



**Government Accounting Standards  
(GASB) Statements 67 and 68  
Crossover Testing Report for  
Measurement Date June 30, 2024,  
based on June 30, 2023, Valuations**

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## 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, 2024, based on financial information as of June 30, 2024, and census information as of our last valuation date on June 30, 2023.

## 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 1,510,913 active and inactive members and 807,308 retirees, beneficiaries, and survivors as of June 30, 2024.

## 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, 2024.

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 considered 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, 2024, 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, 2024, for the PERF A, PERF B, LRF, and JRF II were 6.90%, 6.90%, 4.85%, and 6.15%, 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%, 40%, 60% and 80% 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.

Actuarial 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, refer to the [2021 CalPERS 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, 2024:

- 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, 2024:

- 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, 2023, the funded status and active to retiree ratio for the PERF C Miscellaneous pool are 75.8% and 82.8%, respectively; and for the PERF C Safety pool are 73.0% and 50.1%.

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 the 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 Municipal 20-year AA General Obligation Bond 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, 2023)

Plan	Funded Status (Based on 06/30/2023 funding valuation results)	Active to Retiree Ratio
<b>PERF A - Agency</b>		
California Highway Patrol	66.9%	0.63
State Miscellaneous (Tiers 1 and 2)	71.2%	0.86
State POFF	72.1%	0.84
PA Miscellaneous Plan	55.7%	0.60
PA Safety Plan	59.3%	0.41
<b>PERF B – Cost-Sharing Schools</b>		
Schools	67.5%	1.34
<b>PERF C – Cost-Sharing Agency</b>		
Pooled Miscellaneous Plan	75.8%	0.83
Pooled Safety Plan	73.0%	0.50
<b>Other Defined Benefit Plans</b>		
Legislators' Retirement Fund	99.9%	0.00
Judges' II Retirement Fund	98.8%	3.10

## 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. Included plan amendments (if any) adopted before the measurement date of June 30, 2024.
- Census information of covered active, transfer, separated, retired and beneficiaries' members are as of June 30, 2023, provided by Retirement Benefit Service division of CalPERS.
- Unaudited fair value of assets of the Plan as of June 30, 2024, provided by Financial Reporting & Accounting Services division of CalPERS.
- Economic assumptions regarding inflation, future salary increases, and investment returns adopted by the Board for the June 30, 2023, actuarial valuations.
- Other actuarial assumptions, regarding employee terminations, retirements, disabilities, deaths, etc. adopted by the Board for the June 30, 2023, valuations.

## 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 (actual contributions were used in Fiscal Year (FY) 2023-24), contributions beginning FY 2024-25 were based on covered active members as of June 30, 2023; plus, annual employer contributions to the unfunded actuarial accrued liability; plus, any additional discretionary payments to the unfunded liability in FY 2023-24, if exist. Contributions and benefit payments are assumed to occur in the middle of the year.
- Projected benefit payments (actual benefit payments were used in FY 2023-24) beginning FY 2024-25 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, 2023.
- 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.
- Beginning in FY 2024-25, the long-term expected rate of return on Plan investments of 6.90% per annum for PERF A & B (LRF, and JRF II' are 5.15% and 6.15%), was applied to all periods of projected benefit payments to determine the discount rate to the extent that 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 3.97% for the 20-year tax-exempt General Obligation Municipal Bonds was used.

- Projected administrative expenses (actual administrative expenses were used in FY 2023-24) are calculated as approximately 0.10 % for the PERF (0.15% for JRF II, 0.35 % for LRF) of the average cash flow of Fiduciary Net Position amount during the year.

