,667	2,928,611,068	45,072,299,119	(6,533,085)
3	45,072,299,119	2,495,067,598	3,061,631,051	44,798,248	3,090,768,222	47,551,705,641	(15,661,076)
4	47,551,705,641	2,567,294,351	3,234,204,929	47,229,116	3,258,443,040	50,096,008,987	(22,991,005)
5	50,096,008,987	2,633,998,905	3,412,349,567	49,719,515	3,430,219,415	52,698,158,225	(31,849,667)
.
41	81,819,223,067	418,147	5,675,789,545	79,074,004	5,452,991,903	81,517,769,568	(301,871,646)
42	81,517,769,568	231,838	5,516,172,374	78,849,668	5,437,600,233	81,360,579,597	(157,421,809)
43	81,360,579,597	124,959	5,350,731,763	78,772,451	5,432,363,000	81,363,563,341	2,858,786
44	81,363,563,341	65,474	5,180,028,207	78,857,977	5,438,357,903	81,543,100,534	179,471,719
45	81,543,100,534	33,351	5,004,569,853	79,122,369	5,456,697,228	81,916,138,891	373,005,006
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100	1,487,017,012,560	0	53,869	1,487,016,987	102,604,172,039	1,588,134,113,743	101,117,101,183

Table 3. Actuarial Present Values of Projected Benefit Payments for State POFF (PERF A)

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.90%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) ^(a)
1	\$46,175,075,965	\$2,735,399,765	\$2,735,399,765	0	\$2,645,647,338	0	\$2,645,647,338
2	42,692,692,558	2,892,696,486	2,892,696,486	0	2,617,196,375	0	2,617,196,375
3	45,072,299,119	3,061,631,051	3,061,631,051	0	2,591,245,678	0	2,591,245,678
4	47,551,705,641	3,234,204,929	3,234,204,929	0	2,560,622,554	0	2,560,622,554
5	50,096,008,987	3,412,349,567	3,412,349,567	0	2,527,282,797	0	2,527,282,797
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.
41	81,819,223,067	5,675,789,545	5,675,789,545	0	380,565,332	0	380,565,332
42	81,517,769,568	5,516,172,374	5,516,172,374	0	345,989,614	0	345,989,614
43	81,360,579,597	5,350,731,763	5,350,731,763	0	313,950,160	0	313,950,160
44	81,363,563,341	5,180,028,207	5,180,028,207	0	284,316,424	0	284,316,424
45	81,543,100,534	5,004,569,853	5,004,569,853	0	256,956,065	0	256,956,065
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100	1,487,017,012,560	53,869	53,869	0	70	0	70
Total					\$66,902,256,904	\$0	\$66,902,256,904

PA Miscellaneous Plan (PERF A)

Table 1. Projection of Contributions for PA Miscellaneous Plan (PERF A)

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Contributions to the Unfunded Actuarial Liability (e) = (b) * UAL Rate	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$9,760,203	\$57,374,944	\$1,765,849	\$6,233,181	\$0	\$7,999,030
2	9,334,352	58,981,442	1,762,326	6,959,804	0	8,722,130
3	8,911,471	60,632,922	1,799,226	6,567,555	0	8,366,781
4	8,499,785	62,330,644	1,709,222	7,091,355	0	8,800,577
5	8,090,331	64,075,902	1,617,904	7,095,831	0	8,713,735
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60	0	292,628,106	0	0	0	0
61	0	300,821,693	0	0	0	0
62	0	309,244,701	0	0	0	0
63	0	317,903,552	0	0	0	0
64	0	326,804,852	0	0	0	0
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100	0	883,162,506	0	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for PA Miscellaneous Plan (PERF A)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$126,888,613	\$7,999,030	\$11,567,406	\$82,728	\$9,204,648	\$114,032,862	(\$20,854,782)
2	114,032,862	8,722,130	11,898,035	112,497	7,760,526	118,504,986	(4,250,005)
3	118,504,986	8,366,781	12,380,017	116,564	8,040,697	122,415,884	(4,455,884)
4	122,415,884	8,800,577	12,857,851	120,453	8,309,055	126,547,210	(4,669,250)
5	126,547,210	8,713,735	13,337,944	124,310	8,574,883	130,373,575	(4,887,371)
.
60	25,064,939	0	1,897,748	24,147	1,665,101	24,808,144	(256,795)
61	24,808,144	0	1,691,630	23,990	1,654,374	24,746,899	(61,245)
62	24,746,899	0	1,492,532	24,025	1,656,903	24,887,245	140,346
63	24,887,245	0	1,301,532	24,258	1,673,066	25,234,520	347,276
64	25,234,520	0	1,120,021	24,693	1,703,186	25,792,992	558,472
.
100	221,826,997	0	0	221,827	15,306,063	236,911,232	15,084,236

