County of Riverside
Pension Advisory Review Committee (PARC)

November 15, 2023
10:00 a.m.

A G E N D A

1. Call to Order and Self-Introductions……………………………………...…..…Executive Office

2. Approval of the Meeting Minutes from December 15, 2022…………………Executive Office

3. CalPERS Miscellaneous and Safety Plans – Independent Actuarial Report 6/30/2022 Valuation – Preliminary Results………………………………….... Foster & Foster

   a. CalPERS Miscellaneous Plan Annual Valuation Report as of 6/30/2022
   b. CalPERS Safety Plan Annual Valuation Report as of 6/30/2022

4. Actuarial Valuation Report – Postretirement Benefits Plan as of June 30, 2023………….. Aon

5. Actuarial Valuation Report – Part-time and Temporary Employees' Retirement Plan as of July 1, 2023…………………………………………………………………………...…..Aon

6. Other Business

7. Public Comment

8. Next Meeting Date – December 13, 2023 - 10 a.m.

9. Adjourn

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact Katie Ponce at kmponce@rivco.org or (951) 955-1142. Notification 48 hours prior to the meeting will enable us to make reasonable arrangements to ensure accessibility to the meeting [28 CFR 35 .102.35.104 ADA Title II].

County of Riverside
Pension Advisory Review Committee

MINUTES OF MEETING

December 15, 2022
10:00 a.m.

Members Present:

Don Kent	Chairman, County Executive Office
Mike Bowers	Human Resources
Undersheriff Donald Sharp	Sheriff
Matt Jennings	Treasurer-Tax Collector

Members Absent:

Paul Angulo	Auditor-Controller

Staff and Guests Present:

Bradley Au	Aon
Darren Lathrop	CalPERS
Lee Lo	CalPERS
Matt Goss	CalPERS
Mike Williams	Columbia Capital
Kristine Valdez	County Counsel
Imelda Delos Santos	Executive Office
Jarvyk Punzalan	Executive Office
Jen Kammerer	Executive Office
Stephanie Persi	Executive Office
Paul McDonnell	Feldman
Darrylenn Brockington	Flood Control
Bianca Lin	Foster and Foster
Mary Beth Redding	Foster and Foster
Keith Stribling	Highmark Capital
Amy Onopas	Human Resources
Sonia Moreno	Human Resources
Angela Tang	PARS
Mitch Barker	PARS
Aileen Yan	Riverside Courts
Carol Waterhouse-Tejada	Riverside Courts
Giovane Pizano	Treasurer-Tax Collector
Isela Licea	Treasurer-Tax Collector
John Byerly	Treasurer-Tax Collector
Scott Grimm	US Bank
Terra Murphy	US Bank
Sandra Green	Waste Resources

1. Call to Order and Self-introductions:

Chairman Don Kent called the meeting to order at 10:00 a.m. Self-introductions were given by Committee members.

2. Approval of the Resolution No. 2022-003 for December 15, 2022:
MOTION: Don Sharp moved to approve resolution.
Seconded by Don Kent Motion approved unanimously

3. Approval of the Minutes for November 9, 2022:
MOTION: Don Kent moved to approve the Minutes.
Seconded by Don Sharp Motion approved unanimously

4. Section 115 Pension Trust Investment Report for the period ended 6/30/22

Angela Tang from PARS reported on the summary of the County's Pension Plan. The plan has an effective date of October 1, 2016. The Plan Administrator is Don Kent, County Finance Director. The County has two accounts, General and POB and both are invested in the Moderate Index. The initial contribution was $2,099,212. There have been no disbursements. Account balance as of June 30, 2022 is $62,363,070 (General $39,232,037 and POB $23,131,033).
Report was received and filed.

5. Section 115 OPEB Trust Investment Report for the period ended 6/30/22

Matt Goss from CalPERS reported on CERBT Account as of June 30, 2022, in Strategy 2. The annualized net rate of return for 11/2007 – 6/30/22, 14.59 years, was 6.95%. The County had an initial contribution of $10,411,404 with additional contributions of $30,775,984. Disbursements were $6,140,923 and expenses were $433,578. Investment earnings were $30,431,573. Transfer out to CERBT Strategy 1 in August 2022 was $58,525,114. Total assets as of June 30, 2022, is $6,519,346.

The County voted in January 2021 to transfer from Strategy 2 to Strategy 1 which was completed in August 2022. Initial contribution in March 2021 was $600,000 and additional contributions of $20,090,000. There were no disbursements. CERBT expenses were $44,323. Investment earnings as of June 30, 2022, was ($9,278,344). Total assets were $69,892,447 which include transfer in from CERBT Strategy 2 of $58,525,114. Annualized net rate of return was -17.32% for 1.33 years.

Blended results as of June 30,22 for CERBT Strategy 1 & 2 total assets is $76,411,793 and total investment earnings is $21,153,230.

Report was received and filed.

6. County of Riverside – Part-Time and Temporary Employees' Retirement Plan Investment Report for the period ended 6/30/22

Scott Grimm from US Bank reported that as of June 30, 2022, the portfolio value is $50,991,307. The Equity value is $32,760,248. Total portfolio net of fees for 6 months was -18.53% and for 1 year was -17.45%.

Report was received and filed.

7. Draft 2023 PARC Annual Report

Chair Don Kent discussed the draft PARC Annual Report. He reviewed the highlights and other sections of the report. He mentioned that the funded status is now anticipated to be more than 80% within ten years. The report will go to the Board either February 8 or February 28. Will circulate the report to the committee for comments prior to finalizing report.

8. New Business

No new business to address.

9. Public Comment:

No public comment.

10. Future Meeting Date:

Next meeting is to be determined.

11. Adjourn:

With no further business, Don Kent adjourned the Pension Advisory Review Committee Meeting at 11:27 a.m.

COUNTY OF RIVERSIDE
CALPERS MISCELLANEOUS & SAFETY PLANS

FOSTER & FOSTER
ACTUARIES AND CONSULTANTS

CalPERS Analysis – 6/30/22 Valuation

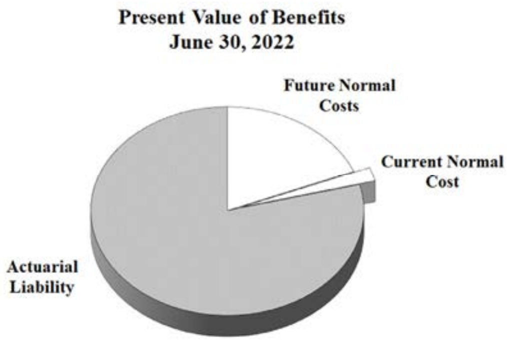
Preliminary Results

Doug Pryor, ASA, EA, MAAA
Bianca Lin, FSA, EA, MAAA
Matthew Childs
Foster & Foster, Inc.

November 8, 2023

Contents

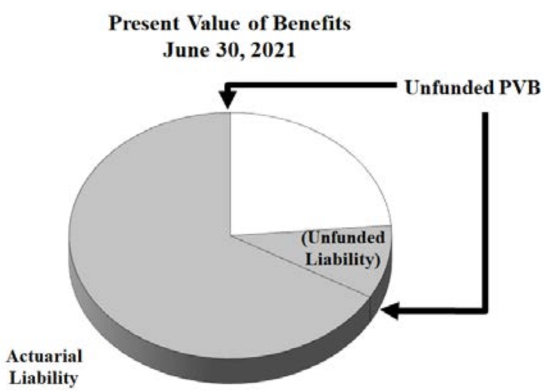
DEFINITIONS

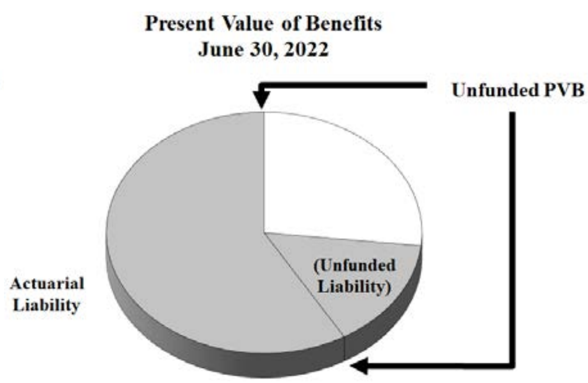


- **PVB - Present Value of all Projected Benefits:**
  - The value now of amounts due to be paid in the future
  - Discounted value (at valuation date - 6/30/22), of all future expected benefit payments based on various (actuarial) assumptions

- **Current Normal Cost (NC):**
  - Portion of PVB allocated to (or "earned" during) current year
  - Value of employee and employer current service benefit
- **Actuarial Liability (AAL):**
  - Discounted value (at valuation date) of benefits earned through valuation date [value of past service benefit]
  - Portion of PVB "earned" at valuation date

DEFINITIONS



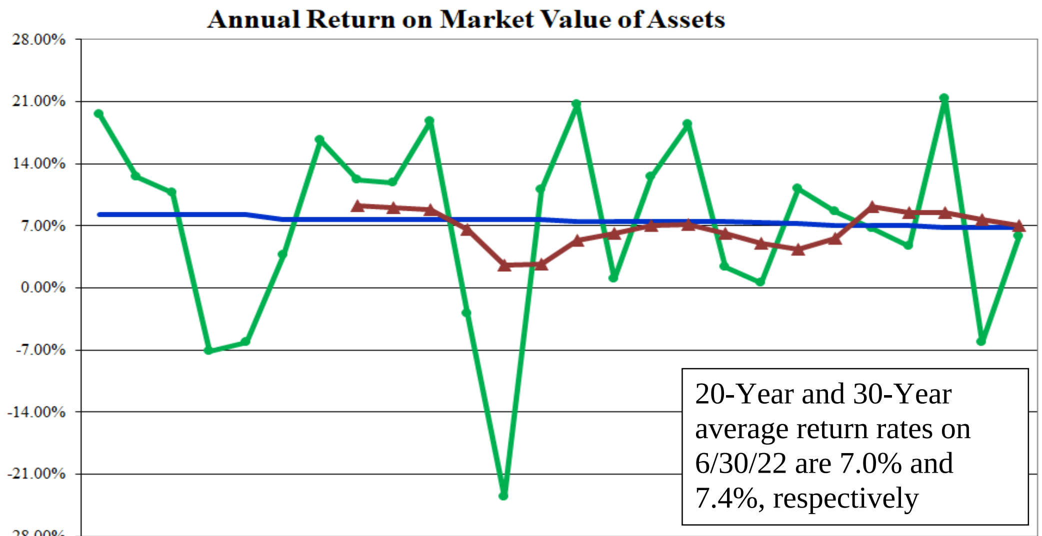


- **Target-** Have money in the bank to cover Actuarial Liability (past service)
- **Unfunded Liability (UAAL or UAL) -** Money short of target at valuation date
  - If all actuarial assumptions were always exactly met, then the plan assets would always equal AAL
  - Any difference is the unfunded (or overfunded) AAL
  - Every year, the actuary calculates the difference between the expected UAAL and Actual UAAL. This is a new layer or amortization base
  - Each new layer gets amortized (paid off) over a period of time as part of the contribution [rate]

How We Got Here

- Investment Losses
- CalPERS Contribution Policy
- Enhanced Benefits
- Demographics

How We Got Here – Investment Return



	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10
Rate of Return	19.5%	12.5%	10.7%	-7.1%	-6.1%	3.7%	16.6%	12.2%	11.9%	18.8%	-2.9%	-23.6%	11.1%
Discount Rate	8.25%	8.25%	8.25%	8.25%	8.25%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%
10-Year Rolling Average								9.3%	9.0%	8.9%	6.6%	2.6%	2.6%

	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	'21	'22	'23
Rate of Return	20.7%	1.0%	12.5%	18.4%	2.4%	0.6%	11.2%	8.6%	6.70%	4.70%	21.30%	-6.10%	5.80%
Discount Rate	7.50%	7.50%	7.50%	7.50%	7.50%	7.375%	7.25%	7.00%	7.00%	7.00%	6.80%	6.80%	6.80%
10-Year Rolling Average	5.4%	6.1%	7.0%	7.2%	6.2%	5.1%	4.4%	5.5%	9.1%	8.5%	8.5%	7.7%	7.1%

Discount rates are expected returns net of administrative expenses.
2013/14 through 2021/22 “money-weighted” returns reported in CalPERS AFCR (without lags on private equity and real estate) are 18.3%, 2.2%, 0.5%, 11.2%, 8.4%, 6.5%, 5.0%, 22.4%, -7.5% respectively.

How We Got Here – Old Contribution Policy

- Effective with 2003 valuations:
  - Slow (15 year) recognition of investment losses into funded status
  - Rolling 30 year amortization of all (primarily investment) losses

- Designed to:
  - First smooth rates and
  - Second pay off UAL

- Mitigated contribution volatility

How We Got Here – Enhanced Benefits

- At CalPERS, Enhanced Benefits implemented using all (future & prior) service
- Typically not negotiated with cost sharing
- County of Riverside

	Tier 1	Tier 2	PEPRA
● Miscellaneous	3%@60 FAE1	2%@60 FAE3	2%@62 FAE3
● Safety[1]	3%@50 FAE1	2%@50 FAE3	2.7%@57 FAE3

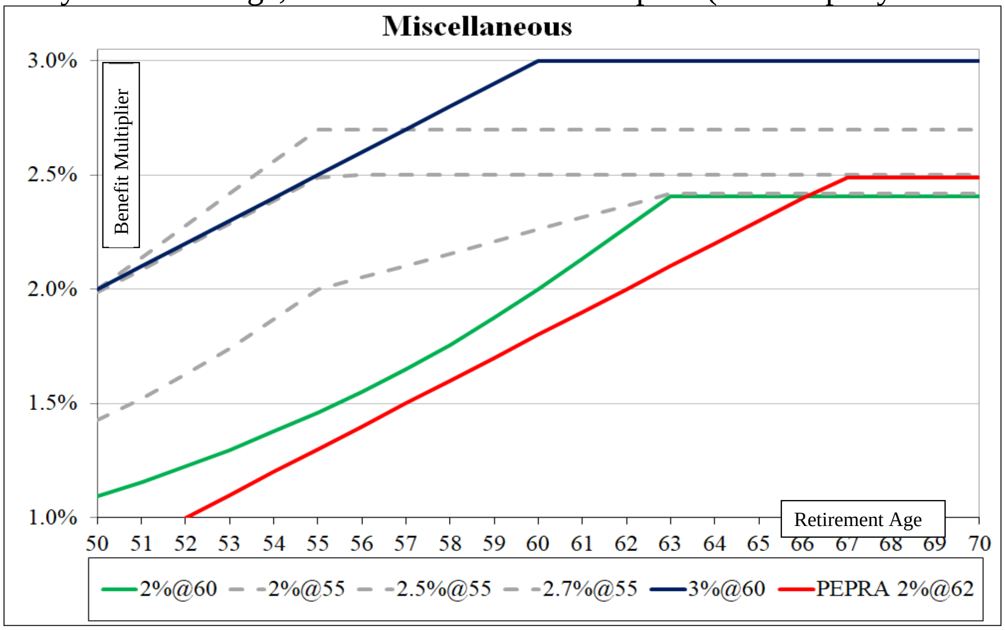
  - Note:
    - FAE1 is highest one year (typically final) average earnings
    - FAE3 is highest three years (typically final three) average earnings

- PEPRA tier implemented for new employees hired after 1/1/13
  - Employee pays half of total normal cost
  - 2024 Compensation limit
    - Social Security participants: $151,446
    - Non-Social Security participants: $181,734

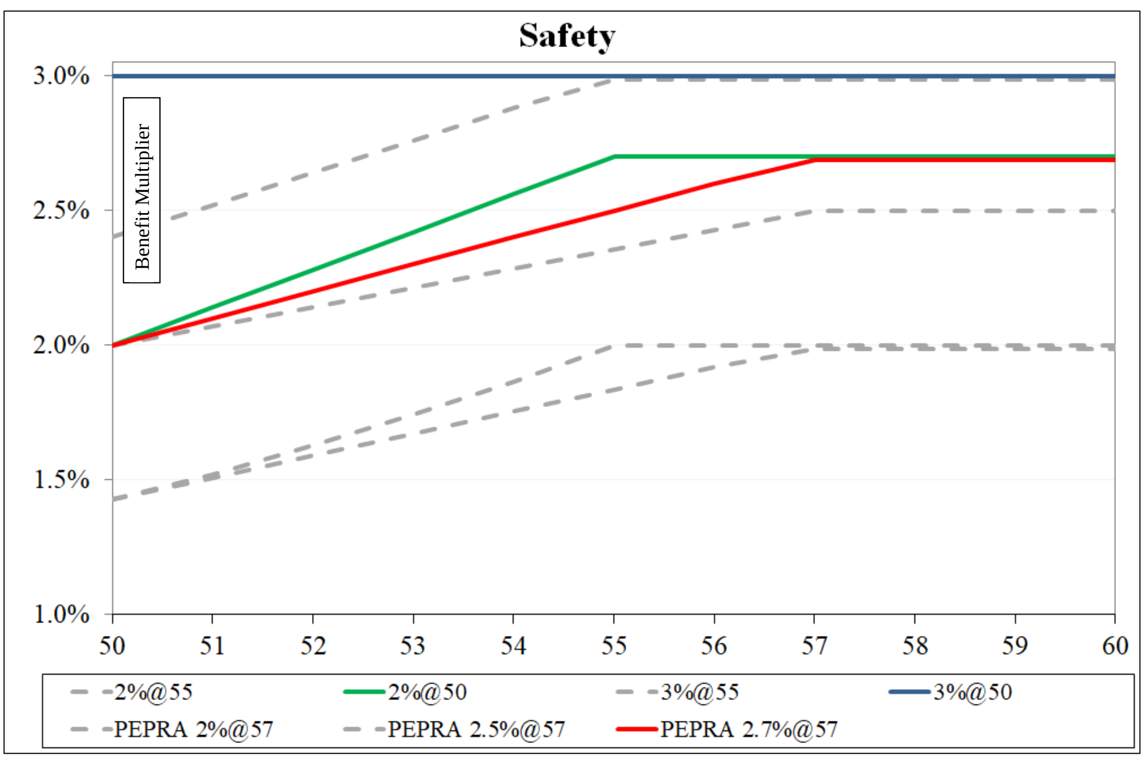
[1] Fire and Peace Officer members are combined in this group.

How We Got Here – Enhanced Benefits

- Available CalPERS Benefit formulas. County's formulas shown in blue (Tier 1), green (Tier 2) and red (PEPRA).
- For any retirement age, chart shows benefit multiplier (% FAE per year of service)



How We Got Here – Enhanced Benefits



HOW WE GOT HERE – DEMOGRAPHIC

- Around the State
  - Large retiree liability compared to actives
    - State average: 59% for Miscellaneous, 67% for Safety
  - Declining active population and increasing number of retirees
  - Higher percentage of retiree liability increases contribution volatility

- County of Riverside percentage of liability belonging to retirees:
  - Miscellaneous 53%
  - Safety 58%

CALPERS CHANGES

- April 2013: CalPERS adopted new contribution policy
  - No asset smoothing or rolling amortization
- February 2018: New amortization policy for 2021/22 contributions
  - Fixed dollar (level) 20-year amortization rather than % pay (escalating)
  - 5-year ramp up (not down) for investment gains and losses
- CalPERS Board changed the discount rate to 7%, still phasing in to rates:

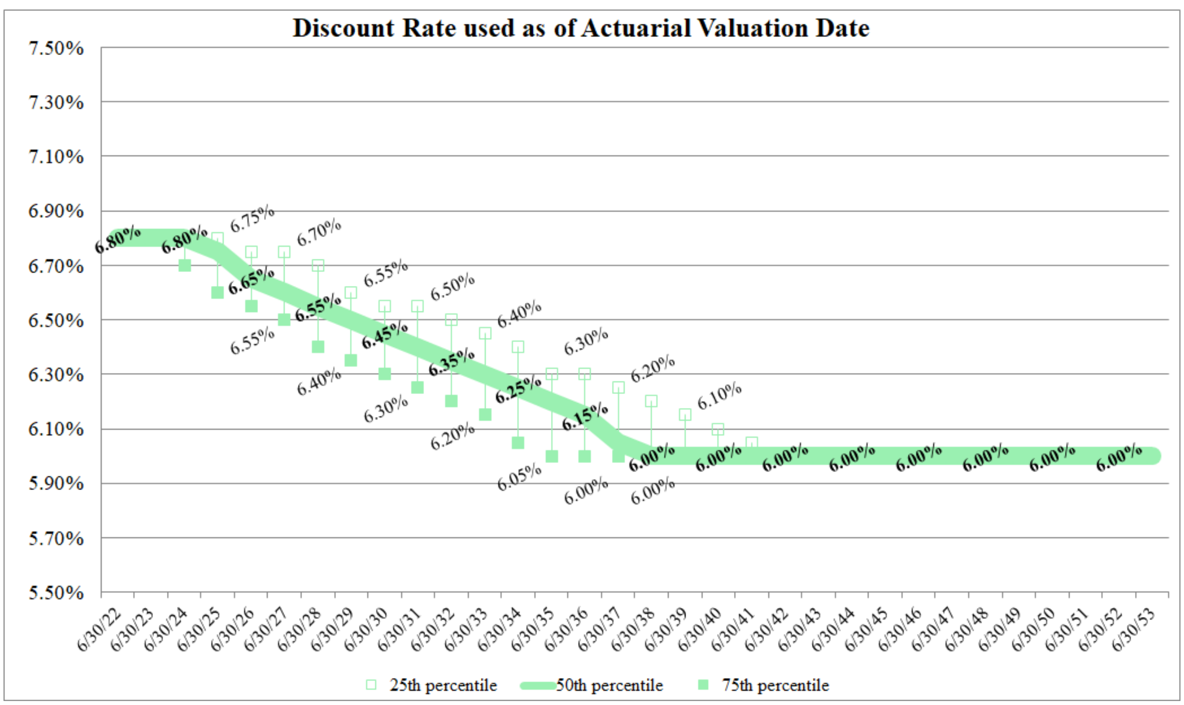
	Rate	Initial Impact	Full Impact
6/30/16 valuation	7.375%	18/19	22/23
6/30/17 valuation	7.25%	19/20	23/24
6/30/18 valuation	7.00%	20/21	24/25

- In the November 2021 meeting, CalPERS Board adopted
  - Discount rate and investment allocation
    - Discount rate: 6.8% for 6/30/2021. UAL impact matches investment gain amortization (5-year ramp-up). Initial impact in 23/24 and full impact in 27/28.
    - Asset allocation has higher investment risk than current portfolio
  - Experience study (Demographic assumptions)

CalPERS Changes

- Risk Mitigation Strategy
  - Move to more conservative investments over time to reduce volatility
    - Only when investment return is better than expected
    - Lower discount rate in concert
    - Essentially use ≈50% of investment gains to pay for cost increases
  - Likely get to 6.0% discount rate over 20+ years
    - Risk mitigation suspended from 6/30/16 to 6/30/18 valuation
    - Did not trigger for 6/30/19 or 6/30/20 valuations
  - First triggered for 6/30/21 valuation – 6.8% discount rate
  - Not triggered for 6/30/22 valuation

CalPERS Changes



Capital Market Assumptions

Asset Class	Asset Segment	Near-Term Return (5-year)	Long-Term Return (20-year)	Volatility (20-year)
Growth	Global Equity – Cap Weighted	6.8%	6.8%	17.0%
	Global Equity – Non-Cap Weighted	5.1%	6.1%	13.5%
	Private Equity	8.9%	9.6%	30.1%
Income	Long U.S. Treasuries	0.1%	2.6%	12.4%
	Mortgage-Backed Securities	1.2%	2.8%	3.1%
	Investment Grade Corporates	0.1%	3.9%	8.5%
	Spread Product – High Yield	2.2%	4.7%	9.2%
	Spread Product – Sovereigns	3.2%	4.5%	10.4%
	High Yield Segment	2.2%	4.6%	9.0%
Real Assets	Real Estate	5.3%	5.5%	12.2%
Liquidity	Liquidity	0.3%	1.7%	0.8%
Other	Private Debt	6.8%	5.9%	9.9%
	Emerging Market Debt	2.7%	4.8%	10.3%

Portfolio Target Allocations

	Prior Portfolio	11/17/21 Portfolio
Asset Classification		
Liquidity	1%	-
Real Assets	13%	15%
Private Debt	-	5%
EM Sov Bonds	1%	5%
High Yield	4%	5%
Investment Grade Corp.	6%	10%
Mtge-backed Securities	7%	5%
Treasury	10%	5%
Private Equity	8%	13%
Global Equity[2]	50%	42%
Leverage	-	(5)%
Total	100%	100%
Standard Deviation	11.2%	12.0%

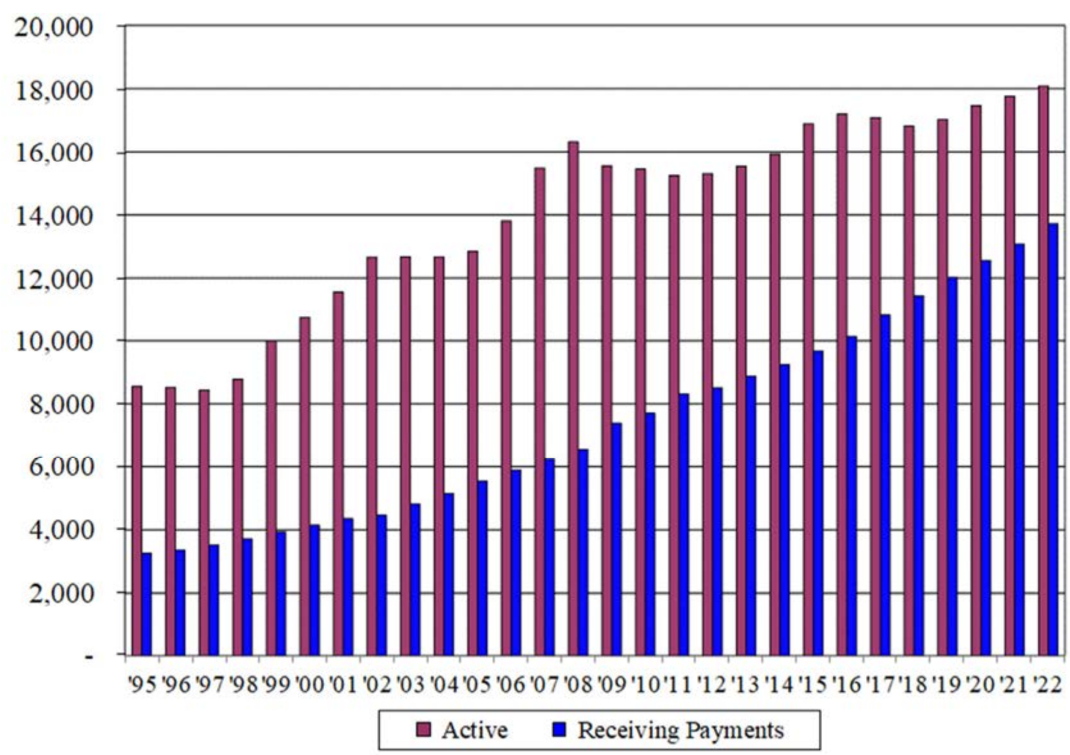
[2] Cap and non-cap weighted combined for this table; actual portfolios have specific allocations for each classification.

SUMMARY OF DEMOGRAPHIC INFORMATION - MISCELLANEOUS

	2002	2012	2021	2022
Actives				
■ Counts	12,656	15,298	17,762	18,082
■ Average				
• Age	43	44	44	44
• County Service	8	9	10	9
• PERSable Wages	$ 41,700	$ 54,700	$ 68,200	$ 68,900
■ Total PERSable Wages	527,200,000	836,400,000	1,211,000,000	1,245,600,000
Inactive Members				
■ Counts				
• Transferred	2,373	3,630	4,069	4,249
• Separated	2,434	7,162	11,338	12,803
• Retired				
☐ Service	3,367	7,135	11,265	11,842
☐ Disability	537	582	688	706
☐ Beneficiaries	563	787	1,120	1,174
☐ Total	4,467	8,504	13,073	13,722
■ Average Annual County Provided Benefit for Service Retirees[3]	$ 10,300	$ 22,800	$ 31,700	$ 33,200

3 Average County-provided pensions are based on County service & County benefit formula and are not representative of benefits for long-service employees.

SUMMARY OF DEMOGRAPHIC INFORMATION - MISCELLANEOUS

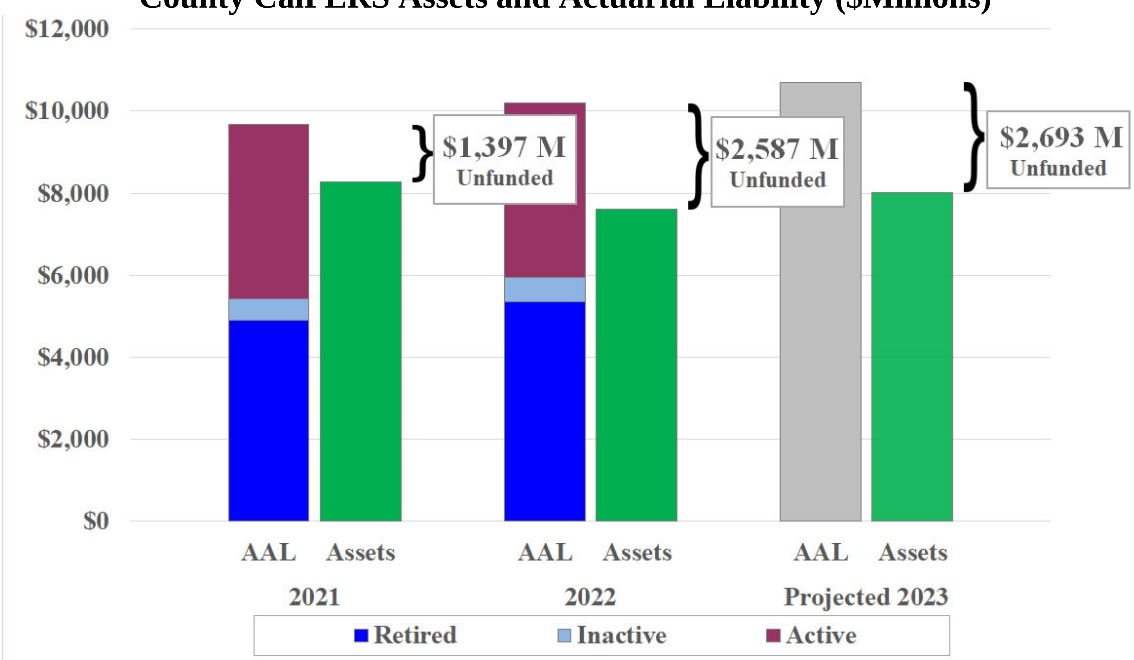


Plan Funded Status - Miscellaneous

	June 30, 2021	June 30, 2022
■ **Actuarial Accrued Liability**		
● Active	$ 4,234,200,000	$ 4,237,600,000
● Retiree	4,899,000,000	5,358,400,000
● Inactive	537,300,000	599,500,000
● Total	9,670,500,000	10,195,500,000
■ **Assets**	8,273,300,000	7,608,800,000
■ **Unfunded Liability**	1,397,200,000	2,586,700,000
■ **Funded Ratio**	85.6%	74.6%
■ **Average funded ratio for CalPERS Public Agency Miscellaneous Plans**	83.7%	75.0%

Plan Funded Status - Miscellaneous

County CalPERS Assets and Actuarial Liability ($Millions)[4]



4 Projected 2023 assets reflects 5.8% CalPERS investment return for 2022/23.

Discount Rate Sensitivity

June 30, 2022

	Discount Rate		
	6.80%	**6.30%**[5]	**5.80%**
AAL	$10,195,500,000	$10,936,700,000	$11,677,800,000
Assets	7,608,800,000	7,608,800,000	7,608,800,000
Unfunded Liability	2,586,700,000	3,327,900,000	4,069,000,000
Funded Ratio	74.6%	69.6%	65.2%

[5] Estimated by Foster & Foster.

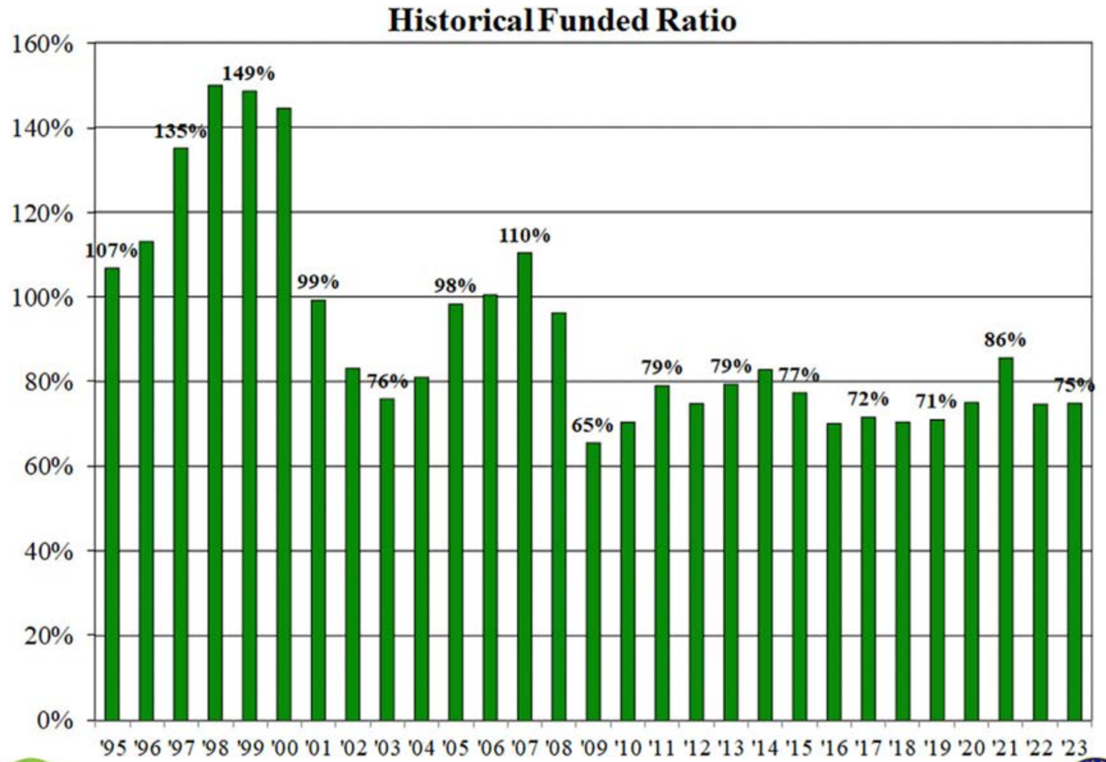
Unfunded Accrued Liability Changes

■ **Unfunded Accrued Liability on 6/30/21**		$1,397,200,000
■ **Expected 6/30/22 Unfunded Accrued Liability**		1,360,800,000
■ **Changes**		
• Benefit change[6]	8,800,000	
• Asset Loss (Gain) (-7.5% return for FY 2022)	1,195,200,000	
• Contribution & Experience Loss (Gain)	21,900,000	
• Total		1,225,900,000
■ **Unfunded Accrued Liability on 6/30/22**		2,586,700,000
■ **Projected Unfunded Accrued Liability on 6/30/23**[7]		2,693,300,000

[6] SB 1168 increased the standard post-retirement lump sum death benefit from $500 to $2,000 for deaths occurring on or after July 1, 2023.

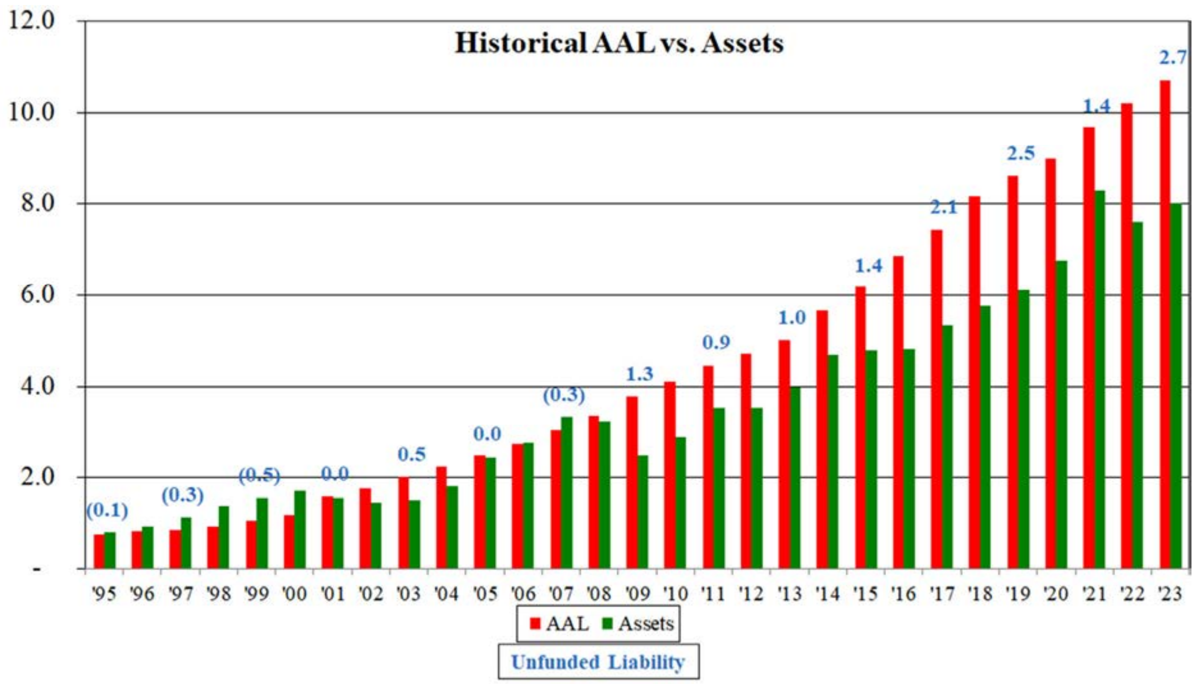
[7] Projected 2023 assets reflects 5.8% CalPERS investment return for 2022/23.

FUNDED RATIO - MISCELLANEOUS



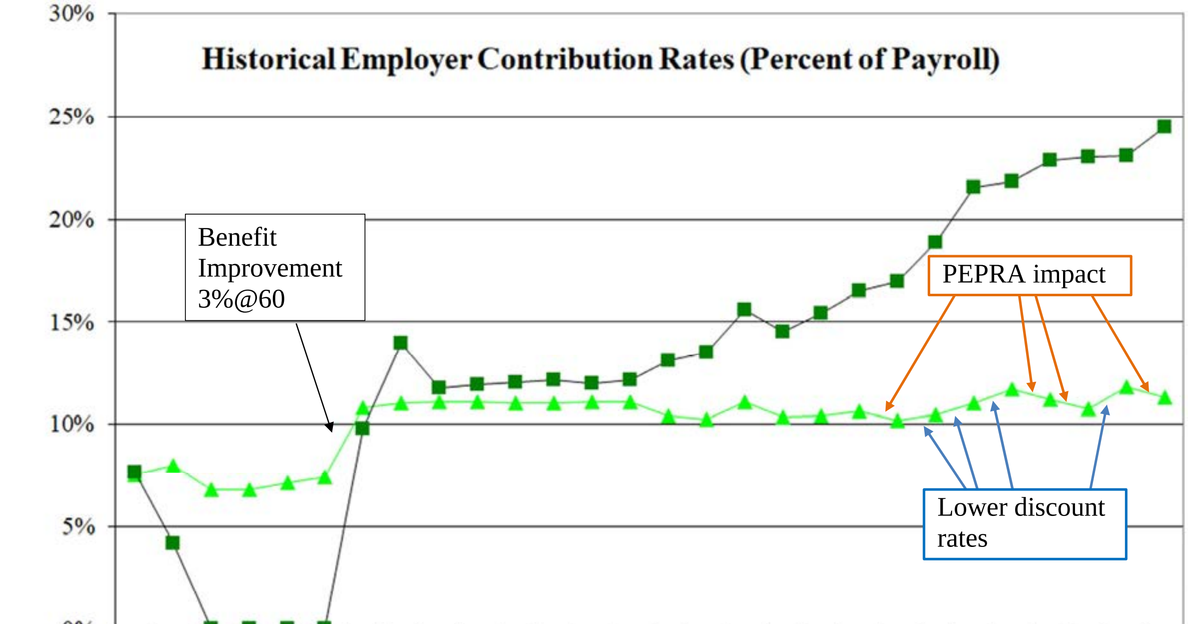
6/30/23 funded status estimated

FUNDED STATUS (BILLIONS) - MISCELLANEOUS



6/30/23 funded status estimated

CONTRIBUTION RATES - MISCELLANEOUS



	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11
Normal Cost	7.5%	8.0%	6.8%	6.8%	7.1%	7.4%	10.8%	11.0%	11.1%	11.1%	11.0%	11.0%	11.1%	11.1%
Total Rate	7.6%	4.2%	0.0%	0.0%	0.0%	0.0%	9.8%	13.9%	11.8%	11.9%	12.1%	12.2%	12.0%	12.2%

	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Normal Cost	10.4%	10.2%	11.1%	10.3%	10.4%	10.7%	10.2%	10.5%	11.0%	11.7%	11.2%	10.8%	11.8%	11.3%
Total Rate	13.1%	13.5%	15.6%	14.5%	15.4%	16.5%	16.9%	18.9%	21.6%	21.8%	22.9%	23.0%	23.1%	24.5%

CONTRIBUTION RATES - MISCELLANEOUS

	6/30/21 2023/2024	6/30/22 2024/2025
■ Total Normal Cost	19.3%	19.1%
■ Employee Normal Cost	7.6%	7.8%
■ Employer Normal Cost	11.8%	11.3%
■ Amortization Payments	11.3%	13.2%[8]
■ Total Employer Contribution Rate	23.1%	24.5%

■ 2023/24 Employer Contribution Rate	23.1%
● 6/30/18 Discount Rate change (5th Year)	0.5%
● 6/30/22 Plan change (1st Year, no ramp)	0.1%
● Other (Gains)/Losses mainly net investment loss	0.8%
■ 2024/25 Employer Contribution Rate	24.5%

[8] Equivalent to 6.9% of UAL. One year, 6.8% interest on the UAL is 13.0% of payroll. 2024/25 amortization payment does exceed interest on the UAL, so there is no “negative amortization.”

CONTRIBUTION PROJECTIONS - MISCELLANEOUS

- Investment returns:
  - June 30, 2023 5.8%[9]
  - Future returns based on stochastic analysis using 1,000 trials
  - Single year returns[10] with current investment mix, no risk mitigation:

	Percentile		
	25th	50th	75th
First 10 years	**-1.8%**	**6.0%**	**14.7%**
After 10 years	**-0.7%**	**7.5%**	**16.4%**

  - Assumes investment returns will generally be lower over the next 8 years and higher beyond that.
- Discount Rate decreases due to Risk Mitigation policy – Ultimate rate 6.0%
- No Other: Gains/Losses, Method/Assumption Changes, Benefit Improvements
- Different from CalPERS projection
- Impact of Risk Mitigation Policy:
  - Net impact of investment gain and discount rate change amortized over 20 years with 5 year ramp up
  - Same amortization method for all future years

9 Gross return based on June 30, 2023 CalPERS News Release issued in July 2023.

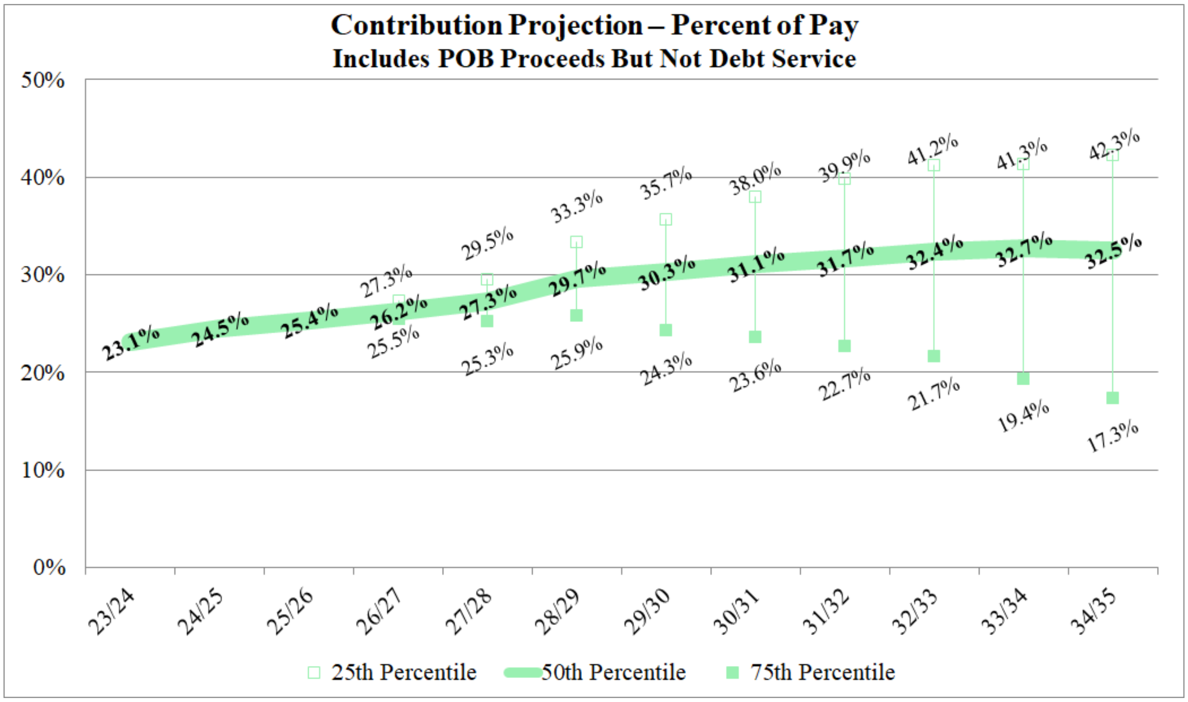
10 Nth percentile means N percentage of our trials result in returns lower than the indicated rates.

