



**Government Accounting Standards
(GASB) Statements 67 and 68
Crossover Testing Report for
Measurement Date June 30, 2018
based on June 30, 2017 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, 2017)	7
Crossover Testing Methodology.....	8
Crossover Testing Assumptions.....	8
Plan Information.....	8
Cash Flow Projections from AVS	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 (Other Defined Benefit Plan)	16
Judges' II Retirement Fund (Other Defined Benefit Plan).....	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 for measurement date June 30, 2018 based on data from valuation date June 30, 2017.

Background

History

The Government Accounting Standards Board approved 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 2.0 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 1,265,054 active and inactive members and 696,890 retirees, beneficiaries, and survivors as of June 30, 2018.

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 school 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 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 in the June 30, 2018 CAFR:

The long-term expected 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 short-term and long-term market return expectations as well as the expected pension fund cash flows. Using historical returns of all of the 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, 2018, reflect the long-term expected rates of return for the respective plans. This excludes the JRF, 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, 2018, for the PERF B, PERF C, LRF, and JRF II were 7.15 percent, 7.15 percent, 5.25 percent, and 6.65 percent, respectively. The financial reporting discount rates are consistent with the long-term funding discount rates. These discount rates are not adjusted for administrative expenses.

CalPERS Amortization Methods and Actuarial Assumptions

Amortization Methods

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.

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 experience and are reviewed in depth periodically.

The assumptions used in the crossover testing of individual plans are the same assumptions adopted by the Board in December of 2017 for the PERF defined benefit plans, and in February of 2018 for the LRF and JRS II plans. For more details, please refer to the experience study report that 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 for valuation date June 30, 2017:

- 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 for valuation date June 30, 2017:

- 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 ratio of actives to retirees.

Funded status is one of the fundamental indicators of a plan's financial health. Active to retiree ratio indicates how many actives a plan has to fund retiree benefits. Plans with low measures in these two areas indicate that they have a higher probability of a crossover event than other CalPERS contracting agencies.

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

For PERF C, CalPERS believes that demonstrating that a crossover event does not occur for other contracting public agencies plans, which have a lower funded status and active to retiree ratio than the PERF C risk pools, is sufficient proof that no crossover event will occur in PERF C risk pools. The funded status and active to retiree ratio for the PERF C Miscellaneous pool are 76.3 percent and 0.983, respectively, and for the PERF C Safety pool are 72.2 percent and 0.574.

CalPERS conducted a crossover test on LRS and JRS II.

CalPERS did not perform a crossover test on the Judges' Retirement Fund because the State funds the JRF benefit obligations using the pay-as-you-go method. Under the pay-as-you-go method, the pension plan's fiduciary net position was not projected to be sufficient to make projected future benefit payments of current active and inactive employees. Therefore, the discount rate will be set upon a range of yields on 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").

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, 2017)

Plan	Funded Status (on a Funding Basis)	Active to Retiree Ratio
PERF A - Agent		
California Highway Patrol	60.2%	0.820
State Miscellaneous (Tiers 1 and 2)	67.5%	0.904
State POFF	65.9%	1.084
PA Miscellaneous Plan	58.4%	0.561
PA Safety Plan	61.2%	0.521
PERF B – Cost-Sharing Schools		
Schools	72.1%	1.410
Other Defined Benefit Plans		
Legislators' Retirement Fund	115.9%	0.034
Judges' II Retirement Fund	99.3%	9.385

Crossover Testing Methodology

The crossover tests are conducted using a mixture of assumptions, plan information and cash flow projections generated from CalPERS Actuarial Valuation System (AVS).

Crossover Testing Assumptions

The assumptions below are used as an input to the crossover testing. The first two assumptions are set by CalPERS Board. The last assumption is based upon available municipal bond rates.

- Discount Rate Assumption
- Employee Payroll Growth Rate
- Municipal Bond Index Rate (in case of a crossover event)

Plan Information

The following plan information is used as an input to the crossover testing:

- Total Plan Payroll
- Beginning Fiduciary Net Position
- Unfunded Actuarial Liability Payment Schedules and Percentages
- Employee and Employer Future Normal Cost Contribution Rates

Cash Flow Projections from AVS

The following cash flow projection data is generated from AVS:

- Future Closed Group Employee Payroll
- Future Closed Group Benefit Payments

Results

Crossover Testing Results

For each plan, the following data was calculated to determine if a crossover event occurred:

- Projection of Contributions
- Projection of the Pension Plan's Fiduciary Net Position
- Actuarial Present Values of Projected Benefit Payments

In this crossover testing, projected cash flows into and out of the pension plan are assumed to be:

- total contributions to the pension plan
- benefit payments, pension plan administrative expense, and pension plan investment earnings

These projected cash flows are used to develop the Projected Beginning Fiduciary Net Position for each pension plan. The pension plan's Projected Beginning 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 Fiduciary Net Position in a given year.

No crossover event occurred for any CalPERS plan tested. The report summarizes the findings for each plan by displaying the year containing the closest point to a crossover event. It also presents the streams of Projected Beginning Fiduciary Net Position, Projected Benefit Payments, "Funded" Portion of Benefit Payments, 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. The detailed projections and calculations used to identify a potential crossover event for each plan are shown in Appendix A.