January 6, 2023

Table 3. Actuarial Present Values of Projected Benefit Payments for PA Miscellaneous Plan (PERF A)

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.90%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) ^(a)
1	\$126,888,613	\$11,567,406	\$11,567,406	\$0	\$11,187,863	\$0	\$11,187,863
2	114,032,862	11,898,035	11,898,035	0	10,764,867	0	10,764,867
3	118,504,986	12,380,017	12,380,017	0	10,477,965	0	10,477,965
4	122,415,884	12,857,851	12,857,851	0	10,179,968	0	10,179,968
5	126,547,210	13,337,944	13,337,944	0	9,878,459	0	9,878,459
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60	25,064,939	1,897,748	1,897,748	0	35,815	0	35,815
61	24,808,144	1,691,630	1,691,630	0	29,864	0	29,864
62	24,746,899	1,492,532	1,492,532	0	24,649	0	24,649
63	24,887,245	1,301,532	1,301,532	0	20,107	0	20,107
64	25,234,520	1,120,021	1,120,021	0	16,186	0	16,186
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100	221,826,997	0	0	0	0	0	0
Total					\$207,484,568		\$207,484,568

January 6, 2023

PA Safety Plan (PERF A)

Table 1. Projection of Contributions for PA Safety Plan (PERF A)

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Contributions to the Unfunded Actuarial Liability (e) = (b) * UAL Rate	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$24,195,253	\$24,332,573	\$7,526,661	\$12,728,384	\$0	\$20,255,045
2	23,822,584	25,013,885	7,580,346	14,192,566	0	21,772,912
3	23,296,125	25,714,274	8,081,426	14,060,807	0	22,142,233
4	22,653,739	26,434,273	7,807,384	15,241,572	0	23,048,957
5	21,862,841	27,174,433	7,487,149	16,205,034	0	23,692,183
.
62	0	131,149,919	0	0	0	0
63	0	134,822,117	0	0	0	0
64	0	138,597,136	0	0	0	0
65	0	142,477,856	0	0	0	0
66	0	146,467,236	0	0	0	0
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100	0	374,547,053	0	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for PA Safety Plan (PERF A)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$332,552,929	\$20,255,045	\$26,018,808	\$216,816	\$24,214,568	\$302,357,782	(\$50,450,192)
2	302,357,782	21,772,912	26,954,682	299,851	20,686,898	317,563,059	(6,567,635)
3	317,563,059	22,142,233	28,200,514	314,633	21,706,327	332,896,471	(6,808,820)
4	332,896,471	23,048,957	29,459,420	329,796	22,752,384	348,908,597	(7,036,831)
5	348,908,597	23,692,183	30,801,446	345,470	23,833,515	365,287,378	(7,313,402)
.
62	111,576,042	0	9,059,895	107,194	7,391,394	109,800,348	(1,775,695)
63	109,800,348	0	8,000,749	105,930	7,304,802	108,998,470	(801,877)
64	108,998,470	0	7,006,028	105,610	7,283,218	109,170,051	171,581
65	109,170,051	0	6,078,595	106,230	7,326,520	110,311,746	1,141,695
66	110,311,746	0	5,220,198	107,787	7,434,418	112,418,180	2,106,433
.
100	832,476,178	0	0	832,476	57,440,856	889,084,558	56,608,380

January 6, 2023

Table 3. Actuarial Present Values of Projected Benefit Payments for PA Safety Plan (PERF A)