CONTRIBUTION PROJECTIONS - MISCELLANEOUS

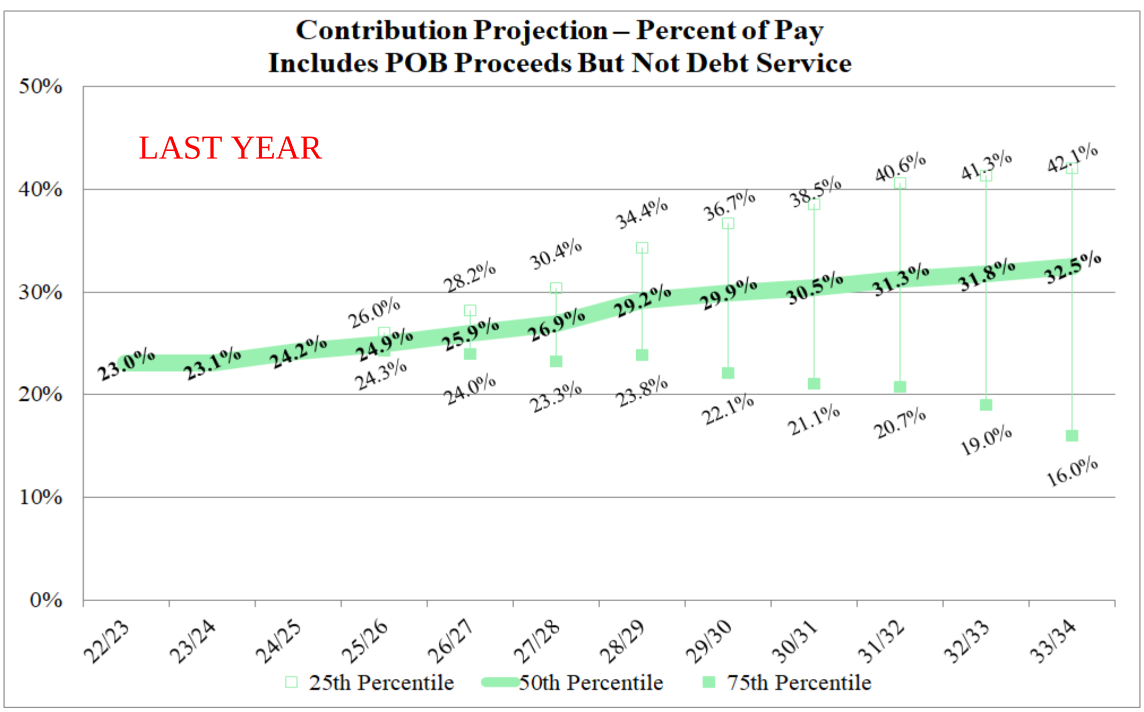
- New hire assumptions:
  - All new hires assumed PEPRA members and none are Classic members
- 6/30/22 employee distribution:

Benefit Tier	Count	% of Total	21/22 Payroll	% of Total
• 3%@60 FAE1	7,284	40.3%	$603,774,600	48.5%
• 2%@60 FAE3	700	3.9%	53,100,200	4.3%
• 2%@62 FAE3 (PEPRA)	10,098	55.8%	588,716,900	47.2%
• Total	18,802	100%	1,245,592,000	100%

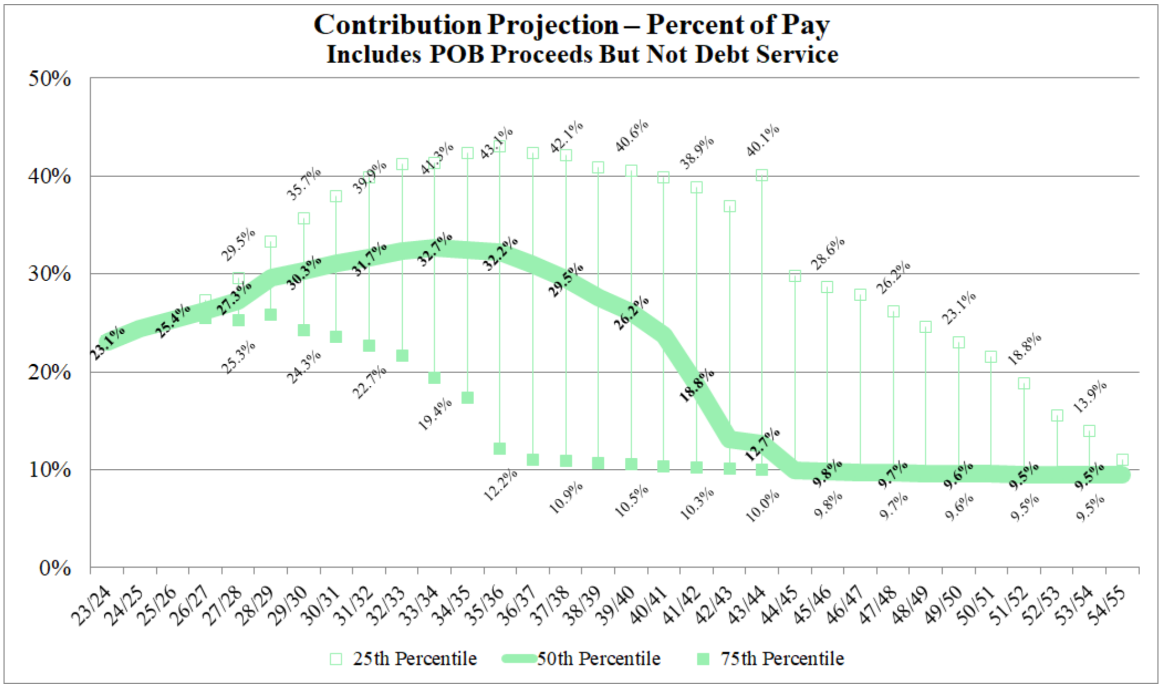
CONTRIBUTION PROJECTIONS - MISCELLANEOUS



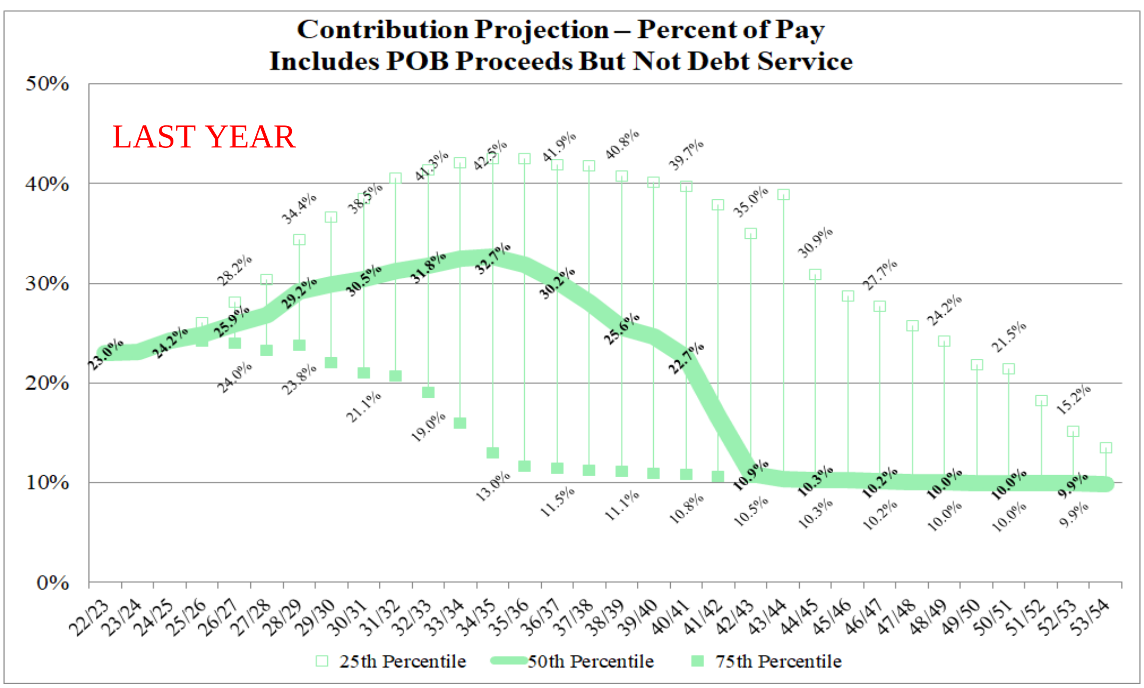
CONTRIBUTION PROJECTIONS - MISCELLANEOUS



CONTRIBUTION PROJECTIONS - MISCELLANEOUS



CONTRIBUTION PROJECTIONS - MISCELLANEOUS



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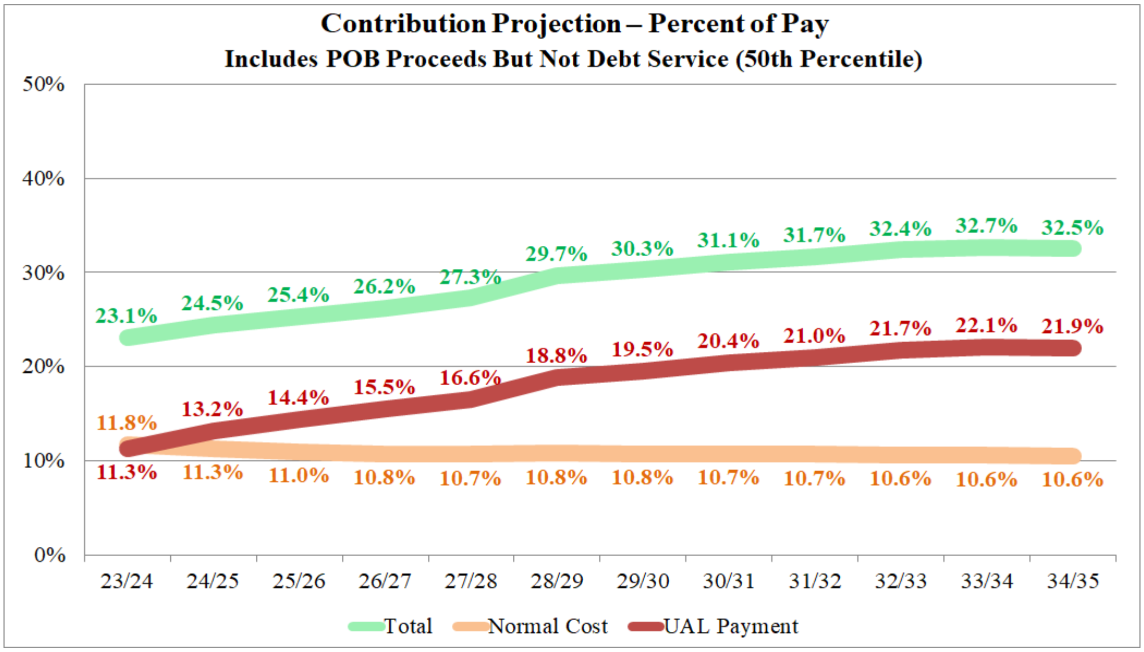
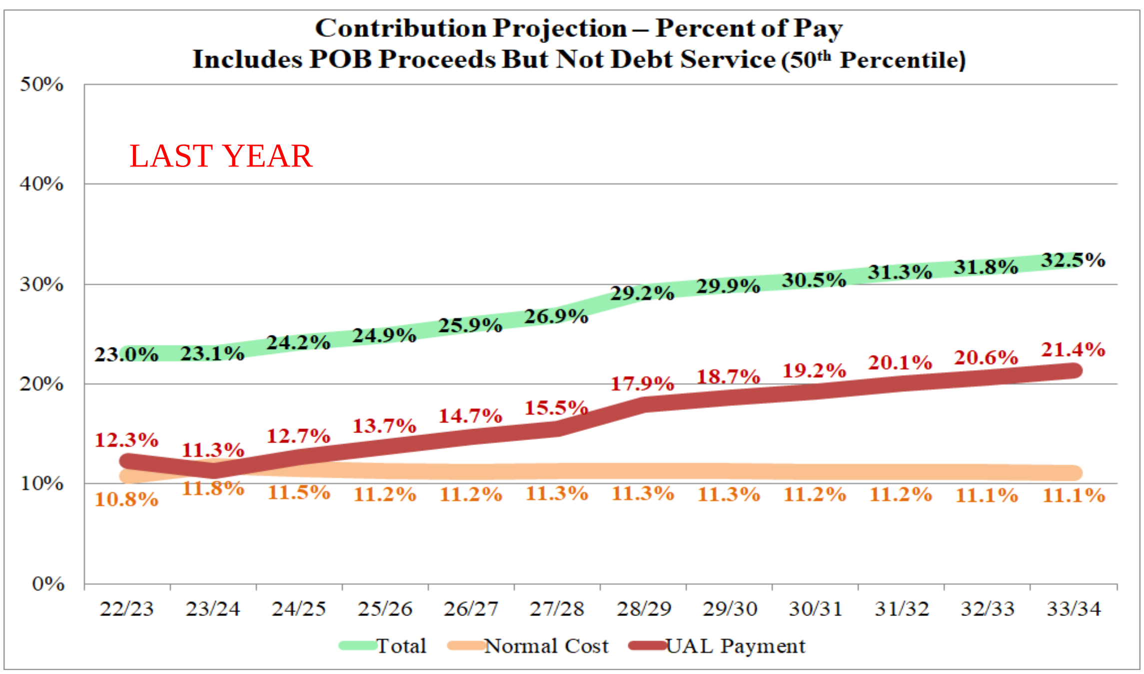


CONTRIBUTION PROJECTIONS - MISCELLANEOUS



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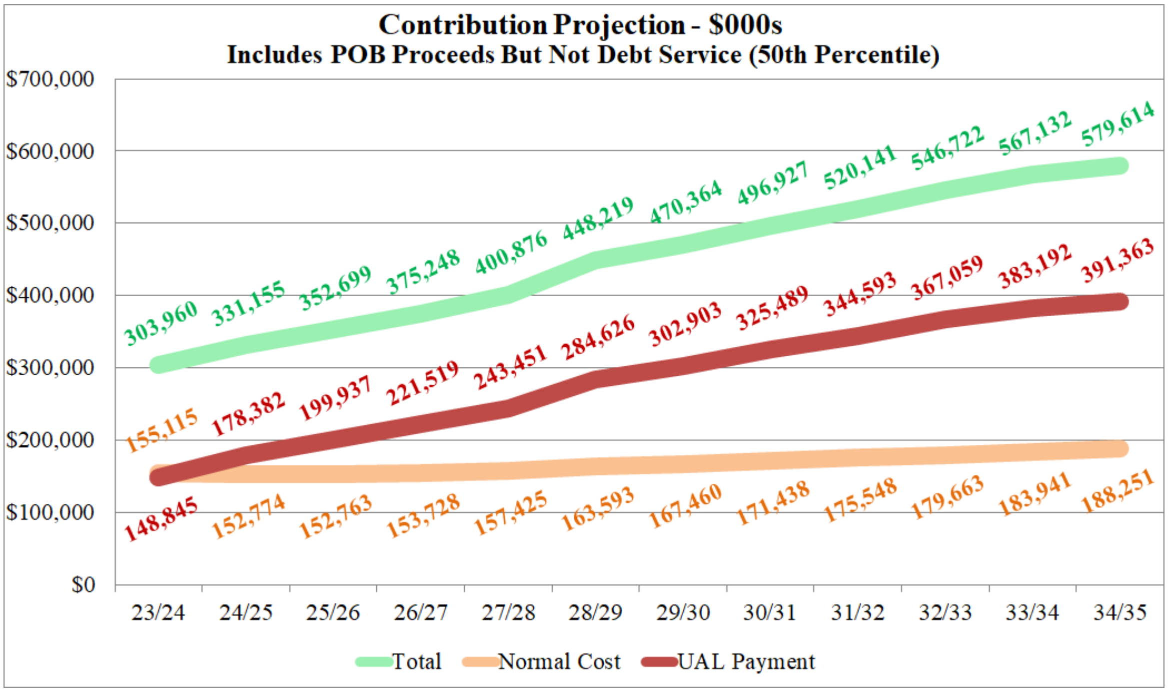

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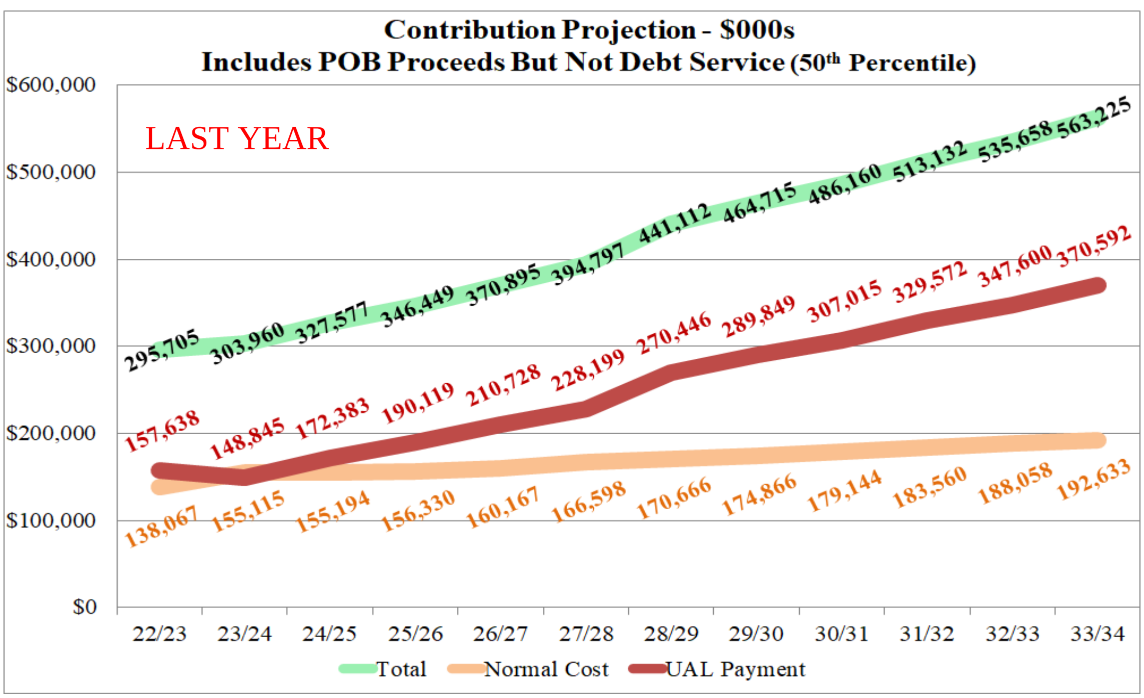
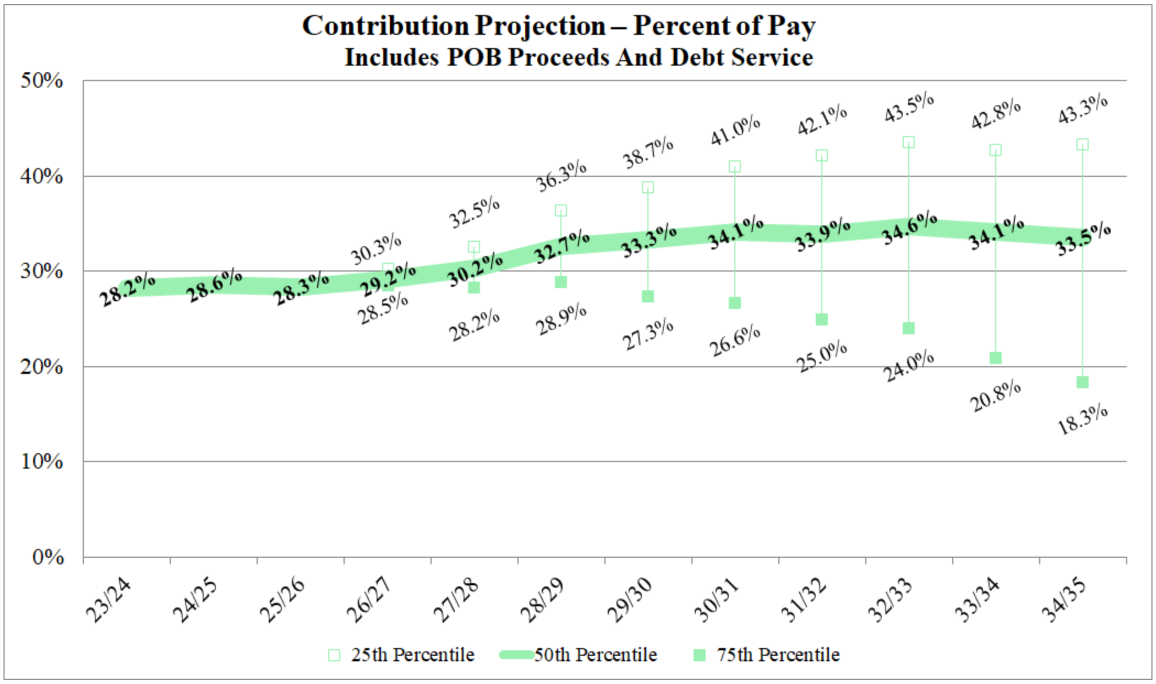
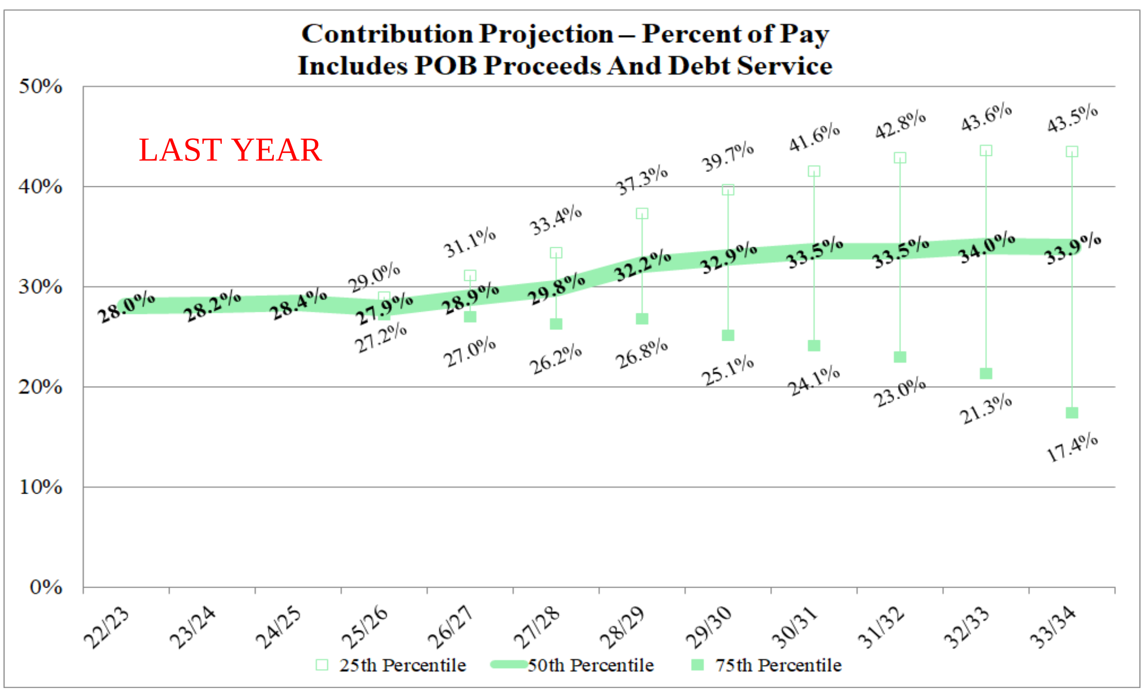


Contribution Projections - Miscellaneous



Contribution Projections - Miscellaneous



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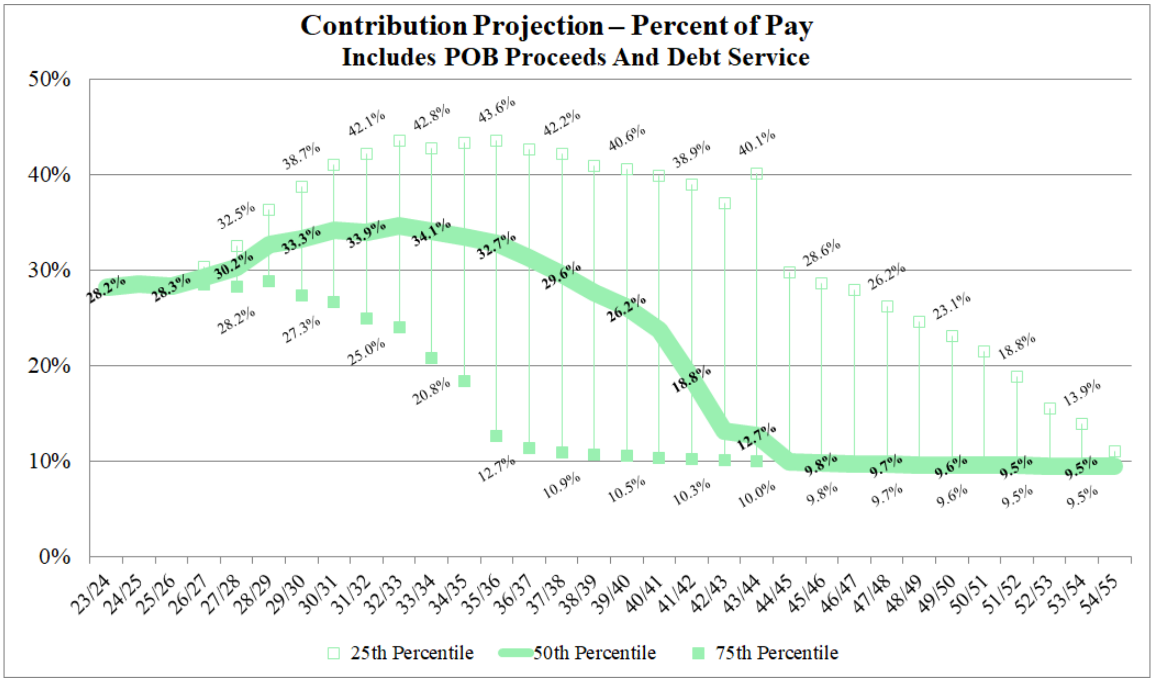

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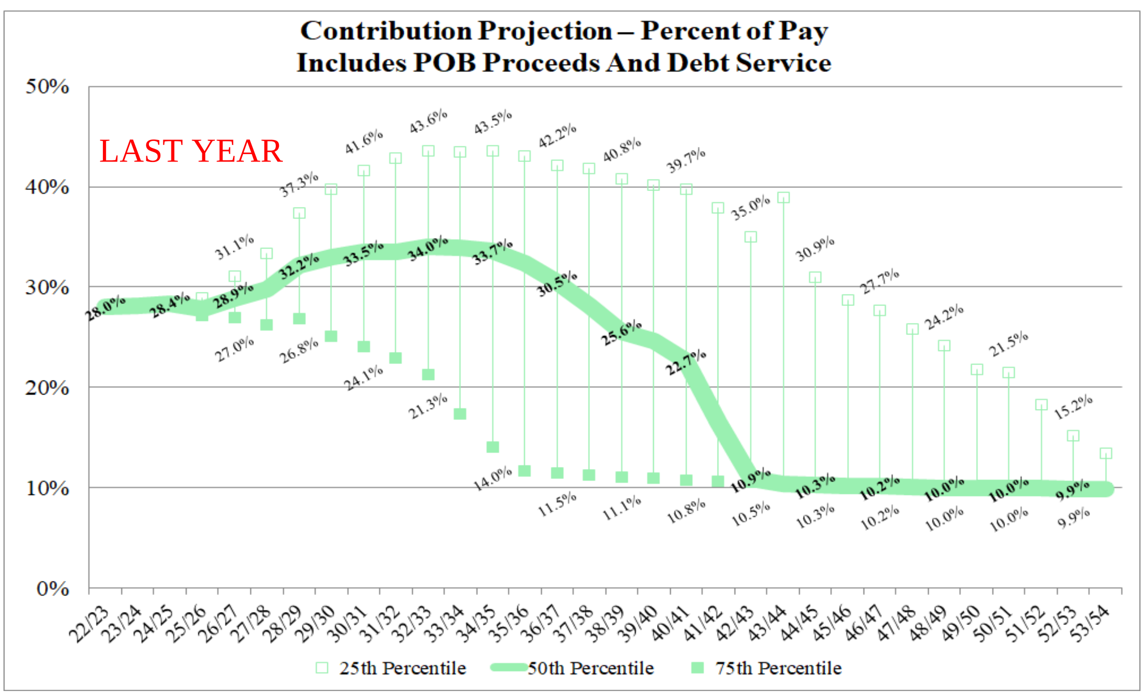

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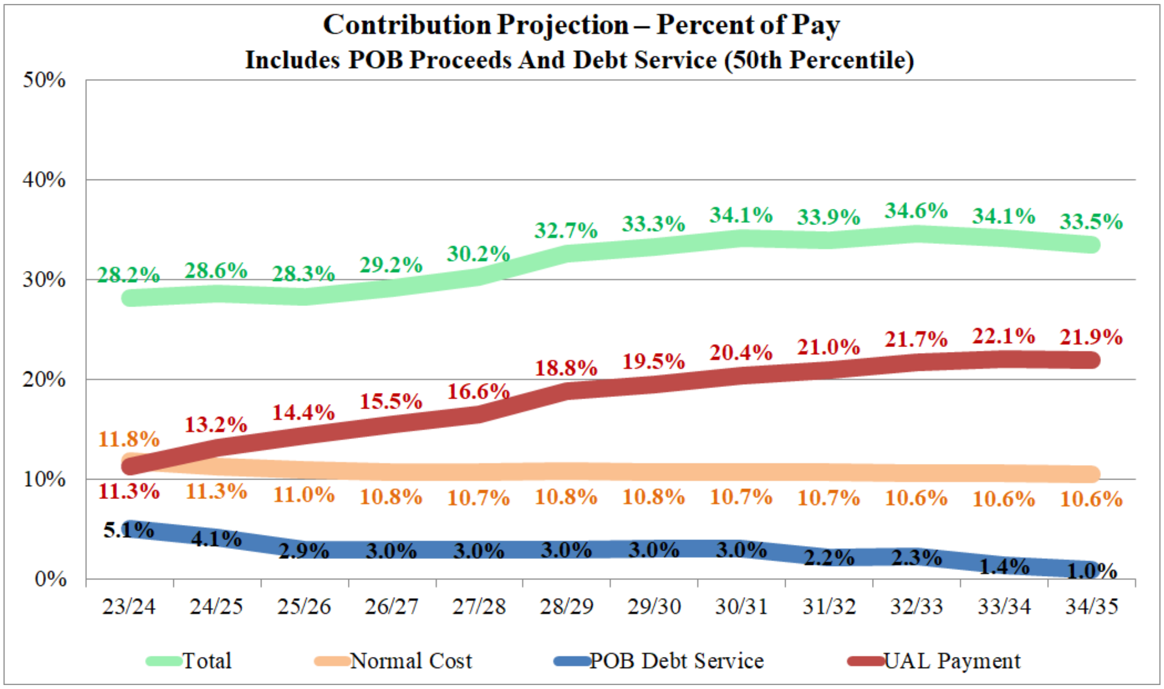

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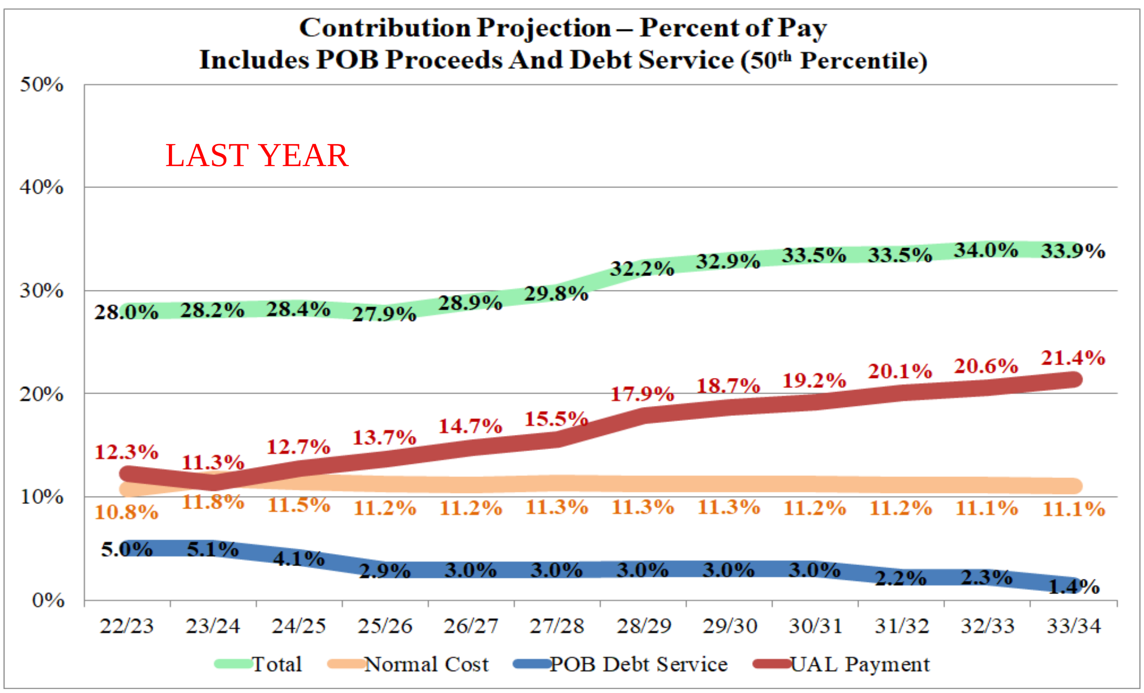

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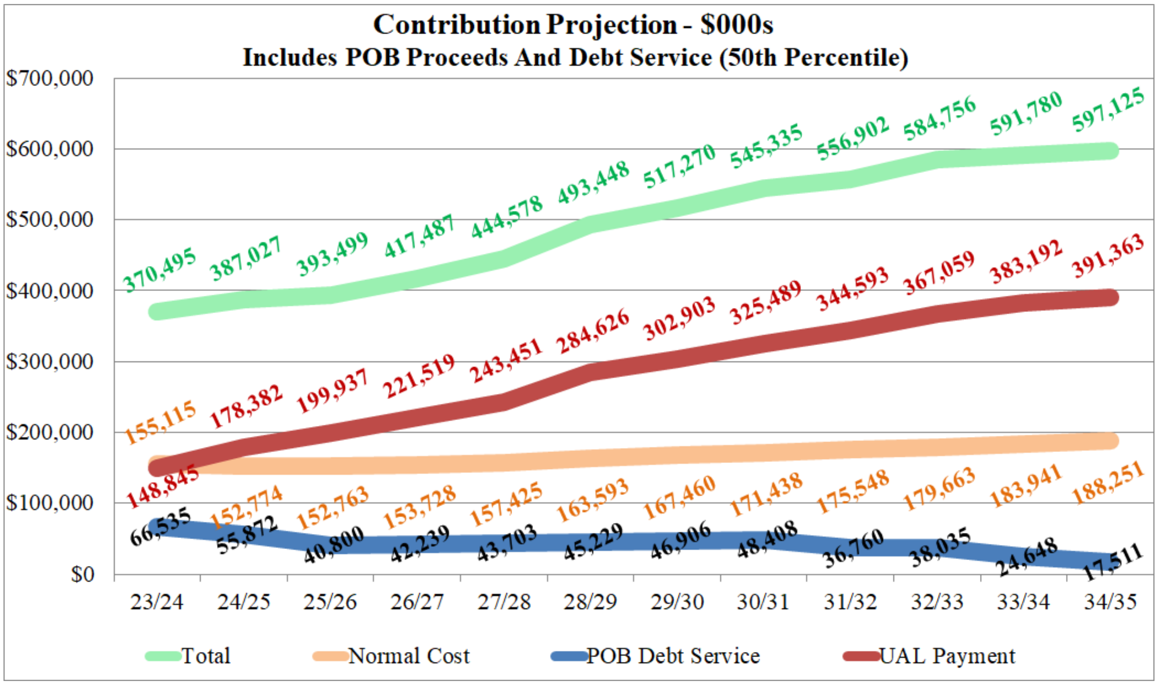

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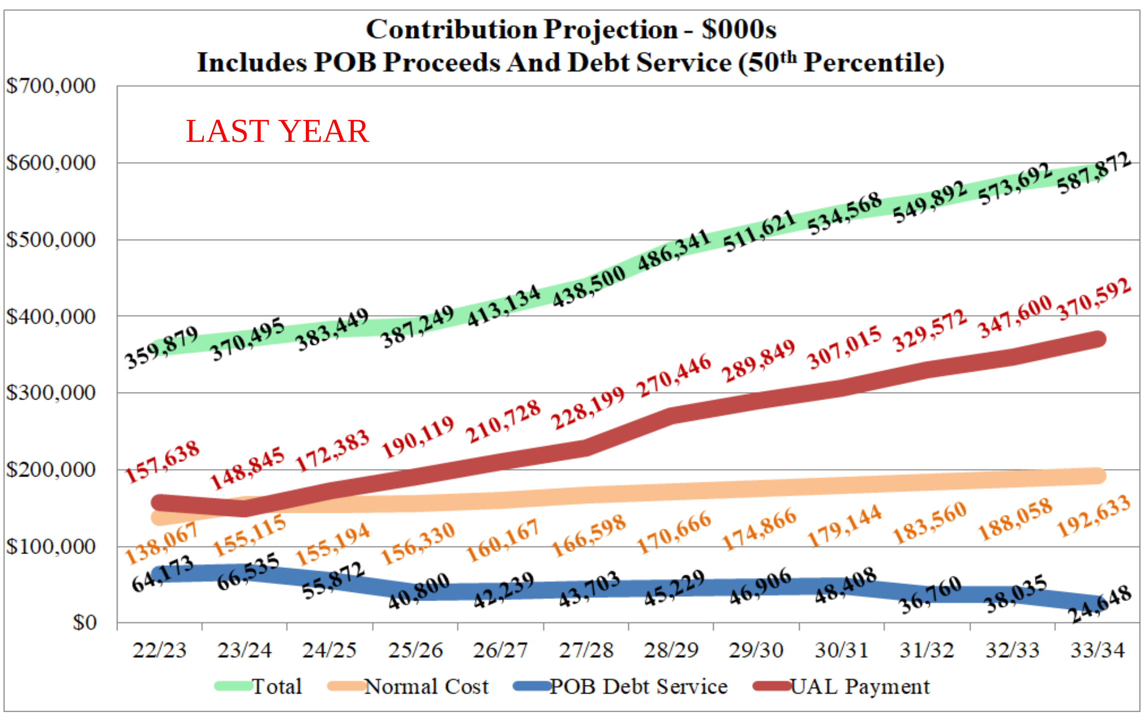
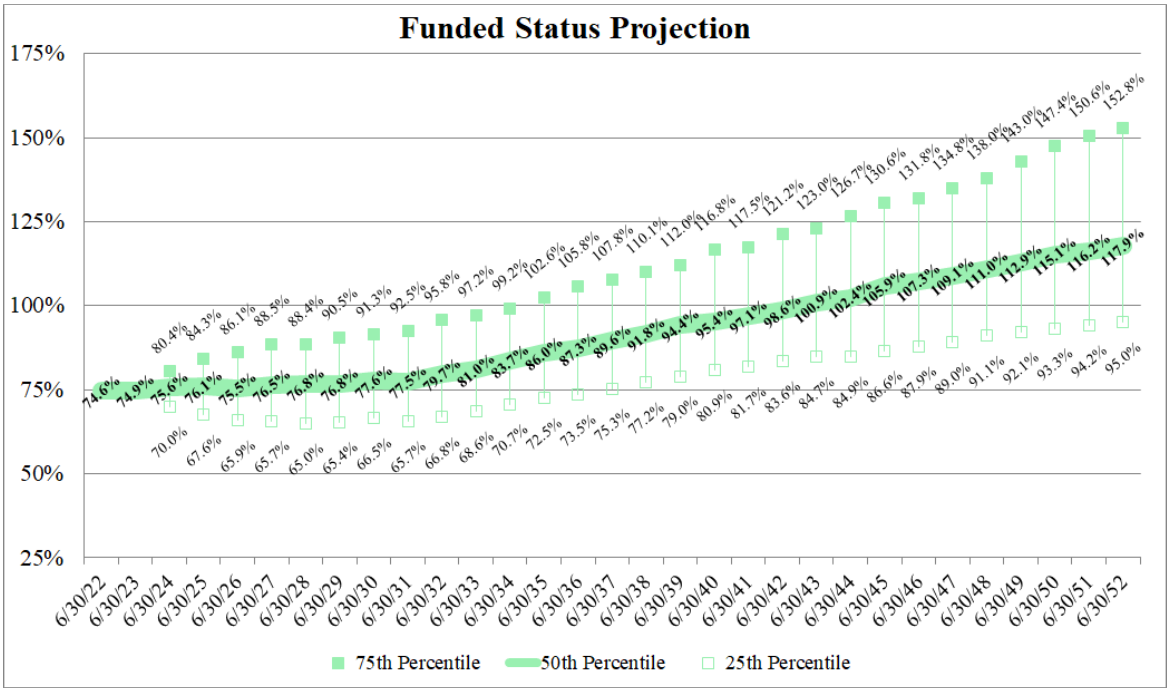
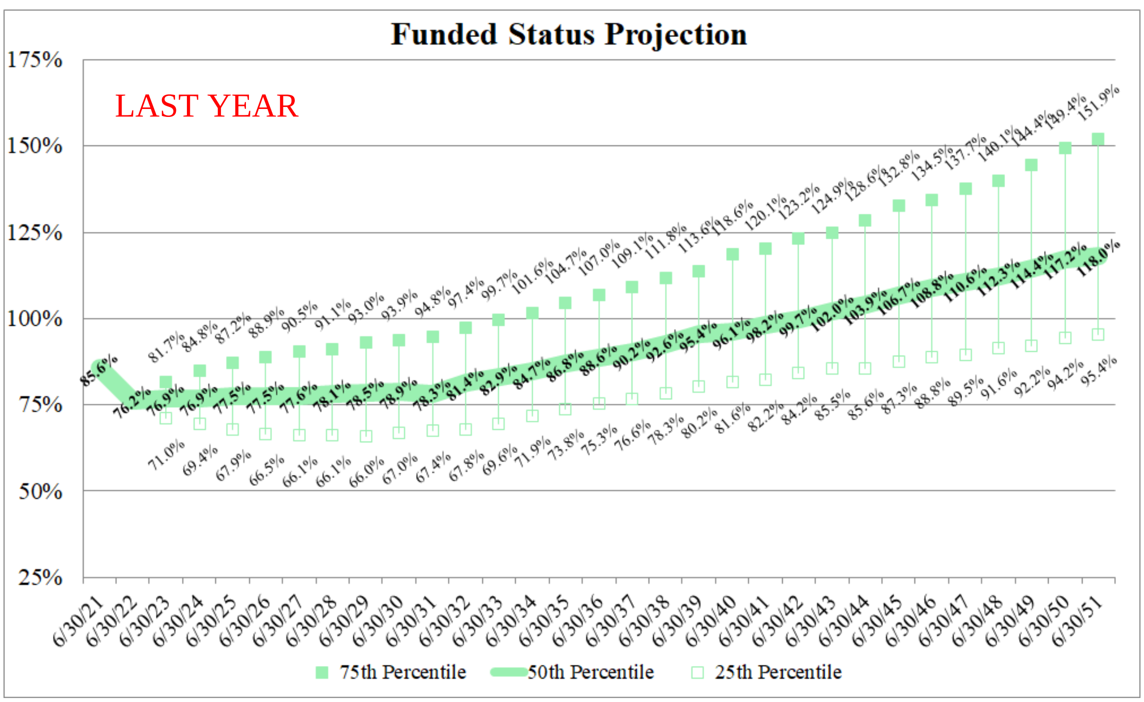


FUNDED STATUS - MISCELLANEOUS



November 8, 2023

FUNDED STATUS - MISCELLANEOUS



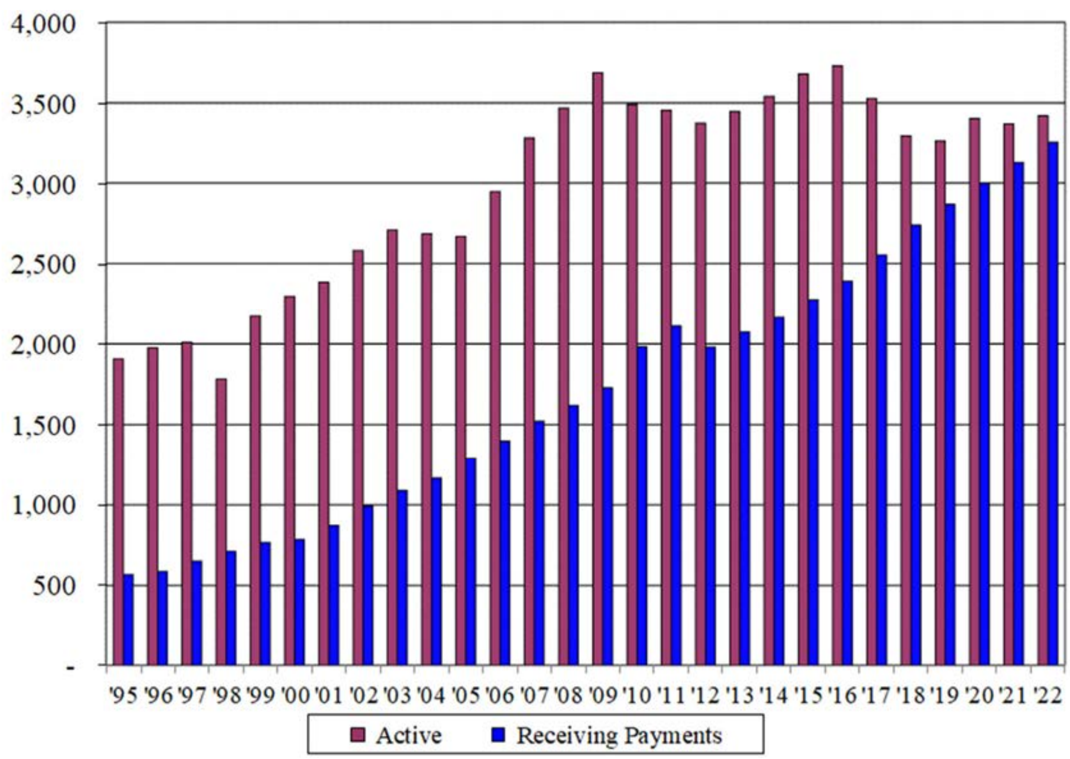
November 8, 2023

SUMMARY OF DEMOGRAPHIC INFORMATION - SAFETY

	2002	2012	2021	2022
Actives				
■ Counts	2,581	3,374	3,370	3,421
■ Average				
• Age	39	39	40	40
• County Service	9	10	12	12
• PERSable Wages	$ 53,200	$ 77,600	$ 96,000	$ 97,600
■ Total PERSable Wages	137,200,000	261,700,000	323,700,000	333,900,000
Inactive Members				
■ Counts				
• Transferred	444	534	689	705
• Separated	274	508	786	891
• Retired				
□ Service	462	1,277	2,153	2,258
□ Disability	430	538	669	676
□ Beneficiaries	101	165	304	322
□ Total	993	1,980	3,126	3,256
■ Average Annual County Provided Benefit for Service Retirees[11]	$ 27,300	$ 49,100	$ 63,900	$ 66,100

[11] Average County-provided pensions are based on County service & County benefit formula, and are not representative of benefits for long-service employees.

SUMMARY OF DEMOGRAPHIC INFORMATION - SAFETY

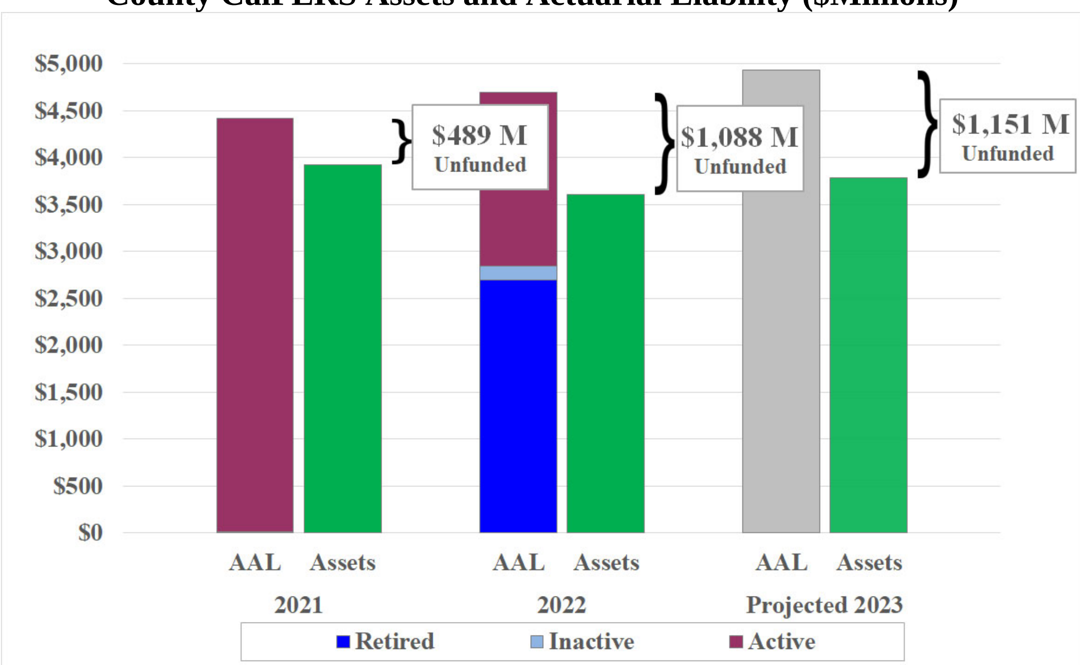


Plan Funded Status - Safety

	June 30, 2021	June 30, 2022
■ **Actuarial Accrued Liability**		
● Active	$ 1,779,900,000	$ 1,842,800,000
● Retiree	2,500,700,000	2,698,500,000
● Inactive	136,300,000	149,700,000
● Total	4,416,900,000	4,691,000,000
■ **Assets**	3,928,100,000	3,603,400,000
■ **Unfunded Liability**	488,800,000	1,087,600,000
■ **Funded Ratio**	88.9%	76.8%
■ **Average funded ratio for CalPERS Public Agency Safety Plans**	80.9%	73.0%

Plan Funded Status - Safety

County CalPERS Assets and Actuarial Liability ($Millions)[12]



[12] Projected 2023 assets reflects 5.8% CalPERS investment return for 2022/23.