## 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 100<sup>th</sup> 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, 2024, 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	\$11,686,186,002	\$851,348,842	\$851,348,842	\$0
2	12,828,948,576	883,694,278	883,694,278	0
3	13,625,088,102	929,875,594	929,875,594	0
4	14,437,775,681	978,619,498	978,619,498	0
5	15,244,863,887	1,030,025,720	1,030,025,720	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
57	9,575,992,267	687,539,542	687,539,542	0
58	9,516,628,289	629,164,309	629,164,309	0
59	9,513,554,912	572,633,652	572,633,652	0
60	9,568,693,636	518,201,059	518,201,059	0
61	9,683,834,658	466,106,655	466,106,655	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	95,084,570,938	6,987	6,987	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, 2024, 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	\$101,081,537,108	\$7,910,410,638	\$7,910,410,638	\$0
2	110,046,650,413	8,366,839,286	8,366,839,286	0
3	115,222,412,297	8,716,098,776	8,716,098,776	0
4	120,480,712,512	9,060,320,262	9,060,320,262	0
5	125,810,427,327	9,402,686,064	9,402,686,064	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
53	97,243,293,271	7,126,655,568	7,126,655,568	0
54	96,490,860,193	6,641,567,421	6,641,567,421	0
55	96,188,571,574	6,158,466,606	6,158,466,606	0
56	96,364,983,449	5,679,893,330	5,679,893,330	0
57	97,047,968,507	5,208,490,448	5,208,490,448	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	1,153,108,306,692	106,097	106,097	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, 2024, 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	\$46,103,000,060	\$3,148,856,689	\$3,148,856,689	\$0
2	50,778,064,322	3,313,348,360	3,313,348,360	0
3	53,466,783,427	3,493,542,304	3,493,542,304	0
4	56,127,967,847	3,680,736,168	3,680,736,168	0
5	58,799,992,834	3,876,369,550	3,876,369,550	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
51	62,727,031,446	4,362,067,559	4,362,067,559	0
52	62,484,530,969	4,153,543,290	4,153,543,290	0
53	62,441,037,748	3,943,018,622	3,943,018,622	0
54	62,612,151,780	3,731,019,447	3,731,019,447	0
55	63,013,990,176	3,518,152,363	3,518,152,363	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	764,173,951,523	85,523	85,523	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, 2024, 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	\$117,253,603	\$12,951,094	\$12,951,094	\$0
2	124,815,014	13,285,076	13,285,076	0
3	129,690,515	13,823,589	13,823,589	0
4	134,651,131	14,330,323	14,330,323	0
5	139,732,912	14,858,795	14,858,795	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
52	76,359,628	5,425,491	5,425,491	0
53	75,945,159	5,109,650	5,109,650	0
54	75,828,908	4,802,558	4,802,558	0
55	76,022,115	4,500,758	4,500,758	0
56	76,540,351	4,201,639	4,201,639	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	927,649,605	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, 2024, 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	\$313,908,941	\$28,926,421	\$28,926,421	\$0
2	338,191,948	30,207,474	30,207,474	0
3	355,373,355	31,695,699	31,695,699	0
4	373,399,574	33,369,621	33,369,621	0
5	391,372,143	35,110,651	35,110,651	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
55	224,419,153	17,174,563	17,174,563	0
56	221,930,760	15,812,338	15,812,338	0
57	220,680,935	14,501,429	14,501,429	0
58	220,700,869	13,242,670	13,242,670	0
59	222,023,012	12,036,879	12,036,879	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	2,337,032,452	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, 2024, 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	\$84,314,661,436	\$5,953,912,458	\$5,953,912,458	\$0
2	93,233,655,349	6,546,329,829	6,546,329,829	0
3	99,280,582,506	6,911,329,133	6,911,329,133	0
4	105,404,533,205	7,276,492,278	7,276,492,278	0
5	111,583,188,534	7,648,984,806	7,648,984,806	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
54	96,444,047,829	7,209,417,699	7,209,417,699	0
55	95,551,736,293	6,707,607,405	6,707,607,405	0
56	95,117,338,832	6,211,722,655	6,211,722,655	0
57	95,165,869,904	5,724,245,871	5,724,245,871	0
58	95,721,479,512	5,247,583,304	5,247,583,304	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	1,049,022,384,235	114,653	114,653	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 using a long-term expected rate of return on Plan investments of 5.15% per annum (based on interim Asset Liability Modeling study of 2024). However, to be consistent with last year's discount rate, 4.85% was used to all periods of projected benefit payments to determine the total pension liability as of June 30, 2024, 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	\$95,668,783	\$7,435,524	\$7,435,524	\$0
2	92,475,068	7,264,871	7,264,871	0
3	89,553,569	7,150,043	7,150,043	0
4	86,532,525	7,007,508	7,007,508	0
5	83,512,386	6,854,375	6,854,375	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
38	27,322,714	1,338,434	1,338,434	0
39	27,264,028	1,291,047	1,291,047	0
40	27,251,035	1,253,614	1,253,614	0
41	27,275,740	1,225,050	1,225,050	0
42	27,330,872	1,203,955	1,203,955	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	161,083,646	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 6.15% per annum was applied to all periods of projected benefit payments to determine the total pension liability as of June 30, 2024, 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	\$2,328,781,645	\$99,168,339	\$99,168,339	\$0
2	2,633,650,369	104,304,673	104,304,673	0
3	2,812,861,859	117,635,825	117,635,825	0
4	2,977,527,541	132,036,408	132,036,408	0
5	3,130,694,952	146,088,686	146,088,686	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
43	1,775,057,937	123,266,859	123,266,859	0
44	1,754,650,809	111,345,082	111,345,082	0
45	1,745,293,079	99,856,175	99,856,175	0
46	1,747,202,439	88,859,422	88,859,422	0
47	1,760,548,211	78,411,983	78,411,983	0
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
100	30,575,354,092	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, 2024, 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 5.15% long-term expected rate of return gross of administrative expenses, using a lower discount rate of 4.85% to determine total pension liability as of June 30, 2024, for the plan in the LRF is appropriate.