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.90%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) ^(a)
1	\$332,552,929	\$26,018,808	\$26,018,808	\$0	\$25,165,093	\$0	\$25,165,093
2	302,357,782	26,954,682	26,954,682	0	24,387,521	0	24,387,521
3	317,563,059	28,200,514	28,200,514	0	23,867,821	0	23,867,821
4	332,896,471	29,459,420	29,459,420	0	23,323,956	0	23,323,956
5	348,908,597	30,801,446	30,801,446	0	22,812,424	0	22,812,424
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62	111,576,042	9,059,895	9,059,895	0	149,622	0	149,622
63	109,800,348	8,000,749	8,000,749	0	123,602	0	123,602
64	108,998,470	7,006,028	7,006,028	0	101,248	0	101,248
65	109,170,051	6,078,595	6,078,595	0	82,175	0	82,175
66	110,311,746	5,220,198	5,220,198	0	66,016	0	66,016
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100	832,476,178	0	0	0	0	0	0
Total					\$545,134,225		\$545,134,225

Schools (PERF B)

Table 1. Projection of Contributions for Schools (PERF B)

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Unfunded Actuarial Contribution as a % of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$14,372,614,181	\$14,767,212,707	\$2,654,486,582	13.590%	\$2,006,864,207	0	\$4,661,350,789
2	13,707,732,851	15,180,694,663	2,363,213,144	15.552%	2,360,951,243	0	4,724,164,386
3	13,111,721,390	15,605,754,114	2,254,691,610	17.233%	2,689,328,836	0	4,944,020,446
4	12,549,056,830	16,042,715,229	2,150,908,341	18.444%	2,958,969,347	0	5,109,877,688
5	12,006,981,660	16,491,911,255	2,049,231,560	19.170%	3,161,462,909	0	5,210,694,469
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57	0	69,328,683,194	0	0.000%	0	0	0
58	0	71,269,886,324	0	0.000%	0	0	0
59	0	73,265,443,141	0	0.000%	0	0	0
60	0	75,316,875,549	0	0.000%	0	0	0
61	0	77,425,748,064	0	0.000%	0	0	0
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100	0	227,309,131,059	0	0.000%	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for Schools (PERF B)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$86,523,055,855	\$4,661,350,789	\$5,298,757,535	\$56,202,246	\$6,152,114,892	\$79,677,331,972	(\$11,507,074,672)
2	79,677,331,972	4,724,164,386	5,725,106,296	79,193,169	5,463,779,390	84,060,976,283	(340,520,075)
3	84,060,976,283	4,944,020,446	6,046,990,886	83,527,461	5,762,789,574	88,637,267,957	(367,728,772)
4	88,637,267,957	5,109,877,688	6,372,283,393	88,026,633	6,073,144,928	93,359,980,547	(387,165,097)
5	93,359,980,547	5,210,694,469	6,707,474,230	92,635,977	6,391,061,060	98,161,625,869	(409,049,147)
.
57	57,954,414,187	0	4,366,875,728	55,842,124	3,850,710,232	57,382,406,568	(572,007,619)
58	57,382,406,568	0	3,980,583,116	55,456,969	3,824,346,514	57,170,712,997	(211,693,571)
59	57,170,712,997	0	3,606,389,212	55,426,276	3,822,434,022	57,331,331,531	160,618,534
60	57,331,331,531	0	3,246,169,626	55,761,135	3,845,736,993	57,875,137,763	543,806,232
61	57,875,137,763	0	2,901,681,237	56,471,573	3,894,946,240	58,811,931,194	936,793,431
.
100	567,425,349,027	0	109,924	567,425,296	39,152,345,354	606,010,159,162	38,584,810,134

Table 3. Actuarial Present Values of Projected Benefit Payments for Schools (PERF B)