Discount Rate Sensitivity

June 30, 2022

	Discount Rate		
	6.80%	**6.30%**[13]	**5.80%**
AAL	$ 4,691,000,000	$ 5,047,000,000	$ 5,402,900,000
Assets	3,603,400,000	3,603,400,000	3,603,400,000
Unfunded Liability	1,087,600,000	1,443,600,000	1,799,500,000
Funded Ratio	76.8%	71.4%	66.7%

[13] Estimated by Foster & Foster.

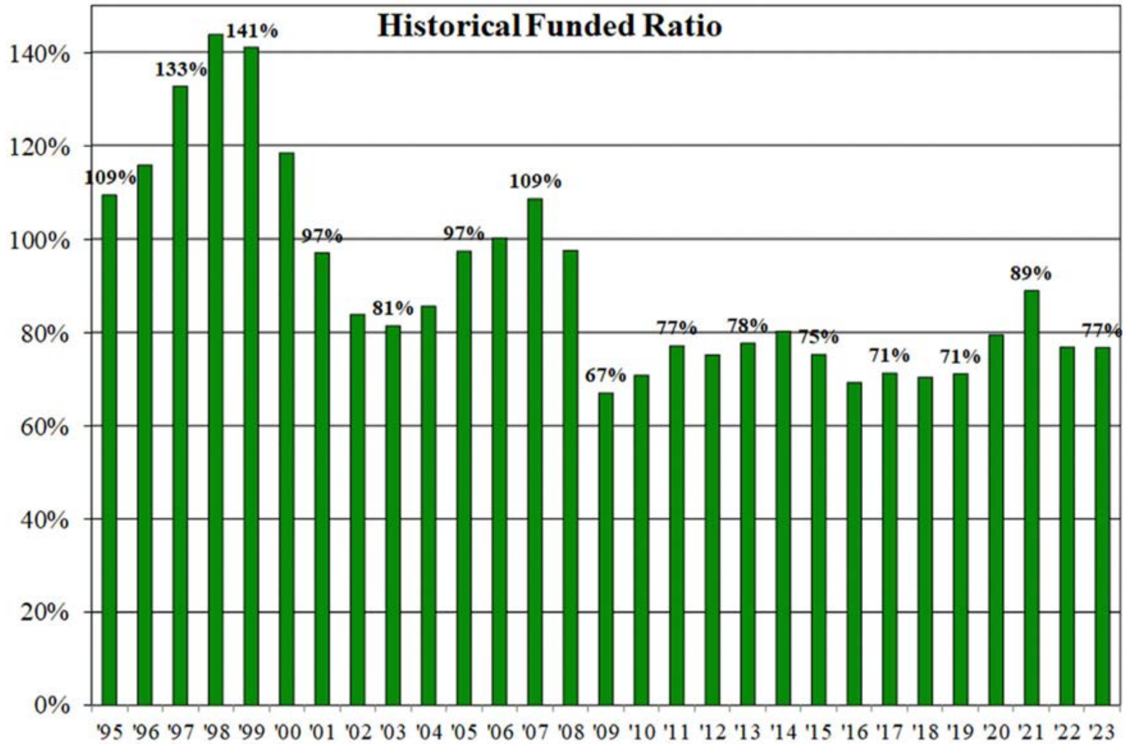
Unfunded Accrued Liability Changes

■ **Unfunded Accrued Liability on 6/30/21**		$ 488,800,000
■ **Expected 6/30/22 Unfunded Accrued Liability**		475,600,000
■ **Changes**		
• Benefit change[14]	1,700,000	
• Asset Loss (Gain) (-7.5% return for FY 2022)	566,800,000	
• Contribution & Experience Loss (Gain)	43,600,000	
• Total		612,100,000
■ **Unfunded Accrued Liability on 6/30/22**		1,087,600,000
■ **Projected Unfunded Accrued Liability on 6/30/23**[15]		1,150,700,000

[14] SB 1168 increased the standard post-retirement lump sum death benefit from $500 to $2,000 for deaths occurring on or after July 1, 2023.

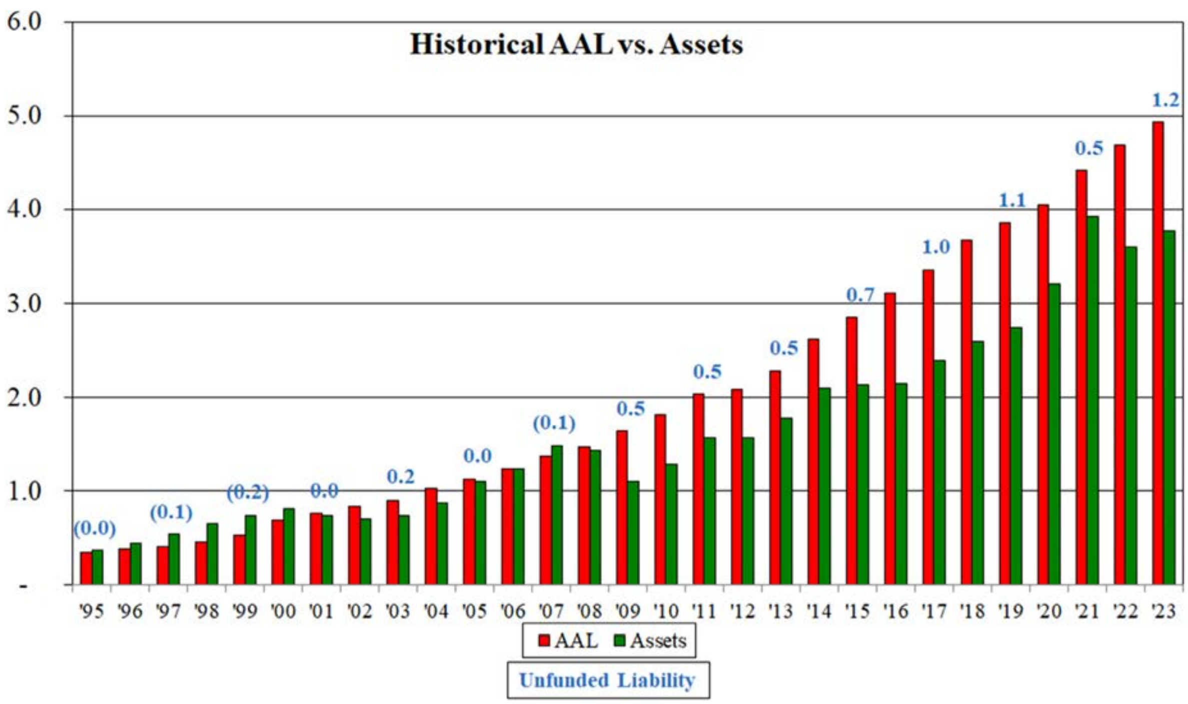
[15] Projected 2023 assets reflects 5.8% CalPERS investment return for 2022/23.

FUNDED RATIO - SAFETY



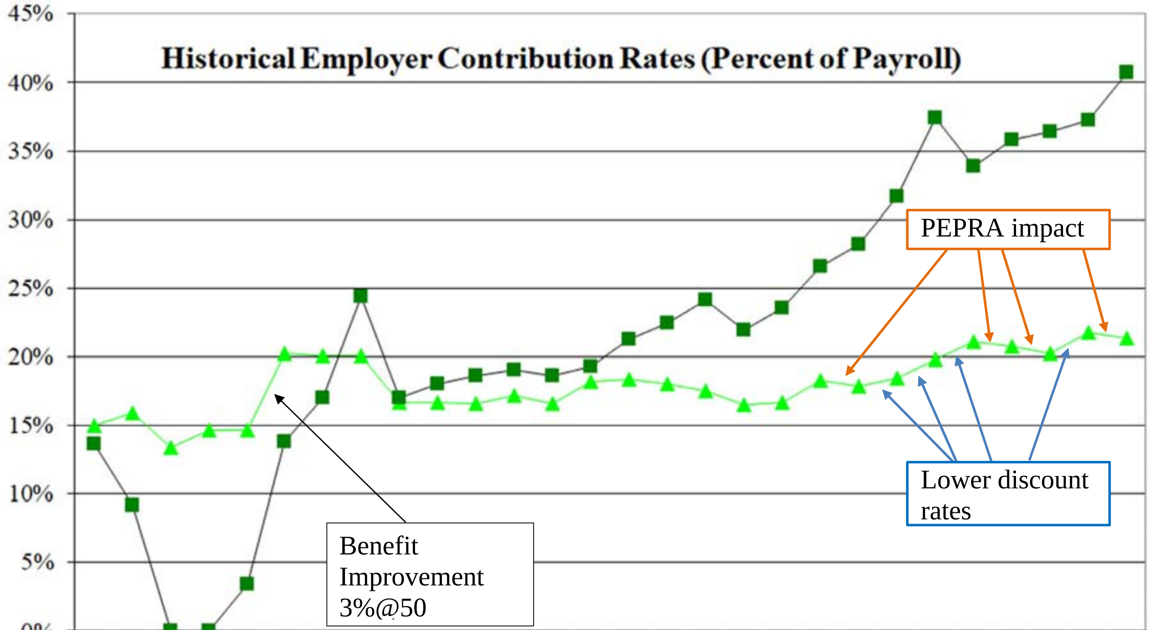
6/30/23 funded status estimated

FUNDED STATUS (BILLIONS) - SAFETY



6/30/23 funded status estimated

Contribution Rates - Safety



	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11
Normal Cost	15.0%	16.0%	13.4%	14.7%	14.7%	20.3%	20.1%	20.1%	16.7%	16.7%	16.6%	17.2%	16.6%	18.2%
Total Rate	13.6%	9.1%	0.0%	0.0%	3.4%	13.8%	17.0%	24.4%	17.0%	18.0%	18.6%	19.0%	18.6%	19.3%

	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Normal Cost	18.4%	18.1%	17.5%	16.6%	16.7%	18.3%	17.9%	18.5%	19.9%	21.1%	20.7%	20.2%	21.7%	21.4%
Total Rate	21.3%	22.5%	24.1%	21.9%	23.6%	26.6%	28.2%	31.6%	37.4%	33.9%	35.8%	36.4%	37.3%	40.7%

Contribution Rates - Safety

	6/30/21 2023/2024	6/30/22 2024/2025
■ Total Normal Cost	31.9%	31.7%
■ Employee Normal Cost	10.2%	10.3%
■ Employer Normal Cost	21.7%	21.4%
■ Amortization Payments	15.5%	19.3%[16]
■ Total Employer Contribution Rate	37.3%	40.7%

■ 2023/24 Employer Contribution Rate	37.3%
● Payroll > Expected	(0.1%)
● 6/30/18 Discount Rate change (5th Year)	0.8%
● 6/30/22 Plan change (1st Year, no ramp)	0.0%
● Other (Gains)/Losses mainly net investment loss	2.7%
■ 2024/25 Employer Contribution Rate	40.7%

[16] Equivalent to 6.4% of UAL. One year, 6.8% interest on the UAL is 20.4% of payroll. 2024/25 amortization payment does not exceed interest on the UAL, so there is “negative amortization.”

CONTRIBUTION PROJECTION - SAFETY

- Investment returns:
  -
  - June 30, 2023 5.8%[17]
  - Future returns based on stochastic analysis using 1,000 trials
  - Single year returns[18] with current investment mix, no risk mitigation:

	Percentile		
	25th	50th	75th
First 10 years	**-1.8%**	**6.0%**	**14.7%**
After 10 years	**-0.7%**	**7.5%**	**16.4%**

  - Assumes investment returns will generally be lower over the next 8 years and higher beyond that.
- Discount Rate decreases due to Risk Mitigation policy – Ultimate rate 6.0%
- No Other: Gains/Losses, Method/Assumption Changes, Benefit Improvements
- Different from CalPERS projection
- Impact of Risk Mitigation Policy:
  - Net impact of investment gain and discount rate change amortized over 20 years with 5 year ramp up
  - Same amortization method for all future years

17 Gross return based on June 30, 2023 CalPERS News Release issued in July 2023.
18 Nth percentile means N percentage of our trials result in returns lower than the indicated rates.

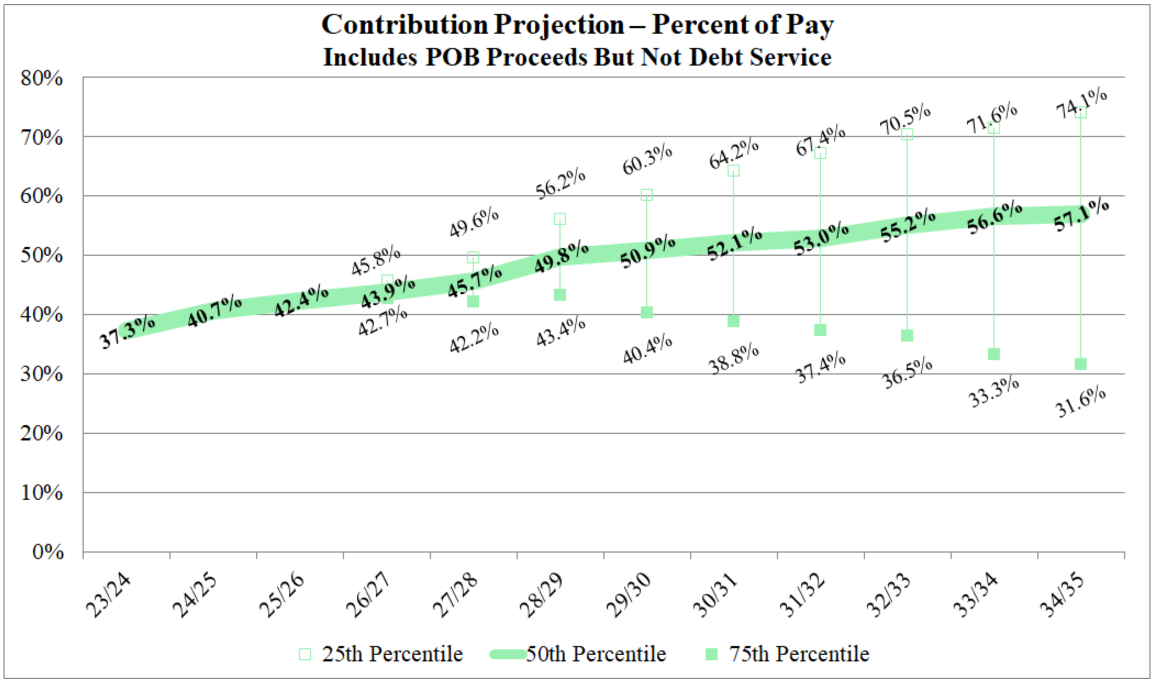
CONTRIBUTION PROJECTION - SAFETY

- New hire assumptions:
  - All new hires assumed PEPRA members and none are Classic members

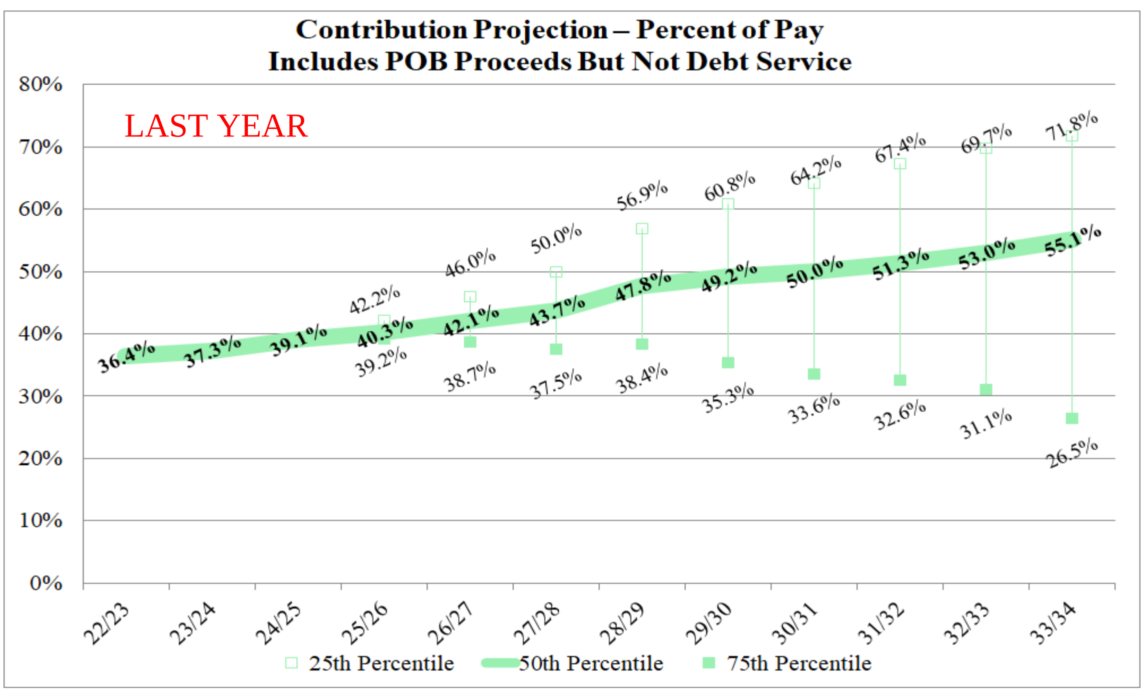
- 6/30/22 employee distribution:

Benefit Tier	Count	% of Total	21/22 Payroll	% of Total
• 3%@50 FAE1	1,898	55.5%	$222,291,400	66.6%
• 2%@50 FAE3	166	4.9%	16,748,300	5.0%
• 2.7%@62 FAE3 (PEPRA)	1,357	39.6%	94,902,200	28.4%
• Total	3,421	100%	333,941,900	100%

CONTRIBUTION PROJECTION - SAFETY



CONTRIBUTION PROJECTION - SAFETY



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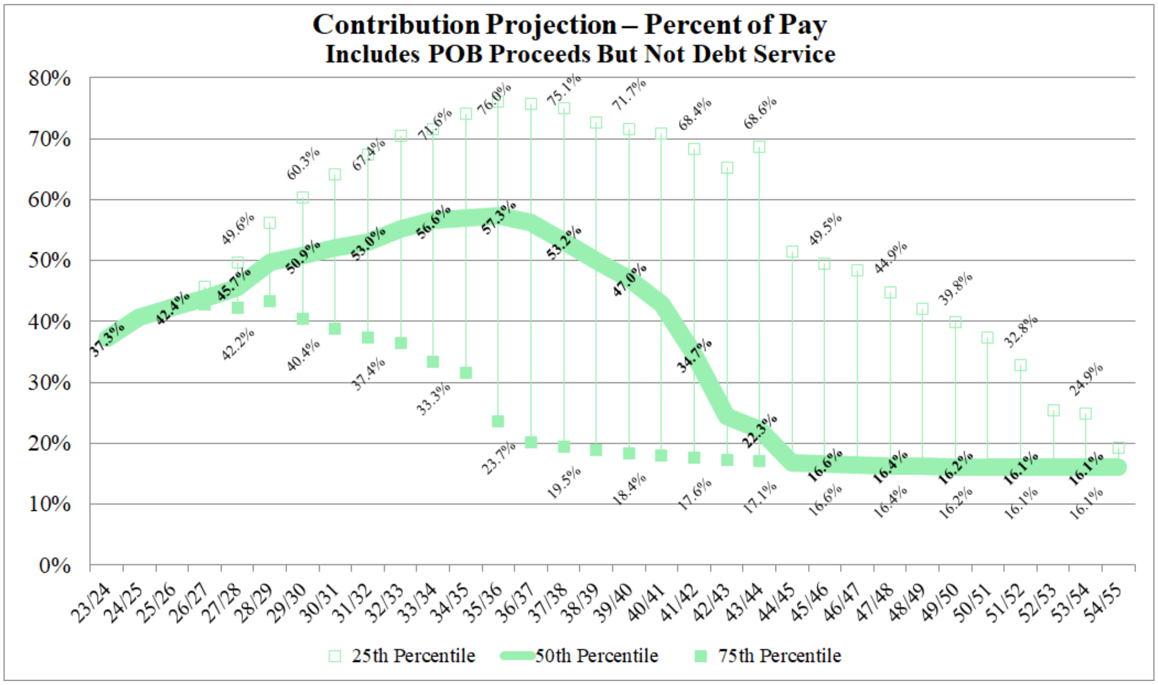

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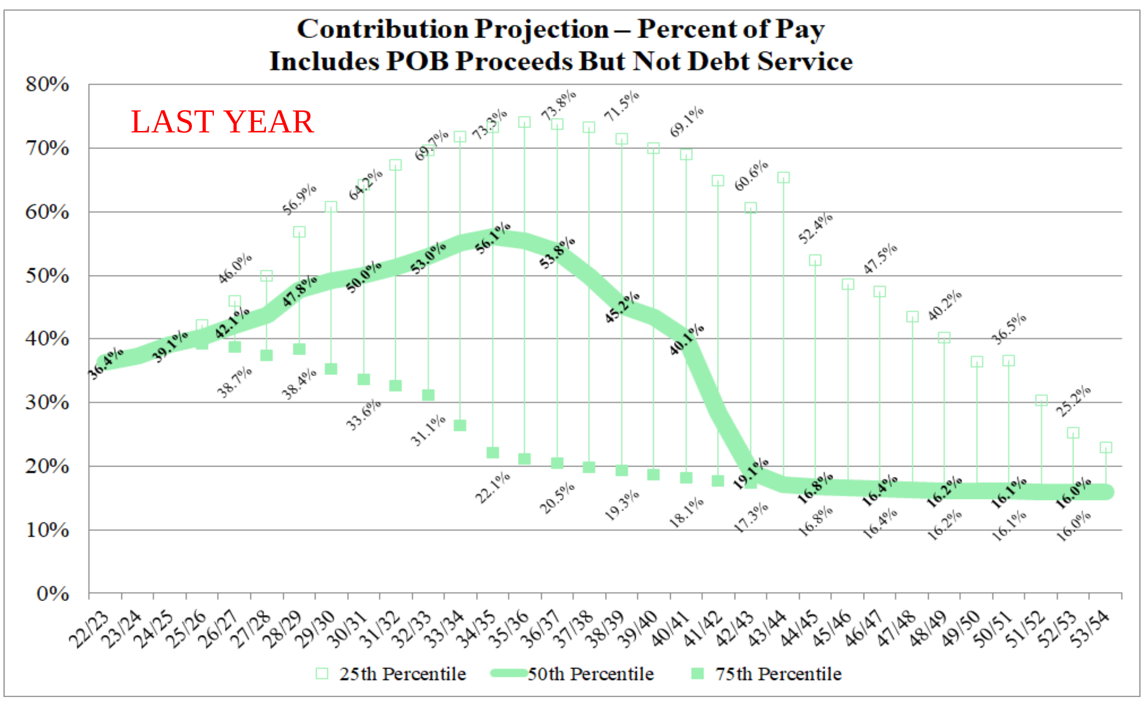

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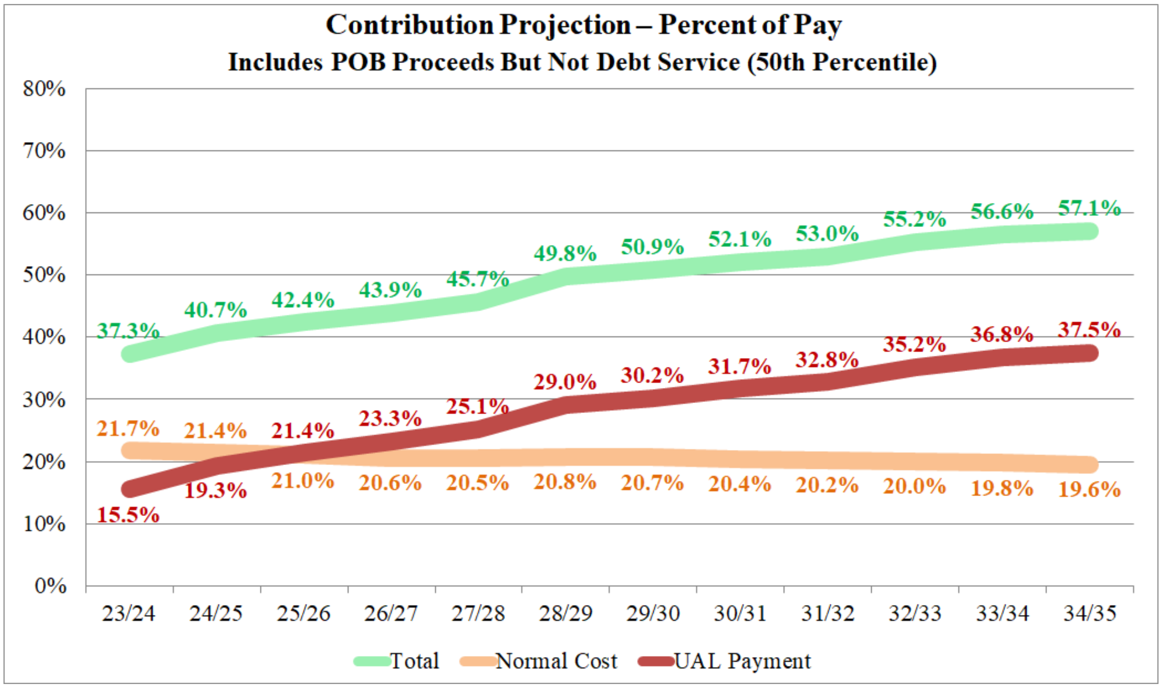

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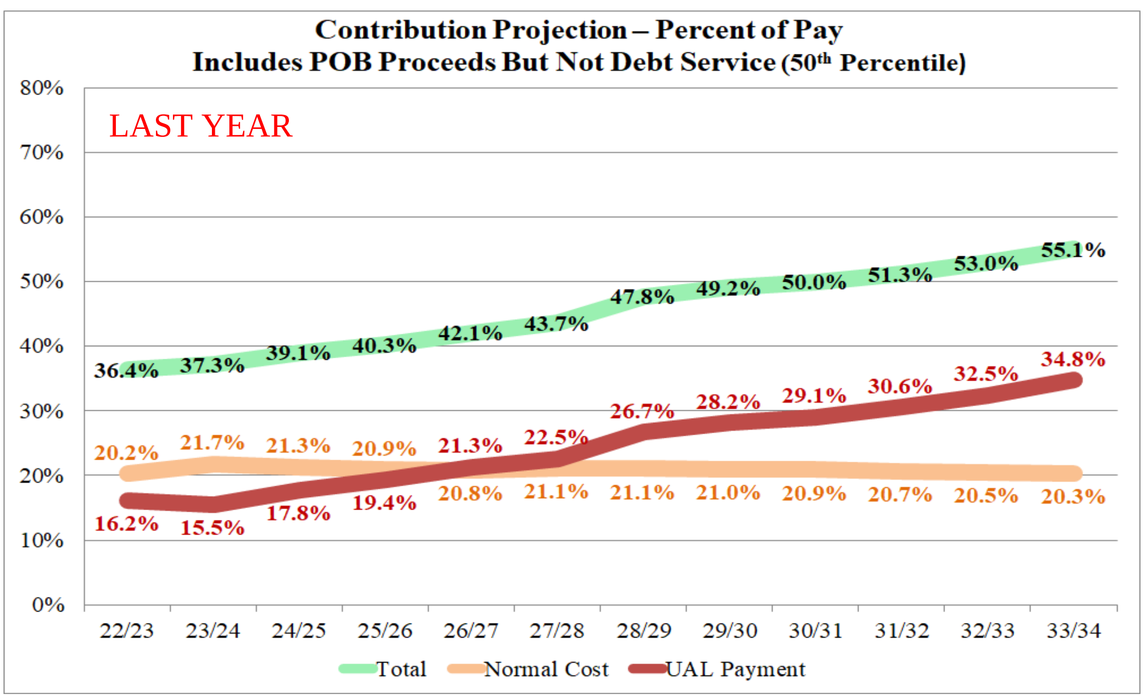

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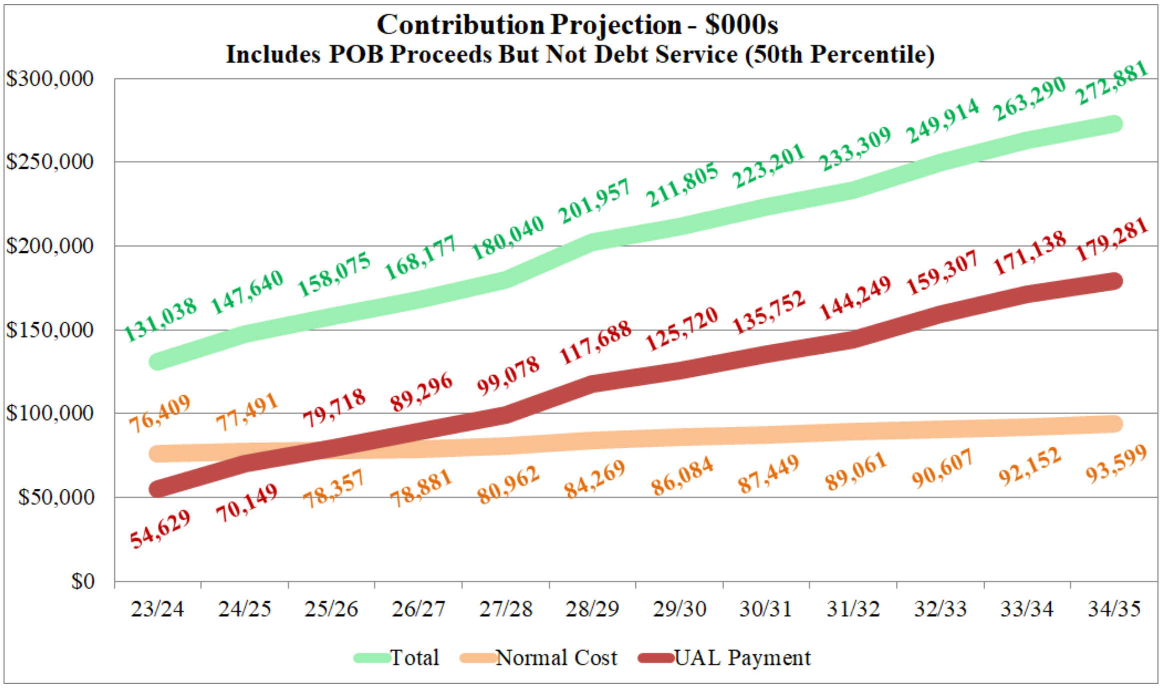

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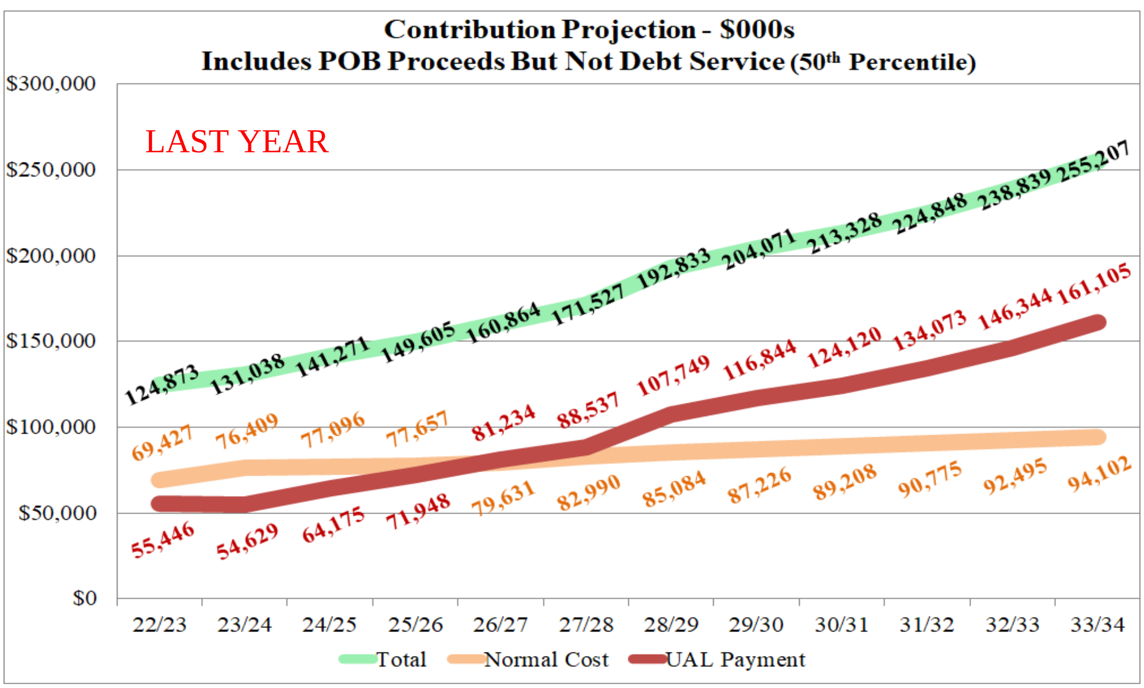

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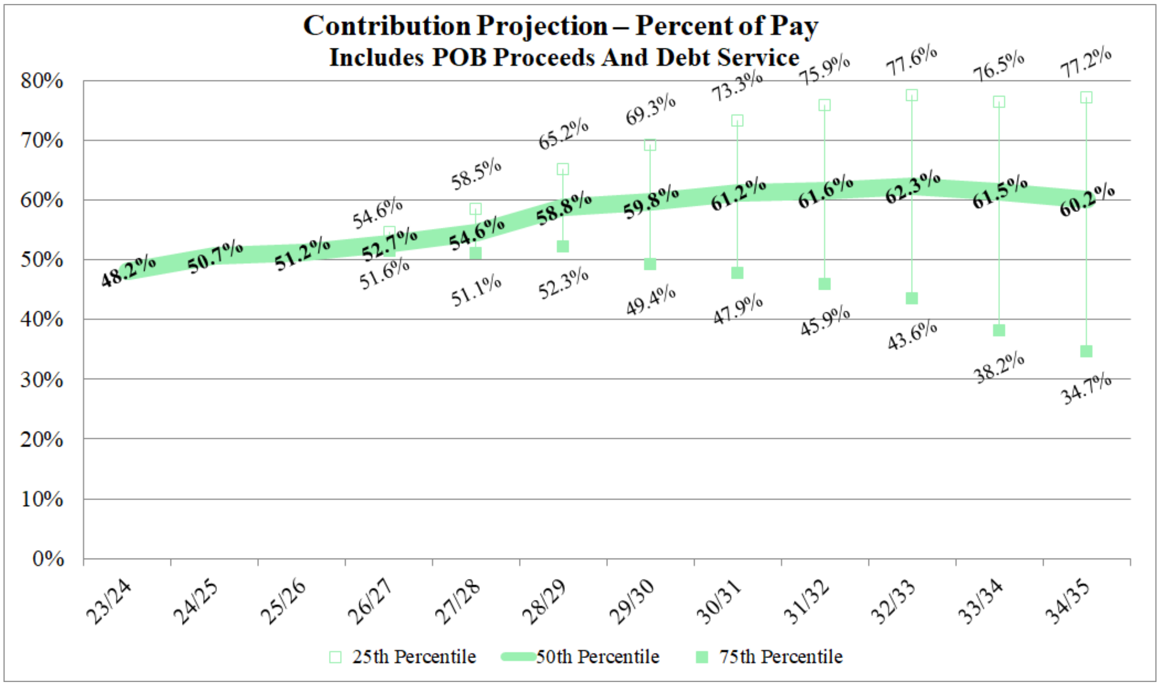

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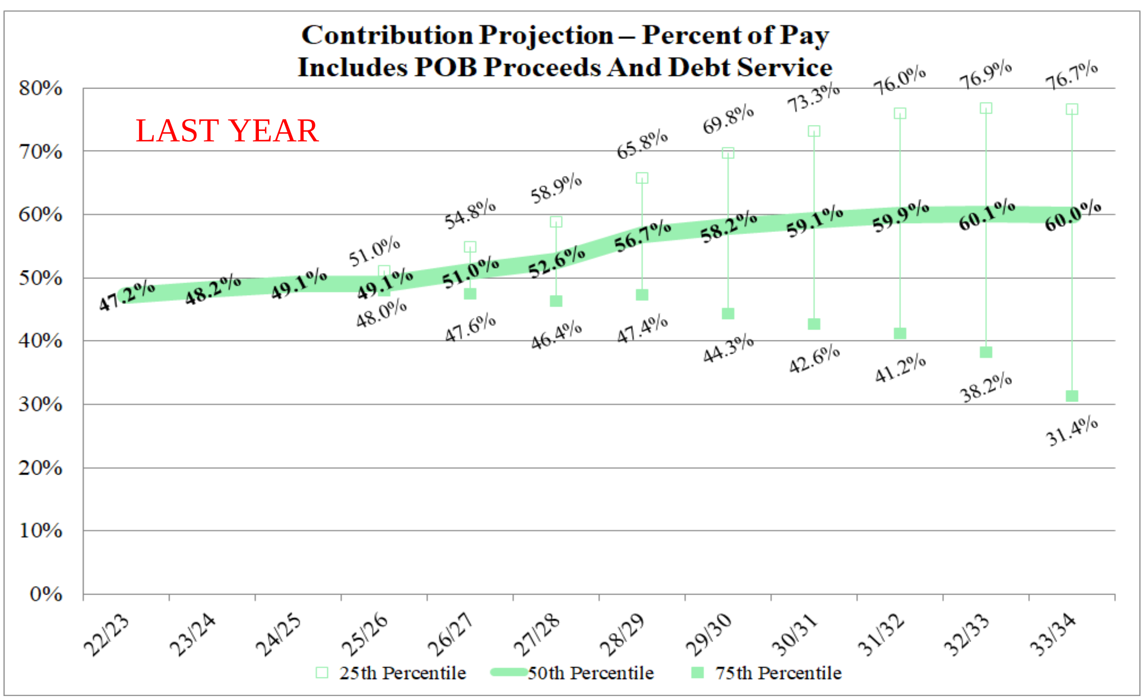

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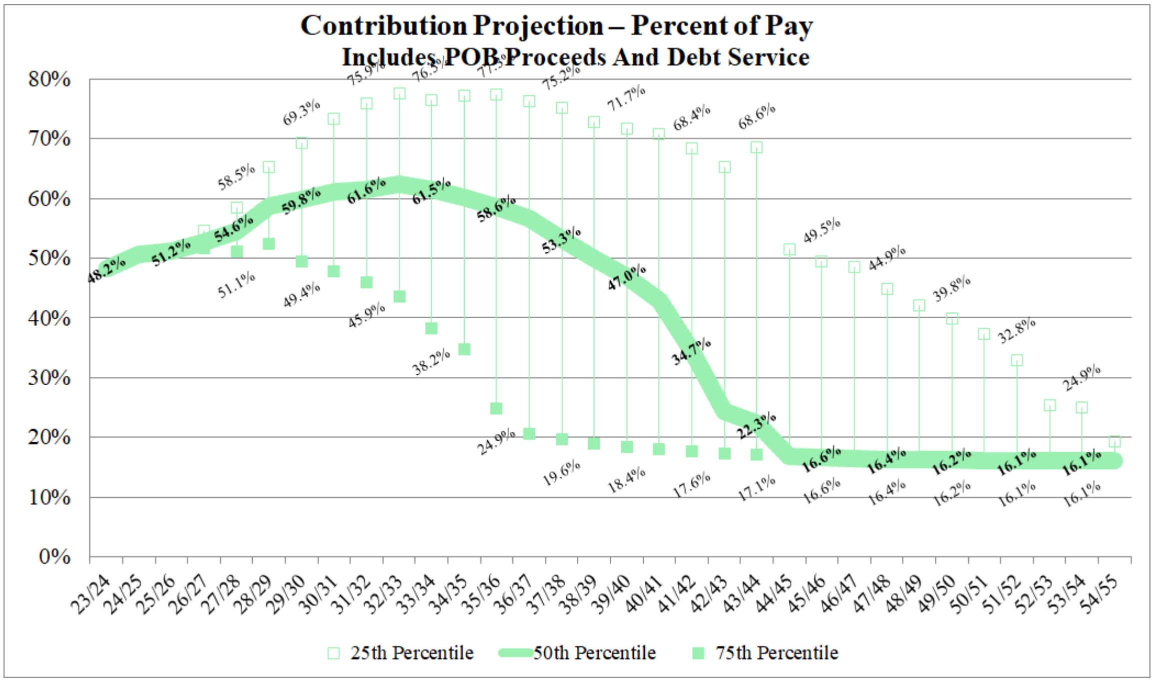

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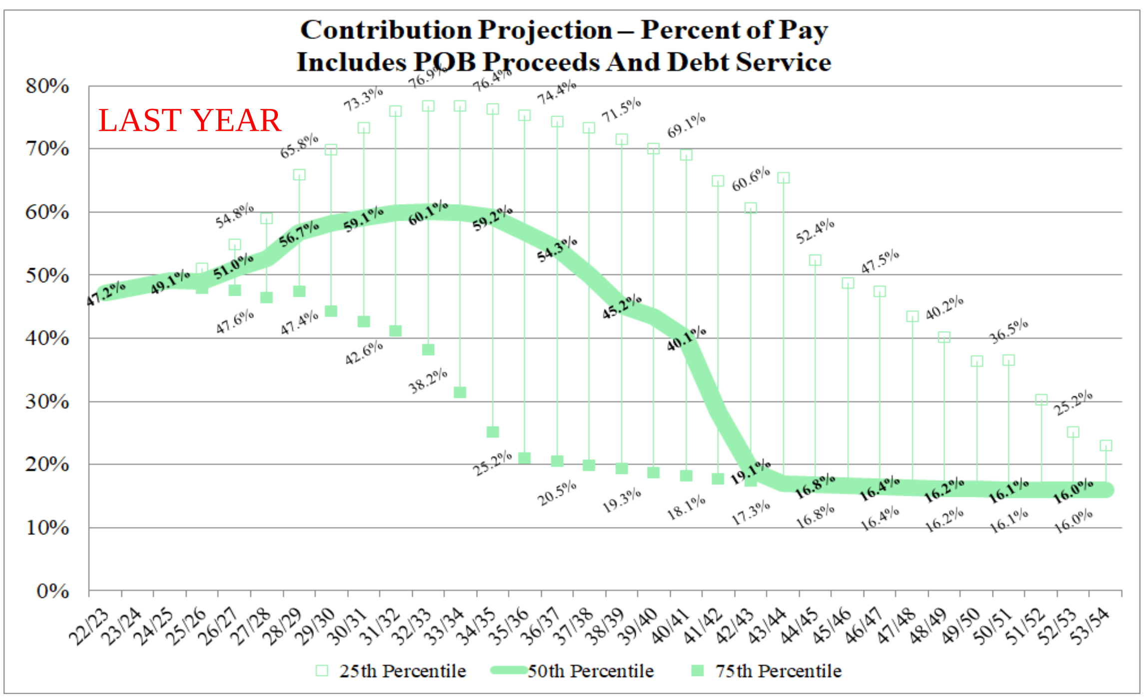
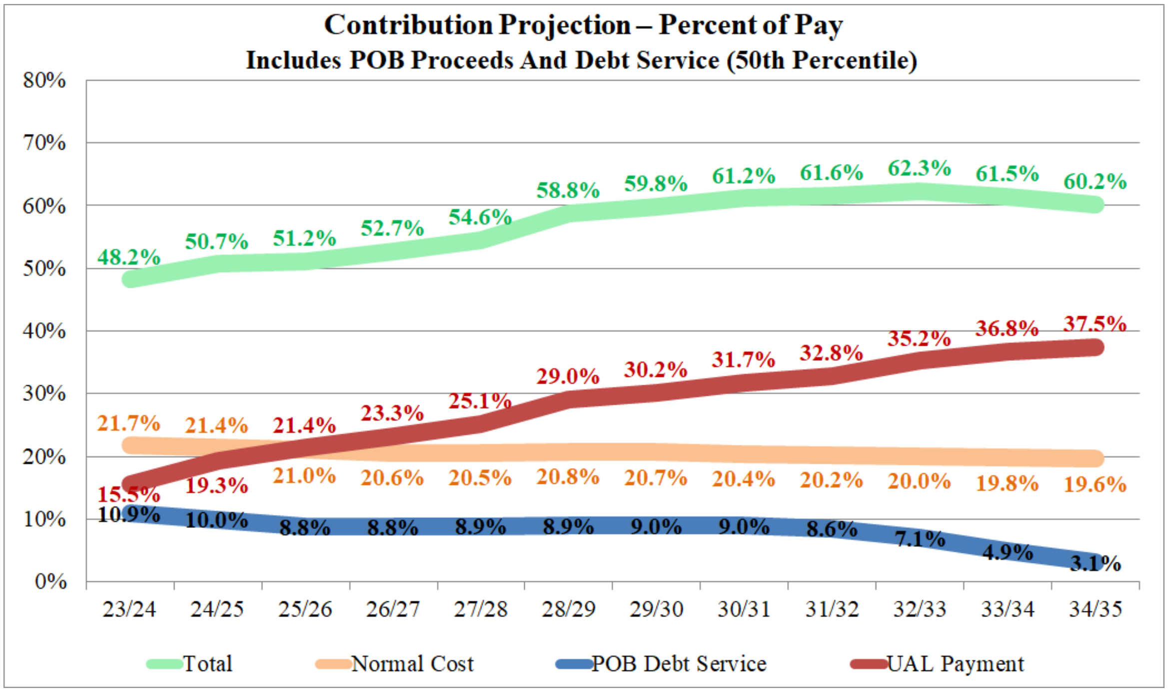


Contribution Projection - Safety



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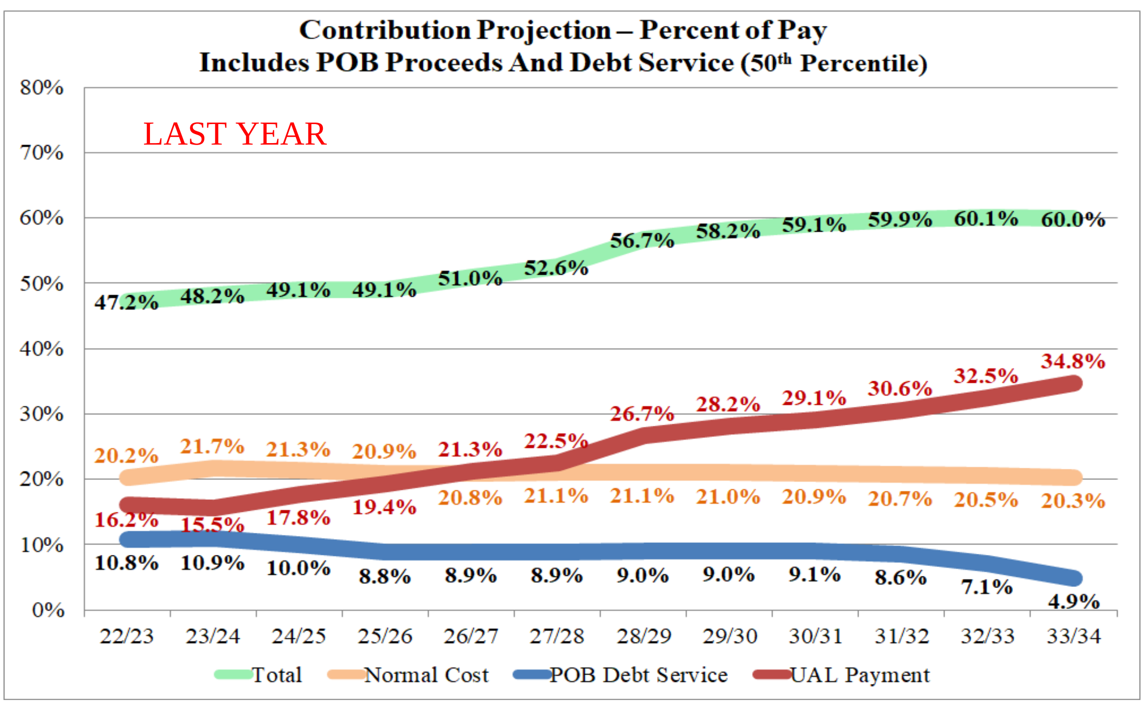