The crossover testing results are very sensitive to the discount rate. As the retiree population reduces over time, benefit payments to the closed population decrease. Eventually in each crossover test, a point occurs where the benefit payments and administration expenses are less than the amount of interest that the balance accrues. After this point, the balance increases very rapidly as interest compounds the excess balance and benefit payments decrease due to members exiting the plan. This results in a large balance at the end of the crossover test.

California Highway Patrol Crossover Test Results (PERF A)

A crossover event did not occur at any point. The beginning of Year 62 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 62 exceeds benefit payments and administration expenses by \$38,203,297. In Year 63, the amount of interest accumulated exceeds benefit payments and administrative expenses and administration expenses by \$85,366,166. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	“Funded” Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	7,433,419,174	572,714,580	572,714,580	0
2	8,554,280,765	603,741,185	603,741,185	0
3	9,117,137,230	636,162,053	636,162,053	0
4	9,725,863,069	669,208,576	669,208,576	0
5	10,368,841,731	705,459,909	705,459,909	0
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60	5,586,075,140	431,566,167	431,566,167	0
61	5,530,684,886	382,764,109	382,764,109	0
62	5,521,898,555	336,742,936	336,742,936	0
63	5,560,101,853	293,734,147	293,734,147	0
64	5,645,468,018	253,927,120	253,927,120	0
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100	52,035,631,802	325	325	0

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

A crossover event did not occur at any point. The beginning of Year 53 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 53 exceeds benefit payments and administration expenses by \$173,931,295. In Year 54, the amount of interest accumulated exceeds benefit payments and administration expenses by \$516,253,361. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	“Funded” Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	72,254,391,877	6,157,615,725	6,157,615,725	0
2	80,033,717,214	6,341,942,951	6,341,942,951	0
3	83,536,195,313	6,692,180,449	6,692,180,449	0
4	87,155,503,461	7,034,764,471	7,034,764,471	0
5	90,796,888,498	7,371,574,333	7,371,574,333	0
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51	62,763,730,048	4,694,771,087	4,694,771,087	0
52	62,300,914,607	4,363,275,794	4,363,275,794	0
53	62,148,571,053	4,037,544,667	4,037,544,667	0
54	62,322,502,348	3,718,379,636	3,718,379,636	0
55	62,838,755,709	3,406,713,512	3,406,713,512	0
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100	924,193,066,085	72,640	72,640	0

State POFF Crossover Test Results (PERF A)

A crossover event did not occur at any point. The beginning of Year 58 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 58 exceeds benefit payments and administration expenses by \$5,193,967. In Year 59, the amount of interest accumulated exceeds benefit payments and administration expenses by \$172,318,754. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	“Funded” Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	29,487,987,887	2,091,389,483	2,091,389,483	0
2	33,297,010,308	2,207,063,714	2,207,063,714	0
3	35,343,577,358	2,356,291,853	2,356,291,853	0
4	37,501,377,068	2,512,319,331	2,512,319,331	0
5	39,715,313,013	2,674,673,879	2,674,673,879	0
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56	26,228,322,206	2,077,081,557	2,077,081,557	0
57	25,915,754,891	1,905,099,696	1,905,099,696	0
58	25,759,207,284	1,738,144,396	1,738,144,396	0
59	25,764,401,251	1,576,930,249	1,576,930,249	0
60	25,936,720,005	1,422,184,807	1,422,184,807	0
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100	278,260,007,681	65,974	65,974	0

PA Miscellaneous Plan (PERF A)

A crossover event did not occur at any point. The beginning of Year 54 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 54 exceeds benefit payments and administration expenses by \$119,475. In Year 55, the amount of interest accumulated exceeds benefit payments and administration expenses by \$361,889. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	“Funded” Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	99,491,183	9,710,210	9,710,210	0
2	103,791,551	10,043,613	10,043,613	0
3	107,099,820	10,610,386	10,610,386	0
4	110,670,975	11,177,254	11,177,254	0
5	114,249,491	11,686,259	11,686,259	0
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52	29,396,616	2,370,921	2,370,921	0
53	29,001,879	2,090,752	2,090,752	0
54	28,869,320	1,838,131	1,838,131	0
55	28,988,795	1,611,865	1,611,865	0
56	29,350,684	1,409,432	1,409,432	0
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100	444,584,167	0	0	0

PA Safety Plan (PERF A)

A crossover event did not occur at any point. The beginning of Year 60 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 60 exceeds benefit payments and administration expenses by \$42,759. In Year 61, the amount of interest accumulated exceeds benefit payments and administration expenses by \$1,118,867. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	“Funded” Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	244,812,136	21,507,137	21,507,137	0
2	258,703,408	22,215,142	22,215,142	0
3	270,580,989	23,224,655	23,224,655	0
4	283,612,777	24,277,601	24,277,601	0
5	297,513,301	25,351,678	25,351,678	0
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58	143,996,791	11,781,918	11,781,918	0
59	141,889,255	10,601,186	10,601,186	0
60	140,855,551	9,490,577	9,490,577	0
61	140,898,311	8,453,158	8,453,158	0
62	142,017,178	7,490,627	7,490,627	0
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100	1,365,570,427	330	330	0