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.90%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) ^(a)
1	\$86,523,055,855	\$5,298,757,535	\$5,298,757,535	0	\$5,124,897,627	0	\$5,124,897,627
2	79,677,331,972	5,725,106,296	5,725,106,296	0	5,179,847,772	0	5,179,847,772
3	84,060,976,283	6,046,990,886	6,046,990,886	0	5,117,938,360	0	5,117,938,360
4	88,637,267,957	6,372,283,393	6,372,283,393	0	5,045,138,738	0	5,045,138,738
5	93,359,980,547	6,707,474,230	6,707,474,230	0	4,967,745,508	0	4,967,745,508
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57	57,954,414,187	4,366,875,728	4,366,875,728	0	100,677,052		100,677,052
58	57,382,406,568	3,980,583,116	3,980,583,116	0	85,847,697		85,847,697
59	57,170,712,997	3,606,389,212	3,606,389,212	0	72,757,345		72,757,345
60	57,331,331,531	3,246,169,626	3,246,169,626	0	61,262,928		61,262,928
61	57,875,137,763	2,901,681,237	2,901,681,237	0	51,226,954		51,226,954
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100	567,425,349,027	109,924	109,924	0	144	0	144
Total					\$128,657,413,277		\$128,657,413,277

Legislators' Retirement Fund

Table 1. Projection of Contributions for Legislators' Retirement Fund

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Unfunded Actuarial Contribution as a % of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$297,551	\$290,588	\$111,225	0.000%	\$0	\$0	\$111,225
2	152,941	298,724	60,871	0.000%	0	0	60,871
3	0	307,089	0	0.000%	0	0	0
4	0	315,687	0	0.000%	0	0	0
5	0	324,526	0	0.000%	0	0	0
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27	0	595,797	0	0.000%	0	0	0
28	0	612,479	0	0.000%	0	0	0
29	0	629,629	0	0.000%	0	0	0
30	0	647,259	0	0.000%	0	0	0
31	0	665,382	0	0.000%	0	0	0
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100	0	4,472,968	0	0.000%	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for Legislators' Retirement Fund

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$122,048,318	\$111,225	\$6,935,519	\$415,496	(\$12,683,744)	\$102,124,784	(\$20,034,759)
2	102,124,784	60,871	6,893,267	345,750	4,789,328	99,735,966	(2,449,689)
3	99,735,966	0	6,818,205	337,414	4,673,810	97,254,158	(2,481,808)
4	97,254,158	0	6,717,242	328,900	4,555,862	94,763,878	(2,490,280)
5	94,763,878	0	6,598,155	320,388	4,437,937	92,283,273	(2,480,606)
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27	57,733,192	0	\$2,780,937	197,309	2,733,421	57,488,366	\$(244,826)
28	57,488,366	0	\$2,610,793	196,744	2,725,624	57,406,453	\$(81,913)
29	57,406,453	0	\$2,447,858	196,736	2,725,555	57,487,415	\$80,962
30	57,487,415	0	\$2,292,571	197,285	2,733,203	57,730,763	\$243,348
31	57,730,763	0	\$2,144,798	198,389	2,748,546	58,136,122	\$405,359
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100	690,282,658	0	0	2,415,989	33,478,709	721,345,378	31,062,720

Table 3. Actuarial Present Values of Projected Benefit Payments for Legislators' Retirement Fund

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 5.25%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 5.25%) ^(a)
1	\$122,048,318	\$6,935,519	\$6,935,519	\$0	\$6,773,213	\$0	\$6,773,213
2	102,124,784	6,893,267	6,893,267	0	6,420,553	0	6,420,553
3	99,735,966	6,818,205	6,818,205	0	6,056,880	0	6,056,880
4	97,254,158	6,717,242	6,717,242	0	5,691,169	0	5,691,169
5	94,763,878	6,598,155	6,598,155	0	5,331,686	0	5,331,686
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27	57,733,192	2,780,937	2,780,937	0	792,734	0	792,734
28	57,488,366	2,610,793	2,610,793	0	709,807	0	709,807
29	57,406,453	2,447,858	2,447,858	0	634,725	0	634,725
30	57,487,415	2,292,571	2,292,571	0	566,962	0	566,962
31	57,730,763	2,144,798	2,144,798	0	505,882	0	505,882
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100	690,282,658	0	0	0	0	0	0
Total					\$92,064,742	0	\$92,064,742