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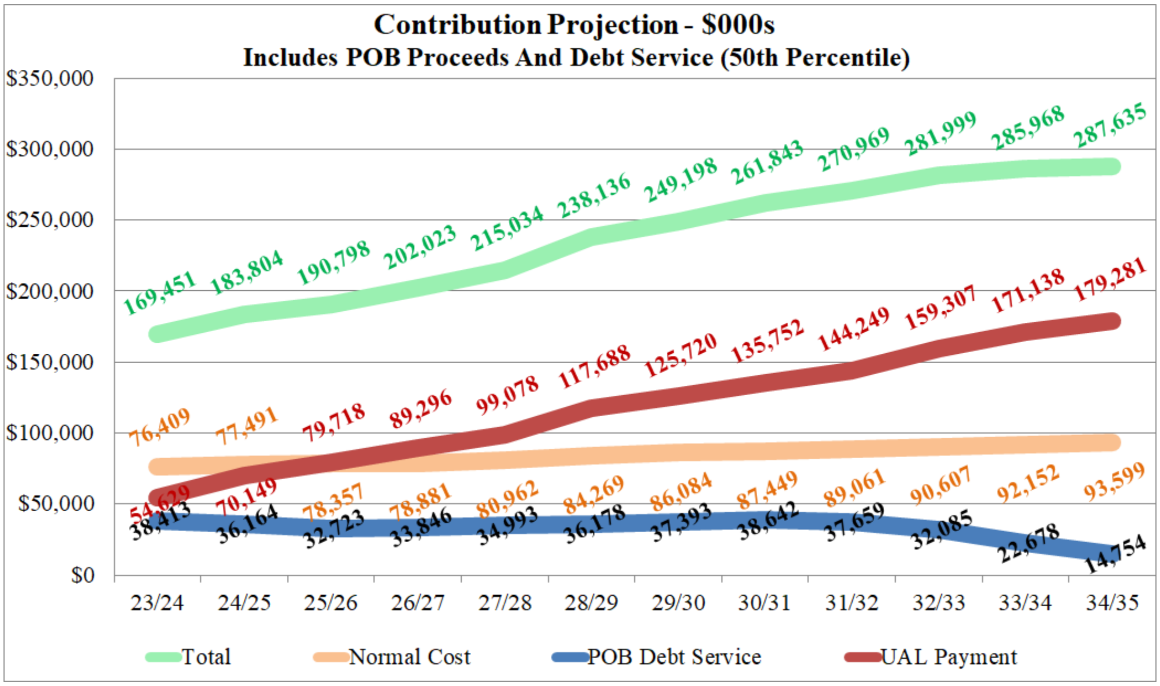

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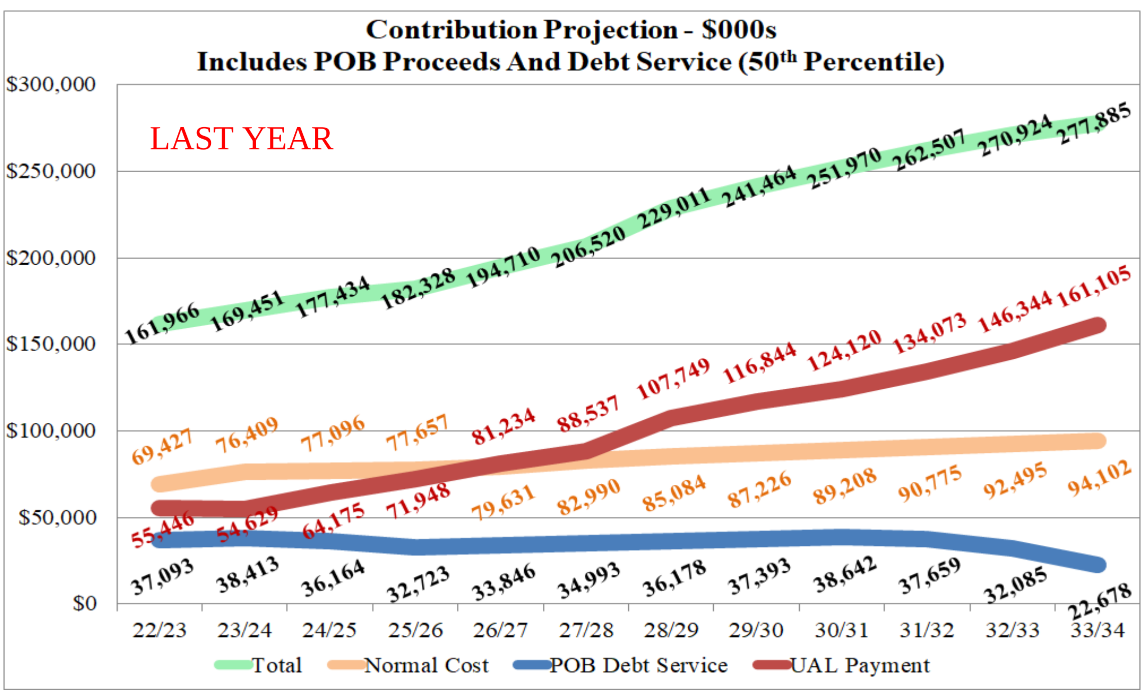
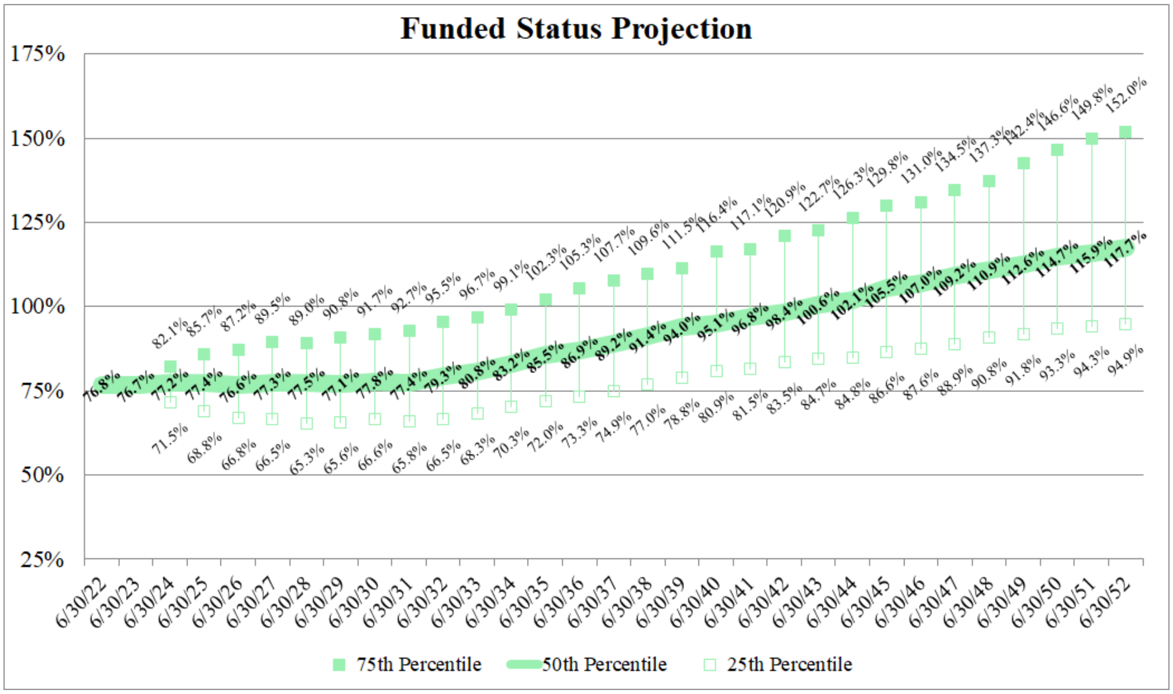


FUNDED STATUS - SAFETY



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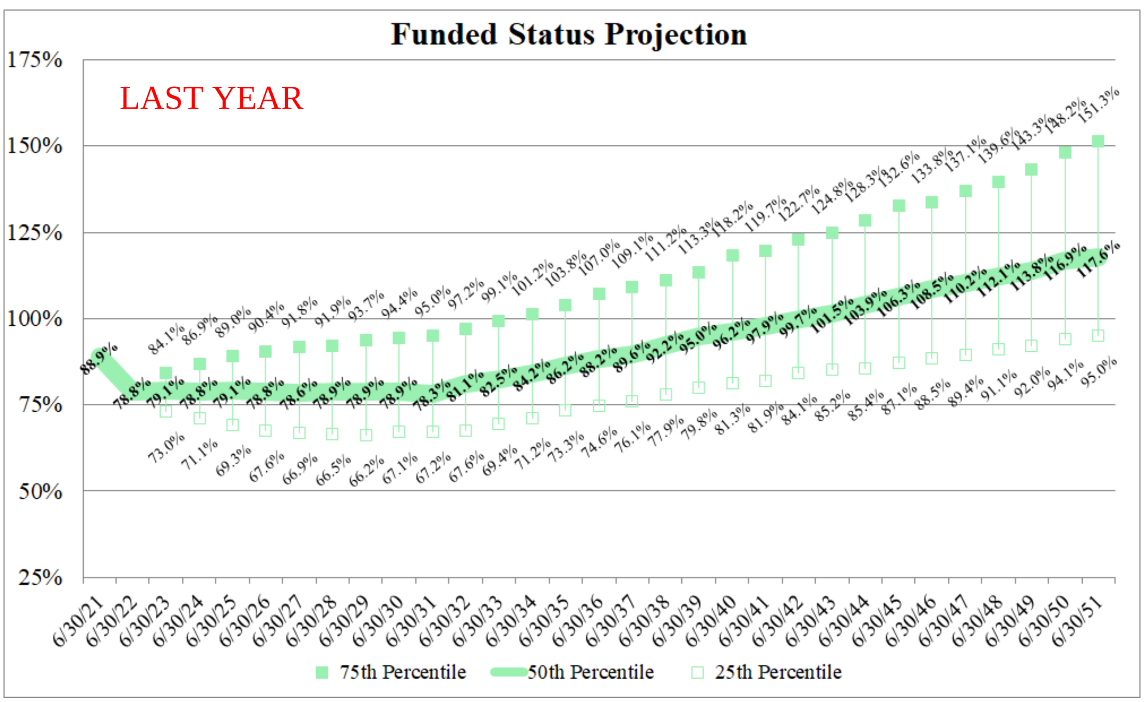
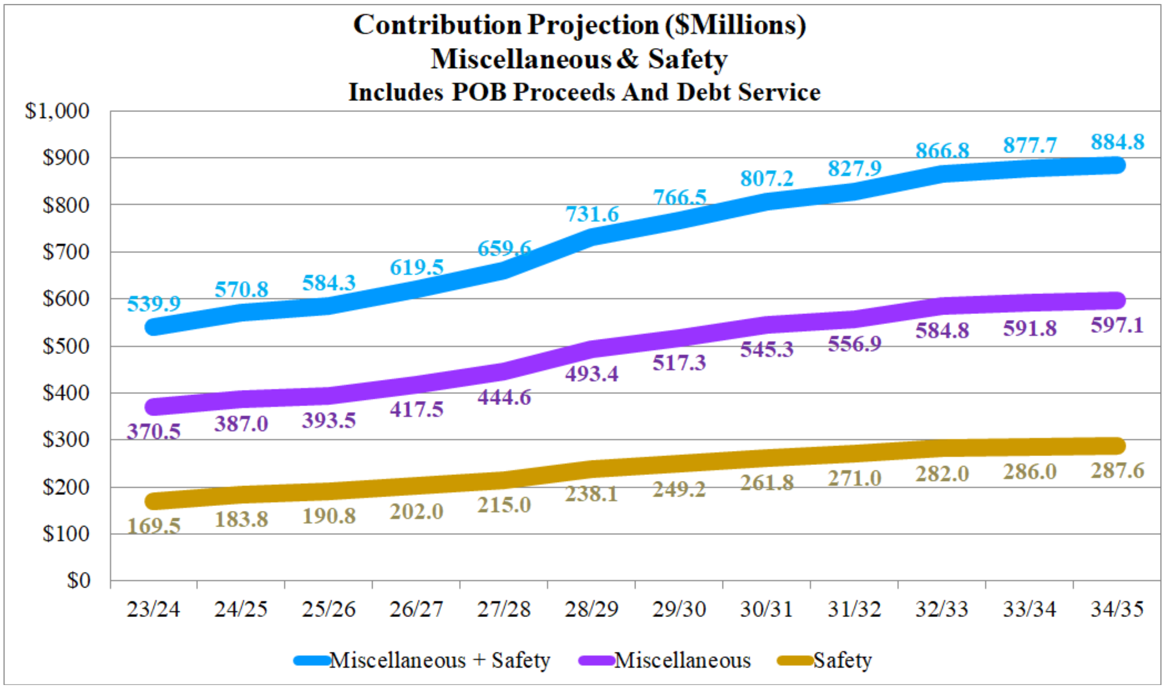
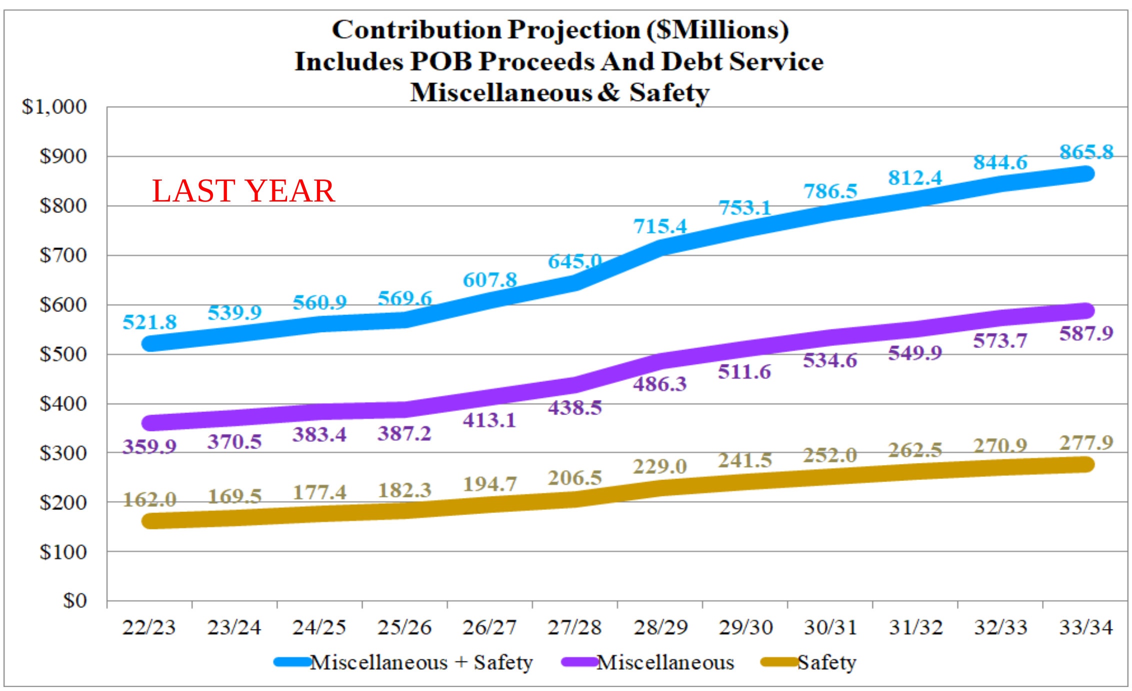


COMBINED MISCELLANEOUS AND SAFETY



COMBINED MISCELLANEOUS AND SAFETY



Funded Status Summary on June 30, 2022

(Amounts in $Millions)

	Miscellaneous	Safety	Total
■ AAL	$ 10,195.5	$ 4,691.0	$ 14,886.5
■ Assets	7,608.8	3,603.4	11,212.2
■ Unfunded AAL	2,586.7	1,087.6	3,674.3
■ Funded Ratio	74.6%	76.8%	75.3%

Projected Funded Status Summary on June 30, 2023[19]

(Amounts in $Millions)

	Miscellaneous	Safety	Total
■ AAL	$ 10,708.7	$ 4,930.6	$ 15,639.3
■ Assets	8,015.4	3,780.0	11,795.4
■ Unfunded AAL	2,693.3	1,150.6	3,843.9
■ Funded Ratio	74.8%	76.7%	75.4%

[19] Projected 2023 assets reflects 5.8% CalPERS investment return for 2022/23.

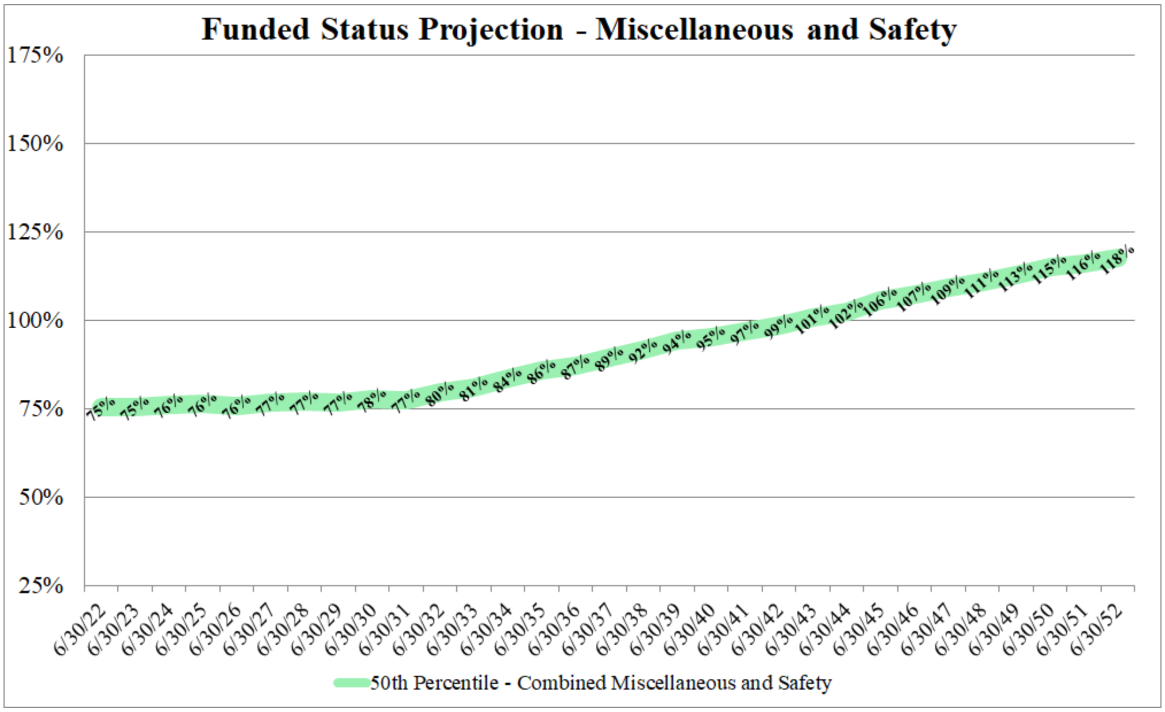
Payroll Projections

($000s)

FY	23/24	24/25	25/26	26/27	27/28
Miscellaneous	$1,315,646	$1,353,178	$1,391,067	$1,430,017	$1,470,058
Safety	351,629	362,786	372,944	383,386	394,121
Total	1,667,275	1,715,964	1,764,011	1,813,403	1,864,179

FY	28/29	29/30	30/31	31/32	32/33
Miscellaneous	$1,511,219	$1,553,534	$1,597,032	$1,641,749	$1,687,718
Safety	405,156	416,501	428,163	440,151	452,476
Total	1,916,375	1,970,035	2,025,195	2,081,900	2,140,194

FY	33/34	34/35
Miscellaneous	$1,734,974	$1,783,554
Safety	465,145	478,169
Total	2,200,119	2,261,723



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LEAVING CALPERS

- Participation in CalPERS is governed by State law and CalPERS rules
- The following are considered "withdrawing" from CalPERS:
  - Exclude new hires from CalPERS & giving them a different pension
  - Stop accruing benefits for current employees
- "Withdrawal" from CalPERS:
  - Treated as plan termination
  - Liability increased for conservative investments
  - Liability increased for future demographic fluctuations
  - Liability must be funded immediately by withdrawing agency
  - Otherwise, retiree benefits are cut

LEAVING CALPERS

CalPERS Termination Estimates on June 30, 2022 (Amounts in Millions)

	Ongoing Plan	Termination Basis	
Discount Rate	**6.80%**	**1.75%**	**4.50%**
Miscellaneous			
Actuarial Accrued Liability	$10,195.5	$21,032.4	$13,034.3
Assets	7,608.8	7,608.8	7,608.8
Unfunded AAL (UAAL)	2,586.7	13,423.6	5,425.5
Safety			
Actuarial Accrued Liability	$4,691.0	$10,282.3	$6,145.7
Assets	3,603.4	3,603.4	3,603.4
Unfunded AAL (UAAL)	1,087.6	6,678.9	2,542.3
Total			
Unfunded AAL (UAAL)	$3,674.3	$20,102.5	$7,967.8
Funded Ratio	75.3%	35.8%	58.5%

2005 POB Proceeds Balance (Millions)

	Safety	Misc.	Total
POB @ 2/16/05	$ 85.7	$ 311.2	$ 396.9
Accumulated earnings through 6/30/23	102.7	372.7	475.4
Accumulated amortization payments through 6/30/23	(100.0)	(362.9)	(462.9)
Balance @ 6/30/23	**88.4**	**321.0**	**409.4**
Earnings 7/1/23 - 2/15/24[20]	3.7	13.5	17.2
Amortization payment through 2/15/24[21]	(4.0)	(14.5)	(18.5)
Balance @ 2/15/24	**88.1**	**319.9**	**408.0**

[20] Based on assumed return from 7/1/23 to 2/15/24.
[21] Based on a 20 year closed amortization.

2005 POB Outstanding Balance (Millions)

	Payments			
	Principal	Interest	Total	Balance
2/17/05	n/a	n/a	n/a	$400.0
8/15/05	n/a	$9.4	$9.4	400.0
.				
.				
.				
.				
.				
2/15/23	$33.7	4.0	37.7	126.9
8/15/23	0.0	3.2	3.2	126.9
2/15/24	37.0	3.2	40.1	89.9

2005 POB NET ESTIMATED GAINS (MILLIONS)

■	Estimated Gains through February 15, 2024:	
A.	CalPERS Estimated Balance of Bond Proceeds (slide 83)	$408.0
B.	Outstanding Bond Balance (slide 84)	(89.9)
C.	Cash Flow Savings/(Deficit) [Payments that would have been paid to CalPERS less POB debt service]	(113.5)
D.	**Net [(A) + (B) + (C)]**	**204.6**
■	Estimated Gains through February 15, 2024:	
E.	CalPERS Investment Earnings[22]	$ 492.6
F.	POB Interest Payments	(284.8)
G.	Cost of Issuance	(3.1)
H.	**Net [(E) + (F) + (G)]**	**204.6**

■ Above estimates based on market rate of return.

[22] Accumulated earnings since issuance based on actual CalPERS investment return for each year

2020 POB PROCEEDS BALANCE (MILLIONS)

	Safety	Misc.	Total
Total issued	**$ 346.3**	**$ 373.7**	**$ 720.0**
Cost of issuance	2.0	2.1	4.1
POB Deposited with CalPERS@ 5/6/20	**344.3**	**371.6**	**715.9**
Accumulated earnings through 6/30/23	69.4	74.9	144.2
Accumulated amortization payments through 6/30/23	(102.3)	(110.4)	(212.7)
Balance @ 6/30/23	**311.4**	**336.0**	**647.4**
Earnings 7/1/23 - 2/15/24[23]	13.1	14.1	27.2
Amortization payment through 2/15/24[24]	(19.0)	(20.5)	(39.6)
Balance @ 2/15/24	**305.4**	**329.6**	**635.1**

[23] Based on assumed return from 7/1/23 to 2/15/24.
[24] Based on a 17 year closed level dollar amortization.

2020 POB Outstanding Balance (Millions)

		Payments			
		Principal	**Interest**	**Total**	**Balance**
■	5/06/2020	n/a	n/a	n/a	$720.0
■	8/15/2020	n/a	$6.4	$6.4	720.0
■	2/15/2021	$29.5	11.6	41.1	690.5
■	8/15/2021	0.0	11.2	11.2	690.5
■	2/15/2022	30.9	11.2	42.2	659.5
■	8/15/2022	0.0	10.9	10.9	659.5
■	2/15/2023	37.8	10.9	48.7	621.7
■	8/15/2023	0.0	10.4	10.4	621.7
■	2/15/2024	40.8	10.4	51.2	580.9

2020 POB Net Estimated Gains (Millions)

- Estimated Gains through February 15, 2024:

A.	CalPERS Estimated Balance (slide 86)	$635.1
B.	Bond Proceeds Balance (slide 87)	(580.9)
C.	Cash Flow Savings/(Deficit) [Payments that would have been paid to CalPERS less POB debt service]	30.1
D.	**Net [(A) + (B) + (C)]**	**84.3**

- Estimated Gains through February 15, 2024:

E.	CalPERS Investment Earnings	$171.4
F.	POB Interest Payments	(83.0)
G.	Cost of Issuance	(4.1)
H.	**Net [(E) + (F) + (G)]**	**84.3**

- Above estimates based on market rate of return.

NET FUNDED RATIO (MILLIONS)

		Safety			
		6/30/21	6/30/22	Proj. 6/30/23	Proj. 6/30/24[25]
(1)	AAL	$4,417	$4,691	$4,931	$5,181
(2)	MVA	3,928	3,603	3,780	4,011
(3)	UAAL [(1) - (2)]	489	1,088	1,151	1,170
(4)	Funding Ratio [(2)/(1)]	88.9%	76.8%	76.7%	77.4%
(5)	POB Balance	$373	$352	$326	$299
(6)	Net MVA [(2) - (5)]	3,555	3,252	3,454	3,712
(7)	Net Funding Ratio [(6)/(1)]	80.5%	69.3%	70.0%	71.6%

[25] Projected 6/30/24 MVA based on assumed returns for 2023/24.

NET FUNDED RATIO (MILLIONS)

		Miscellaneous			
		6/30/21	6/30/22	Proj. 6/30/23	Proj. 6/30/24[26]
(1)	AAL	$9,670	$10,196	$10,709	$11,243
(2)	MVA	8,273	7,609	8,015	8,525
(3)	UAAL [(1) - (2)]	1,397	2,587	2,693	2,718
(4)	Funding Ratio [(2)/(1)]	85.6%	74.6%	74.8%	75.8%
(5)	POB Balance	$508	$468	$422	$372
(6)	Net MVA [(2) - (5)]	7,765	7,141	7,593	8,153
(7)	Net Funding Ratio [(6)/(1)]	80.3%	70.0%	70.9%	72.5%

[26] Projected 6/30/24 MVA based on assumed returns for 2023/24.

NET FUNDED RATIO (MILLIONS)

		Total			
		6/30/21	6/30/22	Proj. 6/30/23	Proj. 6/30/24[27]
(1)	AAL	$14,087	$14,887	$15,639	$16,424
(2)	MVA	12,201	11,212	11,795	12,536
(3)	UAAL [(1) - (2)]	1,886	3,674	3,844	3,889
(4)	Funding Ratio [(2)/(1)]	86.6%	75.3%	75.4%	76.3%
(5)	POB Balance	$882	$820	$749	$671
(6)	Net MVA [(2) - (5)]	11,320	10,392	11,047	11,865
(7)	Net Funding Ratio [(6)/(1)]	80.4%	69.8%	70.6%	72.2%

Amounts above exclude Section 115 Trust balances of $62.4M at 6/30/2022 and $98.9M at 6/30/23. If included, the net funding ratio on (7) would be 70.2% and 71.3% at 6/30/22 and 6/30/23 respectively.

[27] Projected 6/30/24 MVA based on assumed returns for 2023/24.

NET FUNDED RATIO (MILLIONS)

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PEPRA COST SHARING

- Target of 50% of total normal cost paid by all employees
- *PEPRA members* must pay greater of 50% of total normal cost or bargained amount if higher
- Employer cannot pay any part of *PEPRA member* required employee contributions
- Employer may impose current employees pay 50% of total normal cost (limited to 8% of pay for Miscellaneous and 12% for Safety) if not agreed through collective bargaining
- Miscellaneous Plan 2024/25:

	Classic Members		New Members
	Tier 1 3%@60 FAE1	Tier 2 2%@60 FAE3	PEPRA 2%@62 FAE3
Employer Normal Cost	14.4%	11.4%	7.95%
Member Normal Cost	8.0%	7.0%	7.75%
Total Normal Cost	22.4%	18.4%	15.70%
50% Target	11.2%	9.2%	7.85%

PEPRA COST SHARING

- Safety Plan 2024/25:

	Classic Members		New Members
	Tier 1 3%@50 FAE1	Tier 2 2%@50 FAE3	PEPRA 2.7%@57 FAE3
Employer Normal Cost	24.7%	22.0%	13.70%
Member Normal Cost	9.0%	9.0%	13.50%
Total Normal Cost	33.7%	31.0%	27.20%
50% Target	16.9%	15.5%	13.60%

- PEPRA Member Contributions:

	2023/24		2024/25			
Group	Total NC (Basis)	Member Rate	Total Normal Cost	Change	Member Rate	Method
Miscellaneous	14.67%	7.25%	15.70%	**1.03%**	**7.75%**	PEPRA Members
Safety	27.17%	13.50%	27.20%	**0.03%**	**13.50%**	PEPRA Members

Paying Down the UAL & Rate Stabilization

- Where do you get the money from?
- How do you use the money?

Where Do You Get the Money From?

- POB:
  - Usually thought of as interest arbitrage between expected earnings and rate paid on POB
  - No guaranteed savings
  - PEPRA prevents contributions from dropping below normal cost
    - Savings offset when investment return is good
  - GFOA Advisory
- Borrow from General Fund similar to State
- One time payments
  - Governing body resolution to use a portion of one time money, e.g.
    - 1/3 to one time projects
    - 1/3 to replenish reserves and
    - 1/3 to pay down unfunded liability

ADDITIONAL PAYMENTS TO CALPERS

- Internal Service Fund
  - Typically used for rate stabilization
  - Restricted investments:
    - Likely low (0.5%-1.0%) investment returns
    - Short term/high quality, designed for preservation of principal
  - Assets can be used by governing body for other purposes
  - Does not reduce Unfunded Liability

ADDITIONAL PAYMENTS TO CALPERS

Make payments directly to CalPERS:

- Likely best long-term investment return
- Must be considered an irrevocable decision
  - Extra payments cannot be used as future "credit"
  - PEPRA prevents contributions from dropping below normal cost

- Option #1: Request shorter amortization period (Fresh Start):
  - Higher short term payments
  - Less interest and lower long term payments
  - Likely cannot revert to old amortization schedule
    - Savings offset when investment return is good (PEPRA)

ADDITIONAL PAYMENTS TO CALPERS

- Make payments directly to CalPERS (continued):
  - Option #2: Target specific amortization bases with an "Additional Discretionary Payment "ADP" :
    - Extra contribution's impact muted by reduced future contributions
      - CalPERS can't track the "would have been" contribution
    - No guaranteed savings
      - Larger asset pool means larger loss (or gain) opportunity
    - Paying off shorter amortization bases: larger contribution savings over shorter period:
      - e.g. 10 year base reduces contribution 13.7¢ for $1
      - Less interest savings vs paying off longer amortization bases
    - Paying off longer amortization bases: smaller contribution savings over longer period:
      - e.g. 25 year base reduces contribution 8.2¢ for $1
      - More interest savings vs paying off shorter amortization bases
    - Maintaining the current payment schedule – not letting payments reduce due to extra payment – gives the greatest long-term savings

IRREVOCABLE SUPPLEMENTAL (§115) PENSION TRUST

- Can only be used to:
  - Reimburse County for CalPERS contributions
  - Make payments directly to CalPERS
- Investments significantly less restricted than County investment funds
  - Fiduciary rules govern Trust investments
  - Usually, designed for long term returns
- Assets don't count for GASB accounting
  - Are considered Employer assets
- Over 100 trusts established, mostly since 2015
  - Trust providers: PARS, PFM, Keenan
  - California Employers' Pension Prefunding Trust (CEPPT) effective July 2019
    - Strategy 1: 48% stocks / 52% bonds
    - Strategy 2: 22% stocks / 78% bonds

IRREVOCABLE SUPPLEMENTAL (§115) PENSION TRUST

- More flexibility than paying CalPERS directly
  - County decides if and when and how much money to put into Trust
  - County decides if and when and how much to withdraw to pay CalPERS or reimburse Agency
- Funding strategies typically focus on:
  - Reducing the unfunded liability
    - Fund enough to make total CalPERS UAL = 0
    - Make PEPRA required payments from Trust when overfunded
  - Stabilizing contribution rates
    - Mitigate expected contribution rates to better manage budget
  - Combination
    - Use funds for rate stabilization/budget predictability
    - Target increasing fund balance to pay off UAL sooner

IRREVOCABLE SUPPLEMENTAL (§115) PENSION TRUST

- Consider:
  - How much can you put into Trust?
    - Initial seed money?
    - Additional amounts in future years?
  - When do you take money out?
    - Target budget rate?
    - Year target budget rate kicks in?
      - Before or after CalPERS rate exceeds budgeted rate?

COMPARISON OF OPTIONS

- **Supplemental Trust**
  - Flexible
  - Likely lower long-term return
  - Investment strategy choice
  - Does not reduce net pension liability for GASB reporting
  - More visible
- **CalPERS**
  - Locked In
  - Likely higher long-term return
  - No investment choice
  - Reduces net pension liability for GASB reporting
  - More restricted

ACTUARIAL CERTIFICATION

This report presents analysis of the County of Riverside's CalPERS pension plans. The purpose of this report is to provide the County:

- Historical perspective on the plan investment returns, assets, funded status and contributions.
- Projections of likely future contributions and the impact of investment volatility

The calculations and projections in this report are based on information contained in the County's June 30, 2022 and earlier CalPERS actuarial valuation reports. We reviewed this information for reasonableness, but do not make any representation on the accuracy of the CalPERS reports.

Future investment returns and volatility are based on Foster & Foster's Capital Market model which results in long term returns summarized on pages 25 and 57.

Future results may differ from our projections due to differences in actual experience as well as changes in plan provisions, CalPERS actuarial assumptions or methodology. Other than variations in investment return, this study does not analyze these.

To the best of our knowledge, this report is complete and accurate and has been conducted using generally accepted actuarial principles and practices. As members of the American Academy of Actuaries meeting the Academy Qualification Standards, we certify the actuarial results and opinions herein.

Respectfully submitted,

DRAFT	DRAFT
Doug Pryor, ASA, EA, MAAA Foster & Foster, Inc. DRAFT	Bianca Lin, FSA, EA, MAAA Foster & Foster, Inc. DRAFT

California Public Employees' Retirement System
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July 2023

Miscellaneous Plan of the County of Riverside (CalPERS ID: 5982690295)
Annual Valuation Report as of June 30, 2022

Dear Employer,

Attached to this letter is the June 30, 2022 actuarial valuation report for the rate plan noted above. **Provided in this report is the determination of the minimum required employer contributions for fiscal year (FY) 2024-25**. In addition, the report contains important information regarding the current financial status of the plan as well as projections and risk measures to aid in planning for the future.

Actuarial valuations are based on assumptions regarding future plan experience including investment return and payroll growth, eligibility for the types of benefits provided, and longevity among retirees. The CalPERS Board of Administration (board) adopts these assumptions after considering the advice of CalPERS actuarial and investment teams and other professionals. Each actuarial valuation reflects all prior differences between actual and assumed experience and adjusts the contribution requirements as needed. This valuation is based on an investment return assumption of 6.8%, which was adopted by the board in November 2021. Other assumptions used in this report are those recommended in the CalPERS Experience Study and Review of Actuarial Assumptions report from November 2021.

Required Contributions

The table below shows the minimum required employer contributions and the PEPRA member rate for FY 2024-25 along with an estimate of the required employer contribution for FY 2025-26. Employee contributions other than cost sharing (whether paid by the employer or the employee) are in addition to the results shown below. **The required employer contributions in this report do not reflect any cost sharing arrangement between the agency and the employees.**

Fiscal Year	Employer Normal Cost Rate	Employer Amortization of Unfunded Accrued Liability	PEPRA Member Contribution Rate
2024-25	11.29%	$178,381,623	7.75%
Projected Results			
2025-26	*11.1%*	*$197,885,000*	*TBD*

The actual investment return for FY 2022-23 was not known at the time this report was prepared. The projections above assume the investment return for that year would be 6.8%. ***To the extent the actual investment return for FY 2022-23 differs from 6.8%, the actual contribution requirements for FY 2025-26 will differ from those shown above.*** For additional details regarding the assumptions and methods used for these projections, please refer to the "Projected Employer Contributions" in the "Highlights and Executive Summary" section. This section also contains projected required contributions through FY 2029-30.

Changes from Previous Year's Valuations

There are no significant changes in actuarial assumptions or policies in the 2022 actuarial valuation. There may be changes specific to the plan such as contract amendments and funding changes.

Further descriptions of general changes are included in the "Highlights and Executive Summary" section and in Appendix A, "Actuarial Methods and Assumptions." The effects of any changes on the required contributions are included in the "Reconciliation of Required Employer Contributions" section.

Questions

A CalPERS actuary is available to answer questions about this report. Other questions may be directed to the Customer Contact Center at (888)-CalPERS or (**888-225-7377**).

Sincerely,

SCOTT TERANDO, ASA, EA, MAAA, FCA, CFA
Chief Actuary, CalPERS

RANDALL DZIUBEK, ASA, MAAA
Deputy Chief Actuary, CalPERS

Actuarial Valuation as of June 30, 2022

for the Miscellaneous Plan of the County of Riverside

(CalPERS ID: 5982690295)
(Rate Plan ID: 62)

Required Contributions for Fiscal Year July 1, 2024 – June 30, 2025

Table of Contents

Actuarial Certification

To the best of my knowledge, this report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the Miscellaneous Plan of the County of Riverside and satisfies the actuarial valuation requirements of Government Code section 7504. This valuation and related validation work was performed by the CalPERS Actuarial Office and is based on the member and financial data as of June 30, 2022 provided by the various CalPERS databases and the benefits under this plan with CalPERS as of the date this report was produced.

It is my opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods, as prescribed by the CalPERS Board of Administration, are internally consistent and reasonable for this plan.

The undersigned is an actuary who satisfies the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States* with regard to pensions.

KURT SCHNEIDER, MPA, ASA, EA, MAAA
Supervising Actuary, CalPERS

Highlights and Executive Summary

- **Introduction**
- **Purpose**
- **Required Contributions**
- **Additional Discretionary Employer Contributions**
- **Funded Status – Funding Policy Basis**
- **Projected Employer Contributions**
- **Cost**
- **Changes Since the Prior Year’s Valuation**
- **Subsequent Events**

Introduction

This report presents the results of the June 30, 2022 actuarial valuation of the Miscellaneous Plan of the County of Riverside of the California Public Employees' Retirement System (CalPERS). This actuarial valuation sets the minimum required contributions for fiscal year (FY) 2024-25.

Purpose

This report documents the results of the actuarial valuation prepared by the CalPERS Actuarial Office using data as of June 30, 2022. The purpose of the valuation is to:

- Set forth the assets and accrued liabilities of this rate plan as of June 30, 2022;
- Determine the minimum required employer contributions for this rate plan for FY July 1, 2024 through June 30, 2025;
- Determine the required member contribution rate for FY July 1, 2024 through June 30, 2025 for employees subject to the California Public Employees' Pension Reform Act of 2013 (PEPRA); and
- Provide actuarial information as of June 30, 2022 to the CalPERS Board of Administration (board) and other interested parties.

The pension funding information presented in this report should not be used in financial reports subject to Governmental Accounting Standards Board (GASB) Statement No. 68 for an Agent Employer Defined Benefit Pension Plan. A separate accounting valuation report for such purposes is available from CalPERS and details for ordering are available on the CalPERS website (www.calpers.ca.gov).

The measurements shown in this actuarial valuation may not be applicable for other purposes. The agency should contact the plan actuary before disseminating any portion of this report for any reason that is not explicitly described above.

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

Assessment and Disclosure of Risk

This report includes the following risk disclosures consistent with the guidance of Actuarial Standards of Practice No. 51 and recommended by the California Actuarial Advisory Panel (CAAP) in the Model Disclosure Elements document:

- A "Scenario Test," projecting future results under different investment income returns.
- A "Sensitivity Analysis," showing the impact on current valuation results using alternative discount rates 5.8% and 7.8%.
- A "Sensitivity Analysis," showing the impact on current valuation results assuming rates of mortality are 10% lower or 10% higher than our current post-retirement mortality assumptions adopted in 2021.
- Plan maturity measures indicating how sensitive a plan may be to the risks noted above.

Required Contributions

	Fiscal Year
Required Employer Contributions	**2024-25**
Employer Normal Cost Rate	**11.29%**
Plus	
Required Payment on Amortization Bases	**$178,381,623**
Paid either as	
1) Monthly Payment	**$14,865,135**
Or	
2) Annual Prepayment Option*	**$172,609,417**
Required PEPRA Member Contribution Rate	**7.75%**

The total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll and paid as payroll is reported) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly (1) or prepaid annually (2) in dollars).

** Only the UAL portion of the employer contribution can be prepaid* ***(which must be received in full no later than July 31)****.*

For additional detail regarding the determination of the required contribution for PEPRA members, see "PEPRA Member Contribution Rates" in the "Liabilities and Contributions" section. Required member contributions for Classic members can be found in Appendix B.

	Fiscal Year 2023-24	Fiscal Year 2024-25
Normal Cost Contribution as a Percentage of Payroll		
Total Normal Cost	19.34%	19.05%
Employee Contribution[1]	7.55%	7.76%
Employer Normal Cost[2]	11.79%	11.29%
Projected Annual Payroll for Contribution Year	$1,315,646,404	$1,353,178,407
Estimated Employer Contributions Based On Projected Payroll		
Total Normal Cost	$254,446,015	$257,780,487
Offset Due to Employee Contributions	99,331,304	105,006,644
Employer Normal Cost	155,114,711	152,773,843
Unfunded Liability Contribution	148,845,017	178,381,623
% of Projected Payroll (illustrative only)	11.31%	13.18%
Estimated Total Employer Contribution	$303,959,728	$331,155,466
% of Projected Payroll (illustrative only)	23.10%	24.47%

1 For classic members, this is the percentage specified in the Public Employees' Retirement Law , net of any reduction from the use of a modified formula or other factors. For PEPRA members, the member contribution rate is based on 50% of the normal cost. A development of PEPRA member contribution rates can be found in the "Liabilities and Contributions" section. Employee cost sharing is not show n in this report.

2 The Employer Normal Cost is a blended rate for all benefit groups in the plan. For a breakout of normal cost by benefit group, see "Normal Cost by Benefit Group" in the "Liabilities and Contributions" section.

Additional Discretionary Employer Contributions

The minimum required employer contribution towards the Unfunded Accrued Liability (UAL) for this rate plan for FY 2024-25 is $178,381,623. CalPERS allows agencies to make additional discretionary payments (ADPs) at any time and in any amount. These optional payments serve to reduce the UAL and future required contributions and can result in significant long-term savings. Agencies can also use ADPs to stabilize annual contributions as a fixed dollar amount, percent of payroll or percent of revenue.

Provided below are select ADP options for consideration. Making such an ADP during FY 2024-25 does not require an ADP be made in any future year, nor does it change the remaining amortization period of any portion of unfunded liability. For information on permanent changes to amortization periods, see the "Amortization Schedule and Alternatives" section of the report.

Agencies considering making an ADP should contact CalPERS for additional information.

Minimum Required Employer Contribution for Fiscal Year 2024-25

Estimated Normal Cost	Minimum UAL Payment	ADP	Total UAL Contribution	Estimated Total Contribution
$152,773,843	$178,381,623	$0	$178,381,623	$331,155,466

Alternative Fiscal Year 2024-25 Employer Contributions for Greater UAL Reduction

Funding Horizon	Estimated Normal Cost	Minimum UAL Payment	ADP[1]	Total UAL Contribution	Estimated Total Contribution
20 years	$152,773,843	$178,381,623	$59,375,183	$237,756,806	$390,530,649
15 years	$152,773,843	$178,381,623	$98,982,425	$277,364,048	$430,137,891
10 years	$152,773,843	$178,381,623	$182,521,218	$360,902,841	$513,676,684
5 years	$152,773,843	$178,381,623	$442,258,348	$620,639,971	$773,413,814

[1] The ADP amounts are assumed to be made in the middle of the fiscal year. A payment made earlier or later in the fiscal year would have to be less or more than the amount shown to have the same effect on the UAL amortization.

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 2024 as determined in the June 30, 2022 actuarial valuation. New unfunded liabilities can emerge in future years due to assumption or method changes, changes in plan provisions, and actuarial experience different than assumed. Making an ADP illustrated above for the indicated number of years will not result in a plan that is exactly 100% funded in the indicated number of years. Valuation results will vary from one year to the next and can diverge significantly from projections over a period of several years.

Funded Status – Funding Policy Basis

The table below provides information on the current funded status of the plan under the funding policy. The funded status for this purpose is based on the market value of assets relative to the funding target produced by the entry age actuarial cost method and actuarial assumptions adopted by the board. The actuarial cost method allocates the total expected cost of a member's projected benefit (**Present Value of Benefits**) to individual years of service (the **Normal Cost**). The value of the projected benefit that is not allocated to future service is referred to as the **Accrued Liability** and is the plan's funding target on the valuation date. The **Unfunded Accrued Liability** (UAL) equals the funding target minus the assets. The UAL is an absolute measure of funded status and can be viewed as employer debt. The **funded ratio** equals the assets divided by the funding target. The funded ratio is a relative measure of the funded status and allows for comparisons between plans of different sizes.

	June 30, 2021	June 30, 2022
1. Present Value of Benefits	$11,710,325,693	$12,266,967,509
2. Entry Age Accrued Liability	9,670,471,442	10,195,511,990
3. Market Value of Assets (MVA)	8,273,322,890	7,608,796,058
4. Unfunded Accrued Liability (UAL) [(2) – (3)]	$1,397,148,552	$2,586,715,932
5. Funded Ratio [(3) / (2)]	85.6%	74.6%

A funded ratio of 100% (UAL of $0) implies that the funding of the plan is on target and that future contributions equal to the normal cost of the active plan members will be sufficient to fully fund all retirement benefits if future experience matches the actuarial assumptions. A funded ratio of less than 100% (positive UAL) implies that in addition to normal costs, payments toward the UAL will be required. Plans with a funded ratio greater than 100% have a negative UAL (or surplus) but are required under current law to continue contributing the normal cost in most cases, preserving the surplus for future contingencies.

Calculations for the funding target reflect the expected long-term investment return of 6.8%. If it were known on the valuation date that future investment returns will average something greater/less than the expected return, calculated normal costs and accrued liabilities provided in this report would be less/greater than the results shown. Therefore, for example, if actual average future returns are less than the expected return, calculated normal costs and UAL contributions will not be sufficient to fully fund all retirement benefits. Under this scenario, required future normal cost contributions will need to increase from those provided in this report, and the plan will develop unfunded liabilities that will also add to required future contributions. For illustrative purposes, funded statuses based on a 1% lower and higher average future investment return (discount rate) are as follows:

	1% Lower Average Return	Current Assumption	1% Higher Average Return
Discount Rate	5.8%	6.8%	7.8%
1. Present Value of Benefits	$14,552,936,138	$12,266,967,509	$10,502,613,408
2. Entry Age Accrued Liability	11,677,814,952	10,195,511,990	8,983,021,884
3. Market Value of Assets (MVA)	7,608,796,058	7,608,796,058	7,608,796,058
4. Unfunded Accrued Liability (UAL) [(2) – (3)]	$4,069,018,894	$2,586,715,932	$1,374,225,826
5. Funded Ratio [(3) / (2)]	65.2%	74.6%	84.7%

The "Risk Analysis" section of the report provides additional information regarding the sensitivity of valuation results to the expected investment return and other factors. Also provided in that section are measures of funded status that are appropriate for assessing the sufficiency of plan assets to cover estimated termination liabilities.

Projected Employer Contributions

The table below shows the required and projected employer contributions (before cost sharing) for the next six fiscal years. The projection assumes that all actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. In particular, the investment return beginning with FY 2022-23 is assumed to be 6.80% per year, net of investment and administrative expenses. The projected normal cost percentages below reflect that the normal cost is expected to continue to decline over time as new employees are hired into lower cost benefit tiers. Future contribution requirements may differ significantly from those shown below. The actual long-term cost of the plan will depend on the actual benefits and expenses paid and the actual investment experience of the fund.