Schools Crossover Test Results (PERF B)

A crossover event did not occur at any point. Year 54 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 54 exceeds benefit payments and administration expenses by \$165,870,346. In Year 55, the amount of interest accumulated exceeds benefit payments and administration expenses by \$514,786,594. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	“Funded” Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	60,998,386,333	4,754,541,533	4,754,541,533	0
2	64,193,388,625	4,477,709,898	4,477,709,898	0
3	67,357,700,947	4,807,323,949	4,807,323,949	0
4	70,706,977,902	5,138,117,982	5,138,117,982	0
5	74,327,376,778	5,472,576,122	5,472,576,122	0
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52	63,639,514,193	4,772,258,445	4,772,258,445	0
53	63,157,817,667	4,434,786,202	4,434,786,202	0
54	62,991,486,386	4,102,378,871	4,102,378,871	0
55	63,157,356,732	3,776,293,507	3,776,293,507	0
56	63,672,143,326	3,457,878,124	3,457,878,124	0
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100	873,763,665,026	30,272	30,272	0

Legislators' Retirement Fund (Other Defined Benefit Plan)

A crossover event did not occur at any point. Year 24 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 24 exceeds benefit payments and administration expenses by \$75,833. In Year 25, the amount of interest accumulated exceeds benefit payments and administration expenses by \$301,888. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	116,883,856	7,038,915	7,038,915	0
2	115,685,079	6,990,740	6,990,740	0
3	114,885,337	7,428,890	7,428,890	0
4	113,315,924	7,343,105	7,343,105	0
5	111,457,276	7,327,129	7,327,129	0
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22	86,687,157	4,562,034	4,562,034	0
23	86,346,821	4,348,299	4,348,299	0
24	86,208,482	4,132,538	4,132,538	0
25	86,284,315	3,915,631	3,915,631	0
26	86,586,203	3,698,469	3,698,469	0
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100	1,961,929,429	0	0	0

Judges' II Retirement Fund (Other Defined Benefit Plan)

A crossover event did not occur at any point. Year 46 is the closest point to a crossover event.

With CalPERS assumed discount rate, the amount of interest accumulated in Year 46 exceeds benefit payments and administration expenses by \$5,221,595. In Year 47, the amount of interest accumulated exceeds benefit payments and administration expenses by \$12,558,525. This trend continues with each subsequent year as the benefit payments decline to zero.

Year	Projected Beginning Fiduciary Net Position (\$)	Projected Benefit Payments (\$)	"Funded" Portion of Benefit Payments (\$)	Unfunded Portion of Benefit Payments (\$)
1	1,356,099,296	37,729,310	37,729,310	0
2	1,519,881,284	46,907,673	46,907,673	0
3	1,662,948,377	55,563,431	55,563,431	0
4	1,802,707,223	65,229,035	65,229,035	0
5	1,936,032,388	75,418,223	75,418,223	0
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44	823,777,740	61,490,948	61,490,948	0
45	813,865,349	53,470,145	53,470,145	0
46	811,586,030	46,058,171	46,058,171	0
47	816,807,624	39,277,546	39,277,546	0
48	829,366,149	33,139,860	33,139,860	0
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100	18,451,849,076	0	0	0

Conclusion

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 7.15% long-term expected rate of return gross of administrative expenses for all plans in the PERF is appropriate and compliant with GASB Statement 68 reporting requirements for measurement date June 30, 2018 based on data from June 30, 2017 valuations.

As no crossover event occurred on the Legislators' Retirement Fund, CalPERS has determined that using the 5.25% long-term expected rate of return gross of administrative expenses for the LRF is appropriate and compliant with GASB Statement 68 reporting requirements for measurement date June 30, 2018 based on data from June 30, 2017.

CalPERS did not perform a crossover test on the Judges' Retirement Fund because the State funds the JRF benefit obligations using the pay-as-you-go method. Under the pay-as-you-go method, the pension plan's fiduciary net position was not projected to be sufficient to make projected future benefit payments of current active and inactive employees. Therefore, the discount rate will be set upon a range of yields on 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").

As no crossover event occurred on the Judges' II Retirement Fund, CalPERS has determined that using the 6.65% long-term expected rate of return gross of administrative expenses for the JRF II is appropriate and compliant with GASB Statement 68 reporting requirements for measurement date June 30, 2018 based on data from June 30, 2017.