### 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, 2024, was based on the yields of 20-year tax-exempt General Obligation Municipal Bonds with an average rating of AA/Aa or higher, (Fidelity Municipal 20-year AA General Obligation Bond Index as of June 30, 2024, at 3.97% was used).

### 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, 2024, for the plan in the JRF II is appropriate, pursuant to paragraph 44 of GASB Statement no. 67.

Appendix A

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**

## Appendix A

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 percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$951,266,607	\$955,450,001	\$434,857,759	47.680%	\$455,558,560	0	\$890,416,319
2	943,404,294	982,202,601	315,474,396	50.342%	494,457,579	0	809,931,975
3	931,641,306	1,009,704,274	297,435,803	51.728%	522,304,401	0	819,740,204
4	916,344,744	1,037,975,994	290,829,495	49.978%	518,761,907	0	809,591,402
5	897,395,514	1,067,039,321	282,957,780	52.952%	565,017,390	0	847,975,169
.	.	.	.	.	.	.	.
57	0	4,485,619,036	0	0.000%	0	0	0
58	0	4,611,216,369	0	0.000%	0	0	0
59	0	4,740,330,427	0	0.000%	0	0	0
60	0	4,873,059,679	0	0.000%	0	0	0
61	0	5,009,505,350	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
100	0	14,707,075,316	0	0.000%	0	0	0



Appendix A

**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	\$11,686,186,002	\$890,416,319	\$851,348,842	\$9,509,085	\$1,113,204,182	\$12,828,948,576	\$252,346,255
2	12,828,948,576	809,931,975	883,694,278	12,793,269	882,695,098	13,625,088,102	(13,792,449)
3	13,625,088,102	819,740,204	929,875,594	13,571,815	936,394,784	14,437,775,681	(7,052,625)
4	14,437,775,681	809,591,402	978,619,498	14,356,016	990,472,318	15,244,863,887	(2,503,196)
5	15,244,863,887	847,975,169	1,030,025,720	15,156,805	1,045,719,623	16,093,376,155	537,098
.	.	.	.	.	.	.	.
57	9,575,992,267	0	687,539,542	9,243,424	637,418,989	9,516,628,289	(59,363,977)
58	9,516,628,289	0	629,164,309	9,212,297	635,303,228	9,513,554,912	(3,073,377)
59	9,513,554,912	0	572,633,652	9,236,568	637,008,943	9,568,693,636	55,138,724
60	9,568,693,636	0	518,201,059	9,318,036	642,660,117	9,683,834,658	115,141,022
61	9,683,834,658	0	466,106,655	9,458,375	652,372,127	9,860,641,755	176,807,097
.	.	.	.	.	.	.	.
100	95,084,570,938	0	6,987	95,084,568	6,560,835,158	101,550,314,540	6,465,743,603

Appendix A

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

Year (a)	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%) <sup>(a)</sup>	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.97%) <sup>(a)</sup>	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) <sup>(a)</sup>
1	\$11,686,186,002	\$851,348,842	\$851,348,842	\$0	\$823,414,854	\$0	\$823,414,854
2	12,828,948,576	883,694,278	883,694,278	0	799,531,328	0	799,531,328
3	13,625,088,102	929,875,594	929,875,594	0	787,010,608	0	787,010,608
4	14,437,775,681	978,619,498	978,619,498	0	774,804,075	0	774,804,075
5	15,244,863,887	1,030,025,720	1,030,025,720	0	762,866,240	0	762,866,240
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
57	9,575,992,267	687,539,542	687,539,542	0	15,851,024	0	15,851,024
58	9,516,628,289	629,164,309	629,164,309	0	13,568,943	0	13,568,943
59	9,513,554,912	572,633,652	572,633,652	0	11,552,637	0	11,552,637
60	9,568,693,636	518,201,059	518,201,059	0	9,779,684	0	9,779,684
61	9,683,834,658	466,106,655	466,106,655	0	8,228,755	0	8,228,755
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	95,084,570,938	6,987	6,987	0	9	0	9
Total					\$19,876,666,077	\$0	\$19,876,666,077

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 percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$15,553,081,675	\$15,874,906,360	\$2,908,426,273	20.770%	\$3,297,218,051	\$769,620,000	\$7,366,797,844
2	15,027,623,494	16,319,403,738	2,646,364,497	21.372%	3,487,729,360	0	6,134,093,857
3	14,579,839,751	16,776,347,043	2,539,370,689	21.955%	3,683,287,064	0	6,222,657,753
4	14,161,303,066	17,246,084,760	2,456,986,082	22.225%	3,833,002,794	0	6,289,988,876
5	13,751,518,880	17,728,975,133	2,375,162,341	23.835%	4,225,714,804	0	6,600,877,144
.	.	.	.	.	.	.	.
53	0	66,734,918,515	0	0.000%	0	0	0
54	0	68,603,496,233	0	0.000%	0	0	0
55	0	70,524,394,127	0	0.000%	0	0	0
56	0	72,499,077,163	0	0.000%	0	0	0
57	0	74,529,051,324	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
100	0	244,359,666,366	0	0.000%	0	0	0