	Required Contribution	**Projected Future Employer Contributions (Assumes 6.80% Return for Fiscal Year 2022-23 and Beyond)**				
Fiscal Year	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**
Normal Cost %	11.29%	11.1%	10.9%	10.7%	10.5%	10.3%
UAL Payment	$178,381,623	$197,885,000	$216,806,000	$231,945,000	$266,927,000	$272,767,000
*Total as a % of Payroll**	*24.47%*	*25.3%*	*26.0%*	*26.5%*	*28.2%*	*27.9%*
Projected Payroll	*$1,353,178,407*	*$1,391,067,403*	*$1,430,017,290*	*$1,470,057,774*	*$1,511,219,392*	*$1,553,533,535*

*Illustrative only and based on the projected payroll shown.

For ongoing plans, investment gains and losses are amortized using a 5-year ramp up. For more information, please see "Amortization of Unfunded Actuarial Accrued Liability" under "Actuarial Methods" in Appendix A. This method phases in the impact of the change in UAL over a 5-year period in order to reduce employer cost volatility from year to year. As a result of this methodology, dramatic changes in the required employer contributions in any one year are less likely. However, required contributions can change gradually and significantly over the next five years. In years when there is a large investment loss, the relatively small amortization payments during the ramp up period could result in contributions that are less than interest on the UAL (i.e. negative amortization) while the contribution impact of the increase in the UAL is phased in.

For projected contributions under alternate investment return scenarios, please see the "Future Investment Return Scenarios" in the "Risk Analysis" section. Our online pension plan projection tool, Pension Outlook, is available in the Employers section of the CalPERS website. Pension Outlook can help plan and budget pension costs under various scenarios.

Cost

Actuarial Determination of Plan Cost

Contributions to fund the plan are comprised of two components:

- Normal Cost, expressed as a percentage of total active payroll
- Amortization of the Unfunded Accrued Liability (UAL), expressed as a dollar amount

For fiscal years prior to 2017-18, the Amortization of UAL component was expressed as a percentage of total active payroll. Starting with FY 2017-18, the Amortization of UAL component is expressed as a dollar amount and invoiced on a monthly basis. There is an option to prepay this amount during July of each fiscal year.

The Normal Cost component is expressed as a percentage of active payroll with employer and employee contributions payable as part of the regular payroll reporting process.

The determination of both components requires complex actuarial calculations. The calculations are based on a set of actuarial assumptions which can be divided into two categories:

- Demographic assumptions (e.g., mortality rates, retirement rates, employment termination rates, disability rates)
- Economic assumptions (e.g., future investment earnings, inflation, salary growth rates)

These assumptions reflect CalPERS' best estimate of future experience of the plan and are long term in nature. We recognize that all assumptions will not be realized in any given year. For example, the investment earnings at CalPERS have averaged 6.9% over the 20 years ending June 30, 2022, yet individual fiscal year returns have ranged from -23.6% to +21.3%. In addition, CalPERS reviews all actuarial assumptions by conducting in-depth experience studies every four years, with the most recent experience study completed in 2021.

Changes Since the Prior Year's Valuation

Benefits

The standard actuarial practice at CalPERS is to recognize mandated legislative benefit changes in the first annual valuation following the effective date of the legislation. Voluntary benefit changes by plan amendment are generally included in the first valuation that is prepared after the amendment becomes effective, even if the valuation date is prior to the effective date of the amendment.

This valuation generally reflects plan changes by amendments effective before the date of the report. Please refer to the "Plan's Major Benefit Options" and Appendix B for a summary of the plan provisions used in this valuation. The effect of any mandated benefit changes or plan amendments on the unfunded liability is shown in the "(Gain) / Loss Analysis 6/30/21 – 6/30/22" and the effect on the employer contribution is shown in the "Reconciliation of Required Employer Contributions." It should be noted that no change in liability or contribution is shown for any plan changes which were already included in the prior year's valuation.

In 2022, SB 1168 increased the standard retiree lump sum death benefit from $500 to $2,000 for any death occurring on or after July 1, 2023. The impact, if any, is included in plan changes in the "(Gain) / Loss Analysis 6/30/21 – 6/30/22" and the "Reconciliation of Required Employer Contributions."

Actuarial Methods and Assumptions

There are no significant changes to the actuarial methods or assumptions for the June 30, 2022 actuarial valuation.

Subsequent Events

This actuarial valuation report reflects fund investment return through June 30, 2022 and statutory/regulatory changes and board actions through January 2023.

During the time period between the valuation date and the publication of this report, inflation has been significantly higher than the expected inflation of 2.3% per annum. Since inflation influences cost-of-living increases for retirees and beneficiaries and active member pay increases, higher inflation is likely to put at least some upward pressure on contribution requirements and downward pressure on the funded status in the June 30, 2023 valuation. The actual impact of higher inflation on future valuation results will depend on, among other factors, how long higher inflation persists. At this time, we continue to believe the long-term inflation assumption of 2.3% is appropriate.

To the best of our knowledge, there have been no other subsequent events that could materially affect current or future certifications rendered in this report.

Assets

- **Reconciliation of the Market Value of Assets**
- **Asset Allocation**
- **CalPERS History of Investment Returns**

Reconciliation of the Market Value of Assets

1.	Market Value of Assets as of 6/30/21 including Receivables	$8,273,322,890
2.	Change in Receivables for Service Buybacks	(1,028,000)
3.	Employer Contributions	278,088,479
4.	Employee Contributions	92,992,404
5.	Benefit Payments to Retirees and Beneficiaries	(399,178,454)
6.	Refunds	(8,646,885)
7.	Transfers	97,882
8.	Service Credit Purchase (SCP) Payments and Interest	2,717,687
9.	Administrative Expenses	(6,489,784)
10.	Miscellaneous Adjustments	0
11.	Investment Return (Net of Investment Expenses)	(623,080,162)
12.	Market Value of Assets as of 6/30/22 including Receivables	$7,608,796,058

Asset Allocation

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

The asset allocation shown below reflects the allocation of the Public Employees' Retirement Fund (PERF) in its entirety. The assets for County of Riverside Miscellaneous Plan are a subset of the PERF and are invested accordingly.

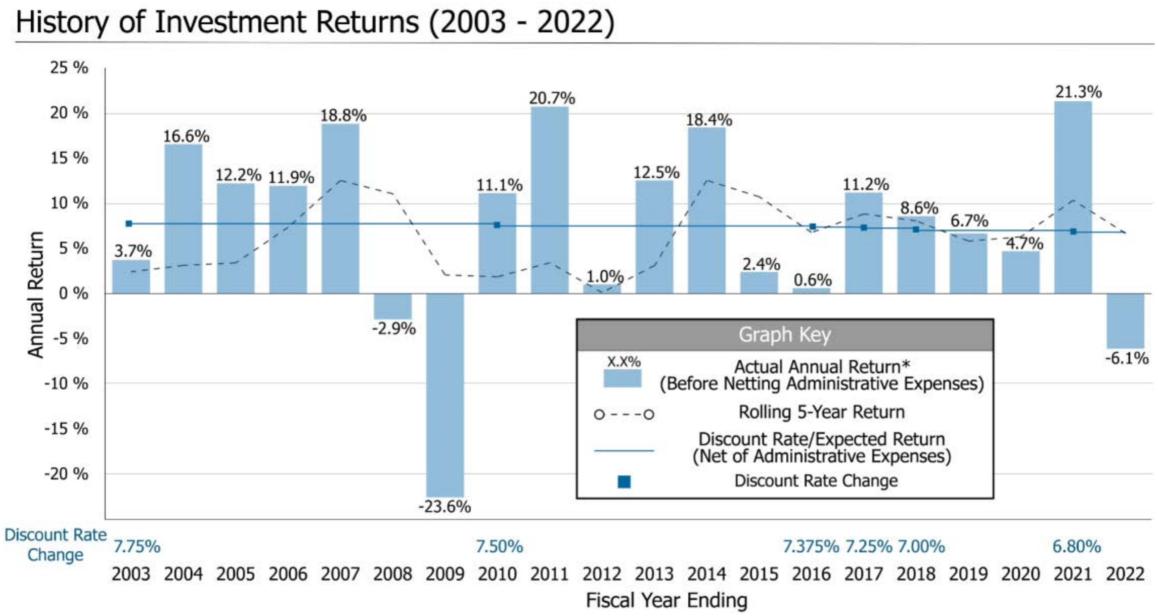
On November 17, 2021, the board adopted changes to the strategic asset allocation. The new allocation was effective July 1, 2022, and is shown below, expressed as a percentage of total assets.

Strategic Asset Allocation Policy Targets

Asset Class	Actual Allocation 9/30/2022	Policy Target Allocation effective 7/1/2022
Global Public Equity		
Market Capitalization Weighted	33.7%	30.0%
Factor Weighted	12.6%	12.0%
Private Equity	11.6%	13.0%
Income		
Treasuries	3.9%	5.0%
Mortgage-backed Securities	5.6%	5.0%
Investment Grade Corporates	5.8%	10.0%
High Yield Bonds	4.6%	5.0%
Emerging Market Sovereign Bonds	2.1%	5.0%
Total Fund Income	1.5%	-
Real Assets	17.1%	15.0%
Private Debt	1.8%	5.0%
Other Trust Level	3.8%	-
Leverage		
Strategic	(0.3%)	(5.0%)
Active	(3.8%)	-
Total Fund	**100.00%**	**100.0%**

CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the PERF for each fiscal year ending on June 30 as reported by the Investment Office. Investment returns reported are net of investment expenses but without reduction for administrative expenses. The assumed rate of return, however, is net of both investment and administrative expenses. Also, the Investment Office uses a three-month lag on private equity and real assets for investment performance reporting purposes. This can lead to a timing difference in the returns below and those used for financial reporting purposes. The investment gain or loss calculation in this report relies on final assets that have been audited and are appropriate for financial reporting. Because of these differences, the effective investment return for funding purposes can be higher or lower than the return reported by the Investment Office shown here.



* As reported by the Investment Office with a 3-month lag on private equity and real assets.

The table below shows annualized investment returns of the PERF for various time periods ending on June 30, 2022 (figures reported are net of investment expenses but without reduction for administrative expenses). These returns are the annual rates that if compounded over the indicated number of years would equate to the actual time-weighted investment performance of the PERF. It should be recognized that in any given year the rate of return is volatile. The portfolio has an expected volatility of 12.1% per year based on the most recent Asset Liability Management study. The realized volatility is a measure of the risk of the portfolio expressed as the standard deviation of the fund's total monthly return distribution, expressed as an annual percentage. Due to their volatile nature, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Compound Annual Rates of Return and Volatilities					
	1 year	**5 year**	**10 year**	**20 year**	**30 year**
Compound Annual Return	-6.1%	6.7%	7.7%	6.9%	7.7%
Realized Volatility	–	8.3%	7.1%	8.5%	8.6%

Liabilities and Contributions

- **Development of Accrued and Unfunded Liabilities**
- **(Gain) / Loss Analysis 6/30/21 - 6/30/22**
- **Schedule of Amortization Bases**
- **Amortization Schedule and Alternatives**
- **Reconciliation of Required Employer Contributions**
- **Employer Contribution History**
- **Funding History**
- **Normal Cost by Benefit Group**
- **PEPRA Member Contribution Rates**

Development of Accrued and Unfunded Liabilities

	June 30, 2021	June 30, 2022
1. Present Value of Projected Benefits		
a) Active Members	$6,273,998,198	$6,309,077,562
b) Transferred Members	245,157,645	258,669,539
c) Separated Members	292,149,736	340,857,694
d) Members and Beneficiaries Receiving Payments	4,899,020,114	5,358,362,714
e) Total	$11,710,325,693	$12,266,967,509
2. Present Value of Future Employer Normal Costs	$1,197,393,802	$1,205,820,896
3. Present Value of Future Employee Contributions	$842,460,449	$865,634,623
4. Entry Age Accrued Liability		
a) Active Members [(1a) - (2) - (3)]	$4,234,143,947	$4,237,622,043
b) Transferred Members (1b)	245,157,645	258,669,539
c) Separated Members (1c)	292,149,736	340,857,694
d) Members and Beneficiaries Receiving Payments (1d)	4,899,020,114	5,358,362,714
e) Total	$9,670,471,442	$10,195,511,990
5. Market Value of Assets (MVA)	$8,273,322,890	$7,608,796,058
6. Unfunded Accrued Liability (UAL) [(4e) - (5)]	$1,397,148,552	$2,586,715,932
7. Funded Ratio [(5) / (4e)]	85.6%	74.6%

(Gain)/Loss Analysis 6/30/21 – 6/30/22

To calculate the cost requirements of the plan, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year, actual experience is compared to the expected experience based on the actuarial assumptions. This results in actuarial gains or losses, as shown below.

1. Total (Gain)/Loss for the Year	
a) Unfunded Accrued Liability (UAL) as of 6/30/21	$1,397,148,552
b) Expected payment on the UAL during 2021-22	126,725,943
c) Interest through 6/30/22 [.068 x (1a) - ((1.068)^{½} - 1) x (1b)]	90,504,106
d) Expected UAL before all other changes [(1a) - (1b) + (1c)]	1,360,926,715
e) Change due to plan changes[1]	8,771,960
f) Change due to AL Significant Increase	0
g) Change due to assumption change	0
h) Change due to method change	0
i) Change due to discount rate change with Funding Risk Mitigation	0
j) Expected UAL after all other changes [(1d) + (1e) + (1f) + (1g) + (1h) + (1i)]	1,369,698,675
k) Actual UAL as of 6/30/22	2,586,715,932
l) Total (Gain)/Loss for 2021-22 [(1k) - (1j)]	$1,217,017,257
2. Investment (Gain)/Loss for the Year	
a) Market Value of Assets as of 6/30/21	$8,273,322,890
b) Prior fiscal year receivables	(10,594,258)
c) Current fiscal year receivables	9,566,258
d) Contributions received	371,080,883
e) Benefits and refunds paid	(407,825,339)
f) Transfers, SCP payments and interest, and miscellaneous adjustments	2,815,569
g) Expected return at 6.8% per year	565,584,539
h) Expected assets as of 6/30/22 [(2a) + (2b) + (2c) + (2d) + (2e) + (2f) + (2g)]	8,803,950,543
i) Actual Market Value of Assets as of 6/30/22	7,608,796,058
j) Investment (Gain)/Loss [(2h) - (2i)]	$1,195,154,485
3. Non-Investment (Gain)/Loss for the Year	
a) Total (Gain)/Loss (1l)	$1,217,017,257
b) Investment (Gain)/Loss (2j)	1,195,154,485
c) Non-Investment (Gain)/Loss [(3a) - (3b)]	$21,862,772

[1] Includes the effect, if any, of SB 1168, which increased the standard post-retirement lump sum death benefit from $500 to $2,000 for deaths occurring on or after July 1, 2023.

Schedule of Amortization Bases

Below is the schedule of the plan's amortization bases. Note that there is a two-year lag between the valuation date and the start of the contribution year.

- The assets, liabilities, and funded status of the plan are measured as of the valuation date: June 30, 2022.
- The required employer contributions determined by the valuation are for the fiscal year beginning two years after the valuation date: FY 2024-25.

This two-year lag is necessary due to the amount of time needed to extract and test the membership and financial data, and the need to provide public agencies with their required employer contribution well in advance of the start of the fiscal year.

The Unfunded Accrued Liability (UAL) is used to determine the employer contribution and therefore must be rolled forward two years from the valuation date to the first day of the fiscal year for which the contribution is being determined. The UAL is rolled forward each year by subtracting the expected payment on the UAL for the fiscal year and adjusting for interest. The expected payment on the UAL for a fiscal year is equal to the Expected Employer Contribution for the fiscal year minus the Expected Normal Cost for the year. The Employer Contribution for the first fiscal year is determined by the actuarial valuation two years ago and the contribution for the second year is from the actuarial valuation one year ago. Additional discretionary payments are reflected in the Expected Payments column in the fiscal year they were made by the agency.

Reason for Base	Date Est.	Ramp Level 2024-25	Ramp Shape	Escala-tion Rate	Amort. Period	Balance 6/30/22	Expected Payment 2022-23	Balance 6/30/23	Expected Payment 2023-24	Balance 6/30/24	Minimum Required Payment 2024-25
Fresh Start	6/30/08	No Ramp		2.80%	16	(10,067,821)	(800,309)	(9,925,361)	(804,712)	(9,768,663)	(827,244)
Special (Gain)/Loss	6/30/09	No Ramp		2.80%	17	116,165,489	8,904,883	114,862,072	8,945,826	113,427,711	9,196,310
Golden Handshake	6/30/10	No Ramp		2.80%	0	939,780	971,207	0	0	0	0
Special (Gain)/Loss	6/30/10	No Ramp		2.80%	18	82,607,134	6,122,726	81,896,944	6,145,425	81,115,003	6,317,496
Special (Gain)/Loss	6/30/11	No Ramp		2.80%	19	(46,045,934)	(3,307,686)	(45,758,760)	(3,317,051)	(45,442,380)	(3,409,928)
(Gain)/Loss	6/30/12	No Ramp		2.80%	20	224,673,858	15,675,451	223,752,029	15,706,320	222,735,614	16,146,097
Payment (Gain)/Loss	6/30/12	No Ramp		2.80%	20	(70,938,390)	(4,949,358)	(70,647,332)	(4,959,104)	(70,326,410)	(5,097,959)
(Gain)/Loss	6/30/13	100%	Up/Down	2.80%	21	648,533,481	46,644,188	644,429,748	46,774,206	639,912,595	48,083,884
(Gain)/Loss	6/30/14	100%	Up/Down	2.80%	22	(518,301,300)	(36,203,124)	(516,132,001)	(36,273,012)	(513,742,965)	(37,288,656)
Assumption Change	6/30/14	100%	Up/Down	2.80%	12	356,404,315	38,196,120	341,166,378	38,619,384	324,454,842	39,700,727
(Gain)/Loss	6/30/15	100%	Up/Down	2.80%	22	495,443,834	34,606,540	493,370,202	34,673,346	491,086,523	35,644,199
(Gain)/Loss	6/30/16	100%	Up/Down	2.80%	22	366,001,944	25,583,412	364,451,133	25,613,100	362,764,186	26,330,266
Assumption Change	6/30/17	100%	Up/Down	2.80%	15	166,569,198	12,280,202	165,205,041	15,477,698	160,443,698	15,911,073
Assumption Change	6/30/18	100%	Up/Down	2.80%	16	308,042,186	16,803,292	311,623,846	22,564,893	309,494,785	28,995,887
Method Change	6/30/18	100%	Up/Down	2.80%	16	74,683,333	4,073,877	75,551,689	5,470,749	75,035,508	7,029,912
Investment (Gain)/Loss	6/30/19	80%	Up Only	0.00%	17	35,449,476	1,482,806	36,327,648	2,184,256	36,540,629	2,912,341
Non-Investment (Gain)/Loss	6/30/19	No Ramp		0.00%	17	(35,221,780)	(3,300,926)	(34,205,549)	(3,243,087)	(33,179,988)	(3,243,087)
Investment (Gain)/Loss	6/30/20	60%	Up Only	0.00%	18	183,020,930	4,009,059	191,323,228	7,864,768	196,205,435	11,797,152
Non-Investment (Gain)/Loss	6/30/20	No Ramp		0.00%	18	(100,163,655)	(9,157,359)	(97,511,195)	(8,992,749)	(94,848,482)	(8,992,749)
Risk Mitigation Offset	6/30/21	No Ramp		0.00%	0	(282,318,888)	0	(301,516,572)	(311,599,544)	0	0

Schedule of Amortization Bases (continued)

Reason for Base	Date Est.	Ramp Level 2024-25	Ramp Shape	Escala-tion Rate	Amort. Period	Balance 6/30/22	Expected Payment 2022-23	Balance 6/30/23	Expected Payment 2023-24	Balance 6/30/24	Minimum Required Payment 2024-25
Assumption Change	6/30/21		No Ramp	0.00%	19	89,640,663	(8,190,795)	104,200,930	9,370,118	101,603,130	9,370,118
Net Investment (Gain)	6/30/21	40%	Up Only	0.00%	19	(857,629,167)	0	(915,947,950)	(19,688,021)	(957,886,005)	(39,376,042)
Non-Investment (Gain)/Loss	6/30/21		No Ramp	0.00%	19	(138,354,470)	0	(147,762,574)	(13,287,336)	(144,078,753)	(13,287,336)
Risk Mitigation	6/30/21		No Ramp	0.00%	0	271,792,499	(10,878,400)	301,516,572	311,599,544	0	0
Benefit Change	6/30/22		No Ramp	0.00%	20	8,771,960	(128,097)	9,500,834	(131,684)	10,282,978	924,682
Investment (Gain)/Loss	6/30/22	20%	Up Only	0.00%	20	1,195,154,485	0	1,276,424,990	0	1,363,221,889	29,302,038
Non-Investment (Gain)/Loss	6/30/22		No Ramp	0.00%	20	21,862,772	0	23,349,440	0	24,937,202	2,242,442
Total						**2,586,715,932**	**138,437,709**	**2,619,545,430**	**148,713,333**	**2,643,988,082**	**178,381,623**

Amortization Schedule and Alternatives

The amortization schedule on the previous page shows the minimum contributions required according to the CalPERS amortization policy. Many agencies have expressed a desire for a more stable pattern of payments or have indicated interest in paying off the unfunded accrued liabilities more quickly than required. As such, we have provided alternative amortization schedules to help analyze the current amortization schedule and illustrate the potential savings of accelerating unfunded liability payments.

Shown on the following page are future year amortization payments based on 1) the current amortization schedule reflecting the individual bases and remaining periods shown on the previous page, and 2) alternative "fresh start" amortization schedules using two sample periods that would both result in interest savings relative to the current amortization schedule. To initiate a fresh start, please contact the plan actuary.

The current amortization schedule typically contains both positive and negative bases. Positive bases result from plan changes, assumption changes, method changes or plan experience that increase unfunded liability. Negative bases result from plan changes, assumption changes, method changes, or plan experience that decrease unfunded liability. The combination of positive and negative bases within an amortization schedule can result in unusual or problematic circumstances in future years, such as:

- When a negative payment would be required on a positive unfunded actuarial liability; or
- When the payment would completely amortize the total unfunded liability in a very short time period, and results in a large change in the employer contribution requirement.

In any year when one of the above scenarios occurs, the actuary will consider corrective action such as replacing the existing unfunded liability bases with a single "fresh start" base and amortizing it over an appropriate period.

The current amortization schedule on the following page may appear to show that, based on the current amortization bases, one of the above scenarios will occur at some point in the future. It is impossible to know today whether such a scenario will in fact arise since there will be additional bases added to the amortization schedule in each future year. Should such a scenario arise in any future year, the actuary will take appropriate action based on guidelines in the CalPERS amortization policy.

Amortization Schedule and Alternatives (continued)

	Current Amortization Schedule		Alternative Schedules			
			15 Year Amortization		10 Year Amortization	
Date	**Balance**	**Payment**	**Balance**	**Payment**	**Balance**	**Payment**
6/30/2024	2,643,988,082	178,381,623	2,643,988,082	277,364,048	2,643,988,082	360,902,841
6/30/2025	2,639,432,414	197,884,609	2,537,139,933	277,364,048	2,450,807,531	360,902,841
6/30/2026	2,614,411,780	216,805,903	2,423,026,110	277,364,048	2,244,490,703	360,902,841
6/30/2027	2,568,135,702	231,945,314	2,301,152,547	277,364,048	2,024,144,330	360,902,841
6/30/2028	2,503,067,168	266,927,456	2,170,991,581	277,364,048	1,788,814,404	360,902,841
6/30/2029	2,397,421,996	272,766,603	2,031,979,670	277,364,047	1,537,482,043	360,902,841
6/30/2030	2,278,558,541	278,769,243	1,883,514,950	277,364,048	1,269,059,081	360,902,841
6/30/2031	2,145,408,995	284,939,957	1,724,954,628	277,364,048	982,383,358	360,902,841
6/30/2032	1,996,828,213	281,380,310	1,555,612,204	277,364,047	676,213,686	360,902,841
6/30/2033	1,841,822,624	277,443,694	1,374,754,496	277,364,048	349,224,476	360,902,841
6/30/2034	1,680,344,917	273,111,806	1,181,598,463	277,364,047		
6/30/2035	1,512,363,473	264,053,835	975,307,821	277,364,048		
6/30/2036	1,342,320,168	244,284,270	754,989,414	277,364,048		
6/30/2037	1,181,144,594	234,615,802	519,689,355	277,364,047		
6/30/2038	1,019,000,873	224,260,157	268,388,893	277,364,047		
6/30/2039	856,533,326	213,186,429				
6/30/2040	694,462,030	207,599,528				
6/30/2041	527,143,616	181,295,643				
6/30/2042	375,631,058	139,768,443				
6/30/2043	256,731,549	225,881,707				
6/30/2044	40,753,912	33,860,912				
6/30/2045	8,531,928	8,817,242				
6/30/2046						
6/30/2047						
6/30/2048						
6/30/2049						
Total		**4,737,980,486**		**4,160,460,715**		**3,609,028,410**
Interest Paid		**2,093,992,404**		**1,516,472,633**		**965,040,328**
Estimated Savings				**577,519,771**		**1,128,952,076**

Reconciliation of Required Employer Contributions

Normal Cost (% of Payroll)

1. For Period 7/1/23 – 6/30/24	
a) Employer Normal Cost	11.79%
b) Employee contribution	7.55%
c) Total Normal Cost	19.34%
2. Changes since the prior year annual valuation	
a) Effect of demographic experience	(0.30%)
b) Effect of plan changes	0.01%
c) Effect of discount rate change due to Funding Risk Mitigation	0.00%
d) Effect of assumption changes	0.00%
e) Effect of method changes	0.00%
f) Net effect of the changes above [sum of (a) through (e)]	(0.29%)
3. For Period 7/1/24 – 6/30/25	
a) Employer Normal Cost	11.29%
b) Employee contribution	7.76%
c) Total Normal Cost	19.05%
Employer Normal Cost Change [(3a) – (1a)]	(0.50%)
Employee Contribution Change [(3b) – (1b)]	0.21%

Unfunded Liability Contribution ($)

1. For Period 7/1/23 – 6/30/24	148,845,017
2. Changes since the prior year annual valuation	
a) Effect of adjustments to prior year's amortization schedule	0
b) Effect of elimination of amortization bases	0
c) Effect of progression of amortization bases [1]	(2,932,556)
d) Effect of investment (gain)/loss during prior year [2]	29,302,038
e) Effect of non-investment (gain)/loss during prior year	2,242,442
f) Effect of re-amortizing existing bases due to Funding Risk Mitigation	0
g) Effect of Golden Handshake	0
h) Effect of plan changes	924,682
i) Effect of AL Significant Increase (Government Code section 20791)	0
j) Effect of assumption changes	0
k) Effect of adjustments to the amortization schedule (e.g., Fresh Start)	0
l) Effect of method change	0
m) Net effect of the changes above [sum of (a) through (l)]	29,536,606
3. For Period 7/1/24 – 6/30/25 [(1) + (2m)]	178,381,623

The amounts shown for the period 7/1/23 – 6/30/24 may be different if a prepayment of unfunded actuarial liability is made or a plan change became effective after the prior year's actuarial valuation was performed.

[1] Includes scheduled escalation in individual amortization base payments due to the 5-year ramp and payroll growth assumption used in the pre-2019 amortization policy.

[2] The unfunded liability contribution for the investment (gain)/loss during the year prior to the valuation date is 20% of the "full" annual requirement due to the 5-year ramp. Increases to this amount that occur during the ramp period will be included in line c) for each of the next four years.

Employer Contribution History

The table below provides a recent history of the required and discretionary employer contributions for the plan. The required amounts are based on the actuarial valuation from two years prior without subsequent adjustments, if any. Additional discretionary payments before July 1, 2018 or after June 30, 2023 are not included.

Fiscal Year	Employer Normal Cost	Unfunded Rate	Unfunded Liability Payment ($)	Additional Discretionary Payments
2015 - 16	10.376%	5.053%	N/A	N/A
2016 - 17	10.650%	5.826%	N/A	N/A
2017 - 18	10.192%	N/A	73,598,564	N/A
2018 - 19	10.458%	N/A	100,265,926	0
2019 - 20	10.998%	N/A	129,905,894	371,563,461
2020 - 21	11.673%	N/A	155,375,654	2,672,775
2021 - 22	11.16%	N/A	145,275,743	0
2022 - 23	10.76%	N/A	157,637,843	0
2023 - 24	11.79%	N/A	148,845,017	
2024 - 25	11.29%	N/A	178,381,623	

Funding History

The table below shows the recent history of actuarial accrued liability, market value of assets, unfunded accrued liability, funded ratio and annual covered payroll.

Valuation Date	Accrued Liability (AL)	Market Value of Assets (MVA)	Unfunded Accrued Liability (UAL)	Funded Ratio	Annual Covered Payroll
6/30/2013	$5,008,806,968	$3,974,442,195	$1,034,364,773	79.3%	$856,593,282
6/30/2014	5,656,121,103	4,682,894,962	973,226,141	82.8%	897,506,714
6/30/2015	6,174,498,346	4,775,099,013	1,399,399,333	77.3%	1,000,223,148
6/30/2016	6,850,143,825	4,799,576,566	2,050,567,259	70.1%	1,090,295,411
6/30/2017	7,441,270,302	5,325,794,759	2,115,475,543	71.6%	1,128,397,500
6/30/2018	8,165,793,889	5,748,832,217	2,416,961,672	70.4%	1,118,711,056
6/30/2019	8,602,935,143	6,103,248,893	2,499,686,250	70.9%	1,145,579,094
6/30/2020	8,992,723,006	6,746,072,475	2,246,650,531	75.0%	1,182,860,410
6/30/2021	9,670,471,442	8,273,322,890	1,397,148,552	85.6%	1,211,043,768
6/30/2022	10,195,511,990	7,608,796,058	2,586,715,932	74.6%	1,245,591,727

Normal Cost by Benefit Group

The table below displays the Total Normal Cost broken out by benefit group for FY 2024-25. The Total Normal Cost is the annual cost of service accrual for the fiscal year for active employees and can be viewed as the long-term contribution rate for the benefits contracted. Generally, the normal cost for a benefit group subject to more generous benefit provisions will exceed the normal cost for a group with less generous benefits. However, based on the characteristics of the members (particularly when the number of actives is small), this may not be the case. Future measurements of the Total Normal Cost for each group may differ significantly from the current values due to such factors as: changes in the demographics of the group, changes in economic and demographic assumptions, changes in plan benefits or applicable law.

Plan Identifier	Benefit Group Name	Total Normal Cost FY 2024-25	Number of Actives	Payroll on 6/30/2022
62	Miscellaneous First Level	18.81%	296	$24,984,995
26035	Miscellaneous PEPRA Level	15.70%	10,098	$588,716,887
30192	Miscellaneous Second Level	22.56%	6,988	$578,789,607
30193	Miscellaneous Third Level	18.42%	700	$53,100,238
	Plan Total	**19.05%**	**18,082**	**$1,245,591,727**

Note that if a Benefit Group above has multiple bargaining units, each of which has separately contracted for different benefits such as Employer Paid Member Contributions, then the Normal Cost shown for the respective benefit level does not reflect those differences. Additionally, if a Second Level Benefit Group amended to the same benefit formula as a First Level Benefit Group, their Normal Costs may be dissimilar due to demographic or other population differences. For questions in these situations, please contact the plan actuary.

PEPRA Member Contribution Rates

The California Public Employees' Pension Reform Act of 2013 ("PEPRA") established new benefit formulas, final compensation period, and contribution requirements for "new" employees (generally those first hired into a CalPERS-covered position on or after January 1, 2013). In accordance with Government Code section 7522.30(b), "new members … shall have an initial contribution rate of at least 50% of the normal cost rate." The normal cost for the plan is dependent on the benefit levels, actuarial assumptions, and demographics of the plan, particularly members' entry age into the plan. Should the total normal cost of the plan change by more than 1% from the base total normal cost established for the plan, the new member rate shall be 50% of the new normal cost rounded to the nearest quarter percent.

The table below shows the determination of the PEPRA member contribution rates effective July 1, 2024, based on 50% of the total normal cost rate for each respective plan as of the June 30, 2022 valuation.

		Basis for Current Rate		Rates Effective July 1, 2024			
Plan Identifier	Benefit Group Name	Total Normal Cost	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
26035	Miscellaneous PEPRA Level	14.672%	7.25%	15.70%	1.028%	Yes	7.75%

For purposes of setting member rates, it is preferable to determine total normal cost using a large active population so that the rate remains relatively stable. While each CalPERS non-pooled plan has a sufficiently large active population for this purpose, the PEPRA active population by itself may not be sufficiently large. The total PEPRA normal cost will be determined based on the plan's PEPRA membership only if the number of members covered under the PEPRA formula meets either:

1. 50% of the active population, or
2. 25% of the active population and 100 or more PEPRA members

Until one of these conditions is met, the plan's total PEPRA normal cost will be determined using the entire active plan population (both PEPRA and Classic) based on the PEPRA benefit provisions. For this reason, the PEPRA member contribution rate determined in the table above may not equal 50% of the total normal cost of the PEPRA group shown on the "Normal Cost by Benefit Group" page.

Risk Analysis

- **Future Investment Return Scenarios**
- **Discount Rate Sensitivity**
- **Mortality Rate Sensitivity**
- **Maturity Measures**
- **Maturity Measures History**
- **Funded Status – Termination Basis**

Future Investment Return Scenarios

Analysis using the investment return scenarios from the Asset Liability Management process completed in 2021 was performed to determine the effects of various future investment returns on required employer contributions. The projections below reflect the impact of the CalPERS Funding Risk Mitigation policy. The projected normal cost rates reflect that the rates are anticipated to decline over time as new employees are hired into lower-cost benefit tiers. The projections also assume that all other actuarial assumptions will be realized and that no further changes in assumptions, contributions, benefits, or funding will occur.

The first table shows projected contribution requirements if the fund were to earn either 3.0% or 10.8% annually. These alternate investment returns were chosen because 90% of long-term average returns are expected to fall between them over the 20-year period ending June 30, 2042.

Assumed Annual Return FY 2022-23 through FY 2041-42	Projected Employer Contributions				
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30
3.0% (5th percentile)					
Normal Cost Rate	11.1%	10.9%	10.7%	10.5%	10.3%
UAL Contribution	$204,953,000	$238,199,000	$275,127,000	$339,594,000	$382,876,000
10.8% (95th percentile)					
Normal Cost Rate	11.3%	11.4%	11.5%	11.5%	11.5%
UAL Contribution	$191,519,000	$197,753,000	$193,181,000	$200,205,000	$169,644,000

Required contributions outside of this range are also possible. In particular, whereas it is unlikely that investment returns will average less than 3.0% or greater than 10.8% over a 20-year period, the likelihood of a single investment return less than 3.0% or greater than 10.8% in any given year is much greater. The following analysis illustrates the effect of an extreme, single year investment return.

The portfolio has an expected volatility (or standard deviation) of 12.0% per year. Accordingly, in any given year there is a 16% probability that the annual return will be -5.2% or less and a 2.5% probability that the annual return will be -17.2% or less. These returns represent one and two standard deviations below the expected return of 6.8%.

The following table shows the effect of a one or two standard deviation investment loss in FY 2022-23 on the FY 2025-26 contribution requirements. Note that a single-year investment gain or loss decreases or increases the required UAL contribution amount incrementally for each of the next five years, not just one, due to the 5-year ramp in the amortization policy. However, the contribution requirements beyond the first year are also impacted by investment returns beyond the first year. Historically, significant downturns in the market are often followed by higher than average returns. Such investment gains would offset the impact of these single year negative returns in years beyond FY 2025-26.

Assumed Annual Return for Fiscal Year 2022-23	Required Employer Contributions	Projected Employer Contributions
	FY 2024-25	FY 2025-26
(17.2%) (2 standard deviation loss)		
Normal Cost Rate	11.29%	11.1%
UAL Contribution	$178,381,623	$242,522,000
(5.2%) (1 standard deviation loss)		
Normal Cost Rate	11.29%	11.1%
UAL Contribution	$178,381,623	$220,205,000

- Without investment gains (returns higher than 6.8%) in year FY 2023-24 or later, projected contributions rates would continue to rise over the next four years due to the continued phase-in of the impact of the illustrated investment loss in FY 2022-23.
- The Pension Outlook Tool can be used to model projected contributions for these scenarios beyond FY 2025-26 as well as to model other investment return scenarios.

Discount Rate Sensitivity

The discount rate assumption is calculated as the sum of the assumed real rate of return and the assumed annual price inflation, currently 4.5% and 2.3%, respectively. Changing either the price inflation assumption or the real rate of return assumption will change the discount rate. The sensitivity of the valuation results to the discount rate assumption depends on which component of the discount rate is changed. Shown below are various valuation results as of June 30, 2022 assuming alternate discount rates by changing the two components independently. Results are shown using the current discount rate of 6.8% as well as alternate discount rates of 5.8% and 7.8%. The rates of 5.8% and 7.8% were selected since they illustrate the impact of a 1.0% increase or decrease to the 6.8% assumption.

Sensitivity to the Real Rate of Return Assumption

As of June 30, 2022	1% Lower Real Return Rate	Current Assumptions	1% Higher Real Return Rate
Discount Rate	**5.8%**	**6.8%**	**7.8%**
Price Inflation	2.3%	2.3%	2.3%
Real Rate of Return	**3.5%**	**4.5%**	**5.5%**
a) Total Normal Cost	24.38%	19.05%	15.08%
b) Accrued Liability	$11,677,814,952	$10,195,511,990	$8,983,021,884
c) Market Value of Assets	$7,608,796,058	$7,608,796,058	$7,608,796,058
d) Unfunded Liability/(Surplus) [(b) - (c)]	$4,069,018,894	$2,586,715,932	$1,374,225,826
e) Funded Ratio	65.2%	74.6%	84.7%

Sensitivity to the Price Inflation Assumption

As of June 30, 2022	1% Lower Inflation Rate	Current Assumptions	1% Higher Inflation Rate
Discount Rate	**5.8%**	**6.8%**	**7.8%**
Price Inflation	**1.3%**	**2.3%**	**3.3%**
Real Rate of Return	4.5%	4.5%	4.5%
a) Total Normal Cost	20.12%	19.05%	17.25%
b) Accrued Liability	$10,555,843,718	$10,195,511,990	$9,378,116,584
c) Market Value of Assets	$7,608,796,058	$7,608,796,058	$7,608,796,058
d) Unfunded Liability/(Surplus) [(b) - (c)]	$2,947,047,660	$2,586,715,932	$1,769,320,526
e) Funded Ratio	72.1%	74.6%	81.1%

Mortality Rate Sensitivity

The following table looks at the change in the June 30, 2022 plan costs and funded status under two different longevity scenarios, namely assuming rates of post-retirement mortality are 10% lower or 10% higher than our current mortality assumptions adopted in 2021. This type of analysis highlights the impact on the plan of a change in the mortality assumption.

As of June 30, 2022	10% Lower Mortality Rates	Current Assumptions	10% Higher Mortality Rates
a) Total Normal Cost	19.34%	19.05%	18.78%
b) Accrued Liability	$10,392,289,761	$10,195,511,990	$10,014,247,570
c) Market Value of Assets	$7,608,796,058	$7,608,796,058	$7,608,796,058
d) Unfunded Liability/(Surplus) [(b) - (c)]	$2,783,493,703	$2,586,715,932	$2,405,451,512
e) Funded Ratio	73.2%	74.6%	76.0%

Maturity Measures

As pension plans mature they become more sensitive to risks. Understanding plan maturity and how it affects the ability of a pension plan sponsor to tolerate risk is important in understanding how the pension plan is impacted by investment return volatility, other economic variables and changes in longevity or other demographic assumptions. One way to look at the maturity level of CalPERS and its plans is to look at the ratio of a plan's retiree liability to its total liability. A pension plan in its infancy will have a very low ratio of retiree liability to total liability. As the plan matures, the ratio increases. A mature plan will often have a ratio above 60%-65%.

Ratio of Retiree Accrued Liability to Total Accrued Liability	June 30, 2021	June 30, 2022
1. Retiree Accrued Liability	4,899,020,114	5,358,362,714
2. Total Accrued Liability	9,670,471,442	10,195,511,990
3. Ratio of Retiree AL to Total AL [(1) / (2)]	51%	53%

Another measure of the maturity level of CalPERS and its plans is the ratio of actives to retirees, also called the support ratio. A pension plan in its infancy will have a very high ratio of active to retired members. As the plan matures and members retire, the ratio declines. A mature plan will often have a ratio near or below one.

To calculate the support ratio for the rate plan, retirees and beneficiaries receiving a continuance are each counted as one, even though they may have only worked a portion of their careers as an active member of this rate plan. For this reason, the support ratio, while intuitive, may be less informative than the ratio of retiree liability to total accrued liability above. For comparison, the support ratio for all CalPERS public agency plans is 0.82 and is calculated consistently with how it is for the individual rate plan. Note that to calculate the support ratio for all public agency plans, a retiree with service from more than one CalPERS agency is counted as a retiree more than once.

Support Ratio	June 30, 2021	June 30, 2022
1. Number of Actives	17,762	18,082
2. Number of Retirees	13,073	13,722
3. Support Ratio [(1) / (2)]	1.36	1.32

The actuarial calculations supplied in this communication are based on various assumptions about long-term demographic and economic behavior. Unless these assumptions (e.g., terminations, deaths, disabilities, retirements, salary growth, investment return) are exactly realized each year, there will be differences on a year-to-year basis. The year-to-year differences between actual experience and the assumptions are called actuarial gains and losses and serve to lower or raise required employer contributions from one year to the next. Therefore, employer contributions will inevitably fluctuate, especially due to the ups and downs of investment returns.

Maturity Measures (continued)

Asset Volatility Ratio

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

Liability Volatility Ratio

Also shown in the table below is the liability volatility ratio (LVR), which is the ratio of accrued liability to payroll. Plans that have a higher LVR experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, a plan with LVR of 8 is expected to have twice the contribution volatility of a plan with LVR of 4 when there is a change in accrued liability, such as when there is a change in actuarial assumptions. It should be noted that this ratio indicates a longer-term potential for contribution volatility, since the AVR, described above, will tend to move closer to the LVR as the funded ratio approaches 100%.

Contribution Volatility	June 30, 2021	June 30, 2022
1. Market Value of Assets without Receivables	$8,262,728,633	$7,599,229,800
2. Payroll	1,211,043,768	1,245,591,727
3. Asset Volatility Ratio (AVR) [(1) / (2)]	6.8	6.1
4. Accrued Liability	$9,670,471,442	$10,195,511,990
5. Liability Volatility Ratio (LVR) [(4) / (2)]	8.0	8.2

Maturity Measures History

Valuation Date	Ratio of Retiree Accrued Liability to Total Accrued Liability	Support Ratio	Asset Volatility Ratio	Liability Volatility Ratio
6/30/2017	45%	1.58	4.7	6.6
6/30/2018	47%	1.47	5.1	7.3
6/30/2019	49%	1.42	5.3	7.5
6/30/2020	50%	1.39	5.7	7.6
6/30/2021	51%	1.36	6.8	8.0
6/30/2022	53%	1.32	6.1	8.2

Funded Status – Termination Basis

The funded status measured on a termination basis is an estimate of the financial position of the plan had the contract with CalPERS been terminated as of June 30, 2022. The accrued liability on a termination basis (termination liability) is calculated differently from the plan's ongoing funding liability. For the termination liability calculation, both compensation and service are frozen as of the valuation date and no future pay increases or service accruals are assumed. This measure of funded status is not appropriate for assessing the need for future employer contributions in the case of an ongoing plan, that is, for an employer that continues to provide CalPERS retirement benefits to active employees. Unlike the actuarial cost method used for ongoing plans, the termination liability is the present value of the benefits earned through the valuation date.

A more conservative investment policy and asset allocation strategy was adopted by the board for the Terminated Agency Pool. The Terminated Agency Pool has limited funding sources since no future employer contributions will be made. Therefore, expected benefit payments are secured by risk-free assets and benefit security for members is increased while limiting the funding risk. However, this asset allocation has a lower expected rate of return than the remainder of the PERF and consequently, a lower discount rate assumption. The lower discount rate for the Terminated Agency Pool results in higher liabilities for terminated plans.

The effective termination discount rate will depend on actual market rates of return for risk-free securities on the date of termination. As market discount rates are variable, the table below shows a range for the termination liability based on the lowest and highest interest rates observed during an approximate 19-month period from 12 months before the valuation date to seven months after.

	Discount Rate: 1.75% Price Inflation: 2.50%			Discount Rate: 4.50% Price Inflation: 2.75%		
Market Value of Assets (MVA)	**Termination Liability[1,2]**	**Funded Ratio**	**Unfunded Termination Liability**	**Termination Liability[1,2]**	**Funded Ratio**	**Unfunded Termination Liability**
$7,608,796,058	$21,032,429,474	36.2%	$13,423,633,416	$13,034,317,464	58.4%	$5,425,521,406

[1] The termination liabilities calculated above include a 5% contingency load. The contingency load and other actuarial assumptions can be found in Appendix A.

[2] The discount rate used for termination valuations is a w eighted average of the 10-year and 30-year U.S. Treasury yields w here the weights are based on matching asset and liability durations as of the termination date. The discount rates used in the table are based on 20-year Treasury bonds, rounded to the nearest quarter percentage point, which is a good proxy for most plans. The 20-year Treasury yield w as 3.38% on June 30, 2022, the valuation date.

In order to terminate the plan, first contact our Pension Contract Services unit to initiate a Resolution of Intent to Terminate. The completed Resolution will allow the plan actuary to provide a preliminary termination valuation with a more up-to-date estimate of the plan liabilities. Before beginning this process, please consult with the plan actuary.

Plan’s Major Benefit Provisions

Plan's Major Benefit Options

Shown below is a summary of the major optional benefits for which the agency has contracted. A description of principal standard and optional plan provisions is in Appendix B.

	Benefit Group						
Member Category	Misc	Misc	Misc	Misc	Misc	Misc	Misc
Demographics							
Actives	No	No	No	No	Yes	No	Yes
Transfers/Separated	Yes	No	No	Yes	Yes	No	Yes
Receiving	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Benefit Provision							
Benefit Formula	2% @ 55			2% @ 55	3% @ 60		2% @ 62
Social Security Coverage	Yes			Yes	Yes		Yes
Full/Modified	Modified			Modified	Modified		Full
Employee Contribution Rate					8.00%		7.25%
Final Average Compensation Period	One Year			One Year	One Year		Three Year
Sick Leave Credit	No			No	No		No
Non-Industrial Disability	Standard			Standard	Standard		Standard
Industrial Disability	No			No	No		No
Pre-Retirement Death Benefits							
Optional Settlement 2	No			No	No		No
1959 Survivor Benefit Level	No			No	No		No
Special	No			No	No		No
Alternate (firefighters)	No			No	No		No
Post-Retirement Death Benefits							
Lump Sum	$2000	$2000	$2000	$2000	$2000	$2000	$2000
Survivor Allowance (PRSA)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
COLA	2%	2%	2%	2%	2%	2%	2%

Plan's Major Benefit Options (continued)

Shown below is a summary of the major optional benefits for which the agency has contracted. A description of principal standard and optional plan provisions is in Appendix B.

	Benefit Group						
Member Category	Misc	Misc	Misc	Misc	Misc	Misc	Misc
Demographics							
Actives	Yes	Yes	Yes	No	No	No	No
Transfers/Separated	Yes	Yes	Yes	Yes	Yes	No	No
Receiving	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Benefit Provision							
Benefit Formula	2% @ 60	3% @ 60	3% @ 60	3% @ 60	2% @ 55		
Social Security Coverage	Yes	Yes	Yes	No	No		
Full/Modified	Modified	Modified	Modified	Full	Full		
Employee Contribution Rate	7.00%	8.00%	8.00%				
Final Average Compensation Period	Three Year	One Year	One Year	One Year	One Year		
Sick Leave Credit	No	No	No	No	No		
Non-Industrial Disability	Standard	Standard	Standard	Standard	Standard		
Industrial Disability	No	No	No	No	No		
Pre-Retirement Death Benefits							
Optional Settlement 2	No	No	No	No	No		
1959 Survivor Benefit Level	No	No	No	Indexed	Indexed		
Special	No	No	No	No	No		
Alternate (firefighters)	No	No	No	No	No		
Post-Retirement Death Benefits							
Lump Sum	$2000	$2000	$2000	$2000	$2000	$2000	$2000
Survivor Allowance (PRSA)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
COLA	2%	2%	2%	2%	2%	2%	2%

Plan's Major Benefit Options (continued)

Shown below is a summary of the major optional benefits for which the agency has contracted. A description of principal standard and optional plan provisions is in Appendix B.