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)

The data in the tables is 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	\$ 868,889,575	\$ 874,511,025	\$ 234,386,084	36.025%	\$ 315,042,597	\$ 497,911,776	\$ 1,047,340,457
2	867,155,910	899,653,217	244,302,419	36.091%	324,691,175		568,993,593
3	864,922,209	924,393,680	255,255,666	38.124%	352,413,020		607,668,687
4	862,089,407	949,814,506	254,135,388	39.850%	378,499,851		632,635,239
5	856,364,929	975,934,405	252,164,369	40.801%	398,193,653		650,358,021
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60	0	4,339,316,312	0	0	0	0	0
61	0	4,458,647,510	0	0	0	0	0
62	0	4,581,260,317	0	0	0	0	0
63	0	4,707,244,976	0	0	0	0	0
64	0	4,836,694,212	0	0	0	0	0
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100	0	12,843,829,473	0	0	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	\$7,433,419,174	\$1,047,340,457	\$572,714,580	\$11,494,137	\$657,729,851	\$8,554,280,765	\$73,521,134
2	8,554,280,765	568,993,593	603,741,185	12,806,236	610,410,293	9,117,137,230	(6,137,128)
3	9,117,137,230	607,668,687	636,162,053	13,655,054	650,874,259	9,725,863,069	1,057,152
4	9,725,863,069	632,635,239	669,208,576	14,562,286	694,114,284	10,368,841,731	10,343,422
5	10,368,841,731	650,358,021	705,459,909	15,513,325	739,436,298	11,037,662,817	18,463,064
.
.
60	5,586,075,140	0	431,566,167	8,066,314	384,242,227	5,530,684,886	(55,390,254)
61	5,530,684,886	0	382,764,109	8,018,601	381,996,379	5,521,898,555	(8,786,331)
62	5,521,898,555	0	336,742,936	8,038,777	382,985,010	5,560,101,853	38,203,297
63	5,560,101,853	0	293,734,147	8,127,255	387,227,567	5,645,468,018	85,366,166
64	5,645,468,018	0	253,927,120	8,284,156	394,729,782	5,777,986,525	132,518,506
.
.
100	52,035,631,802	0	325	78,053,447	3,720,547,662	55,678,125,692	3,642,493,889

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 + 7.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 7.15%) ^(a)
1	\$7,433,419,174	\$572,714,580	\$572,714,580	0	\$553,276,408	0	\$553,276,408
2	8,554,280,765	603,741,185	603,741,185	0	544,330,338	0	544,330,338
3	9,117,137,230	636,162,053	636,162,053	0	535,287,771	0	535,287,771
4	9,725,863,069	669,208,576	669,208,576	0	525,519,558	0	525,519,558
5	10,368,841,731	705,459,909	705,459,909	0	517,020,244	0	517,020,244
.
.
60	5,586,075,140	431,566,167	431,566,167	0	7,087,824	0	7,087,824
61	5,530,684,886	382,764,109	382,764,109	0	5,866,845	0	5,866,845
62	5,521,898,555	336,742,936	336,742,936	0	4,817,034	0	4,817,034
63	5,560,101,853	293,734,147	293,734,147	0	3,921,421	0	3,921,421
64	5,645,468,018	253,927,120	253,927,120	0	3,163,778	0	3,163,778
.
.
100	52,035,631,802	325	325	0	0	0	0

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	\$11,889,142,043	\$12,049,382,263	\$1,865,800,615	19.322%	\$2,328,181,641	\$3,584,964,787	\$7,778,947,042
2	11,409,982,974	12,395,802,003	1,842,619,829	19.920%	2,469,290,467	0	4,311,910,296
3	10,953,698,541	12,736,686,558	1,844,250,739	21.150%	2,693,822,791	0	4,538,073,530
4	10,516,139,481	13,086,945,438	1,769,114,483	22.067%	2,887,961,395	0	4,657,075,878
5	10,088,414,369	13,446,836,438	1,695,645,121	22.570%	3,034,890,091	0	4,730,535,212
.
.
51	206,134	46,836,488,558	31,350	0.000%	0	0	31,350
52	0	48,124,491,993	0	0.000%	0	0	0
53	0	49,447,915,523	0	0.000%	0	0	0
54	0	50,807,733,200	0	0.000%	0	0	0
55	0	52,204,945,863	0	0.000%	0	0	0
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.
100	0	176,967,707,282	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	\$72,254,391,877	\$7,778,947,042	\$6,157,615,725	\$109,556,726	\$6,267,550,746	\$80,033,717,214	\$378,295
2	80,033,717,214	4,311,910,296	6,341,942,951	118,579,211	5,651,089,965	83,536,195,313	(809,432,197)
3	83,536,195,313	4,538,073,530	6,692,180,449	123,743,000	5,897,158,067	87,155,503,461	(918,765,382)
4	87,155,503,461	4,657,075,878	7,034,764,471	129,009,910	6,148,083,540	90,796,888,498	(1,015,690,841)
5	90,796,888,498	4,730,535,212	7,371,574,333	134,281,112	6,399,190,318	94,420,758,584	(1,106,665,126)
.
.
51	62,763,730,048	31,350	4,694,771,087	90,742,855	4,322,667,150	62,300,914,607	(462,846,792)
52	62,300,914,607	0	4,363,275,794	90,288,876	4,301,221,117	62,148,571,053	(152,343,554)
53	62,148,571,053	0	4,037,544,667	90,296,451	4,301,772,413	62,322,502,348	173,931,295
54	62,322,502,348	0	3,718,379,636	90,788,678	4,325,421,675	62,838,755,709	516,253,361
55	62,838,755,709	0	3,406,713,512	91,788,953	4,373,283,507	63,713,536,751	874,781,042
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.
100	924,193,066,085	0	72,640	1,386,289,546	66,079,801,673	988,886,505,571	64,693,439,486