Appendix A

**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	\$101,081,537,108	\$7,366,797,844	\$7,910,410,638	\$82,250,351	\$9,590,976,450	\$110,046,650,413	\$1,598,315,461
2	110,046,650,413	6,134,093,857	8,366,839,286	108,966,655	7,517,473,968	115,222,412,297	(958,331,973)
3	115,222,412,297	6,222,657,753	8,716,098,776	114,016,316	7,865,757,554	120,480,712,512	(964,357,538)
4	120,480,712,512	6,289,988,876	9,060,320,262	119,140,683	8,219,186,884	125,810,427,327	(960,274,061)
5	125,810,427,327	6,600,877,144	9,402,686,064	124,455,172	8,585,869,345	131,470,032,580	(941,271,891)
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
53	97,243,293,271	0	7,126,655,568	93,796,077	6,468,018,567	96,490,860,193	(752,433,078)
54	96,490,860,193	0	6,641,567,421	93,278,285	6,432,557,087	96,188,571,574	(302,288,619)
55	96,188,571,574	0	6,158,466,606	93,209,676	6,428,088,156	96,364,983,449	176,411,875
56	96,364,983,449	0	5,679,893,330	93,617,577	6,456,495,964	97,047,968,507	682,985,058
57	97,047,968,507	0	5,208,490,448	94,528,583	6,519,614,070	98,264,563,545	1,216,595,038
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
100	1,153,108,306,692	-	106,097	1,153,108,255	79,564,469,562	1,231,519,561,902	78,411,255,210

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

Year (a)	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%) <sup>(a)</sup>	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.97%) <sup>(a)</sup>	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) <sup>(a)</sup>
1	\$101,081,537,108	\$7,910,410,638	\$7,910,410,638	\$0	\$7,650,858,610	\$0	\$7,650,858,610
2	110,046,650,413	8,366,839,286	8,366,839,286	0	7,569,982,389	0	7,569,982,389
3	115,222,412,297	8,716,098,776	8,716,098,776	0	7,376,967,672	0	7,376,967,672
4	120,480,712,512	9,060,320,262	9,060,320,262	0	7,173,342,728	0	7,173,342,728
5	125,810,427,327	9,402,686,064	9,402,686,064	0	6,963,895,777	0	6,963,895,777
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
53	97,243,293,271	7,126,655,568	7,126,655,568	0	214,563,698	0	214,563,698
54	96,490,860,193	6,641,567,421	6,641,567,421	0	187,052,431	0	187,052,431
55	96,188,571,574	6,158,466,606	6,158,466,606	0	162,251,103	0	162,251,103
56	96,364,983,449	5,679,893,330	5,679,893,330	0	139,983,723	0	139,983,723
57	97,047,968,507	5,208,490,448	5,208,490,448	0	120,080,235	0	120,080,235
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	1,153,108,306,692	106,097	106,097	0	139	0	139
Total					\$164,163,263,599	\$0	\$164,163,263,599

Appendix A

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 percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$4,147,463,029	\$4,174,521,895	\$1,498,936,502	27.120%	\$1,132,130,338	\$763,629,065	\$3,394,695,905
2	4,074,732,061	4,291,408,508	1,316,953,402	29.290%	1,256,933,898	0	2,573,887,300
3	3,994,968,840	4,411,567,946	1,215,269,521	30.267%	1,335,251,372	0	2,550,520,894
4	3,903,255,092	4,535,091,848	1,178,783,038	30.745%	1,394,316,615	0	2,573,099,653
5	3,799,820,181	4,662,074,420	1,138,844,106	33.442%	1,559,115,909	0	2,697,960,016
.	.	.	.	.	.	.	.
51	901	16,605,902,212	0	0.000%	0	0	0
52	0	17,070,867,474	0	0.000%	0	0	0
53	0	17,548,851,764	0	0.000%	0	0	0
54	0	18,040,219,613	0	0.000%	0	0	0
55	0	18,545,345,762	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
100	0	64,257,687,842	0	0.000%	0	0	0