Judges' II Retirement Fund

Table 1. Projection of Contributions for Judges' II Retirement Fund

Year	Closed Group Employee Payroll (a)	Total Employee Payroll (b)	Contributions to Total Normal Cost (c)	Unfunded Actuarial Contribution as a % of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$350,308,484	\$360,771,470	\$126,992,846	0.640%	\$2,308,951	\$0	\$129,301,798
2	338,481,434	370,873,071	111,529,633	0.000%	0	0	111,529,633
3	325,691,055	381,257,517	107,412,910	0.050%	191,923	0	107,604,833
4	311,820,140	391,932,728	102,931,828	0.049%	191,923	0	103,123,752
5	297,584,827	402,906,844	98,322,027	0.048%	191,923	0	98,513,950
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53	0	1,516,610,815	0	0.000%	0	0	0
54	0	1,559,075,918	0	0.000%	0	0	0
55	0	1,602,730,043	0	0.000%	0	0	0
56	0	1,647,606,485	0	0.000%	0	0	0
57	0	1,693,739,466	0	0.000%	0	0	0
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100	0	5,553,292,354	0	0.000%	0	0	0

Table 2. Projection of the Pension Plan's Fiduciary Net Position for Judges' II Retirement Fund

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Position (f) = (a) + (b) - (c) - (d) + (e)	Projected Investment Earnings (e) - {Projected Benefit Payments (c) + Projected Administrative Expenses (d)}
1	\$2,398,028,581	\$129,301,798	\$66,739,181	\$1,920,602	(\$324,361,115)	\$2,134,309,481	(\$393,020,898)
2	2,134,309,481	111,529,633	77,055,888	3,226,568	132,304,285	2,297,860,942	52,021,829
3	2,297,860,942	107,604,833	90,430,301	3,459,298	141,838,685	2,453,414,861	47,949,086
4	2,453,414,861	103,123,752	103,211,502	3,680,058	150,882,356	2,600,529,408	43,990,795
5	2,600,529,408	98,513,950	116,570,781	3,887,645	159,385,595	2,737,970,528	38,927,170
.
53	269,731,889	0	22,516,469	388,201	15,906,460	262,733,679	(6,998,210)
54	262,733,679	0	18,220,466	380,832	15,606,201	259,738,582	(2,995,097)
55	259,738,582	0	14,523,093	379,032	15,534,001	260,370,458	631,876
56	260,370,458	0	11,387,412	382,263	15,667,845	264,268,627	3,898,170
57	264,268,627	0	8,771,995	390,015	15,986,806	271,093,423	6,824,796
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100	2,908,164,344	0	0	4,362,247	178,852,107	3,082,654,205	174,489,861

Table 3. Actuarial Present Values of Projected Benefit Payments for Judges' II Retirement Fund

Year	Projected Beginning Fiduciary Net Position (b)	Projected Benefit Payments (c)	"Funded" Portion of Benefit Payments (d)	"Unfunded" Portion of Benefit Payments (e)	Present Value of 'Funded' Benefit Payments (f) = (d) ÷ (1 + 6.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.69%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.15%) ^(a)
1	\$2,398,028,581	\$66,739,181	\$66,739,181	\$0	\$64,777,006	\$0	\$64,777,006
2	2,134,309,481	77,055,888	77,055,888	0	70,457,273	0	70,457,273
3	2,297,860,942	90,430,301	90,430,301	0	77,895,789	0	77,895,789
4	2,453,414,861	103,211,502	103,211,502	0	83,754,491	0	83,754,491
5	2,600,529,408	116,570,781	116,570,781	0	89,114,774	0	89,114,774
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53	269,731,889	22,516,469	22,516,469	0	981,071	0	981,071
54	262,733,679	18,220,466	18,220,466	0	747,893	0	747,893
55	259,738,582	14,523,093	14,523,093	0	561,590	0	561,590
56	260,370,458	11,387,412	11,387,412	0	414,825	0	414,825
57	264,268,627	8,771,995	8,771,995	0	301,036	0	301,036
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100	2,908,164,344	0	0	0	0	0	0
Total					\$2,842,640,633		\$2,842,640,633