	Benefit Group				
Member Category	Misc	Misc	Misc	Misc	
Demographics					
Actives	No	No	No	No	
Transfers/Separated	No	No	No	No	
Receiving	Yes	Yes	Yes	Yes	
Benefit Provision					
Benefit Formula					
Social Security Coverage					
Full/Modified					
Employee Contribution Rate					
Final Average Compensation Period					
Sick Leave Credit					
Non-Industrial Disability					
Industrial Disability					
Pre-Retirement Death Benefits					
Optional Settlement 2					
1959 Survivor Benefit Level					
Special					
Alternate (firefighters)					
Post-Retirement Death Benefits					
Lump Sum	$2000	$2000	$2000	$2000	
Survivor Allowance (PRSA)	Yes	Yes	Yes	Yes	
COLA	2%	2%	2%	2%	

Appendices

- **Appendix A – Actuarial Methods and Assumptions**
- **Appendix B – Principal Plan Provisions**
- **Appendix C – Participant Data**
- **Appendix D – Glossary**

Appendix A

Actuarial Methods and Assumptions

- **Actuarial Data**
- **Actuarial Methods**
- **Actuarial Assumptions**
- **Miscellaneous**

Actuarial Data

As stated in the Actuarial Certification, the data which serves as the basis of this valuation has been obtained from the various CalPERS databases. We have reviewed the valuation data and believe that it is reasonable and appropriate in aggregate. We are unaware of any potential data issues that would have a material effect on the results of this valuation, except that data does not always contain the latest salary information for former members now in reciprocal systems and does not recognize the potential for unusually large salary deviation in certain cases such as elected officials. Therefore, salary information in these cases may not be accurate. These situations are relatively infrequent, however, and generally do not have a material impact on the required employer contributions.

Actuarial Methods

Actuarial Cost Method

The actuarial cost method used is the Entry Age Actuarial Cost Method. Under this method, projected benefits are determined for all members and the associated liabilities are spread in a manner that produces level annual cost as a percentage of pay in each year from the member's entry age to their assumed retirement age on the valuation date. The cost allocated to the current fiscal year is called the normal cost.

The actuarial accrued liability for active members is then calculated as the portion of the total cost of the plan allocated to prior years. The actuarial accrued liability for members currently receiving benefits and for members entitled to deferred benefits is equal to the present value of the benefits expected to be paid. No normal costs are applicable for these participants.

CalPERS uses an in-house proprietary actuarial model for calculating plan costs. We believe this model is fit for its intended purpose and meets all applicable Actuarial Standards of Practice. Furthermore, the actuarial results of our model are independently confirmed periodically by outside auditing actuaries. The actuarial assumptions used are internally consistent and the generated results are reasonable.

Amortization of Unfunded Actuarial Accrued Liability

The excess of the total actuarial accrued liability over the market value of plan assets is called the unfunded actuarial accrued liability (UAL). Funding requirements are determined by adding the normal cost and a payment toward the UAL. The UAL payment is equal to the sum of individual amortization payments, each representing a different source of UAL for a given measurement period.

Amortization payments are determined according to the CalPERS amortization policy. The board adopted a new policy effective for the June 30, 2019 actuarial valuation. The new policy applies prospectively only; amortization bases (sources of UAL) established prior to the June 30, 2019 valuation will continue to be amortized according to the prior policy.

<u>Prior Policy (Bases Established prior to June 30, 2019)</u>

Amortization payments are determined as a level percentage of payroll whereby the payment increases each year at an escalation rate. Gains or losses are amortized over a fixed 30-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. All changes in liability due to plan amendments (other than golden handshakes) are amortized over a 20-year period with no ramp. Changes in actuarial assumptions or changes in actuarial methodology are amortized over a 20-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. Changes in unfunded accrued liability due to a Golden Handshake will be amortized over a period of five years. Bases established prior to June 30, 2013 may be amortized differently. A summary is provided in the following table:

Driver	Source				
	(Gain)/Loss		Assumption/Method Change	Benefit Change	Golden Handshake
	Investment	Non-investment			
Amortization Period	30 Years	30 Years	20 Years	20 Years	5 Years
Escalation Rate - Active Plans - Inactive Plans	 2.80% 0%	 2.80% 0%	 2.80% 0%	 2.80% 0%	 2.80% 0%
Ramp Up	5	5	5	0	0
Ramp Down	5	5	5	0	0

The 5-year ramp up means that the payments in the first four years of the amortization period are 20%, 40%, 60% and 80% of the "full" payment 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 are determined as a level dollar amount. Investment gains or losses are amortized over a fixed 20-year period with a 5-year ramp up at the beginning of the amortization period. Non-investment gains or losses are amortized over a fixed 20-year period with no ramps. All changes in liability due to plan amendments (other than golden handshakes) are amortized over a 20-year period with no ramps. Changes in actuarial assumptions or changes in actuarial methodology are amortized over a 20-year period with no ramps. Changes in unfunded accrued liability due to a Golden Handshake are amortized over a period of five years. A summary is provided in the table below:

	Source				
	(Gain)/Loss		Assumption/ Method Change	Benefit Change	Golden Handshake
	Investment	Non-investment			
Amortization Period	20 Years	20 Years	20 Years	20 Years	5 Years
Escalation Rate	0%	0%	0%	0%	0%
Ramp Up	5	0	0	0	0
Ramp Down	0	0	0	0	0

Exceptions for Inconsistencies

An exception to the amortization rules above is used whenever their application results in inconsistencies. In these cases, a "fresh start" approach is used. This means that the current unfunded actuarial liability is projected and amortized over a set number of years. For example, a fresh start is needed in the following situations:

- When a negative payment would be required on a positive unfunded actuarial liability; or
- When the payment would completely amortize the total unfunded liability in a very short time period, and results in a large change in the employer contribution requirement.

It should be noted that the actuary may determine that a fresh start is necessary under other circumstances. In all cases of a fresh start, the period is set by the actuary at what is deemed appropriate; however, the period will not be greater than 20 years.

Exceptions for Plans in Surplus

If a surplus exists (i.e., the Market Value of Assets exceeds the plan's accrued liability) any prior amortization layers shall be considered fully amortized, and the surplus shall not be amortized.

In the event of any subsequent unfunded liability, a Fresh Start shall be used with an amortization period of 20 years or less.

Exceptions for Small Amounts

Where small unfunded liabilities are identified in annual valuations which result in small payment amounts, the actuary may shorten the remaining period for these bases.

- When the balance of a single amortization base has an absolute value less than $250, the amortization period is reduced to one year.
- When the entire unfunded liability is a small amount, the actuary may perform a Fresh Start and use an appropriate amortization period.

Exceptions for Inactive Plans

The following exceptions apply to plans classified as Inactive. These plans have no active members and no expectation to have active members in the future.

- Amortization of the unfunded liability is on a "level dollar" basis rather than a "level percent of pay" basis. For amortization layers, which utilize a ramp up and ramp down, the "ultimate" payment is constant.
- Actuarial judgment will be used to shorten amortization periods for Inactive plans with existing periods that are deemed too long given the duration of the liability. The specific demographics of the plan will be used to determine if shorter periods may be more appropriate.

Exceptions for Inactive Agencies

For a public agency with no active members in any CalPERS rate plan, the unfunded liability shall be amortized over a closed amortization period of no more than 15 years.

Asset Valuation Method

The Actuarial Value of Assets is set equal to the market value of assets. Asset values include accounts receivable.

PEPRA Normal Cost Rate Methodology

Per Government Code section 7522.30(b), the "normal cost rate" shall mean the annual actuarially determined normal cost for the plan of retirement benefits provided to the new member and shall be established based on actuarial assumptions used to determine the liabilities and costs as part of the annual actuarial valuation. The plan of retirement benefits shall include any elements that would impact the actuarial determination of the normal cost, including, but not limited to, the retirement formula, eligibility and vesting criteria, ancillary benefit provisions, and any automatic cost-of-living adjustments as determined by the public retirement system.

For purposes of setting member rates, it is preferable to determine total normal cost using a large active population so that the rate remains relatively stable. While each CalPERS non-pooled plan has a sufficiently large active population for this purpose, the PEPRA active population by itself may not be sufficiently large. The total PEPRA normal cost will be determined based on the plan's PEPRA membership only if the number of members covered under the PEPRA formula meets either:

1. 50% of the active population, or
2. 25% of the active population and 100 or more PEPRA members

Until one of these conditions is met, the plan's total PEPRA normal cost will be determined using the entire active plan population (both PEPRA and Classic) based on the PEPRA benefit provisions.

Actuarial Assumptions

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

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

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

Economic Assumptions

Discount Rate

The prescribed discount rate assumption, adopted by the board on November 17, 2021, is 6.80% compounded annually (net of investment and administrative expenses) as of June 30, 2022.

Termination Liability Discount Rate

The current discount rate assumption used for termination valuations is a weighted average of the 10-year and 30-year U.S. Treasury yields where the weights are based on matching asset and liability durations as of the termination date.

The accrued liabilities on a termination basis in this report are calculated using an observed range of market interest rates. This range is based on the lowest and highest 20-year Treasury bond observed during an approximate 19-month period from 12 months before the valuation date to seven months after. The 20-year Treasury bond has a similar duration to most plan liabilities and serves as a good proxy for the termination discount rate. The 20-year Treasury yield was 3.38% on June 30, 2022.

Salary Growth

Annual increases vary by category, entry age, and duration of service. A sample of assumed increases are shown below. Wage inflation assumption in the valuation year (2.80% for 2022) is added to these factors for total salary growth.

Public Agency Miscellaneous

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.0764	0.0621	0.0521
1	0.0663	0.0528	0.0424
2	0.0576	0.0449	0.0346
3	0.0501	0.0381	0.0282
4	0.0435	0.0324	0.0229
5	0.0378	0.0276	0.0187
10	0.0201	0.0126	0.0108
15	0.0155	0.0102	0.0071
20	0.0119	0.0083	0.0047
25	0.0091	0.0067	0.0031
30	0.0070	0.0054	0.0020

Public Agency Fire

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1517	0.1549	0.0631
1	0.1191	0.1138	0.0517
2	0.0936	0.0835	0.0423
3	0.0735	0.0613	0.0346
4	0.0577	0.0451	0.0284
5	0.0453	0.0331	0.0232
10	0.0188	0.0143	0.0077
15	0.0165	0.0124	0.0088
20	0.0145	0.0108	0.0101
25	0.0127	0.0094	0.0115
30	0.0112	0.0082	0.0132

Public Agency Police

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1181	0.1051	0.0653
1	0.0934	0.0812	0.0532
2	0.0738	0.0628	0.0434
3	0.0584	0.0485	0.0353
4	0.0462	0.0375	0.0288
5	0.0365	0.0290	0.0235
10	0.0185	0.0155	0.0118
15	0.0183	0.0150	0.0131
20	0.0181	0.0145	0.0145
25	0.0179	0.0141	0.0161
30	0.0178	0.0136	0.0179

Salary Growth (continued)

Public Agency County Peace Officers

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1238	0.1053	0.0890
1	0.0941	0.0805	0.0674
2	0.0715	0.0616	0.0510
3	0.0544	0.0471	0.0387
4	0.0413	0.0360	0.0293
5	0.0314	0.0276	0.0222
10	0.0184	0.0142	0.0072
15	0.0174	0.0124	0.0073
20	0.0164	0.0108	0.0074
25	0.0155	0.0094	0.0075
30	0.0147	0.0083	0.0077

Schools

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.0275	0.0275	0.0200
1	0.0422	0.0373	0.0298
2	0.0422	0.0373	0.0298
3	0.0422	0.0373	0.0298
4	0.0388	0.0314	0.0245
5	0.0308	0.0239	0.0179
10	0.0236	0.0160	0.0121
15	0.0182	0.0135	0.0103
20	0.0145	0.0109	0.0085
25	0.0124	0.0102	0.0058
30	0.0075	0.0053	0.0019

- The Miscellaneous salary scale is used for Local Prosecutors.
- The Police salary scale is used for Other Safety, Local Sheriff, and School Police.

Price Inflation

2.30% compounded annually.

Wage Inflation

2.80% compounded annually (used in projecting individual salary increases).

Payroll Growth

2.80% compounded annually (used in projecting the payroll over which the unfunded liability is amortized for level percent of payroll bases). This assumption is used for all plans with active members.

Non-valued Potential Additional Liabilities

The potential liability loss for a cost-of-living increase exceeding the 2.30% price inflation assumption and any potential liability loss from future member service purchases that are not reflected in the valuation.

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1% for those plans that have adopted the provision of providing Credit for Unused Sick Leave.

Conversion of Employer Paid Member Contributions (EPMC)

Total years of service is increased by the Employee Contribution Rate for those plans with the provision providing for the Conversion of Employer Paid Member Contributions (EPMC) during the final compensation period.

Norris Decision (Best Factors)

Employees hired prior to July 1, 1982 have projected benefit amounts increased in order to reflect the use of "Best Factors" in the calculation of optional benefit forms. This is due to a 1983 Supreme Court decision, known as the Norris decision, which required males and females to be treated equally in the determination of benefit amounts. Consequently, anyone already employed at that time is given the best possible conversion factor when optional benefits are determined. No loading is necessary for employees hired after July 1, 1982.

Termination Liability

The termination liabilities include a 5% contingency load. This load is for unforeseen improvements in mortality.

Demographic Assumptions

Pre-Retirement Mortality

The mortality assumptions are based on mortality rates resulting from the most recent CalPERS Experience Study adopted by the CalPERS Board in November 2021. For purposes of the mortality rates, the rates incorporate generational mortality to capture on-going mortality improvement. Generational mortality explicitly assumes that members born more recently will live longer than the members born before them thereby capturing the mortality improvement seen in the past and expected continued improvement. For more details, please refer to the 2021 experience study report that can be found on the CalPERS website.

Rates vary by age and gender are shown in the table below. This table only contains a sample of the 2017 base table rates for illustrative purposes. The non-industrial death rates are used for all plans. The industrial death rates are used for Safety plans (except for local Safety members described in Section 20423.6 where the agency has not specifically contracted for industrial death benefits.)

	Miscellaneous		Safety			
	Non-Industrial Death (Not Job-Related)		Non-Industrial Death (Not Job-Related)		Industrial Death (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
20	0.00039	0.00014	0.00038	0.00014	0.00004	0.00002
25	0.00033	0.00013	0.00034	0.00018	0.00004	0.00002
30	0.00044	0.00019	0.00042	0.00025	0.00005	0.00003
35	0.00058	0.00029	0.00048	0.00034	0.00005	0.00004
40	0.00075	0.00039	0.00055	0.00042	0.00006	0.00005
45	0.00093	0.00054	0.00066	0.00053	0.00007	0.00006
50	0.00134	0.00081	0.00092	0.00073	0.00010	0.00008
55	0.00198	0.00123	0.00138	0.00106	0.00015	0.00012
60	0.00287	0.00179	0.00221	0.00151	0.00025	0.00017
65	0.00403	0.00250	0.00346	0.00194	0.00038	0.00022
70	0.00594	0.00404	0.00606	0.00358	0.00067	0.00040
75	0.00933	0.00688	0.01099	0.00699	0.00122	0.00078
80	0.01515	0.01149	0.02027	0.01410	0.00225	0.00157

- The pre-retirement mortality rates above are for 2017 and are projected generationally for future years using 80% of the Society of Actuaries' Scale MP-2020.
- Miscellaneous plans usually have industrial death rates set to zero unless the agency has specifically contracted for industrial death benefits. If so, each non-industrial death rate shown above will be split into two components: 99% will become the non-industrial death rate and 1% will become the industrial death rate.

Post-Retirement Mortality

Rates vary by age, type of retirement, and gender. See sample rates in table below. These rates are used for all plans.

	Service Retirement		Non-Industrial Disability (Not Job-Related)		Industrial Disability (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
50	0.00267	0.00199	0.01701	0.01439	0.00430	0.00311
55	0.00390	0.00325	0.02210	0.01734	0.00621	0.00550
60	0.00578	0.00455	0.02708	0.01962	0.00944	0.00868
65	0.00857	0.00612	0.03334	0.02276	0.01394	0.01190
70	0.01333	0.00996	0.04001	0.02910	0.02163	0.01858
75	0.02391	0.01783	0.05376	0.04160	0.03446	0.03134
80	0.04371	0.03403	0.07936	0.06112	0.05853	0.05183
85	0.08274	0.06166	0.11561	0.09385	0.10137	0.08045
90	0.14539	0.11086	0.16608	0.14396	0.16584	0.12434
95	0.24665	0.20364	0.24665	0.20364	0.24665	0.20364
100	0.36198	0.31582	0.36198	0.31582	0.36198	0.31582
105	0.52229	0.44679	0.52229	0.44679	0.52229	0.44679
110	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

The post-retirement mortality rates above are for 2017 and are projected generationally for future years using 80% of the Society of Actuaries' Scale MP-2020.

Marital Status

For active members, a percentage who are married upon retirement is assumed according to the member category as shown in the following table.

Member Category	Percent Married
Miscellaneous Member	70%
Local Police	85%
Local Fire	85%
Other Local Safety	70%
School Police	85%
Local County Peace Officers	75%

Age of Spouse

It is assumed that female spouses are 3 years younger than male spouses. This assumption is used for all plans.

Separated Members

It is assumed that separated members refund immediately if non-vested. Separated members who are vested are assumed to retire at age 59 for Miscellaneous members and age 54 for Safety members.

Termination with Refund

Rates vary by entry age and service for Miscellaneous plans. Rates vary by service for Safety plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20		Entry Age 25		Entry Age 30		Entry Age 35		Entry Age 40		Entry Age 45	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	0.1851	0.1944	0.1769	0.1899	0.1631	0.1824	0.1493	0.1749	0.1490	0.1731	0.1487	0.1713
1	0.1531	0.1673	0.1432	0.1602	0.1266	0.1484	0.1101	0.1366	0.1069	0.1323	0.1037	0.1280
2	0.1218	0.1381	0.1125	0.1307	0.0970	0.1183	0.0815	0.1058	0.0771	0.0998	0.0726	0.0938
3	0.0927	0.1085	0.0852	0.1020	0.0727	0.0912	0.0601	0.0804	0.0556	0.0737	0.0511	0.0669
4	0.0672	0.0801	0.0616	0.0752	0.0524	0.0670	0.0431	0.0587	0.0392	0.0523	0.0352	0.0459
5	0.0463	0.0551	0.0423	0.0517	0.0358	0.0461	0.0292	0.0404	0.0261	0.0350	0.0230	0.0296
10	0.0112	0.0140	0.0101	0.0129	0.0083	0.0112	0.0064	0.0094	0.0048	0.0071	0.0033	0.0049
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire		Police		County Peace Officer	
	Male	Female	Male	Female	Male	Female
0	0.1022	0.1317	0.1298	0.1389	0.1086	0.1284
1	0.0686	0.1007	0.0789	0.0904	0.0777	0.0998
2	0.0441	0.0743	0.0464	0.0566	0.0549	0.0759
3	0.0272	0.0524	0.0274	0.0343	0.0385	0.0562
4	0.0161	0.0349	0.0170	0.0206	0.0268	0.0402
5	0.0092	0.0214	0.0113	0.0128	0.0186	0.0276
10	0.0015	0.0000	0.0032	0.0047	0.0046	0.0038
15	0.0000	0.0000	0.0000	0.0000	0.0023	0.0036
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

- The police termination and refund rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

Termination with Refund (continued)

Schools

Duration of Service	Entry Age 20		Entry Age 25		Entry Age 30		Entry Age 35		Entry Age 40		Entry Age 45	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	0.2054	0.2120	0.1933	0.1952	0.1730	0.1672	0.1527	0.1392	0.1423	0.1212	0.1318	0.1032
1	0.1922	0.2069	0.1778	0.1883	0.1539	0.1573	0.1300	0.1264	0.1191	0.1087	0.1083	0.0910
2	0.1678	0.1859	0.1536	0.1681	0.1298	0.1383	0.1060	0.1086	0.0957	0.0934	0.0853	0.0782
3	0.1384	0.1575	0.1256	0.1417	0.1042	0.1155	0.0829	0.0893	0.0736	0.0774	0.0643	0.0656
4	0.1085	0.1274	0.0978	0.1143	0.0800	0.0925	0.0622	0.0707	0.0542	0.0620	0.0462	0.0533
5	0.0816	0.0991	0.0732	0.0887	0.0590	0.0713	0.0449	0.0539	0.0383	0.0476	0.0317	0.0413
10	0.0222	0.0248	0.0200	0.0221	0.0163	0.0174	0.0125	0.0128	0.0094	0.0100	0.0063	0.0072
15	0.0106	0.0132	0.0095	0.0113	0.0077	0.0083	0.0058	0.0052	0.0040	0.0039	0.0021	0.0026
20	0.0059	0.0065	0.0050	0.0054	0.0035	0.0036	0.0021	0.0019	0.0010	0.0009	0.0000	0.0000
25	0.0029	0.0034	0.0025	0.0029	0.0018	0.0020	0.0010	0.0012	0.0005	0.0006	0.0000	0.0000
30	0.0012	0.0015	0.0011	0.0013	0.0011	0.0011	0.0010	0.0009	0.0005	0.0005	0.0000	0.0000
35	0.0006	0.0007	0.0006	0.0007	0.0005	0.0006	0.0005	0.0005	0.0003	0.0002	0.0000	0.0000

Termination with Vested Benefits

Rates vary by entry age and service for Miscellaneous plans. Rates vary by service for Safety plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20		Entry Age 25		Entry Age 30		Entry Age 35		Entry Age 40	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
5	0.0381	0.0524	0.0381	0.0524	0.0358	0.0464	0.0334	0.0405	0.0301	0.0380
10	0.0265	0.0362	0.0265	0.0362	0.0254	0.0334	0.0244	0.0307	0.0197	0.0236
15	0.0180	0.0252	0.0180	0.0252	0.0166	0.0213	0.0152	0.0174	0.0119	0.0132
20	0.0141	0.0175	0.0141	0.0175	0.0110	0.0131	0.0079	0.0087	0.0000	0.0000
25	0.0084	0.0108	0.0084	0.0108	0.0064	0.0076	0.0000	0.0000	0.0000	0.0000
30	0.0047	0.0056	0.0047	0.0056	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0038	0.0041	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire		Police		County Peace Officer	
	Male	Female	Male	Female	Male	Female
5	0.0089	0.0224	0.0156	0.0272	0.0177	0.0266
10	0.0066	0.0164	0.0113	0.0198	0.0126	0.0189
15	0.0048	0.0120	0.0083	0.0144	0.0089	0.0134
20	0.0035	0.0088	0.0060	0.0105	0.0063	0.0095
25	0.0024	0.0061	0.0042	0.0073	0.0042	0.0063
30	0.0012	0.0031	0.0021	0.0037	0.0021	0.0031
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

- After termination with vested benefits, a Miscellaneous member is assumed to retire at age 59 and a Safety member at age 54.
- The Police termination with vested benefits rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

Schools

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

Non-Industrial (Not Job-Related) Disability

Rates vary by age and gender for Miscellaneous plans. Rates vary by age and category for Safety plans.

	Miscellaneous		Fire	Police	County Peace Officer	Schools	
Age	Male	Female	Male and Female	Male and Female	Male and Female	Male	Female
20	0.0001	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
25	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0002
30	0.0002	0.0003	0.0001	0.0001	0.0001	0.0002	0.0002
35	0.0004	0.0007	0.0001	0.0002	0.0003	0.0005	0.0004
40	0.0009	0.0012	0.0001	0.0002	0.0006	0.0010	0.0008
45	0.0015	0.0019	0.0002	0.0003	0.0011	0.0019	0.0015
50	0.0015	0.0019	0.0004	0.0005	0.0016	0.0027	0.0021
55	0.0014	0.0013	0.0006	0.0007	0.0009	0.0024	0.0017
60	0.0012	0.0009	0.0006	0.0011	0.0005	0.0020	0.0010

- The Miscellaneous non-industrial disability rates are used for Local Prosecutors.
- The police non-industrial disability rates are also used for Other Safety, Local Sheriff, and School Police.

Industrial (Job-Related) Disability

Rates vary by age and category.

Age	Fire	Police	County Peace Officer
20	0.0001	0.0000	0.0004
25	0.0002	0.0017	0.0013
30	0.0006	0.0048	0.0025
35	0.0012	0.0079	0.0037
40	0.0023	0.0110	0.0051
45	0.0040	0.0141	0.0067
50	0.0208	0.0185	0.0092
55	0.0307	0.0479	0.0151
60	0.0438	0.0602	0.0174

- The police industrial disability rates are also used for Local Sheriff and Other Safety.
- 50% of the police industrial disability rates are used for School Police.
- 1% of the police industrial disability rates are used for Local Prosecutors.
- Normally, rates are zero for Miscellaneous plans unless the agency has specifically contracted for industrial disability benefits. If so, each Miscellaneous non-industrial disability rate will be split into two components: 50% will become the non-industrial disability rate and 50% will become the industrial disability rate.

Service Retirement

Retirement rates vary by age, service, and formula, except for the Safety Half Pay at 55 and 2% at 55 formulas, where retirement rates vary by age only.

Public Agency Miscellaneous 1.5% at 65

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.008	0.011	0.013	0.015	0.017	0.019
51	0.007	0.010	0.012	0.013	0.015	0.017
52	0.010	0.014	0.017	0.019	0.021	0.024
53	0.008	0.012	0.015	0.017	0.019	0.022
54	0.012	0.016	0.019	0.022	0.025	0.028
55	0.018	0.025	0.031	0.035	0.038	0.043
56	0.015	0.021	0.025	0.029	0.032	0.036
57	0.020	0.028	0.033	0.038	0.043	0.048
58	0.024	0.033	0.040	0.046	0.052	0.058
59	0.028	0.039	0.048	0.054	0.060	0.067
60	0.049	0.069	0.083	0.094	0.105	0.118
61	0.062	0.087	0.106	0.120	0.133	0.150
62	0.104	0.146	0.177	0.200	0.223	0.251
63	0.099	0.139	0.169	0.191	0.213	0.239
64	0.097	0.136	0.165	0.186	0.209	0.233
65	0.140	0.197	0.240	0.271	0.302	0.339
66	0.092	0.130	0.157	0.177	0.198	0.222
67	0.129	0.181	0.220	0.249	0.277	0.311
68	0.092	0.129	0.156	0.177	0.197	0.221
69	0.092	0.130	0.158	0.178	0.199	0.224
70	0.103	0.144	0.175	0.198	0.221	0.248

Public Agency Miscellaneous 2% at 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.010	0.011	0.014	0.014	0.017	0.017
51	0.017	0.013	0.014	0.010	0.010	0.010
52	0.014	0.014	0.018	0.015	0.016	0.016
53	0.015	0.012	0.013	0.010	0.011	0.011
54	0.006	0.010	0.017	0.016	0.018	0.018
55	0.012	0.016	0.024	0.032	0.036	0.036
56	0.010	0.014	0.023	0.030	0.034	0.034
57	0.006	0.018	0.030	0.040	0.044	0.044
58	0.022	0.023	0.033	0.042	0.046	0.046
59	0.039	0.033	0.040	0.047	0.050	0.050
60	0.063	0.069	0.074	0.090	0.137	0.116
61	0.044	0.058	0.066	0.083	0.131	0.113
62	0.084	0.107	0.121	0.153	0.238	0.205
63	0.173	0.166	0.165	0.191	0.283	0.235
64	0.120	0.145	0.164	0.147	0.160	0.172
65	0.138	0.160	0.214	0.216	0.237	0.283
66	0.198	0.228	0.249	0.216	0.228	0.239
67	0.207	0.242	0.230	0.233	0.233	0.233
68	0.201	0.234	0.225	0.231	0.231	0.231
69	0.152	0.173	0.164	0.166	0.166	0.166
70	0.200	0.200	0.200	0.200	0.200	0.200

Service Retirement

Public Agency Miscellaneous 2% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.014	0.017	0.021	0.023	0.024
51	0.013	0.017	0.017	0.018	0.018	0.019
52	0.013	0.018	0.018	0.020	0.020	0.021
53	0.013	0.019	0.021	0.024	0.025	0.026
54	0.017	0.025	0.028	0.032	0.033	0.035
55	0.045	0.042	0.053	0.086	0.098	0.123
56	0.018	0.036	0.056	0.086	0.102	0.119
57	0.041	0.046	0.056	0.076	0.094	0.120
58	0.052	0.044	0.048	0.074	0.106	0.123
59	0.043	0.058	0.073	0.092	0.105	0.126
60	0.059	0.064	0.083	0.115	0.154	0.170
61	0.087	0.074	0.087	0.107	0.147	0.168
62	0.115	0.123	0.151	0.180	0.227	0.237
63	0.116	0.127	0.164	0.202	0.252	0.261
64	0.084	0.138	0.153	0.190	0.227	0.228
65	0.167	0.187	0.210	0.262	0.288	0.291
66	0.187	0.258	0.280	0.308	0.318	0.319
67	0.195	0.235	0.244	0.277	0.269	0.280
68	0.228	0.248	0.250	0.241	0.245	0.245
69	0.188	0.201	0.209	0.219	0.231	0.231
70	0.229	0.229	0.229	0.229	0.229	0.229

Public Agency Miscellaneous 2.5% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.017	0.027	0.035	0.046	0.050
51	0.019	0.021	0.025	0.030	0.038	0.040
52	0.018	0.020	0.026	0.034	0.038	0.037
53	0.013	0.021	0.031	0.045	0.052	0.053
54	0.025	0.025	0.030	0.046	0.057	0.068
55	0.029	0.042	0.064	0.109	0.150	0.225
56	0.036	0.047	0.068	0.106	0.134	0.194
57	0.051	0.047	0.060	0.092	0.116	0.166
58	0.035	0.046	0.062	0.093	0.119	0.170
59	0.029	0.053	0.072	0.112	0.139	0.165
60	0.039	0.069	0.094	0.157	0.177	0.221
61	0.080	0.077	0.086	0.140	0.167	0.205
62	0.086	0.131	0.149	0.220	0.244	0.284
63	0.135	0.135	0.147	0.214	0.222	0.262
64	0.114	0.128	0.158	0.177	0.233	0.229
65	0.112	0.174	0.222	0.209	0.268	0.273
66	0.235	0.254	0.297	0.289	0.321	0.337
67	0.237	0.240	0.267	0.249	0.267	0.277
68	0.258	0.271	0.275	0.207	0.210	0.212
69	0.117	0.208	0.266	0.219	0.250	0.270
70	0.229	0.229	0.229	0.229	0.229	0.229

Service Retirement

Public Agency Miscellaneous 2.7% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.011	0.016	0.022	0.033	0.034	0.038
51	0.018	0.019	0.023	0.032	0.031	0.031
52	0.019	0.020	0.026	0.035	0.034	0.037
53	0.020	0.020	0.025	0.043	0.048	0.053
54	0.018	0.030	0.040	0.052	0.053	0.070
55	0.045	0.058	0.082	0.138	0.208	0.278
56	0.057	0.062	0.080	0.121	0.178	0.222
57	0.045	0.052	0.071	0.106	0.147	0.182
58	0.074	0.060	0.074	0.118	0.163	0.182
59	0.058	0.067	0.086	0.123	0.158	0.187
60	0.087	0.084	0.096	0.142	0.165	0.198
61	0.073	0.084	0.101	0.138	0.173	0.218
62	0.130	0.133	0.146	0.187	0.214	0.249
63	0.122	0.140	0.160	0.204	0.209	0.243
64	0.104	0.124	0.154	0.202	0.214	0.230
65	0.182	0.201	0.242	0.264	0.293	0.293
66	0.272	0.249	0.273	0.285	0.312	0.312
67	0.182	0.217	0.254	0.249	0.264	0.264
68	0.223	0.197	0.218	0.242	0.273	0.273
69	0.217	0.217	0.217	0.217	0.217	0.217
70	0.227	0.227	0.227	0.227	0.227	0.227

Public Agency Miscellaneous 3% at 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.015	0.020	0.025	0.039	0.040	0.044
51	0.041	0.034	0.032	0.041	0.036	0.037
52	0.024	0.020	0.022	0.039	0.040	0.041
53	0.018	0.024	0.032	0.047	0.048	0.057
54	0.033	0.033	0.035	0.051	0.049	0.052
55	0.137	0.043	0.051	0.065	0.076	0.108
56	0.173	0.038	0.054	0.075	0.085	0.117
57	0.019	0.035	0.059	0.088	0.111	0.134
58	0.011	0.040	0.070	0.105	0.133	0.162
59	0.194	0.056	0.064	0.081	0.113	0.163
60	0.081	0.085	0.133	0.215	0.280	0.333
61	0.080	0.090	0.134	0.170	0.223	0.292
62	0.137	0.153	0.201	0.250	0.278	0.288
63	0.128	0.140	0.183	0.227	0.251	0.260
64	0.174	0.147	0.173	0.224	0.239	0.264
65	0.152	0.201	0.262	0.299	0.323	0.323
66	0.272	0.273	0.317	0.355	0.380	0.380
67	0.218	0.237	0.268	0.274	0.284	0.284
68	0.200	0.228	0.269	0.285	0.299	0.299
69	0.250	0.250	0.250	0.250	0.250	0.250
70	0.245	0.245	0.245	0.245	0.245	0.245

Service Retirement

Public Agency Miscellaneous 2% at 62

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.000	0.000	0.000	0.000	0.000	0.000
51	0.000	0.000	0.000	0.000	0.000	0.000
52	0.005	0.008	0.012	0.015	0.019	0.031
53	0.007	0.011	0.014	0.018	0.021	0.032
54	0.007	0.011	0.015	0.019	0.023	0.034
55	0.010	0.019	0.028	0.036	0.061	0.096
56	0.014	0.026	0.038	0.050	0.075	0.108
57	0.018	0.029	0.039	0.050	0.074	0.107
58	0.023	0.035	0.048	0.060	0.073	0.099
59	0.025	0.038	0.051	0.065	0.092	0.128
60	0.031	0.051	0.071	0.091	0.111	0.138
61	0.038	0.058	0.079	0.100	0.121	0.167
62	0.044	0.074	0.104	0.134	0.164	0.214
63	0.077	0.105	0.134	0.163	0.192	0.237
64	0.072	0.101	0.129	0.158	0.187	0.242
65	0.108	0.141	0.173	0.206	0.239	0.300
66	0.132	0.172	0.212	0.252	0.292	0.366
67	0.132	0.172	0.212	0.252	0.292	0.366
68	0.120	0.156	0.193	0.229	0.265	0.333
69	0.120	0.156	0.193	0.229	0.265	0.333
70	0.120	0.156	0.193	0.229	0.265	0.333

Service Retirement

Public Agency Fire Half Pay at 55 and 2% at 55

Age	Rate	Age	Rate
50	0.016	56	0.111
51	0.000	57	0.000
52	0.034	58	0.095
53	0.020	59	0.044
54	0.041	60	1.000
55	0.075		

Public Agency Police Half Pay at 55 and 2% at 55

Age	Rate	Age	Rate
50	0.026	56	0.069
51	0.000	57	0.051
52	0.016	58	0.072
53	0.027	59	0.070
54	0.010	60	0.300
55	0.167		

Service Retirement

Public Agency Police 2% at 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.018	0.077	0.056	0.046	0.043	0.046
51	0.022	0.087	0.060	0.048	0.044	0.047
52	0.020	0.102	0.081	0.071	0.069	0.075
53	0.016	0.072	0.053	0.045	0.042	0.046
54	0.006	0.071	0.071	0.069	0.072	0.080
55	0.009	0.040	0.099	0.157	0.186	0.186
56	0.020	0.051	0.108	0.165	0.194	0.194
57	0.036	0.072	0.106	0.139	0.156	0.156
58	0.001	0.046	0.089	0.130	0.152	0.152
59	0.066	0.094	0.119	0.143	0.155	0.155
60	0.177	0.177	0.177	0.177	0.177	0.177
61	0.134	0.134	0.134	0.134	0.134	0.134
62	0.184	0.184	0.184	0.184	0.184	0.184
63	0.250	0.250	0.250	0.250	0.250	0.250
64	0.177	0.177	0.177	0.177	0.177	0.177
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2% at 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.054	0.054	0.056	0.080	0.064	0.066
51	0.020	0.020	0.021	0.030	0.024	0.024
52	0.037	0.037	0.038	0.054	0.043	0.045
53	0.051	0.051	0.053	0.076	0.061	0.063
54	0.082	0.082	0.085	0.121	0.097	0.100
55	0.139	0.139	0.139	0.139	0.139	0.139
56	0.129	0.129	0.129	0.129	0.129	0.129
57	0.085	0.085	0.085	0.085	0.085	0.085
58	0.119	0.119	0.119	0.119	0.119	0.119
59	0.167	0.167	0.167	0.167	0.167	0.167
60	0.152	0.152	0.152	0.152	0.152	0.152
61	0.179	0.179	0.179	0.179	0.179	0.179
62	0.179	0.179	0.179	0.179	0.179	0.179
63	0.179	0.179	0.179	0.179	0.179	0.179
64	0.179	0.179	0.179	0.179	0.179	0.179
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.019	0.053	0.045	0.054	0.057	0.061
51	0.002	0.017	0.028	0.044	0.053	0.060
52	0.002	0.031	0.037	0.051	0.059	0.066
53	0.026	0.049	0.049	0.080	0.099	0.114
54	0.019	0.034	0.047	0.091	0.121	0.142
55	0.006	0.115	0.141	0.199	0.231	0.259
56	0.017	0.188	0.121	0.173	0.199	0.199
57	0.008	0.137	0.093	0.136	0.157	0.157
58	0.017	0.126	0.105	0.164	0.194	0.194
59	0.026	0.146	0.110	0.167	0.195	0.195
60	0.155	0.155	0.155	0.155	0.155	0.155
61	0.210	0.210	0.210	0.210	0.210	0.210
62	0.262	0.262	0.262	0.262	0.262	0.262
63	0.172	0.172	0.172	0.172	0.172	0.172
64	0.227	0.227	0.227	0.227	0.227	0.227
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 3% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.003	0.006	0.013	0.019	0.025	0.028
51	0.004	0.008	0.017	0.026	0.034	0.038
52	0.005	0.011	0.022	0.033	0.044	0.049
53	0.005	0.034	0.024	0.038	0.069	0.138
54	0.007	0.047	0.032	0.051	0.094	0.187
55	0.010	0.067	0.046	0.073	0.134	0.266
56	0.010	0.063	0.044	0.069	0.127	0.253
57	0.135	0.100	0.148	0.196	0.220	0.220
58	0.083	0.062	0.091	0.120	0.135	0.135
59	0.137	0.053	0.084	0.146	0.177	0.177
60	0.162	0.063	0.099	0.172	0.208	0.208
61	0.598	0.231	0.231	0.231	0.231	0.231
62	0.621	0.240	0.240	0.240	0.240	0.240
63	0.236	0.236	0.236	0.236	0.236	0.236
64	0.236	0.236	0.236	0.236	0.236	0.236
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% at 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.124	0.103	0.113	0.143	0.244	0.376
51	0.060	0.081	0.087	0.125	0.207	0.294
52	0.016	0.055	0.111	0.148	0.192	0.235
53	0.072	0.074	0.098	0.142	0.189	0.237
54	0.018	0.049	0.105	0.123	0.187	0.271
55	0.069	0.074	0.081	0.113	0.209	0.305
56	0.064	0.108	0.113	0.125	0.190	0.288
57	0.056	0.109	0.160	0.182	0.210	0.210
58	0.108	0.129	0.173	0.189	0.214	0.214
59	0.093	0.144	0.204	0.229	0.262	0.262
60	0.343	0.180	0.159	0.188	0.247	0.247
61	0.221	0.221	0.221	0.221	0.221	0.221
62	0.213	0.213	0.213	0.213	0.213	0.213
63	0.233	0.233	0.233	0.233	0.233	0.233
64	0.234	0.234	0.234	0.234	0.234	0.234
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 3% at 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.095	0.048	0.053	0.093	0.134	0.175
51	0.016	0.032	0.053	0.085	0.117	0.149
52	0.013	0.032	0.054	0.087	0.120	0.154
53	0.085	0.044	0.049	0.089	0.129	0.170
54	0.038	0.065	0.074	0.105	0.136	0.167
55	0.042	0.043	0.049	0.085	0.132	0.215
56	0.133	0.103	0.075	0.113	0.151	0.209
57	0.062	0.048	0.060	0.124	0.172	0.213
58	0.124	0.097	0.092	0.153	0.194	0.227
59	0.092	0.071	0.078	0.144	0.192	0.233
60	0.056	0.044	0.061	0.131	0.186	0.233
61	0.282	0.219	0.158	0.198	0.233	0.260
62	0.292	0.227	0.164	0.205	0.241	0.269
63	0.196	0.196	0.196	0.196	0.196	0.196
64	0.197	0.197	0.197	0.197	0.197	0.197
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2% at 57

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.040	0.040	0.040	0.040	0.040	0.080
51	0.028	0.028	0.028	0.028	0.040	0.066
52	0.028	0.028	0.028	0.028	0.043	0.061
53	0.028	0.028	0.028	0.028	0.057	0.086
54	0.028	0.028	0.028	0.032	0.069	0.110
55	0.050	0.050	0.050	0.067	0.099	0.179
56	0.046	0.046	0.046	0.062	0.090	0.160
57	0.054	0.054	0.054	0.072	0.106	0.191
58	0.060	0.060	0.060	0.066	0.103	0.171
59	0.060	0.060	0.060	0.069	0.105	0.171
60	0.113	0.113	0.113	0.113	0.113	0.171
61	0.108	0.108	0.108	0.108	0.108	0.128
62	0.113	0.113	0.113	0.113	0.113	0.159
63	0.113	0.113	0.113	0.113	0.113	0.159
64	0.113	0.113	0.113	0.113	0.113	0.239
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2% at 57

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.005	0.005	0.005	0.008	0.012
51	0.006	0.006	0.006	0.006	0.009	0.013
52	0.012	0.012	0.012	0.012	0.019	0.028
53	0.033	0.033	0.033	0.033	0.050	0.075
54	0.045	0.045	0.045	0.045	0.069	0.103
55	0.061	0.061	0.061	0.061	0.094	0.140
56	0.055	0.055	0.055	0.055	0.084	0.126
57	0.081	0.081	0.081	0.081	0.125	0.187
58	0.059	0.059	0.059	0.059	0.091	0.137
59	0.055	0.055	0.055	0.055	0.084	0.126
60	0.085	0.085	0.085	0.085	0.131	0.196
61	0.085	0.085	0.085	0.085	0.131	0.196
62	0.085	0.085	0.085	0.085	0.131	0.196
63	0.085	0.085	0.085	0.085	0.131	0.196
64	0.085	0.085	0.085	0.085	0.131	0.196
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.5% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.050	0.050	0.100
51	0.038	0.038	0.038	0.038	0.055	0.089
52	0.038	0.038	0.038	0.038	0.058	0.082
53	0.036	0.036	0.036	0.036	0.073	0.111
54	0.036	0.036	0.036	0.041	0.088	0.142
55	0.061	0.061	0.061	0.082	0.120	0.217
56	0.056	0.056	0.056	0.075	0.110	0.194
57	0.060	0.060	0.060	0.080	0.118	0.213
58	0.072	0.072	0.072	0.079	0.124	0.205
59	0.072	0.072	0.072	0.083	0.126	0.205
60	0.135	0.135	0.135	0.135	0.135	0.205
61	0.130	0.130	0.130	0.130	0.130	0.153
62	0.135	0.135	0.135	0.135	0.135	0.191
63	0.135	0.135	0.135	0.135	0.135	0.191
64	0.135	0.135	0.135	0.135	0.135	0.287
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2.5% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.007	0.007	0.007	0.007	0.010	0.015
51	0.008	0.008	0.008	0.008	0.012	0.018
52	0.016	0.016	0.016	0.016	0.025	0.038
53	0.042	0.042	0.042	0.042	0.064	0.096
54	0.057	0.057	0.057	0.057	0.088	0.132
55	0.074	0.074	0.074	0.074	0.114	0.170
56	0.066	0.066	0.066	0.066	0.102	0.153
57	0.090	0.090	0.090	0.090	0.139	0.208
58	0.071	0.071	0.071	0.071	0.110	0.164
59	0.066	0.066	0.066	0.066	0.101	0.151
60	0.102	0.102	0.102	0.102	0.157	0.235
61	0.102	0.102	0.102	0.102	0.157	0.236
62	0.102	0.102	0.102	0.102	0.157	0.236
63	0.102	0.102	0.102	0.102	0.157	0.236
64	0.102	0.102	0.102	0.102	0.157	0.236
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.7% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.050	0.050	0.100
51	0.040	0.040	0.040	0.040	0.058	0.094
52	0.038	0.038	0.038	0.038	0.058	0.083
53	0.038	0.038	0.038	0.038	0.077	0.117
54	0.038	0.038	0.038	0.044	0.093	0.150
55	0.068	0.068	0.068	0.091	0.134	0.242
56	0.063	0.063	0.063	0.084	0.123	0.217
57	0.060	0.060	0.060	0.080	0.118	0.213
58	0.080	0.080	0.080	0.088	0.138	0.228
59	0.080	0.080	0.080	0.092	0.140	0.228
60	0.150	0.150	0.150	0.150	0.150	0.228
61	0.144	0.144	0.144	0.144	0.144	0.170
62	0.150	0.150	0.150	0.150	0.150	0.213
63	0.150	0.150	0.150	0.150	0.150	0.213
64	0.150	0.150	0.150	0.150	0.150	0.319
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2.7% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.007	0.007	0.007	0.007	0.010	0.015
51	0.008	0.008	0.008	0.008	0.013	0.019
52	0.016	0.016	0.016	0.016	0.025	0.038
53	0.044	0.044	0.044	0.044	0.068	0.102
54	0.061	0.061	0.061	0.061	0.093	0.140
55	0.083	0.083	0.083	0.083	0.127	0.190
56	0.074	0.074	0.074	0.074	0.114	0.171
57	0.090	0.090	0.090	0.090	0.139	0.208
58	0.079	0.079	0.079	0.079	0.122	0.182
59	0.073	0.073	0.073	0.073	0.112	0.168
60	0.114	0.114	0.114	0.114	0.175	0.262
61	0.114	0.114	0.114	0.114	0.175	0.262
62	0.114	0.114	0.114	0.114	0.175	0.262
63	0.114	0.114	0.114	0.114	0.175	0.262
64	0.114	0.114	0.114	0.114	0.175	0.262
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Schools 2% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.003	0.004	0.006	0.007	0.010	0.010
51	0.004	0.005	0.007	0.008	0.011	0.011
52	0.005	0.007	0.008	0.009	0.012	0.012
53	0.007	0.008	0.010	0.012	0.015	0.015
54	0.006	0.009	0.012	0.015	0.020	0.021
55	0.011	0.023	0.034	0.057	0.070	0.090
56	0.012	0.027	0.036	0.056	0.073	0.095
57	0.016	0.027	0.036	0.055	0.068	0.087
58	0.019	0.030	0.040	0.062	0.078	0.103
59	0.023	0.034	0.046	0.070	0.085	0.109
60	0.022	0.043	0.062	0.095	0.113	0.141
61	0.030	0.051	0.071	0.103	0.124	0.154
62	0.065	0.098	0.128	0.188	0.216	0.248
63	0.075	0.112	0.144	0.197	0.222	0.268
64	0.091	0.116	0.138	0.180	0.196	0.231
65	0.163	0.164	0.197	0.232	0.250	0.271
66	0.208	0.204	0.243	0.282	0.301	0.315
67	0.189	0.185	0.221	0.257	0.274	0.287
68	0.127	0.158	0.200	0.227	0.241	0.244
69	0.168	0.162	0.189	0.217	0.229	0.238
70	0.191	0.190	0.237	0.250	0.246	0.254

Schools 2% at 62

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.000	0.000	0.000	0.000	0.000	0.000
51	0.000	0.000	0.000	0.000	0.000	0.000
52	0.004	0.007	0.010	0.011	0.013	0.015
53	0.004	0.008	0.010	0.013	0.014	0.016
54	0.005	0.011	0.015	0.018	0.020	0.022
55	0.014	0.027	0.038	0.045	0.050	0.056
56	0.013	0.026	0.037	0.043	0.048	0.055
57	0.013	0.027	0.038	0.045	0.050	0.055
58	0.017	0.034	0.047	0.056	0.062	0.069
59	0.019	0.037	0.052	0.062	0.068	0.076
60	0.026	0.053	0.074	0.087	0.097	0.108
61	0.030	0.058	0.081	0.095	0.106	0.119
62	0.053	0.105	0.147	0.174	0.194	0.217
63	0.054	0.107	0.151	0.178	0.198	0.222
64	0.053	0.105	0.147	0.174	0.194	0.216
65	0.072	0.142	0.199	0.235	0.262	0.293
66	0.077	0.152	0.213	0.252	0.281	0.314
67	0.070	0.139	0.194	0.229	0.255	0.286
68	0.063	0.124	0.173	0.205	0.228	0.255
69	0.066	0.130	0.183	0.216	0.241	0.270
70	0.071	0.140	0.196	0.231	0.258	0.289

Miscellaneous

Internal Revenue Code Section 415

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. This results in lower contributions for those employers contributing to the Replacement Benefit Fund and protects CalPERS from prefunding expected benefits in excess of limits imposed by federal tax law. The Section 415(b) dollar limit for the 2022 calendar year is $245,000.