Appendix A

**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	\$46,103,000,060	\$3,394,695,905	\$3,148,856,689	\$37,514,150	\$4,466,739,196	\$50,778,064,322	\$1,280,368,357
2	50,778,064,322	2,573,887,300	3,313,348,360	50,420,382	3,478,600,546	53,466,783,427	114,831,805
3	53,466,783,427	2,550,520,894	3,493,542,304	53,010,637	3,657,216,468	56,127,967,847	110,663,527
4	56,127,967,847	2,573,099,653	3,680,736,168	55,592,196	3,835,253,698	58,799,992,834	98,925,334
5	58,799,992,834	2,697,960,016	3,876,369,550	58,229,987	4,017,222,478	61,580,575,790	82,622,941
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
51	62,727,031,446	204	4,362,067,559	60,617,067	4,180,183,945	62,484,530,969	(242,500,680)
52	62,484,530,969	0	4,153,543,290	60,475,431	4,170,525,500	62,441,037,748	(43,493,222)
53	62,441,037,748	0	3,943,018,622	60,533,770	4,174,666,425	62,612,151,780	171,114,032
54	62,612,151,780	0	3,731,019,447	60,807,430	4,193,665,272	63,013,990,176	401,838,396
55	63,013,990,176	0	3,518,152,363	61,312,234	4,228,613,544	63,663,139,123	649,148,948
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	764,173,951,523	0	85,523	764,173,910	52,727,999,754	816,137,691,844	51,963,740,320

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

Year (a)	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 + 3.97%)^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%)^(a)
1	\$46,103,000,060	\$3,148,856,689	\$3,148,856,689	0	\$3,045,538,141	0	\$3,045,538,141
2	50,778,064,322	3,313,348,360	3,313,348,360	0	2,997,785,409	0	2,997,785,409
3	53,466,783,427	3,493,542,304	3,493,542,304	0	2,956,798,598	0	2,956,798,598
4	56,127,967,847	3,680,736,168	3,680,736,168	0	2,914,155,489	0	2,914,155,489
5	58,799,992,834	3,876,369,550	3,876,369,550	0	2,870,949,147	0	2,870,949,147
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
51	62,727,031,446	4,362,067,559	4,362,067,559	0	150,078,429	0	150,078,429
52	62,484,530,969	4,153,543,290	4,153,543,290	0	133,680,150	0	133,680,150
53	62,441,037,748	3,943,018,622	3,943,018,622	0	118,713,280	0	118,713,280
54	62,612,151,780	3,731,019,447	3,731,019,447	0	105,080,053	0	105,080,053
55	63,013,990,176	3,518,152,363	3,518,152,363	0	92,689,323	0	92,689,323
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	764,173,951,523	85,523	85,523	0	112	0	112
Total					\$74,203,349,781	\$0	\$74,203,349,781



**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)	Unfunded Actuarial Contribution as a percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * UAL Rate	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$11,769,096	\$12,066,848	\$2,980,830	54.417%	\$6,566,410	\$0	\$9,547,240
2	11,213,391	12,404,720	2,218,009	61.041%	7,572,024	0	9,790,033
3	10,720,463	12,752,052	2,063,689	62.942%	8,026,412	0	10,090,101
4	10,262,733	13,109,109	1,962,029	64.273%	8,425,644	0	10,387,674
5	9,760,431	13,476,164	1,851,651	64.724%	8,722,360	0	10,574,012
.	.	.	.		.	.	.
.	.	.	.		.	.	.
52	0	49,344,947	0	0.000%	0	0	0
53	0	50,726,606	0	0.000%	0	0	0
54	0	52,146,951	0	0.000%	0	0	0
55	0	53,607,066	0	0.000%	0	0	0
56	0	55,108,063	0	0.000%	0	0	0
.	.	.	.		.	.	.
.	.	.	.		.	.	.
100	0	185,742,888	0	0.000%	0	0	0

Appendix A

**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	\$117,253,603	\$9,547,240	\$12,951,094	\$95,410	\$11,060,675	\$124,815,014	(\$1,985,829)
2	124,815,014	9,790,033	13,285,076	123,124	8,493,668	129,690,515	(4,914,532)
3	129,690,515	10,090,101	13,823,589	127,885	8,821,989	134,651,131	(5,129,485)
4	134,651,131	10,387,674	14,330,323	132,744	9,157,175	139,732,912	(5,305,892)
5	139,732,912	10,574,012	14,858,795	137,660	9,496,212	144,806,680	(5,500,244)
.	.	.	.	.	.	.	.
52	76,359,628	0	5,425,491	73,735	5,084,757	75,945,159	(414,469)
53	75,945,159	0	5,109,650	73,474	5,066,873	75,828,908	(116,251)
54	75,828,908	0	4,802,558	73,506	5,069,270	76,022,115	193,206
55	76,022,115	0	4,500,758	73,845	5,092,840	76,540,351	518,236
56	76,540,351	0	4,201,639	74,508	5,138,745	77,402,949	862,598
.	.	.	.	.	.	.	.
100	927,649,605	0	0	927,650	64,007,823	990,729,778	63,080,173