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 + 7.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 7.15%) ^(a)
1	\$72,254,391,877	\$6,157,615,725	\$6,157,615,725	0	\$5,948,623,671	0	\$5,948,623,671
2	80,033,717,214	6,341,942,951	6,341,942,951	0	5,717,867,245	0	5,717,867,245
3	83,536,195,313	6,692,180,449	6,692,180,449	0	5,631,021,745	0	5,631,021,745
4	87,155,503,461	7,034,764,471	7,034,764,471	0	5,524,296,090	0	5,524,296,090
5	90,796,888,498	7,371,574,333	7,371,574,333	0	5,402,508,514	0	5,402,508,514
.
.
51	62,763,730,048	4,694,771,087	4,694,771,087	0	143,552,105	0	143,552,105
52	62,300,914,607	4,363,275,794	4,363,275,794	0	124,513,268	0	124,513,268
53	62,148,571,053	4,037,544,667	4,037,544,667	0	107,529,625	0	107,529,625
54	62,322,502,348	3,718,379,636	3,718,379,636	0	92,421,358	0	92,421,358
55	62,838,755,709	3,406,713,512	3,406,713,512	0	79,024,554	0	79,024,554
.
.
100	924,193,066,085	72,640	72,640	0	75	0	75

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	\$3,449,037,329	\$3,514,893,969	\$954,074,047	26.012%	\$914,294,219	\$1,493,735,328	\$3,362,103,594
2	3,410,208,434	3,615,947,170	970,729,310	26.592%	961,565,009	0	1,932,294,319
3	3,338,459,162	3,715,385,717	990,515,631	28.531%	1,060,045,126	0	2,050,560,757
4	3,256,339,868	3,817,558,825	963,095,291	30.170%	1,151,740,231	0	2,114,835,522
5	3,165,403,646	3,922,541,692	933,100,632	31.238%	1,225,312,532	0	2,158,413,164
.
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56	0	15,647,354,660	0	0.000%	0	0	0
57	0	16,077,656,913	0	0.000%	0	0	0
58	0	16,519,792,478	0	0.000%	0	0	0
59	0	16,974,086,771	0	0.000%	0	0	0
60	0	17,440,874,157	0	0.000%	0	0	0
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100	0	51,622,789,731	0	0.000%	0	0	0

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	\$29,487,987,887	\$3,362,103,594	\$2,091,389,483	\$45,152,993	\$2,583,461,304	\$33,297,010,308	\$446,918,827
2	33,297,010,308	1,932,294,319	2,207,063,714	49,746,363	2,371,082,807	35,343,577,358	114,272,730
3	35,343,577,358	2,050,560,757	2,356,291,853	52,793,773	2,516,324,579	37,501,377,068	107,238,953
4	37,501,377,068	2,114,835,522	2,512,319,331	55,963,970	2,667,383,725	39,715,313,013	99,100,424
5	39,715,313,013	2,158,413,164	2,674,673,879	59,198,785	2,821,507,174	41,961,360,688	87,634,511
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.
56	26,228,322,206	0	2,077,081,557	37,837,018	1,802,351,260	25,915,754,891	(312,567,315)
57	25,915,754,891	0	1,905,099,696	37,492,819	1,786,044,909	25,759,207,284	(156,547,607)
58	25,759,207,284	0	1,738,144,396	37,379,007	1,780,717,369	25,764,401,251	5,193,967
59	25,764,401,251	0	1,576,930,249	37,503,645	1,786,752,649	25,936,720,005	172,318,754
60	25,936,720,005	0	1,422,184,807	37,874,283	1,804,510,087	26,281,171,002	344,450,997
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.
100	278,260,007,681	0	65,974	417,389,964	19,895,588,231	297,738,139,975	19,478,132,293

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 + 7.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 7.15%) ^(a)
1	\$29,487,987,887	\$2,091,389,483	\$2,091,389,483	0	\$2,020,406,849	0	\$2,020,406,849
2	33,297,010,308	2,207,063,714	2,207,063,714	0	1,989,878,720	0	1,989,878,720
3	35,343,577,358	2,356,291,853	2,356,291,853	0	1,982,661,819	0	1,982,661,819
4	37,501,377,068	2,512,319,331	2,512,319,331	0	1,972,887,068	0	1,972,887,068
5	39,715,313,013	2,674,673,879	2,674,673,879	0	1,960,225,557	0	1,960,225,557
.
.
56	26,228,322,206	2,077,081,557	2,077,081,557	0	44,966,369	0	44,966,369
57	25,915,754,891	1,905,099,696	1,905,099,696	0	38,491,054	0	38,491,054
58	25,759,207,284	1,738,144,396	1,738,144,396	0	32,774,477	0	32,774,477
59	25,764,401,251	1,576,930,249	1,576,930,249	0	27,750,462	0	27,750,462
60	25,936,720,005	1,422,184,807	1,422,184,807	0	23,357,244	0	23,357,244
.
.
100	278,260,007,681	65,974	65,974	0	68	0	68