Internal Revenue Code Section 401(a)(17)

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. The compensation limit for classic members for the 2022 calendar year is $305,000.

Appendix B

Principal Plan Provisions

The following is a description of the principal plan provisions used in calculating costs and liabilities. We have indicated whether a plan provision is standard or optional. Standard benefits are applicable to all members while optional benefits vary among employers. Optional benefits that apply to a single period of time, such as Golden Handshakes, have not been included. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the Public Employees' Retirement Law and the California Public Employees' Pension Reform Act of 2013. The law itself governs in all situations.

Service Retirement

Eligibility

A classic CalPERS member or PEPRA Safety member becomes eligible for Service Retirement upon attainment of age 50 with at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements). For employees hired into a plan with the 1.5% at age 65 formula, eligibility for service retirement is age 55 with at least 5 years of service. PEPRA Miscellaneous members become eligible for service retirement upon attainment of age 52 with at least 5 years of service.

Benefit

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

- The *benefit factor* depends on the benefit formula specified in the agency's contract. The table below shows the factors for each of the available formulas. Factors vary by the member's age at retirement. Listed are the factors for retirement at whole year ages:

Miscellaneous Plan Formulas

Retirement Age	1.5% at 65	2% at 60	2% at 55	2.5% at 55	2.7% at 55	3% at 60	PEPRA 2% at 62
50	0.5000%	1.092%	1.426%	2.000%	2.000%	2.000%	N/A
51	0.5667%	1.156%	1.522%	2.100%	2.140%	2.100%	N/A
52	0.6334%	1.224%	1.628%	2.200%	2.280%	2.200%	1.000%
53	0.7000%	1.296%	1.742%	2.300%	2.420%	2.300%	1.100%
54	0.7667%	1.376%	1.866%	2.400%	2.560%	2.400%	1.200%
55	0.8334%	1.460%	2.000%	2.500%	2.700%	2.500%	1.300%
56	0.9000%	1.552%	2.052%	2.500%	2.700%	2.600%	1.400%
57	0.9667%	1.650%	2.104%	2.500%	2.700%	2.700%	1.500%
58	1.0334%	1.758%	2.156%	2.500%	2.700%	2.800%	1.600%
59	1.1000%	1.874%	2.210%	2.500%	2.700%	2.900%	1.700%
60	1.1667%	2.000%	2.262%	2.500%	2.700%	3.000%	1.800%
61	1.2334%	2.134%	2.314%	2.500%	2.700%	3.000%	1.900%
62	1.3000%	2.272%	2.366%	2.500%	2.700%	3.000%	2.000%
63	1.3667%	2.418%	2.418%	2.500%	2.700%	3.000%	2.100%
64	1.4334%	2.418%	2.418%	2.500%	2.700%	3.000%	2.200%
65	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.300%
66	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.400%
67 & up	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.500%

Safety Plan Formulas

Retirement Age	Half Pay at 55*	2% at 55	2% at 50	3% at 55	3% at 50
50	1.783%	1.426%	2.000%	2.400%	3.000%
51	1.903%	1.522%	2.140%	2.520%	3.000%
52	2.035%	1.628%	2.280%	2.640%	3.000%
53	2.178%	1.742%	2.420%	2.760%	3.000%
54	2.333%	1.866%	2.560%	2.880%	3.000%
55 & Up	2.500%	2.000%	2.700%	3.000%	3.000%

* For this formula, the benefit factor also varies by entry age. The factors shown are for members with an entry age of 35 or greater. If entry age is less than 35, then the age 55 benefit factor is 50% divided by the difference between age 55 and entry age. The benefit factor for ages prior to age 55 is the same proportion of the age 55 benefit factor as in the above table.

PEPRA Safety Plan Formulas

Retirement Age	2% at 57	2.5% at 57	2.7% at 57
50	1.426%	2.000%	2.000%
51	1.508%	2.071%	2.100%
52	1.590%	2.143%	2.200%
53	1.672%	2.214%	2.300%
54	1.754%	2.286%	2.400%
55	1.836%	2.357%	2.500%
56	1.918%	2.429%	2.600%
57 & Up	2.000%	2.500%	2.700%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. An agency may contract for an optional benefit where any unused sick leave accumulated at the time of retirement will be converted to credited service at a rate of 0.004 years of service for each day of sick leave.

- The *final compensation* is the monthly average of the member's highest 36 or 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). The standard benefit is 36 months. Employers had the option of providing a final compensation equal to the highest 12 consecutive months for classic plans only. Final compensation must be defined by the highest 36 consecutive months' pay under the 1.5% at 65 formula. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security contribution and benefit base. For employees that participate in Social Security this cap is $134,974 for 2022 and for those employees that do not participate in Social Security the cap for 2022 is $161,969. Adjustments to the caps are permitted annually based on changes to the CPI for all urban consumers.

- PEPRA benefit formulas have no Social Security offsets and Social Security coverage is optional. For Classic benefit formulas, employees must be covered by Social Security with the 1.5% at 65 formula. Social Security is optional for all other Classic benefit formulas. For employees covered by Social Security, the modified formula is the standard benefit. Under this type of formula, the final compensation is offset by $133.33 (or by one third if the final compensation is less than $400). Employers may contract for the full benefit with Social Security that will eliminate the offset applicable to the final compensation. For employees not covered by Social Security, the full benefit is paid with no offsets. Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is $317 if members are not covered by Social Security or $513 if members are covered by Social Security.

- The Miscellaneous and PEPRA Safety service retirement benefit is not capped. The Classic Safety service retirement benefit is capped at 90% of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS classic members and PEPRA Safety members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for deferred status and upon attainment of age 50 (55 for employees hired into a 1.5% at 65 plan). PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for deferred status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the service retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury, which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively employed by any CalPERS employer at the time of disability in order to be eligible for this benefit.

Standard Benefit

The standard Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8% of final compensation, multiplied by *service*, which is determined as follows:

- *Service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or

- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33⅓% of final compensation.

Improved Benefit

Employers have the option of providing the improved Non-Industrial Disability Retirement benefit. This benefit provides a monthly allowance equal to 30% of final compensation for the first 5 years of service, plus 1% for each additional year of service to a maximum of 50% of final compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job Related) Disability Retirement

This is a standard benefit for Safety members except those described in Section 20423.6. For excluded Safety members and all Miscellaneous members, employers have the option of providing this benefit. An employer may choose to provide the increased benefit option or the improved benefit option.

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes disabled while working, where disabled means the member is unable to perform the duties of the job because of a work-related illness or injury, which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described below.

Standard Benefit

The standard Industrial Disability Retirement benefit is a monthly allowance equal to 50% of final compensation.

Increased Benefit (75% of Final Compensation)

The increased Industrial Disability Retirement benefit is a monthly allowance equal to 75% of final compensation for total disability.

Improved Benefit (50% to 90% of Final Compensation)

The improved Industrial Disability Retirement benefit is a monthly allowance equal to the Workman's Compensation Appeals Board permanent disability rate percentage (if 50% or greater, with a maximum of 90%) times the final compensation.

For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return of accumulated member contributions with respect to employment in this group. With the standard or increased benefit, a member may also choose to receive the annuitization of the accumulated member contributions.

If a member is eligible for service retirement and if the service retirement benefit is more than the industrial disability retirement benefit, the member may choose to receive the larger benefit.

Post-Retirement Death Benefit

Standard Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $500 will be made to the retiree's designated survivor(s), or to the retiree's estate. The lump sum payment amount increases to $2,000 for any death occurring on or after July 1, 2023 due to SB 1168.

Optional Lump Sum Payment

In lieu of the standard lump sum death benefit, employers have the option of providing a lump sum death benefit of $600, $3,000, $4,000 or $5,000.

Form of Payment for Retirement Allowance

Standard Form of Payment

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

Improved Form of Payment (Post-Retirement Survivor Allowance)

Employers have the option to contract for the post-retirement survivor allowance.

For retirement allowances with respect to service subject to a modified Classic formula, 25% of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. For retirement allowances with respect to service subject to a PEPRA formula or a full or supplemental Classic formula, 50% of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. This additional benefit is referred to as post-retirement survivor allowance (PRSA) or simply as survivor continuance.

In other words, 25% or 50% of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried child(ren) until they attain age 18; or, if no eligible child(ren), to a qualifying dependent parent) for the rest of his or her lifetime. This benefit will not be discontinued in the event the spouse remarries.

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

Pre-Retirement Death Benefits

Basic Death Benefit

This is a standard benefit.

Eligibility

An employee's beneficiary (or estate) may receive the basic death benefit if the member dies while actively employed. A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this basic death benefit.

Benefit

The basic death benefit is a lump sum in the amount of the member's accumulated contributions, where interest is credited annually at the greater of 6% or the prevailing discount rate through the date of death, plus a lump sum in the amount of one month's salary for each completed year of current service, up to a maximum of six months' salary. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

1957 Survivor Benefit

This is a standard benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for classic and PEPRA Safety members and age 52 for PEPRA Miscellaneous members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other retirement systems with which CalPERS has reciprocity agreements). A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. An eligible survivor means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried child(ren) under age 18. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this 1957 Survivor benefit.

Benefit

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

Optional Settlement 2 Death Benefit

This is an optional benefit.

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2 Death benefit if the member dies while actively employed, has attained at least age 50 for classic and PEPRA Safety members and age 52 for PEPRA Miscellaneous members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other retirement systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Optional Settlement 2 Death benefit.

Benefit

The Optional Settlement 2 Death benefit is a monthly allowance equal to the service retirement benefit that the member would have received had the member retired on the date of his or her death and elected 100% to continue to the eligible survivor after the member's death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried child(ren) under age 18, if applicable. The total amount paid will be at least equal to the basic death benefit.

Special Death Benefit

This is a standard benefit for Safety members except those described in Section 20423.6. For excluded Safety members and all Miscellaneous members, employers have the option of providing this benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the special death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried child(ren) under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The special death benefit is a monthly allowance equal to 50% of final compensation and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death at which time the allowance is continued to any unmarried child(ren) under age 22. There is a guarantee that the total amount paid will at least equal the basic death benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving child(ren) (*eligible* means unmarried child(ren) under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

Alternate Death Benefit for Local Fire Members

This is an optional benefit available only to local fire members.

Eligibility

An employee's *eligible survivor(s)* may receive the alternate death benefit in lieu of the basic death benefit or the 1957 Survivor benefit if the member dies while actively employed and has at least 20 years of total CalPERS service. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried child(ren) under age 18.

Benefit

The Alternate Death benefit is a monthly allowance equal to the service retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2. (A retiree who elects Optional Settlement 2 receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) If the member has not yet attained age 50, the benefit is equal to that which would be payable if the member had retired at age 50, based on service credited at the time of death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried child(ren) under ag e 18, if applicable. The total amount paid will be at least equal to the basic death benefit.

Cost-of-Living Adjustments (COLA)

Standard Benefit

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2%. Annual adjustments are calculated by first determining the lesser of 1) 2% compounded from the end of the year of retirement or 2) actual rate of price inflation. The resulting increase is divided by the total increase provided in prior years. For any given year, the COLA adjustment may be less than 2% (when the rate of price inflation is low), may be greater than the rate of price inflation (when the rate of price inflation is low after several years of high price inflation) or may even be greater than 2% (when price inflation is high after several years of low price inflation).

Improved Benefit

Employers have the option of providing a COLA of 3%, 4%, or 5%, determined in the same manner as described above for the standard 2% COLA. An improved COLA is not available with the 1.5% at 65 formula.

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against price inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 80% of the initial allowance at retirement adjusted for price inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan.

Employee Contributions

Each employee contributes toward his or her retirement based upon the retirement formula. The standard employee contribution is as described below.

- The percent contributed below the monthly compensation breakpoint is 0%.
- The monthly compensation breakpoint is $0 for full and supplemental formula members and $133.33 for employees covered by the modified formula.
- The percent contributed above the monthly compensation breakpoint depends upon the benefit formula, as shown in the table below.

Benefit Formula	Percent Contributed above the Breakpoint
Miscellaneous, 1.5% at 65	2%
Miscellaneous, 2% at 60	7%
Miscellaneous, 2% at 55	7%
Miscellaneous, 2.5% at 55	8%
Miscellaneous, 2.7% at 55	8%
Miscellaneous, 3% at 60	8%
Miscellaneous, 2% at 62	50% of the Total Normal Cost
Miscellaneous, 1.5% at 65	50% of the Total Normal Cost
Safety, Half Pay at 55	Varies by entry age
Safety, 2% at 55	7%
Safety, 2% at 50	9%
Safety, 3% at 55	9%
Safety, 3% at 50	9%
Safety, 2% at 57	50% of the Total Normal Cost
Safety, 2.5% at 57	50% of the Total Normal Cost
Safety, 2.7% at 57	50% of the Total Normal Cost

The employer may choose to “pick-up” these contributions for classic members (Employer Paid Member Contributions or EPMC). EPMC is prohibited for new PEPRA members.

An employer may also include Employee Cost Sharing in the contract, where employees agree to share the cost of the employer contribution. These contributions are paid in addition to the member contribution.

Auxiliary organizations of the CSU system may elect reduced contribution rates, in which case the offset is $317 and the contribution rate is 6% if members are not covered by Social Security. If members are covered by Social Security, the offset is $513 and the contribution rate is 5%.

Refund of Employee Contributions

If the member’s service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited with 6% interest compounded annually.

1959 Survivor Benefit

This is a pre-retirement death benefit available only to members not covered by Social Security. Any agency joining CalPERS subsequent to 1993 is required to provide this benefit if the members are not covered by Social Security. The benefit is optional for agencies joining CalPERS prior to 1994. Levels 1, 2, and 3 are now closed. Any new agency or any agency wishing to add this benefit or increase the current level may only choose the 4th or Indexed Level.

This benefit is not included in the results presented in this valuation. More information on this benefit is available on the CalPERS website.

Appendix C
Participant Data

- **Summary of Valuation Data**
- **Active Members**
- **Transferred and Separated Members**
- **Retired Members and Beneficiaries**

Summary of Valuation Data

	June 30, 2021	June 30, 2022
1. **Active Members**		
a) Counts	17,762	18,082
b) Average Attained Age	43.89	43.68
c) Average Entry Age to Rate Plan	34.19	34.34
d) Average Years of Credited Service	9.47	9.13
e) Average Annual Covered Pay	$68,182	$68,886
f) Annual Covered Payroll	1,211,043,768	1,245,591,727
g) Projected Annual Payroll for Contribution Year	1,315,646,404	1,353,178,407
h) Present Value of Future Payroll	11,203,017,370	11,562,595,117
2. **Transferred Members**		
a) Counts	4,069	4,249
b) Average Attained Age	43.87	43.84
c) Average Years of Credited Service	2.58	2.62
d) Average Annual Covered Pay	$87,702	$88,754
3. **Separated Members**		
a) Counts	11,338	12,803
b) Average Attained Age	45.42	45.12
c) Average Years of Credited Service	2.34	2.42
d) Average Annual Covered Pay	$46,798	$48,116
4. **Retired Members and Beneficiaries**		
a) Counts	13,073	13,722
b) Average Attained Age	69.06	69.20
c) Average Annual Benefits	$29,199	$30,526
d) Total Annual Benefits	$381,712,516	$418,874,637
5. **Active to Retired Ratio** [(1a) / (4a)]	1.36	1.32

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Average Annual Benefits represents benefit amounts payable by this plan only. Some members may have service with another agency and would therefore have a larger total benefit than would be included as part of the average shown here.

Active Members

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Active Members by Age and Service

	Years of Service at Valuation Date						
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**
15-24	426	0	0	0	0	0	426
25-29	1,493	122	3	0	0	0	1,618
30-34	1,538	752	125	16	0	0	2,431
35-39	1,206	765	507	272	4	0	2,754
40-44	877	670	541	554	165	2	2,809
45-49	674	463	412	518	374	87	2,528
50-54	494	425	381	467	388	240	2,395
55-59	332	313	278	322	283	247	1,775
60-64	174	188	185	198	166	96	1,007
65 and Over	64	72	69	71	35	28	339
All Ages	**7,278**	**3,770**	**2,501**	**2,418**	**1,415**	**700**	**18,082**

Distribution of Average Annual Salaries by Age and Service

	Years of Service at Valuation Date						
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Average Salary**
15-24	$43,286	$0	$0	$0	$0	$0	$43,286
25-29	49,395	51,310	54,519	0	0	0	49,548
30-34	53,789	58,435	63,001	63,930	0	0	55,766
35-39	57,129	65,547	73,895	74,303	57,823	0	64,251
40-44	60,138	68,816	80,821	85,315	76,465	80,164	72,130
45-49	60,282	73,072	88,855	87,630	85,782	87,470	77,593
50-54	63,340	72,562	85,210	84,557	88,595	86,976	79,053
55-59	65,064	74,667	82,553	84,762	82,266	86,963	78,860
60-64	66,793	68,754	80,721	80,360	80,710	83,676	76,289
65 and Over	70,698	79,320	107,773	88,197	79,370	101,992	87,220
Average	**$55,815**	**$67,144**	**$81,416**	**$83,890**	**$83,931**	**$87,161**	**$68,886**

Transferred and Separated Members

Distribution of Transfers to Other CalPERS Plans by Age, Service, and average Salary

	Years of Service at Valuation Date							
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**	**Average Salary**
15-24	32	0	0	0	0	0	32	$51,233
25-29	233	3	0	0	0	0	236	60,984
30-34	498	48	4	0	0	0	550	67,498
35-39	625	79	29	5	0	0	738	83,448
40-44	702	90	45	14	1	0	852	96,573
45-49	627	83	30	18	3	1	762	99,983
50-54	383	62	23	14	7	0	489	100,239
55-59	267	52	18	9	4	1	351	94,150
60-64	115	38	14	4	1	0	172	85,636
65 and Over	56	7	3	1	0	0	67	106,213
All Ages	**3,538**	**462**	**166**	**65**	**16**	**2**	**4,249**	**$88,754**

Distribution of Separated Participants with Funds on Deposit by Age, Service, and average Salary

	Years of Service at Valuation Date							
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**	**Average Salary**
15-24	165	0	0	0	0	0	165	$38,593
25-29	783	15	0	0	0	0	798	43,037
30-34	1,491	182	15	0	0	0	1,688	44,179
35-39	1,747	282	80	17	0	0	2,126	46,810
40-44	1,668	251	107	33	4	0	2,063	49,221
45-49	1,353	258	88	47	21	2	1,769	53,379
50-54	1,181	192	65	16	6	2	1,462	52,429
55-59	961	152	51	20	3	6	1,193	49,939
60-64	762	76	22	11	1	0	872	44,481
65 and Over	615	41	8	1	0	2	667	45,331
All Ages	**10,726**	**1,449**	**436**	**145**	**35**	**12**	**12,803**	**$48,116**

Retired Members and Beneficiaries

Distribution of Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	1	0	15	16
30-34	0	1	2	0	0	16	19
35-39	0	7	10	0	0	17	34
40-44	0	23	29	0	1	16	69
45-49	0	30	22	1	1	21	75
50-54	431	44	46	6	1	26	554
55-59	1,089	69	20	7	1	65	1,251
60-64	2,236	64	29	5	0	86	2,420
65-69	2,872	54	25	11	0	146	3,108
70-74	2,425	64	31	12	0	179	2,711
75-79	1,538	51	21	3	0	182	1,795
80-84	745	31	4	2	0	144	926
85 and Over	506	23	6	2	0	207	744
All Ages	**11,842**	**461**	**245**	**50**	**4**	**1,120**	**13,722**

Distribution of Average Annual Disbursements to Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 30	$0	$0	$0	$4,045	$0	$4,305	$4,289
30-34	0	6,652	146	0	0	5,441	4,948
35-39	0	12,217	243	0	0	7,742	6,458
40-44	0	14,574	269	0	177	6,535	6,489
45-49	0	17,821	279	9,621	281	11,585	10,586
50-54	23,970	13,843	1,762	10,014	142	18,133	20,854
55-59	32,493	12,631	1,450	13,373	986	12,035	29,706
60-64	39,442	14,257	3,168	22,216	0	13,858	37,397
65-69	35,652	14,126	1,831	9,064	0	21,465	34,246
70-74	33,525	14,480	3,245	17,428	0	19,392	31,725
75-79	30,135	15,670	2,083	5,979	0	20,839	28,413
80-84	26,148	12,815	353	21,358	0	16,931	24,146
85 and Over	18,108	13,733	1,230	4,900	0	13,241	16,447
All Ages	**$33,152**	**$14,223**	**$1,704**	**$13,155**	**$396**	**$16,655**	**$30,526**

Retired Members and Beneficiaries (continued)

Distribution of Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Yrs	3,735	81	63	15	1	456	4,351
5-9	2,747	76	58	9	0	268	3,158
10-14	2,579	60	27	13	1	190	2,870
15-19	1,641	64	29	6	1	106	1,847
20-24	634	93	20	3	1	56	807
25-29	315	53	21	2	0	27	418
30 and Over	191	34	27	2	0	17	271
All Years	**11,842**	**461**	**245**	**50**	**4**	**1,120**	**13,722**

Distribution of Average Annual Disbursements to Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 5 Yrs	$37,643	$15,163	$1,132	$13,020	$281	$17,729	$34,516
5-9	33,817	14,563	1,877	11,197	0	17,179	31,291
10-14	34,086	14,524	2,807	16,245	986	14,272	31,979
15-19	31,629	16,215	3,263	10,756	177	19,718	29,881
20-24	18,804	14,139	1,469	8,409	142	13,060	17,377
25-29	16,719	11,721	1,104	24,103	0	10,898	14,960
30 and Over	10,975	11,075	532	6,259	0	8,083	9,731
All Years	**$33,152**	**$14,223**	**$1,704**	**$13,155**	**$396**	**$16,655**	**$30,526**

* Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the total counts may not match information on C-1 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Appendix D

Glossary

Glossary

Accrued Liability (Actuarial Accrued Liability)
The Present Value of Benefits minus the present value of future Normal Cost or the Present Value of Benefits allocated to prior years. Different actuarial cost methods and different assumptions will lead to different measures of Accrued Liability.

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

Actuarial Methods
Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include an actuarial cost method, an amortization policy, and an asset valuation method.

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

Actuary
A business professional proficient in mathematics and statistics who measures and manages risk. A public retirement system actuary in California performs actuarial valuations necessary to properly fund a pension plan and disclose its liabilities and must satisfy the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States* with regard to pensions.

Amortization Bases
Separate payment schedules for different portions of the Unfunded Accrued Liability (UAL). The total UAL of a rate plan can be segregated by cause. The impact of such individual causes on the UAL are quantified at the time of their occurrence, resulting in new amortization bases. Each base is separately amortized and paid for over a specific period of time. Generally, in an actuarial valuation, the separate bases consist of changes in UAL due to contract amendments, actuarial assumption changes, method changes, and/or gains and losses.

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

Classic Member (under PEPRA)
A member who joined a public retirement system prior to January 1, 2013 and who is not defined as a new member under PEPRA. (See definition of New Member below.)

Discount Rate
This is the rate used to discount the expected future benefit payments to the valuation date to determine the Projected Value of Benefits. Different discount rates will produce different measures of the Projected Value of Benefits. The discount rate for funding purposes is based on the assumed long-term rate of return on plan assets, net of investment and administrative expenses. This rate is called the “actuarial interest rate” in Section 20014 of the California Public Employees’ Retirement Law.

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

Entry Age Actuarial Cost Method
An actuarial cost method that allocates the cost of the projected benefits on an individual basis as a level percent of earnings for the individual between entry age and retirement age. This method yields a total normal cost rate, expressed as a percentage of payroll, which is designed to remain level throughout the member’s career.

Fresh Start
A Fresh Start is when multiple amortization bases are combined into a single base and amortized over a new Amortization Period.

Glossary (continued)

Funded Ratio

Defined as the Market Value of Assets divided by the Accrued Liability. Different actuarial cost methods and different assumptions will lead to different measures of Funded Ratio. The Funded Ratio with the Accrued Liability equal to the funding target is a measure of how well funded a rate plan is. A ratio greater than 100% means the rate plan has more assets than the funding target and the employer need only contribute the Normal Cost. A ratio less than 100% means assets are less than the funding target and contributions in addition to Normal Cost are required.

Funded Status

Any comparison of a particular measure of plan assets to a particular measure of pension obligations. The methods and assumptions used to calculate a funded status should be consistent with the purpose of the measurement.

Funding Target

The Accrued Liability measure upon which the funding requirements are based. The funding target is the Accrued Liability under the Entry Age Actuarial Cost Method using the assumptions adopted by the board.

GASB 68

Statement No. 68 of the Governmental Accounting Standards Board. The accounting standard governing a state or local governmental employer's accounting and financial reporting for pensions.

New Member (under PEPRA)

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

Normal Cost

The portion of the Present Value of Benefits allocated to the upcoming fiscal year for active employees. Different actuarial cost methods and different assumptions will lead to different measures of Normal Cost. The Normal Cost under the Entry Age Actuarial Cost Method, using the assumptions adopted by the board, plus the required amortization of the UAL, if any, make up the required contributions.

PEPRA

The California Public Employees' Pension Reform Act of 2013.

Present Value of Benefits (PVB)

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

Traditional Unit Credit Actuarial Cost Method

An actuarial cost method that sets the Accrued Liability equal to the Present Value of Benefits assuming no future pay increases or service accruals. The Traditional Unit Credit Cost Method is used to measure the accrued liability on a termination basis.

Unfunded Accrued Liability (UAL)

The Accrued Liability minus the Market Value of Assets. If the UAL for a rate plan is positive, the employer is required to make contributions in excess of the Normal Cost.

California Public Employees' Retirement System
Actuarial Office
400 Q Street, Sacramento, CA 95811 | Phone: (916) 795-3000 | Fax: (916) 795-2744
888 CalPERS (or **888**-225-7377) | TTY: (877) 249-7442 | www.calpers.ca.gov

July 2023

Safety Plan of the County of Riverside (CalPERS ID: 5982690295)
Annual Valuation Report as of June 30, 2022

Dear Employer,

Attached to this letter is the June 30, 2022 actuarial valuation report for the rate plan noted above. **Provided in this report is the determination of the minimum required employer contributions for fiscal year (FY) 2024-25**. In addition, the report contains important information regarding the current financial status of the plan as well as projections and risk measures to aid in planning for the future.

Actuarial valuations are based on assumptions regarding future plan experience including investment return and payroll growth, eligibility for the types of benefits provided, and longevity among retirees. The CalPERS Board of Administration (board) adopts these assumptions after considering the advice of CalPERS actuarial and investment teams and other professionals. Each actuarial valuation reflects all prior differences between actual and assumed experience and adjusts the contribution requirements as needed. This valuation is based on an investment return assumption of 6.8%, which was adopted by the board in November 2021. Other assumptions used in this report are those recommended in the CalPERS Experience Study and Review of Actuarial Assumptions report from November 2021.

Required Contributions

The table below shows the minimum required employer contributions and the PEPRA member rate for FY 2024-25 along with an estimate of the required employer contribution for FY 2025-26. Employee contributions other than cost sharing (whether paid by the employer or the employee) are in addition to the results shown below. **The required employer contributions in this report do not reflect any cost sharing arrangement between the agency and the employees.**

Fiscal Year	Employer Normal Cost Rate	Employer Amortization of Unfunded Accrued Liability	PEPRA Member Contribution Rate
2024-25	21.36%	$70,148,901	13.50%
Projected Results			
2025-26	*20.9%*	*$78,746,000*	*TBD*

The actual investment return for FY 2022-23 was not known at the time this report was prepared. The projections above assume the investment return for that year would be 6.8%. ***To the extent the actual investment return for FY 2022-23 differs from 6.8%, the actual contribution requirements for FY 2025-26 will differ from those shown above.*** For additional details regarding the assumptions and methods used for these projections, please refer to the "Projected Employer Contributions" in the "Highlights and Executive Summary" section. This section also contains projected required contributions through FY 2029-30.

Changes from Previous Year's Valuations

There are no significant changes in actuarial assumptions or policies in the 2022 actuarial valuation. There may be changes specific to the plan such as contract amendments and funding changes.

Further descriptions of general changes are included in the "Highlights and Executive Summary" section and in Appendix A, "Actuarial Methods and Assumptions." The effects of any changes on the required contributions are included in the "Reconciliation of Required Employer Contributions" section.

Questions

A CalPERS actuary is available to answer questions about this report. Other questions may be directed to the Customer Contact Center at (888)-CalPERS or (**888-225-7377**).

Sincerely,

SCOTT TERANDO, ASA, EA, MAAA, FCA, CFA
Chief Actuary, CalPERS

RANDALL DZIUBEK, ASA, MAAA
Deputy Chief Actuary, Valuation Services, CalPERS

Actuarial Valuation as of June 30, 2022

for the Safety Plan of the County of Riverside

(CalPERS ID: 5982690295)
(Rate Plan ID: 63)

Required Contributions for Fiscal Year July 1, 2024 – June 30, 2025

Table of Contents

Actuarial Certification

To the best of my knowledge, this report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the Safety Plan of the County of Riverside and satisfies the actuarial valuation requirements of Government Code section 7504. This valuation and related validation work was performed by the CalPERS Actuarial Office and is based on the member and financial data as of June 30, 2022 provided by the various CalPERS databases and the benefits under this plan with CalPERS as of the date this report was produced.

It is my opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods, as prescribed by the CalPERS Board of Administration, are internally consistent and reasonable for this plan.

The undersigned is an actuary who satisfies the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States* with regard to pensions.

KURT SCHNEIDER, MPA, ASA, EA, MAAA
Supervising Actuary, CalPERS

Highlights and Executive Summary

- **Introduction**
- **Purpose**
- **Required Contributions**
- **Additional Discretionary Employer Contributions**
- **Funded Status – Funding Policy Basis**
- **Projected Employer Contributions**
- **Cost**
- **Changes Since the Prior Year's Valuation**
- **Subsequent Events**

Introduction

This report presents the results of the June 30, 2022 actuarial valuation of the Safety Plan of the County of Riverside of the California Public Employees' Retirement System (CalPERS). This actuarial valuation sets the minimum required contributions for fiscal year (FY) 2024-25.

Purpose

This report documents the results of the actuarial valuation prepared by the CalPERS Actuarial Office using data as of June 30, 2022. The purpose of the valuation is to:

- Set forth the assets and accrued liabilities of this rate plan as of June 30, 2022;
- Determine the minimum required employer contributions for this rate plan for FY July 1, 2024 through June 30, 2025;
- Determine the required member contribution rate for FY July 1, 2024 through June 30, 2025 for employees subject to the California Public Employees' Pension Reform Act of 2013 (PEPRA); and
- Provide actuarial information as of June 30, 2022 to the CalPERS Board of Administration (board) and other interested parties.

The pension funding information presented in this report should not be used in financial reports subject to Governmental Accounting Standards Board (GASB) Statement No. 68 for an Agent Employer Defined Benefit Pension Plan. A separate accounting valuation report for such purposes is available from CalPERS and details for ordering are available on the CalPERS website (www.calpers.ca.gov).

The measurements shown in this actuarial valuation may not be applicable for other purposes. The agency should contact the plan actuary before disseminating any portion of this report for any reason that is not explicitly described above.

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

Assessment and Disclosure of Risk

This report includes the following risk disclosures consistent with the guidance of Actuarial Standards of Practice No. 51 and recommended by the California Actuarial Advisory Panel (CAAP) in the Model Disclosure Elements document:

- A "Scenario Test," projecting future results under different investment income returns.
- A "Sensitivity Analysis," showing the impact on current valuation results using alternative discount rates 5.8% and 7.8%.
- A "Sensitivity Analysis," showing the impact on current valuation results assuming rates of mortality are 10% lower or 10% higher than our current post-retirement mortality assumptions adopted in 2021.
- Plan maturity measures indicating how sensitive a plan may be to the risks noted above.

Required Contributions

	Fiscal Year
Required Employer Contributions	**2024-25**
Employer Normal Cost Rate	**21.36%**
Plus	
Required Payment on Amortization Bases	**$70,148,901**
Paid either as	
1) Monthly Payment	**$5,845,742**
Or	
2) Annual Prepayment Option*	**$67,878,970**
Required PEPRA Member Contribution Rate	**13.50%**

The total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll and paid as payroll is reported) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly (1) or prepaid annually (2) in dollars).

** Only the UAL portion of the employer contribution can be prepaid* ***(which must be received in full no later than July 31)****.*

For additional detail regarding the determination of the required contribution for PEPRA members, see "PEPRA Member Contribution Rates" in the "Liabilities and Contributions" section. Required member contributions for Classic members can be found in Appendix B.

	Fiscal Year 2023-24	Fiscal Year 2024-25
Normal Cost Contribution as a Percentage of Payroll		
Total Normal Cost	31.89%	31.67%
Employee Contribution[1]	10.16%	10.31%
Employer Normal Cost[2]	21.73%	21.36%
Projected Annual Payroll for Contribution Year	$351,629,460	$362,785,833
Estimated Employer Contributions Based On Projected Payroll		
Total Normal Cost	$112,134,635	$114,894,273
Offset Due to Employee Contributions	35,725,553	37,403,219
Employer Normal Cost	76,409,082	77,491,054
Unfunded Liability Contribution	54,629,206	70,148,901
% of Projected Payroll (illustrative only)	15.54%	19.34%
Estimated Total Employer Contribution	$131,038,288	$147,639,955
% of Projected Payroll (illustrative only)	37.27%	40.70%

[1] For classic members, this is the percentage specified in the Public Employees' Retirement Law , net of any reduction from the use of a modified formula or other factors. For PEPRA members, the member contribution rate is based on 50% of the normal cost. A development of PEPRA member contribution rates can be found in the "Liabilities and Contributions" section. Employee cost sharing is not shown in this report.

[2] The Employer Normal Cost is a blended rate for all benefit groups in the plan. For a breakout of normal cost by benefit group, see "Normal Cost by Benefit Group" in the "Liabilities and Contributions" section.

Additional Discretionary Employer Contributions

The minimum required employer contribution towards the Unfunded Accrued Liability (UAL) for this rate plan for FY 2024-25 is $70,148,901. CalPERS allows agencies to make additional discretionary payments (ADPs) at any time and in any amount. These optional payments serve to reduce the UAL and future required contributions and can result in significant long-term savings. Agencies can also use ADPs to stabilize annual contributions as a fixed dollar amount, percent of payroll or percent of revenue.

Provided below are select ADP options for consideration. Making such an ADP during FY 2024-25 does not require an ADP be made in any future year, nor does it change the remaining amortization period of any portion of unfunded liability. For information on permanent changes to amortization periods, see the "Amortization Schedule and Alternatives" section of the report.

Agencies considering making an ADP should contact CalPERS for additional information.

Minimum Required Employer Contribution for Fiscal Year 2024-25

Estimated Normal Cost	Minimum UAL Payment	ADP	Total UAL Contribution	Estimated Total Contribution
$77,491,054	$70,148,901	$0	$70,148,901	$147,639,955

The minimum required contribution above is less than interest on the UAL. With no ADP the UAL is projected to increase over the following year. If the minimum UAL payment were split between interest and principal, the principal portion would be negative. This situation is referred to as **negative amortization**. If only the minimum required contribution is made, contributions are not expected to exceed interest on the UAL until FY 2025-26, as shown in the "Amortization Schedule and Alternatives" section of the report (see columns labelled Current Amortization Schedule).

Fiscal Year 2024-25 Employer Contribution Necessary to Avoid Negative Amortization

Estimated Normal Cost	Minimum UAL Payment	ADP[1]	Total UAL Contribution	Estimated Total Contribution
$77,491,054	$70,148,901	$4,276,421	$74,425,322	$151,916,376

Alternative Fiscal Year 2024-25 Employer Contributions for Greater UAL Reduction

Funding Horizon	Estimated Normal Cost	Minimum UAL Payment	ADP[1]	Total UAL Contribution	Estimated Total Contribution
20 years	$77,491,054	$70,148,901	$31,562,796	$101,711,697	$179,202,751
15 years	$77,491,054	$70,148,901	$48,506,663	$118,655,564	$196,146,618
10 years	$77,491,054	$70,148,901	$84,244,325	$154,393,226	$231,884,280
5 years	$77,491,054	$70,148,901	$195,359,143	$265,508,044	$342,999,098

[1] The ADP amounts are assumed to be made in the middle of the fiscal year. A payment made earlier or later in the fiscal year would have to be less or more than the amount shown to have the same effect on the UAL amortization.

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 2024 as determined in the June 30, 2022 actuarial valuation. New unfunded liabilities can emerge in future years due to assumption or method changes, changes in plan provisions, and actuarial experience different than assumed. Making an ADP illustrated above for the indicated number of years will not result in a plan that is exactly 100% funded in the indicated number of years. Valuation results will vary from one year to the next and can diverge significantly from projections over a period of several years.

Funded Status – Funding Policy Basis

The table below provides information on the current funded status of the plan under the funding policy. The funded status for this purpose is based on the market value of assets relative to the funding target produced by the entry age actuarial cost method and actuarial assumptions adopted by the board. The actuarial cost method allocates the total expected cost of a member's projected benefit (**Present Value of Benefits**) to individual years of service (the **Normal Cost**). The value of the projected benefit that is not allocated to future service is referred to as the **Accrued Liability** and is the plan's funding target on the valuation date. The **Unfunded Accrued Liability** (UAL) equals the funding target minus the assets. The UAL is an absolute measure of funded status and can be viewed as employer debt. The **funded ratio** equals the assets divided by the funding target. The funded ratio is a relative measure of the funded status and allows for comparisons between plans of different sizes.

	June 30, 2021	June 30, 2022
1. Present Value of Benefits	$5,349,485,247	$5,651,460,573
2. Entry Age Accrued Liability	4,416,850,557	4,691,047,110
3. Market Value of Assets (MVA)	3,928,117,059	3,603,373,342
4. Unfunded Accrued Liability (UAL) [(2) – (3)]	$488,733,498	$1,087,673,768
5. Funded Ratio [(3) / (2)]	88.9%	76.8%

A funded ratio of 100% (UAL of $0) implies that the funding of the plan is on target and that future contributions equal to the normal cost of the active plan members will be sufficient to fully fund all retirement benefits if future experience matches the actuarial assumptions. A funded ratio of less than 100% (positive UAL) implies that in addition to normal costs, payments toward the UAL will be required. Plans with a funded ratio greater than 100% have a negative UAL (or surplus) but are required under current law to continue contributing the normal cost in most cases, preserving the surplus for future contingencies.

Calculations for the funding target reflect the expected long-term investment return of 6.8%. If it were known on the valuation date that future investment returns will average something greater/less than the expected return, calculated normal costs and accrued liabilities provided in this report would be less/greater than the results shown. Therefore, for example, if actual average future returns are less than the expected return, calculated normal costs and UAL contributions will not be sufficient to fully fund all retirement benefits. Under this scenario, required future normal cost contributions will need to increase from those provided in this report, and the plan will develop unfunded liabilities that will also add to required future contributions. For illustrative purposes, funded statuses based on a 1% lower and higher average future investment return (discount rate) are as follows:

	1% Lower Average Return	Current Assumption	1% Higher Average Return
Discount Rate	5.8%	6.8%	7.8%
1. Present Value of Benefits	$6,737,700,793	$5,651,460,573	$4,817,760,315
2. Entry Age Accrued Liability	5,402,920,339	4,691,047,110	4,115,090,929
3. Market Value of Assets (MVA)	3,603,373,342	3,603,373,342	3,603,373,342
4. Unfunded Accrued Liability (UAL) [(2) – (3)]	$1,799,546,997	$1,087,673,768	$511,717,587
5. Funded Ratio [(3) / (2)]	66.7%	76.8%	87.6%

The "Risk Analysis" section of the report provides additional information regarding the sensitivity of valuation results to the expected investment return and other factors. Also provided in that section are measures of funded status that are appropriate for assessing the sufficiency of plan assets to cover estimated termination liabilities.

Projected Employer Contributions

The table below shows the required and projected employer contributions (before cost sharing) for the next six fiscal years. The projection assumes that all actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. In particular, the investment return beginning with FY 2022-23 is assumed to be 6.80% per year, net of investment and administrative expenses. The projected normal cost percentages below reflect that the normal cost is expected to continue to decline over time as new employees are hired into lower cost benefit tiers. Future contribution requirements may differ significantly from those shown below. The actual long-term cost of the plan will depend on the actual benefits and expenses paid and the actual investment experience of the fund.

	Required Contribution	**Projected Future Employer Contributions (Assumes 6.80% Return for Fiscal Year 2022-23 and Beyond)**				
Fiscal Year	**2024-25**	**2025-26**	**2026-27**	**2027-28**	**2028-29**	**2029-30**
Normal Cost %	21.36%	20.9%	20.5%	20.0%	19.5%	19.1%
UAL Payment	$70,148,901	$78,746,000	$87,065,000	$93,539,000	$109,412,000	$111,445,000
*Total as a % of Payroll**	*40.70%*	*42.0%*	*43.2%*	*43.7%*	*46.5%*	*45.8%*
Projected Payroll	*$362,785,833*	*$372,943,837*	*$383,386,264*	*$394,121,079*	*$405,156,469*	*$416,500,851*

*Illustrative only and based on the projected payroll shown.

For ongoing plans, investment gains and losses are amortized using a 5-year ramp up. For more information, please see “Amortization of Unfunded Actuarial Accrued Liability” under “Actuarial Methods” in Appendix A. This method phases in the impact of the change in UAL over a 5-year period in order to reduce employer cost volatility from year to year. As a result of this methodology, dramatic changes in the required employer contributions in any one year are less likely. However, required contributions can change gradually and significantly over the next five years. In years when there is a large investment loss, the relatively small amortization payments during the ramp up period could result in contributions that are less than interest on the UAL (i.e. negative amortization) while the contribution impact of the increase in the UAL is phased in.

The required contribution for FY 2024-25 is less than interest on the UAL, a situation referred to as **negative amortization**, as explained in the “Additional Discretionary Employer Contributions” section earlier in this report. If only the minimum required contribution is made, contributions are not expected to exceed interest on the UAL until FY 2025-26, as shown in the “Amortization Schedule and Alternatives” section of the report (see columns labelled “Current Amortization Schedule”).

For projected contributions under alternate investment return scenarios, please see the “Future Investment Return Scenarios” in the “Risk Analysis” section. Our online pension plan projection tool, Pension Outlook, is available in the Employers section of the CalPERS website. Pension Outlook can help plan and budget pension costs under various scenarios.

Cost

Actuarial Determination of Plan Cost

Contributions to fund the plan are comprised of two components:

- Normal Cost, expressed as a percentage of total active payroll
- Amortization of the Unfunded Accrued Liability (UAL), expressed as a dollar amount

For fiscal years prior to 2017-18, the Amortization of UAL component was expressed as a percentage of total active payroll. Starting with FY 2017-18, the Amortization of UAL component is expressed as a dollar amount and invoiced on a monthly basis. There is an option to prepay this amount during July of each fiscal year.

The Normal Cost component is expressed as a percentage of active payroll with employer and employee contributions payable as part of the regular payroll reporting process.

The determination of both components requires complex actuarial calculations. The calculations are based on a set of actuarial assumptions which can be divided into two categories:

- Demographic assumptions (e.g., mortality rates, retirement rates, employment termination rates, disability rates)
- Economic assumptions (e.g., future investment earnings, inflation, salary growth rates)

These assumptions reflect CalPERS' best estimate of future experience of the plan and are long term in nature. We recognize that all assumptions will not be realized in any given year. For example, the investment earnings at CalPERS have averaged 6.9% over the 20 years ending June 30, 2022, yet individual fiscal year returns have ranged from -23.6% to +21.3%. In addition, CalPERS reviews all actuarial assumptions by conducting in-depth experience studies every four years, with the most recent experience study completed in 2021.

Changes Since the Prior Year's Valuation

Benefits

The standard actuarial practice at CalPERS is to recognize mandated legislative benefit changes in the first annual valuation following the effective date of the legislation. Voluntary benefit changes by plan amendment are generally included in the first valuation that is prepared after the amendment becomes effective, even if the valuation date is prior to the effective date of the amendment.

This valuation generally reflects plan changes by amendments effective before the date of the report. Please refer to the "Plan's Major Benefit Options" and Appendix B for a summary of the plan provisions used in this valuation. The effect of any mandated benefit changes or plan amendments on the unfunded liability is shown in the "(Gain) / Loss Analysis 6/30/21 – 6/30/22" and the effect on the employer contribution is shown in the "Reconciliation of Required Employer Contributions." It should be noted that no change in liability or contribution is shown for any plan changes which were already included in the prior year's valuation.

In 2022, SB 1168 increased the standard retiree lump sum death benefit from $500 to $2,000 for any death occurring on or after July 1, 2023. The impact, if any, is included in plan changes in the "(Gain) / Loss Analysis 6/30/21 – 6/30/22" and the "Reconciliation of Required Employer Contributions."

Actuarial Methods and Assumptions

There are no significant changes to the actuarial methods or assumptions for the June 30, 2022 actuarial valuation.

Subsequent Events

This actuarial valuation report reflects fund investment return through June 30, 2022 and statutory/regulatory changes and board actions through January 2023.

During the time period between the valuation date and the publication of this report, inflation has been significantly higher than the expected inflation of 2.3% per annum. Since inflation influences cost-of-living increases for retirees and beneficiaries and active member pay increases, higher inflation is likely to put at least some upward pressure on contribution requirements and downward pressure on the funded status in the June 30, 2023 valuation. The actual impact of higher inflation on future valuation results will depend on, among other factors, how long higher inflation persists. At this time, we continue to believe the long-term inflation assumption of 2.3% is appropriate.

To the best of our knowledge, there have been no other subsequent events that could materially affect current or future certifications rendered in this report.

Assets

- **Reconciliation of the Market Value of Assets**
- **Asset Allocation**
- **CalPERS History of Investment Returns**

Reconciliation of the Market Value of Assets

1.	Market Value of Assets as of 6/30/21 including Receivables	$3,928,117,059
2.	Change in Receivables for Service Buybacks	(500,435)
3.	Employer Contributions	119,984,372
4.	Employee Contributions	33,423,281
5.	Benefit Payments to Retirees and Beneficiaries	(177,734,560)
6.	Refunds	(2,030,570)
7.	Transfers	(97,882)
8.	Service Credit Purchase (SCP) Payments and Interest	1,350,155
9.	Administrative Expenses	(3,081,008)
10.	Miscellaneous Adjustments	0
11.	Investment Return (Net of Investment Expenses)	(296,057,069)
12.	Market Value of Assets as of 6/30/22 including Receivables	$3,603,373,342

Asset Allocation

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

The asset allocation shown below reflects the allocation of the Public Employees' Retirement Fund (PERF) in its entirety. The assets for County of Riverside Safety Plan are a subset of the PERF and are invested accordingly.