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

Year (a)	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 + 3.97%)^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%)^(a)
1	\$117,253,603	\$12,951,094	\$12,951,094	\$0	\$12,526,150	\$0	\$12,526,150
2	124,815,014	13,285,076	13,285,076	0	12,019,807	0	12,019,807
3	129,690,515	13,823,589	13,823,589	0	11,699,749	0	11,699,749
4	134,651,131	14,330,323	14,330,323	0	11,345,771	0	11,345,771
5	139,732,912	14,858,795	14,858,795	0	11,004,845	0	11,004,845
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
52	76,359,628	5,425,491	5,425,491	0	174,617	0	174,617
53	75,945,159	5,109,650	5,109,650	0	153,837	0	153,837
54	75,828,908	4,802,558	4,802,558	0	135,259	0	135,259
55	76,022,115	4,500,758	4,500,758	0	118,577	0	118,577
56	76,540,351	4,201,639	4,201,639	0	103,551	0	103,551
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	927,649,605	0	0	0	0	0	0
Total					\$226,031,565		\$226,031,565

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)	Unfunded Actuarial Contribution as a percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * UAL Rate	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$24,323,853	\$24,714,376	\$9,138,210	56.893%	\$14,060,807	\$0	\$23,199,017
2	23,554,279	25,406,379	8,159,202	64.633%	16,420,813	0	24,580,015
3	22,678,059	26,117,757	7,887,429	68.412%	17,867,757	0	25,755,186
4	21,632,689	26,849,055	7,468,037	69.734%	18,723,039	0	26,191,076
5	20,547,935	27,600,828	7,036,846	70.397%	19,430,103	0	26,466,949
.	.	.	.		.	.	.
55	0	109,793,807	0	0.000%	0	0	0
56	0	112,868,034	0	0.000%	0	0	0
57	0	116,028,339	0	0.000%	0	0	0
58	0	119,277,132	0	0.000%	0	0	0
59	0	122,616,892	0	0.000%	0	0	0
.	.	.	.		.	.	.
100	0	380,424,085	0	0.000%	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	\$313,908,941	\$23,199,017	\$28,926,421	\$255,429	\$30,265,840	\$338,191,948	\$1,083,990
2	338,191,948	24,580,015	30,207,474	335,470	23,144,335	355,373,355	(7,398,609)
3	355,373,355	25,755,186	31,695,699	352,500	24,319,232	373,399,574	(7,728,967)
4	373,399,574	26,191,076	33,369,621	369,927	25,521,042	391,372,143	(8,218,507)
5	391,372,143	26,466,949	35,110,651	387,191	26,711,444	409,052,693	(8,786,398)
.	.	.	.	.	.	.	.
55	224,419,153	0	17,174,563	216,112	14,902,282	221,930,760	(2,488,393)
56	221,930,760	0	15,812,338	214,282	14,776,796	220,680,935	(1,249,825)
57	220,680,935	0	14,501,429	213,666	14,735,030	220,700,869	19,934
58	220,700,869	0	13,242,670	214,295	14,779,108	222,023,012	1,322,143
59	222,023,012	0	12,036,879	216,201	14,911,242	224,681,175	2,658,163
.	.	.	.	.	.	.	.
100	2,337,032,452	0	0	2,337,032	161,255,239	2,495,950,659	158,918,207

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

Year (a)	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%) <sup>(a)</sup>	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.97%) <sup>(a)</sup>	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) <sup>(a)</sup>
1	\$313,908,941	\$28,926,421	\$28,926,421	\$0	\$27,977,303	\$0	\$27,977,303
2	338,191,948	30,207,474	30,207,474	0	27,330,517	0	27,330,517
3	355,373,355	31,695,699	31,695,699	0	26,826,009	0	26,826,009
4	373,399,574	33,369,621	33,369,621	0	26,419,787	0	26,419,787
5	391,372,143	35,110,651	35,110,651	0	26,003,943	0	26,003,943
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
55	224,419,153	17,174,563	17,174,563	0	452,481	0	452,481
56	221,930,760	15,812,338	15,812,338	0	389,703	0	389,703
57	220,680,935	14,501,429	14,501,429	0	334,326	0	334,326
58	220,700,869	13,242,670	13,242,670	0	285,600	0	285,600
59	222,023,012	12,036,879	12,036,879	0	242,839	0	242,839
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	2,337,032,452	0	0	0	0	0	0
Total					\$586,054,025		\$586,054,025