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	\$9,251,337	\$9,630,850	\$1,562,628	\$4,204,157	0	\$5,766,785
2	8,668,687	9,919,776	1,487,845	4,730,257	0	6,218,102
3	8,121,831	10,204,969	1,505,109	5,310,032	0	6,815,141
4	7,614,691	10,485,606	1,472,003	5,675,456	0	7,147,459
5	7,148,657	10,773,960	1,379,847	6,083,233	0	7,463,079
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52	0	38,558,612	0	0	0	0
53	0	39,618,974	0	0	0	0
54	0	40,708,496	0	0	0	0
55	0	41,827,980	0	0	0	0
56	0	42,978,249	0	0	0	0
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100	0	141,791,195	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	\$99,491,183	\$5,766,785	\$9,710,210	\$146,379	\$8,390,171	\$103,791,551	\$(1,466,418)
2	103,791,551	6,218,102	10,043,613	152,915	7,286,695	107,099,820	(2,909,833)
3	107,099,820	6,815,141	10,610,386	157,899	7,524,299	110,670,975	(3,243,986)
4	110,670,975	7,147,459	11,177,254	163,086	7,771,397	114,249,491	(3,568,943)
5	114,249,491	7,463,079	11,686,259	168,313	8,020,466	117,878,463	(3,834,107)
.
.
52	29,396,616	0	2,370,921	\$42,376	2,018,561	29,001,879	(394,737)
53	29,001,879	0	2,090,752	\$41,987	2,000,180	28,869,320	(132,559)
54	28,869,320	0	1,838,131	\$41,972	1,999,578	28,988,795	119,475
55	28,988,795	0	1,611,865	\$42,315	2,016,069	29,350,684	361,889
56	29,350,684	0	1,409,432	\$43,004	2,049,057	29,947,304	596,620
.
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100	444,584,167	0	0	666,876	31,787,768	475,705,058	31,120,892

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 + 7.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 7.15%) ^(a)
1	\$99,491,183	\$9,710,210	\$9,710,210	0	\$9,380,642	0	\$9,380,642
2	103,791,551	10,043,613	10,043,613	0	9,055,276	0	9,055,276
3	107,099,820	10,610,386	10,610,386	0	8,927,930	0	8,927,930
4	110,670,975	11,177,254	11,177,254	0	8,777,332	0	8,777,332
5	114,249,491	11,686,259	11,686,259	0	8,564,672	0	8,564,672
.
.
52	29,396,616	2,370,921	2,370,921	0	67,658	0	67,658
53	29,001,879	2,090,752	2,090,752	0	55,682	0	55,682
54	28,869,320	1,838,131	1,838,131	0	45,687	0	45,687
55	28,988,795	1,611,865	1,611,865	0	37,390	0	37,390
56	29,350,684	1,409,432	1,409,432	0	30,513	0	30,513
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.
100	444,584,167	0	0	0	0	0	0

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	\$22,505,360	\$22,756,271	\$6,695,530	\$8,286,325	0	\$14,981,855
2	22,154,115	23,438,959	6,777,556	9,413,216	0	16,190,772
3	21,758,562	24,112,829	6,821,591	10,690,733	0	17,512,324
4	21,288,122	24,775,932	6,956,586	11,566,642	0	18,523,228
5	20,766,614	25,457,270	6,773,383	12,585,075	0	19,358,458
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58	0	107,213,346	0	0	0	0
59	0	110,161,713	0	0	0	0
60	0	113,191,160	0	0	0	0
61	0	116,303,917	0	0	0	0
62	0	119,502,275	0	0	0	0
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100	0	335,031,571	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	\$244,812,136	\$14,981,855	\$21,507,137	\$362,489	\$20,779,043	\$258,703,408	\$(1,090,583)
2	258,703,408	16,190,772	22,215,142	383,689	18,285,640	270,580,989	(4,313,190)
3	270,580,989	17,512,324	23,224,655	401,731	19,145,850	283,612,777	(4,480,536)
4	283,612,777	18,523,228	24,277,601	421,248	20,076,146	297,513,301	(4,622,704)
5	297,513,301	19,358,458	25,351,678	441,926	21,061,642	312,139,797	(4,731,962)
.
.
58	143,996,791	0	11,781,918	207,456	9,881,838	141,889,255	(2,107,535)
59	141,889,255	0	10,601,186	205,150	9,772,632	140,855,551	(1,033,704)
60	140,855,551	0	9,490,577	204,405	9,737,741	140,898,311	42,759
61	140,898,311	0	8,453,158	205,221	9,777,246	142,017,178	1,118,867
62	142,017,178	0	7,490,627	207,597	9,891,061	144,210,016	2,192,837
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100	1,365,570,427	0	330	2,048,355	97,638,274	1,461,160,016	95,589,588

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 + 7.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 7.15%) ^(a)
1	\$244,812,136	\$21,507,137	\$21,507,137	0	\$20,777,176	0	\$20,777,176
2	258,703,408	22,215,142	22,215,142	0	20,029,072	0	20,029,072
3	270,580,989	23,224,655	23,224,655	0	19,541,992	0	19,541,992
4	283,612,777	24,277,601	24,277,601	0	19,064,840	0	19,064,840
5	297,513,301	25,351,678	25,351,678	0	18,579,838	0	18,579,838
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58	143,996,791	11,781,918	11,781,918	0	222,160	0	222,160
59	141,889,255	10,601,186	10,601,186	0	186,557	0	186,557
60	140,855,551	9,490,577	9,490,577	0	155,868	0	155,868
61	140,898,311	8,453,158	8,453,158	0	129,566	0	129,566
62	142,017,178	7,490,627	7,490,627	0	107,152	0	107,152
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100	1,365,570,427	330	330	0	0	0	0