Appendix A

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 percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$18,020,915,963	\$18,535,627,746	\$3,768,647,397	16.910%	3,134,374,652	0	\$6,903,022,049
2	17,146,829,822	19,054,625,323	2,934,851,392	17.466%	3,327,996,894	0	6,262,848,287
3	16,395,330,030	19,588,154,832	2,800,322,369	17.889%	3,504,170,961	0	6,304,493,331
4	15,712,648,139	20,136,623,167	2,676,021,105	18.094%	3,643,616,289	0	6,319,637,394
5	15,056,536,818	20,700,448,616	2,554,190,906	19.216%	3,977,814,791	0	6,532,005,697
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
54	0	80,101,818,519	0	0.000%	0	0	0
55	0	82,344,669,437	0	0.000%	0	0	0
56	0	84,650,320,182	0	0.000%	0	0	0
57	0	87,020,529,147	0	0.000%	0	0	0
58	0	89,457,103,963	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	0	285,315,686,859	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	\$84,314,661,436	\$6,903,022,049	\$5,953,912,458	\$69,778,980	\$8,039,663,302	\$93,233,655,349	\$2,015,971,864
2	93,233,655,349	6,262,848,287	6,546,329,829	93,096,533	6,423,505,232	99,280,582,506	(215,921,130)
3	99,280,582,506	6,304,493,331	6,911,329,133	98,987,052	6,829,773,554	105,404,533,205	(180,542,631)
4	105,404,533,205	6,319,637,394	7,276,492,278	104,941,695	7,240,451,908	111,583,188,534	(140,982,065)
5	111,583,188,534	6,532,005,697	7,648,984,806	111,042,897	7,661,346,982	118,016,513,509	(98,680,722)
.	.	.	.	.	.	.	.
54	96,444,047,829	0	\$7,209,417,699	92,956,799	6,410,062,962	95,551,736,293	(892,311,535)
55	95,551,736,293	0	\$6,707,607,405	92,307,217	6,365,517,161	95,117,338,832	(434,397,461)
56	95,117,338,832	0	\$6,211,722,655	92,112,682	6,352,366,409	95,165,869,904	48,531,071
57	95,165,869,904	0	\$5,724,245,871	92,397,010	6,372,252,489	95,721,479,512	555,609,608
58	95,721,479,512	0	\$5,247,583,304	93,183,185	6,426,760,121	96,807,473,144	1,085,993,632
.	.	.	.	.	.	.	.
100	1,049,022,384,235	0	114,653	1,049,022,329	72,382,540,623	1,120,355,787,876	71,333,403,641



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

Year (a)	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%) <sup>(a)</sup>	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.97%) <sup>(a)</sup>	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.90%) <sup>(a)</sup>
1	\$84,314,661,436	\$5,953,912,458	\$5,953,912,458	0	\$5,758,555,969	0	\$5,758,555,969
2	93,233,655,349	6,546,329,829	6,546,329,829	0	5,922,858,062	0	5,922,858,062
3	99,280,582,506	6,911,329,133	6,911,329,133	0	5,849,480,702	0	5,849,480,702
4	105,404,533,205	7,276,492,278	7,276,492,278	0	5,761,029,573	0	5,761,029,573
5	111,583,188,534	7,648,984,806	7,648,984,806	0	5,665,054,924	0	5,665,054,924
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
54	96,444,047,829	7,209,417,699	7,209,417,699	0	203,045,309	0	203,045,309
55	95,551,736,293	6,707,607,405	6,707,607,405	0	176,718,779	0	176,718,779
56	95,117,338,832	6,211,722,655	6,211,722,655	0	153,090,915	0	153,090,915
57	95,165,869,904	5,724,245,871	5,724,245,871	0	131,970,826	0	131,970,826
58	95,721,479,512	5,247,583,304	5,247,583,304	0	113,172,600	0	113,172,600
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	1,049,022,384,235	114,653	114,653	0	150	0	150
Total					\$147,995,452,597		\$147,995,452,597

**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 percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$0	\$0	\$0	0.000%	\$0	\$0	\$0
2	0	0	0	0.000%	75,085	0	75,085
3	0	0	0	0.000%	0	0	0
4	0	0	0	0.000%	0	0	0
5	0	0	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
38	0	0	0	0.000%	0	0	0
39	0	0	0	0.000%	0	0	0
40	0	0	0	0.000%	0	0	0
41	0	0	0	0.000%	0	0	0
42	0	0	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	0	0	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	\$95,668,783	\$0	\$7,435,524	\$663,188	\$4,904,996	\$92,475,068	(\$3,193,715)
2	92,475,068	75,085	7,264,871	311,365	4,579,653	89,553,569	(2,996,583)
3	89,553,569	0	7,150,043	301,208	4,430,207	86,532,525	(3,021,044)
4	86,532,525	0	7,007,508	290,878	4,278,247	83,512,386	(3,020,139)
5	83,512,386	0	6,854,375	280,569	4,126,603	80,504,046	(3,008,340)
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
38	27,322,714	0	1,338,434	93,340	1,373,088	27,264,028	(58,686)
39	27,264,028	0	1,291,047	93,216	1,371,270	27,251,035	(12,992)
40	27,251,035	0	1,253,614	93,234	1,371,553	27,275,740	24,705
41	27,275,740	0	1,225,050	93,370	1,373,552	27,330,872	55,132
42	27,330,872	0	1,203,955	93,599	1,376,927	27,410,246	79,373
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	161,083,646	0	0	563,3793	8,295,808	168,815,661	7,732,015

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

Year (a)	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 + 4.85%) <sup>(a)</sup>	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.97%) <sup>(a)</sup>	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 4.85%) <sup>(a)</sup>
1	\$95,668,783	\$7,435,524	\$7,435,524	\$0	\$7,261,517	\$0	\$7,261,517
2	92,475,068	7,264,871	7,264,871	0	6,766,674	0	6,766,674
3	89,553,569	7,150,043	7,150,043	0	6,351,665	0	6,351,665
4	86,532,525	7,007,508	7,007,508	0	5,937,096	0	5,937,096
5	83,512,386	6,854,375	6,854,375	0	5,538,726	0	5,538,726
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
38	27,322,714	1,338,434	1,338,434	0	226,611	0	226,611
39	27,264,028	1,291,047	1,291,047	0	208,477	0	208,477
40	27,251,035	1,253,614	1,253,614	0	193,068	0	193,068
41	27,275,740	1,225,050	1,225,050	0	179,942	0	179,942
42	27,330,872	1,203,955	1,203,955	0	168,663	0	168,663
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	161,083,646	0	0	0	0	0	0
Total					\$93,518,537	0	\$93,518,537

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 percent of Payroll (d)	Contributions to the Unfunded Actuarial Liability (e) = (b) * (d)	Additional Discretionary Payments (f)	Total Contributions (g) = (c) + (e) + (f)
1	\$372,384,471	\$399,243,881	\$137,495,626	0.079%	\$1,756,673	\$0	\$139,252,299
2	363,077,826	410,422,710	120,106,145	1.165%	\$4,782,473	0	124,888,618
3	343,720,350	421,914,545	113,647,696	0.000%	0	0	113,647,696
4	324,610,966	433,728,153	107,283,924	0.000%	0	0	107,283,924
5	305,871,174	445,872,541	101,010,896	0.000%	0	0	101,010,896
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
43	1,498	1,273,353,787	382	0.000%	0	0	0
44	0	1,309,007,693	0	0.000%	0	0	0
45	0	1,345,659,909	0	0.000%	0	0	0
46	0	1,383,338,386	0	0.000%	0	0	0
47	0	1,422,071,861	0	0.000%	0	0	0
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	0	6,145,491,465	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	\$2,328,781,645	\$139,252,299	\$99,168,339	\$2,637,555	\$267,422,319	\$2,633,650,369	\$165,616,425
2	2,633,650,369	124,888,618	104,304,673	3,965,465	162,593,011	2,812,861,859	54,322,872
3	2,812,861,859	113,647,696	117,635,825	4,216,389	172,870,199	2,977,527,541	51,017,985
4	2,977,527,541	107,283,924	132,036,408	4,448,266	182,368,161	3,130,694,952	45,883,487
5	3,130,694,952	101,010,896	146,088,686	4,663,216	191,172,278	3,272,126,224	40,420,376
.	.	.	.	.	.	.	.
43	1,775,057,937	382	123,266,859	2,572,823	105,432,171	1,754,650,809	(20,407,511)
44	1,754,650,809	0	111,345,082	2,550,894	104,538,246	1,745,293,079	(9,357,730)
45	1,745,293,079	0	99,856,175	2,545,224	104,310,759	1,747,202,439	1,909,361
46	1,747,202,439	0	88,859,422	2,556,096	104,761,290	1,760,548,211	13,345,772
47	1,760,548,211	0	78,411,983	2,583,722	105,898,520	1,785,451,027	24,902,815
.	.	.	.	.	.	.	.
100	30,575,354,092	0	0	45,863,031	1,880,384,277	32,409,875,338	1,834,521,246

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

Year (a)	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%) <sup>(a)</sup>	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.97%) <sup>(a)</sup>	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.15%) <sup>(a)</sup>
1	\$2,328,781,645	\$99,168,339	\$99,168,339	\$0	\$96,252,726	\$0	\$96,252,726
2	2,633,650,369	104,304,673	104,304,673	0	95,372,632	0	95,372,632
3	2,812,861,859	117,635,825	117,635,825	0	101,330,365	0	101,330,365
4	2,977,527,541	132,036,408	132,036,408	0	107,145,443	0	107,145,443
5	3,130,694,952	146,088,686	146,088,686	0	111,680,305	0	111,680,305
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
43	1,775,057,937	123,266,859	123,266,859	0	9,755,429	0	9,755,429
44	1,754,650,809	111,345,082	111,345,082	0	8,301,396	0	8,301,396
45	1,745,293,079	99,856,175	99,856,175	0	7,013,503	0	7,013,503
46	1,747,202,439	88,859,422	88,859,422	0	5,879,543	0	5,879,543
47	1,760,548,211	78,411,983	78,411,983	0	4,887,677	0	4,887,677
.	.	.	.	.	.	.	.
.	.	.	.	.	.	.	.
100	30,575,354,092	0	0	0	0	0	0
Total					\$3,316,281,507		\$3,316,281,507