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	\$12,848,072,448	\$13,284,888,611	\$1,897,793,070	7.428%	\$986,801,526	0	\$2,884,594,596
2	12,176,024,359	13,683,435,270	1,916,948,871	9.323%	1,275,750,831	0	3,192,699,703
3	11,564,822,352	14,076,834,034	1,858,331,051	11.570%	1,628,660,830	0	3,486,991,881
4	10,988,855,436	14,463,946,970	1,861,437,535	13.771%	1,991,801,054	0	3,853,238,590
5	10,433,728,082	14,861,705,511	1,766,451,770	15.197%	2,258,541,691	0	4,024,993,460
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52	0	53,188,125,785	0	0.000%	0	0	0
53	0	54,650,799,244	0	0.000%	0	0	0
54	0	56,153,696,223	0	0.000%	0	0	0
55	0	57,697,922,869	0	0.000%	0	0	0
56	0	59,284,615,748	0	0.000%	0	0	0
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100	0	195,588,156,570	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	\$60,998,386,333	\$2,884,594,596	\$4,754,541,533	\$90,142,245	\$5,155,091,474	\$64,193,388,625	\$310,407,696
2	64,193,388,625	3,192,699,703	4,477,709,898	95,358,710	4,544,681,227	67,357,700,947	(28,387,381)
3	67,357,700,947	3,486,991,881	4,807,323,949	100,079,577	4,769,688,600	70,706,977,902	(137,714,926)
4	70,706,977,902	3,853,238,590	5,138,117,982	105,129,188	5,010,407,456	74,327,376,778	(232,839,714)
5	74,327,376,778	4,024,993,460	5,472,576,122	110,441,860	5,263,549,747	78,032,902,004	(319,468,234)
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52	63,639,514,193	0	4,772,258,445	92,000,346	4,382,562,264	63,157,817,667	(481,696,527)
53	63,157,817,667	0	4,434,786,202	91,522,400	4,359,977,321	62,991,486,386	(166,331,281)
54	62,991,486,386	0	4,102,378,871	91,513,832	4,359,763,049	63,157,356,732	165,870,346
55	63,157,356,732	0	3,776,293,507	91,998,983	4,383,079,084	63,672,143,326	514,786,594
56	63,672,143,326	0	3,457,878,124	93,001,950	4,431,073,163	64,552,336,415	880,193,089
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100	873,763,665,026	0	30,272	1,310,645,476	62,474,100,986	934,927,090,264	61,163,425,238

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 + 7.15%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 7.15%) ^(a)
1	\$60,998,386,333	\$4,754,541,533	\$4,754,541,533	0	\$4,593,170,404	0	\$4,593,170,404
2	64,193,388,625	4,477,709,898	4,477,709,898	0	4,037,083,109	0	4,037,083,109
3	67,357,700,947	4,807,323,949	4,807,323,949	0	4,045,041,208	0	4,045,041,208
4	70,706,977,902	5,138,117,982	5,138,117,982	0	4,034,887,762	0	4,034,887,762
5	74,327,376,778	5,472,576,122	5,472,576,122	0	4,010,763,204	0	4,010,763,204
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52	63,639,514,193	4,772,258,445	4,772,258,445	0	136,184,262	0	136,184,262
53	63,157,817,667	4,434,786,202	4,434,786,202	0	118,109,133	0	118,109,133
54	62,991,486,386	4,102,378,871	4,102,378,871	0	101,965,765	0	101,965,765
55	63,157,356,732	3,776,293,507	3,776,293,507	0	87,597,595	0	87,597,595
56	63,672,143,326	3,457,878,124	3,457,878,124	0	74,858,987	0	74,858,987
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100	873,763,665,026	30,272	30,272	0	31	0	31

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	\$1,230,875	\$1,241,787	\$594,640	3.551%	\$44,096	0	\$638,736
2	1,242,731	1,275,936	565,418	0.000%	0	0	565,418
3	640,691	1,311,025	291,469	0.000%	0	0	291,469
4	0	1,347,078	0	0.000%	0	0	0
5	0	1,384,122	0	0.000%	0	0	0
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22	0	2,195,157	0	0.000%	0	0	0
23	0	2,255,524	0	0.000%	0	0	0
24	0	2,317,551	0	0.000%	0	0	0
25	0	2,381,284	0	0.000%	0	0	0
26	0	2,446,769	0	0.000%	0	0	0
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100	0	18,215,806	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	\$116,883,856	\$638,736	\$7,038,915	\$284,407	\$5,485,809	\$115,685,079	\$(1,837,513)
2	115,685,079	565,418	6,990,740	281,379	5,906,959	114,885,337	(1,365,160)
3	114,885,337	291,469	7,428,890	278,512	5,846,519	113,315,924	(1,860,882)
4	113,315,924	0	7,343,105	274,337	5,758,795	111,457,276	(1,858,647)
5	111,457,276	0	7,327,129	269,710	5,661,630	109,522,067	(1,935,209)
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22	86,687,157	0	4,562,034	211,156	4,432,854	86,346,821	\$(340,336)
23	86,346,821	0	4,348,299	210,566	4,420,525	86,208,482	\$(138,339)
24	86,208,482	0	4,132,538	210,483	4,418,854	86,284,315	\$75,833
25	86,284,315	0	3,915,631	210,937	4,428,456	86,586,203	\$301,888
26	86,586,203	0	3,698,469	211,957	4,449,933	87,125,710	\$539,507
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100	1,961,929,429	0	0	4,904,824	103,001,295	2,060,025,900	98,096,471

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 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 5.25%) ^(a)
1	\$116,883,856	\$7,038,915	\$7,038,915	0	\$6,861,115	0	\$6,861,115
2	115,685,079	6,990,740	6,990,740	0	6,474,258	0	6,474,258
3	114,885,337	7,428,890	7,428,890	0	6,536,852	0	6,536,852
4	113,315,924	7,343,105	7,343,105	0	6,139,067	0	6,139,067
5	111,457,276	7,327,129	7,327,129	0	5,820,152	0	5,820,152
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22	86,687,157	4,562,034	4,562,034	0	1,518,390	0	1,518,390
23	86,346,821	4,348,299	4,348,299	0	1,375,061	0	1,375,061
24	86,208,482	4,132,538	4,132,538	0	1,241,645	0	1,241,645
25	86,284,315	3,915,631	3,915,631	0	1,117,790	0	1,117,790
26	86,586,203	3,698,469	3,698,469	0	1,003,133	0	1,003,133
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100	1,961,929,429	0	0	0	0	0	0

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	\$284,224,164	\$299,396,204	\$97,980,893	0.587%	\$1,757,456	0	\$99,738,348
2	267,041,115	307,629,600	87,883,553	0.626%	1,926,552	0	89,810,105
3	256,465,108	316,089,414	84,429,010	0.576%	1,820,039	0	86,249,049
4	245,625,269	324,781,873	80,877,657	0.000%	0	0	80,877,657
5	233,785,090	333,713,374	76,994,534	0.000%	0	0	76,994,534
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44	0	961,313,416	0	0.000%	0	0	0
45	0	987,749,535	0	0.000%	0	0	0
46	0	1,014,912,647	0	0.000%	0	0	0
47	0	1,042,822,745	0	0.000%	0	0	0
48	0	1,071,500,371	0	0.000%	0	0	0
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100	0	4,391,850,155	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	\$1,356,099,296	\$99,738,348	\$37,729,310	\$2,079,198	\$103,852,148	\$1,519,881,284	\$64,043,639
2	1,519,881,284	89,810,105	46,907,673	2,310,990	102,475,653	1,662,948,377	53,256,989
3	1,662,948,377	86,249,049	55,563,431	2,516,716	111,589,943	1,802,707,223	53,509,797
4	1,802,707,223	80,877,657	65,229,035	2,715,430	120,391,973	1,936,032,388	52,447,508
5	1,936,032,388	76,994,534	75,418,223	2,905,194	128,797,723	2,063,501,228	50,474,306
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44	823,777,740	0	61,490,948	1,190,994	52,769,551	813,865,349	(9,912,391)
45	813,865,349	0	53,470,145	1,181,952	52,372,777	811,586,030	(2,279,320)
46	811,586,030	0	46,058,171	1,183,918	52,463,684	816,807,624	5,221,595
47	816,807,624	0	39,277,546	1,196,676	53,032,747	829,366,149	12,558,525
48	829,366,149	0	33,139,860	1,219,973	54,068,683	849,074,999	19,708,850
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100	18,451,849,076	0	0	27,677,774	1,227,047,964	19,651,219,266	1,199,370,190

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 + 6.65%) ^(a)	Present Value of 'Unfunded' Benefit Payments (g) = (e) ÷ (1 + 3.62%) ^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) ÷ (1 + 6.65%) ^(a)
1	\$1,356,099,296	\$37,729,310	\$37,729,310	0	\$36,534,102	0	\$36,534,102
2	1,519,881,284	46,907,673	46,907,673	0	42,589,506	0	42,589,506
3	1,662,948,377	55,563,431	55,563,431	0	47,302,806	0	47,302,806
4	1,802,707,223	65,229,035	65,229,035	0	52,068,845	0	52,068,845
5	1,936,032,388	75,418,223	75,418,223	0	56,448,503	0	56,448,503
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44	823,777,740	61,490,948	61,490,948	0	3,736,920	0	3,736,920
45	813,865,349	53,470,145	53,470,145	0	3,046,864	0	3,046,864
46	811,586,030	46,058,171	46,058,171	0	2,460,864	0	2,460,864
47	816,807,624	39,277,546	39,277,546	0	1,967,725	0	1,967,725
48	829,366,149	33,139,860	33,139,860	0	1,556,718	0	1,556,718
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100	18,451,849,076	0	0	0	0	0	0