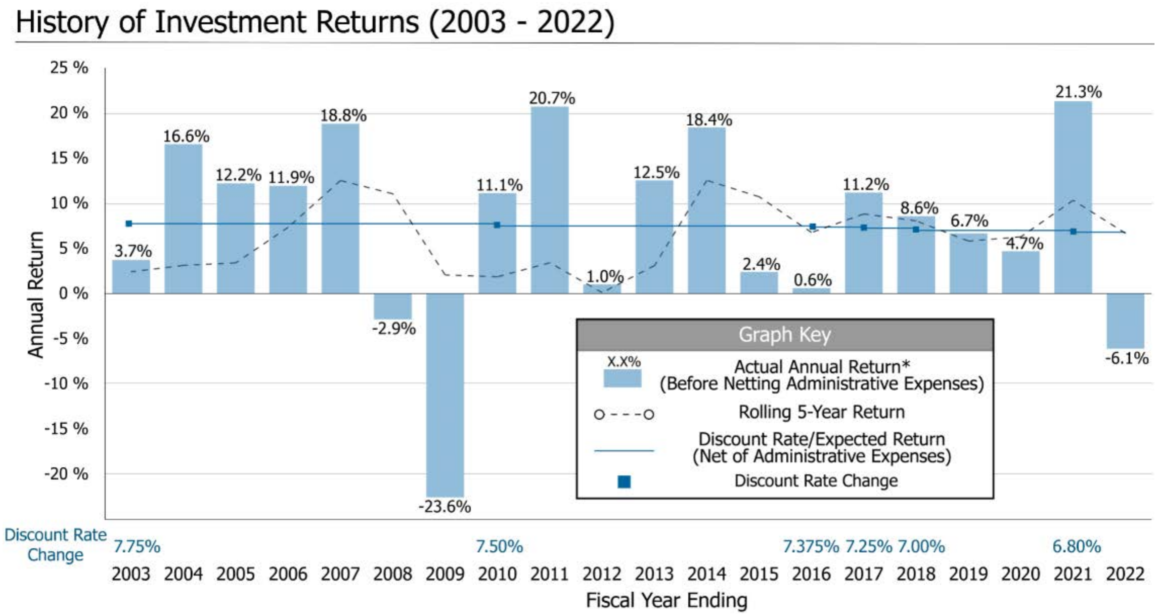
On November 17, 2021, the board adopted changes to the strategic asset allocation. The new allocation was effective July 1, 2022, and is shown below, expressed as a percentage of total assets.

Strategic Asset Allocation Policy Targets

Asset Class	Actual Allocation 9/30/2022	Policy Target Allocation effective 7/1/2022
Global Public Equity		
Market Capitalization Weighted	33.7%	30.0%
Factor Weighted	12.6%	12.0%
Private Equity	11.6%	13.0%
Income		
Treasuries	3.9%	5.0%
Mortgage-backed Securities	5.6%	5.0%
Investment Grade Corporates	5.8%	10.0%
High Yield Bonds	4.6%	5.0%
Emerging Market Sovereign Bonds	2.1%	5.0%
Total Fund Income	1.5%	-
Real Assets	17.1%	15.0%
Private Debt	1.8%	5.0%
Other Trust Level	3.8%	-
Leverage		
Strategic	(0.3%)	(5.0%)
Active	(3.8%)	-
Total Fund	**100.00%**	**100.0%**

CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the PERF for each fiscal year ending on June 30 as reported by the Investment Office. Investment returns reported are net of investment expenses but without reduction for administrative expenses. The assumed rate of return, however, is net of both investment and administrative expenses. Also, the Investment Office uses a three-month lag on private equity and real assets for investment performance reporting purposes. This can lead to a timing difference in the returns below and those used for financial reporting purposes. The investment gain or loss calculation in this report relies on final assets that have been audited and are appropriate for financial reporting. Because of these differences, the effective investment return for funding purposes can be higher or lower than the return reported by the Investment Office shown here.



* As reported by the Investment Office with a 3-month lag on private equity and real assets.

The table below shows annualized investment returns of the PERF for various time periods ending on June 30, 2022 (figures reported are net of investment expenses but without reduction for administrative expenses). These returns are the annual rates that if compounded over the indicated number of years would equate to the actual time-weighted investment performance of the PERF. It should be recognized that in any given year the rate of return is volatile. The portfolio has an expected volatility of 12.1% per year based on the most recent Asset Liability Management study. The realized volatility is a measure of the risk of the portfolio expressed as the standard deviation of the fund's total monthly return distribution, expressed as an annual percentage. Due to their volatile nature, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Compound Annual Rates of Return and Volatilities					
	1 year	**5 year**	**10 year**	**20 year**	**30 year**
Compound Annual Return	-6.1%	6.7%	7.7%	6.9%	7.7%
Realized Volatility	–	8.3%	7.1%	8.5%	8.6%

Liabilities and Contributions

- **Development of Accrued and Unfunded Liabilities**
- **(Gain) / Loss Analysis 6/30/21 - 6/30/22**
- **Schedule of Amortization Bases**
- **Amortization Schedule and Alternatives**
- **Reconciliation of Required Employer Contributions**
- **Employer Contribution History**
- **Funding History**
- **Normal Cost by Benefit Group**
- **PEPRA Member Contribution Rates**

Development of Accrued and Unfunded Liabilities

	June 30, 2021	June 30, 2022
1. Present Value of Projected Benefits		
a) Active Members	$2,712,443,533	$2,803,232,648
b) Transferred Members	82,700,423	89,998,205
c) Separated Members	53,642,902	59,690,317
d) Members and Beneficiaries Receiving Payments	2,500,698,389	2,698,539,403
e) Total	$5,349,485,247	$5,651,460,573
2. Present Value of Future Employer Normal Costs	$614,338,095	$610,423,784
3. Present Value of Future Employee Contributions	$318,296,595	$349,989,679
4. Entry Age Accrued Liability		
a) Active Members [(1a) - (2) - (3)]	$1,779,808,843	$1,842,819,185
b) Transferred Members (1b)	82,700,423	89,998,205
c) Separated Members (1c)	53,642,902	59,690,317
d) Members and Beneficiaries Receiving Payments (1d)	2,500,698,389	2,698,539,403
e) Total	$4,416,850,557	$4,691,047,110
5. Market Value of Assets (MVA)	$3,928,117,059	$3,603,373,342
6. Unfunded Accrued Liability (UAL) [(4e) - (5)]	$488,733,498	$1,087,673,768
7. Funded Ratio [(5) / (4e)]	88.9%	76.8%

(Gain)/Loss Analysis 6/30/21 – 6/30/22

To calculate the cost requirements of the plan, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year, actual experience is compared to the expected experience based on the actuarial assumptions. This results in actuarial gains or losses, as shown below.

1.	**Total (Gain)/Loss for the Year**	
a)	Unfunded Accrued Liability (UAL) as of 6/30/21	$488,733,498
b)	Expected payment on the UAL during 2021-22	44,866,118
c)	Interest through 6/30/22 [.068 x (1a) - ((1.068)^{½} - 1) x (1b)]	31,733,516
d)	Expected UAL before all other changes [(1a) - (1b) + (1c)]	475,600,896
e)	Change due to plan changes [1]	1,679,647
f)	Change due to AL Significant Increase	0
g)	Change due to assumption change	0
h)	Change due to method change	0
i)	Change due to discount rate change with Funding Risk Mitigation	0
j)	Expected UAL after all other changes [(1d) + (1e) + (1f) + (1g) + (1h) + (1i)]	477,280,543
k)	Actual UAL as of 6/30/22	1,087,673,768
l)	Total (Gain)/Loss for 2021-22 [(1k) - (1j)]	$610,393,225
2.	**Investment (Gain)/Loss for the Year**	
a)	Market Value of Assets as of 6/30/21	$3,928,117,059
b)	Prior fiscal year receivables	(4,161,728)
c)	Current fiscal year receivables	3,661,292
d)	Contributions received	153,407,653
e)	Benefits and refunds paid	(179,765,131)
f)	Transfers, SCP payments and interest, and miscellaneous adjustments	1,252,272
g)	Expected return at 6.8% per year	267,637,419
h)	Expected assets as of 6/30/22 [(2a) + (2b) + (2c) + (2d) + (2e) + (2f) + (2g)]	4,170,148,838
i)	Actual Market Value of Assets as of 6/30/22	3,603,373,342
j)	Investment (Gain)/Loss [(2h) - (2i)]	$566,775,496
3.	**Non-Investment (Gain)/Loss for the Year**	
a)	Total (Gain)/Loss (1l)	$610,393,225
b)	Investment (Gain)/Loss (2j)	566,775,496
c)	Non-Investment (Gain)/Loss [(3a) - (3b)]	$43,617,729

[1] Includes the effect, if any, of SB 1168, w hich increased the standard post-retirement lump sum death benefit from $500 to $2,000 for deaths occurring on or after July 1, 2023.

Schedule of Amortization Bases

Below is the schedule of the plan's amortization bases. Note that there is a two-year lag between the valuation date and the start of the contribution year.

- The assets, liabilities, and funded status of the plan are measured as of the valuation date: June 30, 2022.
- The required employer contributions determined by the valuation are for the fiscal year beginning two years after the valuation date: FY 2024-25.

This two-year lag is necessary due to the amount of time needed to extract and test the membership and financial data, and the need to provide public agencies with their required employer contribution well in advance of the start of the fiscal year.

The Unfunded Accrued Liability (UAL) is used to determine the employer contribution and therefore must be rolled forward two years from the valuation date to the first day of the fiscal year for which the contribution is being determined. The UAL is rolled forward each year by subtracting the expected payment on the UAL for the fiscal year and adjusting for interest. The expected payment on the UAL for a fiscal year is equal to the Expected Employer Contribution for the fiscal year minus the Expected Normal Cost for the year. The Employer Contribution for the first fiscal year is determined by the actuarial valuation two years ago and the contribution for the second year is from the actuarial valuation one year ago. Additional discretionary payments are reflected in the Expected Payments column in the fiscal year they were made by the agency.

Reason for Base	Date Est.	Ramp Level 2024-25	Ramp Shape	Escala-tion Rate	Amort. Period	Balance 6/30/22	Expected Payment 2022-23	Balance 6/30/23	Expected Payment 2023-24	Balance 6/30/24	Minimum Required Payment 2024-25
Fresh Start	6/30/08	No	Ramp	2.80%	16	(4,982,846)	(396,095)	(4,912,339)	(398,275)	(4,834,784)	(409,426)
Special (Gain)/Loss	6/30/09	No	Ramp	2.80%	17	71,397,768	5,473,129	70,596,661	5,498,294	69,715,072	5,652,246
Special (Gain)/Loss	6/30/10	No	Ramp	2.80%	18	57,309,361	4,247,690	56,816,661	4,263,438	56,274,183	4,382,814
Special (Gain)/Loss	6/30/11	No	Ramp	2.80%	19	63,209,561	4,540,627	62,815,342	4,553,482	62,381,031	4,680,980
(Gain)/Loss	6/30/12	No	Ramp	2.80%	20	(5,208,970)	(363,429)	(5,187,598)	(364,145)	(5,164,032)	(374,341)
Payment (Gain)/Loss	6/30/12	No	Ramp	2.80%	20	(36,496,047)	(2,546,322)	(36,346,305)	(2,551,336)	(36,181,199)	(2,622,774)
(Gain)/Loss	6/30/13	100%	Up/Down	2.80%	21	379,267,791	27,277,911	376,867,893	27,353,946	374,226,224	28,119,857
(Gain)/Loss	6/30/14	100%	Up/Down	2.80%	22	(217,458,042)	(15,189,351)	(216,547,893)	(15,218,673)	(215,545,551)	(15,644,796)
(Gain)/Loss	6/30/15	100%	Up/Down	2.80%	23	207,536,817	14,105,938	207,071,668	14,121,275	206,559,039	14,516,671
(Gain)/Loss	6/30/16	100%	Up/Down	2.80%	24	214,490,666	14,370,605	214,224,861	14,203,780	214,113,385	14,601,486
(Gain)/Loss	6/30/17	100%	Up/Down	2.80%	25	(115,429,540)	(6,048,966)	(117,027,500)	(7,557,472)	(117,175,170)	(7,769,081)
Assumption Change	6/30/17	100%	Up/Down	2.80%	15	82,892,961	6,111,228	82,214,090	7,702,458	79,844,613	7,918,126
(Gain)/Loss	6/30/18	100%	Up/Down	2.80%	26	(59,159,877)	(2,329,315)	(60,775,539)	(3,100,960)	(61,703,617)	(3,984,733)
Assumption Change	6/30/18	100%	Up/Down	2.80%	16	147,188,161	8,028,918	148,899,544	10,781,916	147,882,241	13,854,763
Method Change	6/30/18	100%	Up/Down	2.80%	16	22,139,656	1,207,689	22,397,077	1,621,787	22,244,057	2,083,997
Investment (Gain)/Loss	6/30/19	80%	Up Only	0.00%	17	16,065,310	671,991	16,463,288	989,880	16,559,809	1,319,841
Non-Investment (Gain)/Loss	6/30/19	No	Ramp	0.00%	17	(26,896,255)	(2,520,672)	(26,120,235)	(2,476,505)	(25,337,090)	(2,476,505)
Investment (Gain)/Loss	6/30/20	60%	Up Only	0.00%	18	88,299,119	1,934,185	92,304,593	3,794,386	94,660,032	5,691,579
Non-Investment (Gain)/Loss	6/30/20	No	Ramp	0.00%	18	(34,230,297)	(3,129,470)	(33,323,835)	(3,073,215)	(32,413,870)	(3,073,215)
Risk Mitigation Offset	6/30/21	No	Ramp	0.00%	0	(134,447,350)	0	(143,589,770)	(148,391,535)	0	0

Schedule of Amortization Bases (continued)

Reason for Base	Date Est.	Ramp Level 2024-25	Ramp Shape	Escalation Rate	Amort. Period	Balance 6/30/22	Expected Payment 2022-23	Balance 6/30/23	Expected Payment 2023-24	Balance 6/30/24	Minimum Required Payment 2024-25
Assumption Change	6/30/21		No Ramp	0.00%	19	40,949,231	(2,325,954)	46,137,515	4,148,849	44,987,276	4,148,849
Net Investment (Gain)	6/30/21	40%	Up Only	0.00%	19	(407,106,710)	0	(434,789,966)	(9,345,677)	(454,697,479)	(18,691,355)
Non-Investment (Gain)/Loss	6/30/21		No Ramp	0.00%	19	(3,311,463)	0	(3,536,642)	(318,027)	(3,448,472)	(318,028)
Risk Mitigation	6/30/21		No Ramp	0.00%	0	129,581,891	(5,028,164)	143,589,770	148,391,535	0	0
Benefit Change	6/30/22		No Ramp	0.00%	20	1,679,647	0	1,793,863	0	1,915,846	172,280
Investment (Gain)/Loss	6/30/22	20%	Up Only	0.00%	20	566,775,496	0	605,316,230	0	646,477,734	13,895,841
Non-Investment (Gain)/Loss	6/30/22		No Ramp	0.00%	20	43,617,729	0	46,583,735	0	49,751,429	4,473,825
Total						**1,087,673,768**	**48,092,173**	**1,111,935,169**	**54,629,206**	**1,131,090,707**	**70,148,901**

Amortization Schedule and Alternatives

The amortization schedule on the previous page shows the minimum contributions required according to the CalPERS amortization policy. Many agencies have expressed a desire for a more stable pattern of payments or have indicated interest in paying off the unfunded accrued liabilities more quickly than required. As such, we have provided alternative amortization schedules to help analyze the current amortization schedule and illustrate the potential savings of accelerating unfunded liability payments.

Shown on the following page are future year amortization payments based on 1) the current amortization schedule reflecting the individual bases and remaining periods shown on the previous page, and 2) alternative "fresh start" amortization schedules using two sample periods that would both result in interest savings relative to the current amortization schedule. To initiate a fresh start, please contact the plan actuary.

The current amortization schedule typically contains both positive and negative bases. Positive bases result from plan changes, assumption changes, method changes or plan experience that increase unfunded liability. Negative bases result from plan changes, assumption changes, method changes, or plan experience that decrease unfunded liability. The combination of positive and negative bases within an amortization schedule can result in unusual or problematic circumstances in future years, such as:

- When a negative payment would be required on a positive unfunded actuarial liability; or
- When the payment would completely amortize the total unfunded liability in a very short time period, and results in a large change in the employer contribution requirement.

In any year when one of the above scenarios occurs, the actuary will consider corrective action such as replacing the existing unfunded liability bases with a single "fresh start" base and amortizing it over an appropriate period.

The current amortization schedule on the following page may appear to show that, based on the current amortization bases, one of the above scenarios will occur at some point in the future. It is impossible to know today whether such a scenario will in fact arise since there will be additional bases added to the amortization schedule in each future year. Should such a scenario arise in any future year, the actuary will take appropriate action based on guidelines in the CalPERS amortization policy.

Amortization Schedule and Alternatives (continued)

	Current Amortization Schedule		Alternative Schedules			
			20 Year Amortization		15 Year Amortization	
Date	Balance	Payment	Balance	Payment	Balance	Payment
6/30/2024	1,131,090,707	70,148,901	1,131,090,707	101,711,697	1,131,090,707	118,655,564
6/30/2025	1,135,510,133	78,746,380	1,102,891,852	101,711,697	1,085,381,368	118,655,564
6/30/2026	1,131,345,096	87,064,867	1,072,775,475	101,711,697	1,036,563,794	118,655,564
6/30/2027	1,118,300,171	93,538,548	1,040,611,184	101,711,697	984,426,625	118,655,564
6/30/2028	1,097,678,026	109,411,762	1,006,259,721	101,711,697	928,744,128	118,655,564
6/30/2029	1,059,249,547	111,444,506	969,572,359	101,711,697	869,275,221	118,655,564
6/30/2030	1,016,107,211	113,534,168	930,390,256	101,711,697	805,762,429	118,655,564
6/30/2031	967,871,653	115,682,341	888,543,770	101,711,697	737,930,767	118,655,564
6/30/2032	914,136,071	117,890,656	843,851,723	101,711,697	665,486,552	118,655,564
6/30/2033	854,464,300	120,160,809	796,120,617	101,711,696	588,116,130	118,655,564
6/30/2034	788,388,784	122,494,527	745,143,797	101,711,697	505,484,519	118,655,564
6/30/2035	715,408,371	122,747,845	690,700,552	101,711,696	417,233,959	118,655,564
6/30/2036	637,203,500	118,507,993	632,555,167	101,711,696	322,982,361	118,655,564
6/30/2037	558,062,338	113,963,328	570,455,896	101,711,696	222,321,654	118,655,564
6/30/2038	478,236,220	109,100,114	504,133,875	101,711,697	114,816,019	118,655,565
6/30/2039	398,007,772	103,904,082	433,301,955	101,711,696		
6/30/2040	317,693,579	101,460,723	357,653,466	101,711,696		
6/30/2041	234,443,084	86,065,436	276,860,880	101,711,697		
6/30/2042	161,441,674	69,702,110	190,574,397	101,711,697		
6/30/2043	100,386,700	96,643,583	98,420,433	101,711,696		
6/30/2044	7,337,567	7,582,942				
6/30/2045						
6/30/2046						
6/30/2047						
6/30/2048						
6/30/2049						
Total		**2,069,795,621**		**2,034,233,933**		**1,779,833,461**
Interest Paid		**938,704,914**		**903,143,226**		**648,742,754**
Estimated Savings				**35,561,688**		**289,962,160**

Reconciliation of Required Employer Contributions

Normal Cost (% of Payroll)

1. For Period 7/1/23 – 6/30/24	
a) Employer Normal Cost	21.73%
b) Employee contribution	10.16%
c) Total Normal Cost	31.89%
2. Changes since the prior year annual valuation	
a) Effect of demographic experience	(0.22%)
b) Effect of plan changes	0.00%
c) Effect of discount rate change due to Funding Risk Mitigation	0.00%
d) Effect of assumption changes	0.00%
e) Effect of method changes	0.00%
f) Net effect of the changes above [sum of (a) through (e)]	(0.22%)
3. For Period 7/1/24 – 6/30/25	
a) Employer Normal Cost	21.36%
b) Employee contribution	10.31%
c) Total Normal Cost	31.67%
Employer Normal Cost Change [(3a) – (1a)]	(0.37%)
Employee Contribution Change [(3b) – (1b)]	0.15%

Unfunded Liability Contribution ($)

1. For Period 7/1/23 – 6/30/24	54,629,206
2. Changes since the prior year annual valuation	
a) Effect of adjustments to prior year's amortization schedule	0
b) Effect of elimination of amortization bases	0
c) Effect of progression of amortization bases [1]	(3,022,251)
d) Effect of investment (gain)/loss during prior year[2]	13,895,841
e) Effect of non-investment (gain)/loss during prior year	4,473,825
f) Effect of re-amortizing existing bases due to Funding Risk Mitigation	0
g) Effect of Golden Handshake	0
h) Effect of plan changes	172,280
i) Effect of AL Significant Increase (Government Code section 20791)	0
j) Effect of assumption changes	0
k) Effect of adjustments to the amortization schedule (e.g., Fresh Start)	0
l) Effect of method change	0
m) Net effect of the changes above [sum of (a) through (l)]	15,519,695
3. For Period 7/1/24 – 6/30/25 [(1) + (2m)]	70,148,901

The amounts shown for the period 7/1/23 – 6/30/24 may be different if a prepayment of unfunded actuarial liability is made or a plan change became effective after the prior year's actuarial valuation was performed.

[1] Includes scheduled escalation in individual amortization base payments due to the 5-year ramp and payroll growth assumption used in the pre-2019 amortization policy.
[2] The unfunded liability contribution for the investment (gain)/loss during the year prior to the valuation date is 20% of the "full" annual requirement due to the 5-year ramp. Increases to this amount that occur during the ramp period will be included in line c) for each of the next four years.

Employer Contribution History

The table below provides a recent history of the required and discretionary employer contributions for the plan. The required amounts are based on the actuarial valuation from two years prior without subsequent adjustments, if any. Additional discretionary payments before July 1, 2018 or after June 30, 2023 are not included.

Fiscal Year	Employer Normal Cost	Unfunded Rate	Unfunded Liability Payment ($)	Additional Discretionary Payments
2015 - 16	16.729%	6.856%	N/A	N/A
2016 - 17	18.321%	8.249%	N/A	N/A
2017 - 18	17.912%	N/A	35,778,888	N/A
2018 - 19	18.464%	N/A	48,790,038	0
2019 - 20	19.853%	N/A	62,876,977	344,292,468
2020 - 21	21.095%	N/A	73,668,397	0
2021 - 22	20.74%	N/A	49,686,992	2,344,574
2022 - 23	20.24%	N/A	55,446,291	0
2023 - 24	21.73%	N/A	54,629,206	
2024 - 25	21.36%	N/A	70,148,901	

Funding History

The table below shows the recent history of actuarial accrued liability, market value of assets, unfunded accrued liability, funded ratio and annual covered payroll.

Valuation Date	Accrued Liability (AL)	Market Value of Assets (MVA)	Unfunded Accrued Liability (UAL)	Funded Ratio	Annual Covered Payroll
6/30/2013	$2,285,586,497	$1,776,122,369	$509,464,128	77.7%	$271,367,032
6/30/2014	2,615,686,777	2,098,296,808	517,389,969	80.2%	295,171,068
6/30/2015	2,846,014,858	2,140,637,485	705,377,373	75.2%	319,499,129
6/30/2016	3,110,254,402	2,151,981,845	958,272,557	69.2%	338,809,025
6/30/2017	3,361,565,098	2,394,890,161	966,674,937	71.2%	328,400,573
6/30/2018	3,676,571,381	2,586,874,850	1,089,696,531	70.4%	309,713,827
6/30/2019	3,857,810,725	2,742,688,693	1,115,122,032	71.1%	304,732,882
6/30/2020	4,045,933,495	3,213,666,825	832,266,670	79.4%	316,205,748
6/30/2021	4,416,850,557	3,928,117,059	488,733,498	88.9%	323,672,580
6/30/2022	4,691,047,110	3,603,373,342	1,087,673,768	76.8%	333,941,947

Normal Cost by Benefit Group

The table below displays the Total Normal Cost broken out by benefit group for FY 2024-25. The Total Normal Cost is the annual cost of service accrual for the fiscal year for active employees and can be viewed as the long-term contribution rate for the benefits contracted. Generally, the normal cost for a benefit group subject to more generous benefit provisions will exceed the normal cost for a group with less generous benefits. However, based on the characteristics of the members (particularly when the number of actives is small), this may not be the case. Future measurements of the Total Normal Cost for each group may differ significantly from the current values due to such factors as: changes in the demographics of the group, changes in economic and demographic assumptions, changes in plan benefits or applicable law.

Plan Identifier	Benefit Group Name	Total Normal Cost FY 2024-25	Number of Actives	Payroll on 6/30/2022
63	Safety County Peace Officer First Level	33.71%	1,898	$222,291,424
25051	Safety County Peace Officer PEPRA Level	27.20%	1,357	$94,902,214
25052	Safety Fire PEPRA Level	27.20%	0	$0
30194	Safety Fire First Level	N/A	0	$0
30195	Safety County Peace Officer Second Level	30.98%	166	$16,748,309
	Plan Total	**31.67%**	**3,421**	**$333,941,947**

Note that if a Benefit Group above has multiple bargaining units, each of which has separately contracted for different benefits such as Employer Paid Member Contributions, then the Normal Cost shown for the respective benefit level does not reflect those differences. Additionally, if a Second Level Benefit Group amended to the same benefit formula as a First Level Benefit Group, their Normal Costs may be dissimilar due to demographic or other population differences. For questions in these situations, please contact the plan actuary.

PEPRA Member Contribution Rates

The California Public Employees' Pension Reform Act of 2013 ("PEPRA") established new benefit formulas, final compensation period, and contribution requirements for "new" employees (generally those first hired into a CalPERS-covered position on or after January 1, 2013). In accordance with Government Code section 7522.30(b), "new members … shall have an initial contribution rate of at least 50% of the normal cost rate." The normal cost for the plan is dependent on the benefit levels, actuarial assumptions, and demographics of the plan, particularly members' entry age into the plan. Should the total normal cost of the plan change by more than 1% from the base total normal cost established for the plan, the new member rate shall be 50% of the new normal cost rounded to the nearest quarter percent.

The table below shows the determination of the PEPRA member contribution rates effective July 1, 2024, based on 50% of the total normal cost rate for each respective plan as of the June 30, 2022 valuation.

		Basis for Current Rate		Rates Effective July 1, 2024			
Plan Identifier	Benefit Group Name	Total Normal Cost	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
25051	Safety County Peace Officer PEPRA Level	27.170%	13.50%	27.20%	0.030%	No	13.50%
25052	Safety Fire PEPRA Level	27.170%	13.50%	27.20%	0.030%	No	13.50%

For purposes of setting member rates, it is preferable to determine total normal cost using a large active population so that the rate remains relatively stable. While each CalPERS non-pooled plan has a sufficiently large active population for this purpose, the PEPRA active population by itself may not be sufficiently large. The total PEPRA normal cost will be determined based on the plan's PEPRA membership only if the number of members covered under the PEPRA formula meets either:

1. 50% of the active population, or
2. 25% of the active population and 100 or more PEPRA members

Until one of these conditions is met, the plan's total PEPRA normal cost will be determined using the entire active plan population (both PEPRA and Classic) based on the PEPRA benefit provisions. For this reason, the PEPRA member contribution rate determined in the table above may not equal 50% of the total normal cost of the PEPRA group shown on the "Normal Cost by Benefit Group" page.

Risk Analysis

- **Future Investment Return Scenarios**
- **Discount Rate Sensitivity**
- **Mortality Rate Sensitivity**
- **Maturity Measures**
- **Maturity Measures History**
- **Funded Status – Termination Basis**

Future Investment Return Scenarios

Analysis using the investment return scenarios from the Asset Liability Management process completed in 2021 was performed to determine the effects of various future investment returns on required employer contributions. The projections below reflect the impact of the CalPERS Funding Risk Mitigation policy. The projected normal cost rates reflect that the rates are anticipated to decline over time as new employees are hired into lower-cost benefit tiers. The projections also assume that all other actuarial assumptions will be realized and that no further changes in assumptions, contributions, benefits, or funding will occur.

The first table shows projected contribution requirements if the fund were to earn either 3.0% or 10.8% annually. These alternate investment returns were chosen because 90% of long-term average returns are expected to fall between them over the 20-year period ending June 30, 2042.

Assumed Annual Return FY 2022-23 through FY 2041-42	Projected Employer Contributions				
	FY 2025-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30
3.0% (5th percentile)					
Normal Cost Rate	20.9%	20.5%	20.0%	19.5%	19.1%
UAL Contribution	$82,089,000	$97,173,000	$113,927,000	$143,698,000	$163,367,000
10.8% (95th percentile)					
Normal Cost Rate	21.4%	21.3%	21.3%	21.3%	21.2%
UAL Contribution	$75,794,000	$78,194,000	$75,462,000	$78,270,000	$63,296,000

Required contributions outside of this range are also possible. In particular, whereas it is unlikely that investment returns will average less than 3.0% or greater than 10.8% over a 20-year period, the likelihood of a single investment return less than 3.0% or greater than 10.8% in any given year is much greater. The following analysis illustrates the effect of an extreme, single year investment return.

The portfolio has an expected volatility (or standard deviation) of 12.0% per year. Accordingly, in any given year there is a 16% probability that the annual return will be -5.2% or less and a 2.5% probability that the annual return will be -17.2% or less. These returns represent one and two standard deviations below the expected return of 6.8%.

The following table shows the effect of a one or two standard deviation investment loss in FY 2022-23 on the FY 2025-26 contribution requirements. Note that a single-year investment gain or loss decreases or increases the required UAL contribution amount incrementally for each of the next five years, not just one, due to the 5-year ramp in the amortization policy. However, the contribution requirements beyond the first year are also impacted by investment returns beyond the first year. Historically, significant downturns in the market are often followed by higher than average returns. Such investment gains would offset the impact of these single year negative returns in years beyond FY 2025-26.

Assumed Annual Return for Fiscal Year 2022-23	Required Employer Contributions	Projected Employer Contributions
	FY 2024-25	FY 2025-26
(17.2%) (2 standard deviation loss)		
Normal Cost Rate	21.36%	20.9%
UAL Contribution	$70,148,901	$99,855,000
(5.2%) (1 standard deviation loss)		
Normal Cost Rate	21.36%	20.9%
UAL Contribution	$70,148,901	$89,302,000

- Without investment gains (returns higher than 6.8%) in year FY 2023-24 or later, projected contributions rates would continue to rise over the next four years due to the continued phase-in of the impact of the illustrated investment loss in FY 2022-23.
- The Pension Outlook Tool can be used to model projected contributions for these scenarios beyond FY 2025-26 as well as to model other investment return scenarios.

Discount Rate Sensitivity

The discount rate assumption is calculated as the sum of the assumed real rate of return and the assumed annual price inflation, currently 4.5% and 2.3%, respectively. Changing either the price inflation assumption or the real rate of return assumption will change the discount rate. The sensitivity of the valuation results to the discount rate assumption depends on which component of the discount rate is changed. Shown below are various valuation results as of June 30, 2022 assuming alternate discount rates by changing the two components independently. Results are shown using the current discount rate of 6.8% as well as alternate discount rates of 5.8% and 7.8%. The rates of 5.8% and 7.8% were selected since they illustrate the impact of a 1.0% increase or decrease to the 6.8% assumption.

Sensitivity to the Real Rate of Return Assumption

As of June 30, 2022	1% Lower Real Return Rate	Current Assumptions	1% Higher Real Return Rate
Discount Rate	**5.8%**	**6.8%**	**7.8%**
Price Inflation	2.3%	2.3%	2.3%
Real Rate of Return	**3.5%**	**4.5%**	**5.5%**
a) Total Normal Cost	40.72%	31.67%	24.93%
b) Accrued Liability	$5,402,920,339	$4,691,047,110	$4,115,090,929
c) Market Value of Assets	$3,603,373,342	$3,603,373,342	$3,603,373,342
d) Unfunded Liability/(Surplus) [(b) - (c)]	$1,799,546,997	$1,087,673,768	$511,717,587
e) Funded Ratio	66.7%	76.8%	87.6%

Sensitivity to the Price Inflation Assumption

As of June 30, 2022	1% Lower Inflation Rate	Current Assumptions	1% Higher Inflation Rate
Discount Rate	**5.8%**	**6.8%**	**7.8%**
Price Inflation	**1.3%**	**2.3%**	**3.3%**
Real Rate of Return	4.5%	4.5%	4.5%
a) Total Normal Cost	33.40%	31.67%	28.64%
b) Accrued Liability	$4,867,925,537	$4,691,047,110	$4,303,233,081
c) Market Value of Assets	$3,603,373,342	$3,603,373,342	$3,603,373,342
d) Unfunded Liability/(Surplus) [(b) - (c)]	$1,264,552,195	$1,087,673,768	$699,859,739
e) Funded Ratio	74.0%	76.8%	83.7%

Mortality Rate Sensitivity

The following table looks at the change in the June 30, 2022 plan costs and funded status under two different longevity scenarios, namely assuming rates of post-retirement mortality are 10% lower or 10% higher than our current mortality assumptions adopted in 2021. This type of analysis highlights the impact on the plan of a change in the mortality assumption.

As of June 30, 2022	10% Lower Mortality Rates	Current Assumptions	10% Higher Mortality Rates
a) Total Normal Cost	32.03%	31.67%	31.34%
b) Accrued Liability	$4,760,894,669	$4,691,047,110	$4,626,288,353
c) Market Value of Assets	$3,603,373,342	$3,603,373,342	$3,603,373,342
d) Unfunded Liability/(Surplus) [(b) - (c)]	$1,157,521,327	$1,087,673,768	$1,022,915,011
e) Funded Ratio	75.7%	76.8%	77.9%

Maturity Measures

As pension plans mature they become more sensitive to risks. Understanding plan maturity and how it affects the ability of a pension plan sponsor to tolerate risk is important in understanding how the pension plan is impacted by investment return volatility, other economic variables and changes in longevity or other demographic assumptions. One way to look at the maturity level of CalPERS and its plans is to look at the ratio of a plan's retiree liability to its total liability. A pension plan in its infancy will have a very low ratio of retiree liability to total liability. As the plan matures, the ratio increases. A mature plan will often have a ratio above 60%-65%.

Ratio of Retiree Accrued Liability to Total Accrued Liability	**June 30, 2021**	**June 30, 2022**
1. Retiree Accrued Liability	2,500,698,389	2,698,539,403
2. Total Accrued Liability	4,416,850,557	4,691,047,110
3. Ratio of Retiree AL to Total AL [(1) / (2)]	57%	58%

Another measure of the maturity level of CalPERS and its plans is the ratio of actives to retirees, also called the support ratio. A pension plan in its infancy will have a very high ratio of active to retired members. As the plan matures and members retire, the ratio declines. A mature plan will often have a ratio near or below one.

To calculate the support ratio for the rate plan, retirees and beneficiaries receiving a continuance are each counted as one, even though they may have only worked a portion of their careers as an active member of this rate plan. For this reason, the support ratio, while intuitive, may be less informative than the ratio of retiree liability to total accrued liability above. For comparison, the support ratio for all CalPERS public agency plans is 0.82 and is calculated consistently with how it is for the individual rate plan. Note that to calculate the support ratio for all public agency plans, a retiree with service from more than one CalPERS agency is counted as a retiree more than once.

Support Ratio	**June 30, 2021**	**June 30, 2022**
1. Number of Actives	3,370	3,421
2. Number of Retirees	3,126	3,256
3. Support Ratio [(1) / (2)]	1.08	1.05

The actuarial calculations supplied in this communication are based on various assumptions about long-term demographic and economic behavior. Unless these assumptions (e.g., terminations, deaths, disabilities, retirements, salary growth, investment return) are exactly realized each year, there will be differences on a year-to-year basis. The year-to-year differences between actual experience and the assumptions are called actuarial gains and losses and serve to lower or raise required employer contributions from one year to the next. Therefore, employer contributions will inevitably fluctuate, especially due to the ups and downs of investment returns.

Maturity Measures (continued)

Asset Volatility Ratio

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

Liability Volatility Ratio

Also shown in the table below is the liability volatility ratio (LVR), which is the ratio of accrued liability to payroll. Plans that have a higher LVR experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, a plan with LVR of 8 is expected to have twice the contribution volatility of a plan with LVR of 4 when there is a change in accrued liability, such as when there is a change in actuarial assumptions. It should be noted that this ratio indicates a longer-term potential for contribution volatility, since the AVR, described above, will tend to move closer to the LVR as the funded ratio approaches 100%.

Contribution Volatility	June 30, 2021	June 30, 2022
1. Market Value of Assets without Receivables	$3,923,955,332	$3,599,712,050
2. Payroll	323,672,580	333,941,947
3. Asset Volatility Ratio (AVR) [(1) / (2)]	12.1	10.8
4. Accrued Liability	$4,416,850,557	$4,691,047,110
5. Liability Volatility Ratio (LVR) [(4) / (2)]	13.6	14.0

Maturity Measures History

Valuation Date	Ratio of Retiree Accrued Liability to Total Accrued Liability	Support Ratio	Asset Volatility Ratio	Liability Volatility Ratio
6/30/2017	51%	1.38	7.3	10.2
6/30/2018	54%	1.20	8.3	11.9
6/30/2019	56%	1.14	9.0	12.7
6/30/2020	57%	1.14	10.1	12.8
6/30/2021	57%	1.08	12.1	13.6
6/30/2022	58%	1.05	10.8	14.0

Funded Status – Termination Basis

The funded status measured on a termination basis is an estimate of the financial position of the plan had the contract with CalPERS been terminated as of June 30, 2022. The accrued liability on a termination basis (termination liability) is calculated differently from the plan's ongoing funding liability. For the termination liability calculation, both compensation and service are frozen as of the valuation date and no future pay increases or service accruals are assumed. This measure of funded status is not appropriate for assessing the need for future employer contributions in the case of an ongoing plan, that is, for an employer that continues to provide CalPERS retirement benefits to active employees. Unlike the actuarial cost method used for ongoing plans, the termination liability is the present value of the benefits earned through the valuation date.

A more conservative investment policy and asset allocation strategy was adopted by the board for the Terminated Agency Pool. The Terminated Agency Pool has limited funding sources since no future employer contributions will be made. Therefore, expected benefit payments are secured by risk-free assets and benefit security for members is increased while limiting the funding risk. However, this asset allocation has a lower expected rate of return than the remainder of the PERF and consequently, a lower discount rate assumption. The lower discount rate for the Terminated Agency Pool results in higher liabilities for terminated plans.

The effective termination discount rate will depend on actual market rates of return for risk-free securities on the date of termination. As market discount rates are variable, the table below shows a range for the termination liability based on the lowest and highest interest rates observed during an approximate 19-month period from 12 months before the valuation date to seven months after.

	Discount Rate: 1.75% Price Inflation: 2.50%			Discount Rate: 4.50% Price Inflation: 2.75%		
Market Value of Assets (MVA)	**Termination Liability[1,2]**	**Funded Ratio**	**Unfunded Termination Liability**	**Termination Liability[1,2]**	**Funded Ratio**	**Unfunded Termination Liability**
$3,603,373,342	$10,282,338,702	35.0%	$6,678,965,360	$6,145,684,353	58.6%	$2,542,311,011

[1] The termination liabilities calculated above include a 5% contingency load. The contingency load and other actuarial assumptions can be found in Appendix A.

[2] The discount rate used for termination valuations is a w eighted average of the 10-year and 30-year U.S. Treasury yields w here the weights are based on matching asset and liability durations as of the termination date. The discount rates used in the table are based on 20-year Treasury bonds, rounded to the nearest quarter percentage point, which is a good proxy for most plans. The 20-year Treasury yield w as 3.38% on June 30, 2022, the valuation date.

In order to terminate the plan, first contact our Pension Contract Services unit to initiate a Resolution of Intent to Terminate. The completed Resolution will allow the plan actuary to provide a preliminary termination valuation with a more up-to-date estimate of the plan liabilities. Before beginning this process, please consult with the plan actuary.

Plan's Major Benefit Provisions

Plan's Major Benefit Options

Shown below is a summary of the major optional benefits for which the agency has contracted. A description of principal standard and optional plan provisions is in Appendix B.

	Benefit Group						
Member Category	Peace	Fire	Peace	Peace	Peace	Peace	Fire
Demographics							
Actives	Yes	No	Yes	Yes	Yes	Yes	No
Transfers/Separated	Yes	Yes	No	Yes	Yes	Yes	No
Receiving	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Benefit Provision							
Benefit Formula	3% @ 50	3% @ 50	2% @ 50	3% @ 50	2.7% @ 57	2% @ 50	
Social Security Coverage	No	No	No	No	No	No	
Full/Modified	Full	Full	Full	Full	Full	Full	
Employee Contribution Rate	9.00%		9.00%	9.00%	13.50%	9.00%	
Final Average Compensation Period	One Year	Three Year	One Year	One Year	Three Year	Three Year	
Sick Leave Credit	No	No	No	No	No	No	
Non-Industrial Disability	Standard	Standard	Standard	Standard	Standard	Standard	
Industrial Disability	Standard	Standard	Standard	Standard	Standard	Standard	
Pre-Retirement Death Benefits							
Optional Settlement 2	Yes	Yes	Yes	Yes	Yes	Yes	
1959 Survivor Benefit Level	Indexed	Indexed	Indexed	Indexed	Indexed	Indexed	
Special	Yes	Yes	Yes	Yes	Yes	Yes	
Alternate (firefighters)	No	No	No	No	No	No	
Post-Retirement Death Benefits							
Lump Sum	$2000	$2000	$2000	$2000	$2000	$2000	$2000
Survivor Allowance (PRSA)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
COLA	2%	2%	2%	2%	2%	2%	2%

Plan's Major Benefit Options (continued)

Shown below is a summary of the major optional benefits for which the agency has contracted. A description of principal standard and optional plan provisions is in Appendix B.

	Benefit Group				
Member Category	Peace	Peace	Peace	Peace	
Demographics					
Actives	Yes	No	No	No	
Transfers/Separated	No	No	No	No	
Receiving	No	Yes	Yes	Yes	
Benefit Provision					
Benefit Formula	2% @ 50				
Social Security Coverage	No				
Full/Modified	Full				
Employee Contribution Rate	9.00%				
Final Average Compensation Period	Three Year				
Sick Leave Credit	No				
Non-Industrial Disability	Standard				
Industrial Disability	Standard				
Pre-Retirement Death Benefits					
Optional Settlement 2	Yes				
1959 Survivor Benefit Level	Indexed				
Special	Yes				
Alternate (firefighters)	No				
Post-Retirement Death Benefits					
Lump Sum	$2000	$2000	$2000	$2000	
Survivor Allowance (PRSA)	Yes	Yes	Yes	Yes	
COLA	2%	2%	2%	2%	

Appendices

- **Appendix A – Actuarial Methods and Assumptions**
- **Appendix B – Principal Plan Provisions**
- **Appendix C – Participant Data**
- **Appendix D – Glossary**

Appendix A

Actuarial Methods and Assumptions

- **Actuarial Data**
- **Actuarial Methods**
- **Actuarial Assumptions**
- **Miscellaneous**

Actuarial Data

As stated in the Actuarial Certification, the data which serves as the basis of this valuation has been obtained from the various CalPERS databases. We have reviewed the valuation data and believe that it is reasonable and appropriate in aggregate. We are unaware of any potential data issues that would have a material effect on the results of this valuation, except that data does not always contain the latest salary information for former members now in reciprocal systems and does not recognize the potential for unusually large salary deviation in certain cases such as elected officials. Therefore, salary information in these cases may not be accurate. These situations are relatively infrequent, however, and generally do not have a material impact on the required employer contributions.

Actuarial Methods

Actuarial Cost Method

The actuarial cost method used is the Entry Age Actuarial Cost Method. Under this method, projected benefits are determined for all members and the associated liabilities are spread in a manner that produces level annual cost as a percentage of pay in each year from the member's entry age to their assumed retirement age on the valuation date. The cost allocated to the current fiscal year is called the normal cost.

The actuarial accrued liability for active members is then calculated as the portion of the total cost of the plan allocated to prior years. The actuarial accrued liability for members currently receiving benefits and for members entitled to deferred benefits is equal to the present value of the benefits expected to be paid. No normal costs are applicable for these participants.

CalPERS uses an in-house proprietary actuarial model for calculating plan costs. We believe this model is fit for its intended purpose and meets all applicable Actuarial Standards of Practice. Furthermore, the actuarial results of our model are independently confirmed periodically by outside auditing actuaries. The actuarial assumptions used are internally consistent and the generated results are reasonable.

Amortization of Unfunded Actuarial Accrued Liability

The excess of the total actuarial accrued liability over the market value of plan assets is called the unfunded actuarial accrued liability (UAL). Funding requirements are determined by adding the normal cost and a payment toward the UAL. The UAL payment is equal to the sum of individual amortization payments, each representing a different source of UAL for a given measurement period.

Amortization payments are determined according to the CalPERS amortization policy. The board adopted a new policy effective for the June 30, 2019 actuarial valuation. The new policy applies prospectively only; amortization bases (sources of UAL) established prior to the June 30, 2019 valuation will continue to be amortized according to the prior policy.

<u>Prior Policy (Bases Established prior to June 30, 2019)</u>

Amortization payments are determined as a level percentage of payroll whereby the payment increases each year at an escalation rate. Gains or losses are amortized over a fixed 30-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. All changes in liability due to plan amendments (other than golden handshakes) are amortized over a 20-year period with no ramp. Changes in actuarial assumptions or changes in actuarial methodology are amortized over a 20-year period with a 5-year ramp up at the beginning and a 5-year ramp down at the end of the amortization period. Changes in unfunded accrued liability due to a Golden Handshake will be amortized over a period of five years. Bases established prior to June 30, 2013 may be amortized differently. A summary is provided in the following table:

Driver	Source (Gain)/Loss Investment	Non-investment	Assumption/Method Change	Benefit Change	Golden Handshake
Amortization Period	30 Years	30 Years	20 Years	20 Years	5 Years
Escalation Rate - Active Plans - Inactive Plans	 2.80% 0%	 2.80% 0%	 2.80% 0%	 2.80% 0%	 2.80% 0%
Ramp Up	5	5	5	0	0
Ramp Down	5	5	5	0	0

The 5-year ramp up means that the payments in the first four years of the amortization period are 20%, 40%, 60% and 80% of the "full" payment 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 are determined as a level dollar amount. Investment gains or losses are amortized over a fixed 20-year period with a 5-year ramp up at the beginning of the amortization period. Non-investment gains or losses are amortized over a fixed 20-year period with no ramps. All changes in liability due to plan amendments (other than golden handshakes) are amortized over a 20-year period with no ramps. Changes in actuarial assumptions or changes in actuarial methodology are amortized over a 20-year period with no ramps. Changes in unfunded accrued liability due to a Golden Handshake are amortized over a period of five years. A summary is provided in the table below:

	Source (Gain)/Loss Investment	Non-investment	Assumption/Method Change	Benefit Change	Golden Handshake
Amortization Period	20 Years	20 Years	20 Years	20 Years	5 Years
Escalation Rate	0%	0%	0%	0%	0%
Ramp Up	5	0	0	0	0
Ramp Down	0	0	0	0	0

Exceptions for Inconsistencies

An exception to the amortization rules above is used whenever their application results in inconsistencies. In these cases, a "fresh start" approach is used. This means that the current unfunded actuarial liability is projected and amortized over a set number of years. For example, a fresh start is needed in the following situations:

- When a negative payment would be required on a positive unfunded actuarial liability; or
- When the payment would completely amortize the total unfunded liability in a very short time period, and results in a large change in the employer contribution requirement.

It should be noted that the actuary may determine that a fresh start is necessary under other circumstances. In all cases of a fresh start, the period is set by the actuary at what is deemed appropriate; however, the period will not be greater than 20 years.

Exceptions for Plans in Surplus

If a surplus exists (i.e., the Market Value of Assets exceeds the plan's accrued liability) any prior amortization layers shall be considered fully amortized, and the surplus shall not be amortized.

In the event of any subsequent unfunded liability, a Fresh Start shall be used with an amortization period of 20 years or less.

Exceptions for Small Amounts

Where small unfunded liabilities are identified in annual valuations which result in small payment amounts, the actuary may shorten the remaining period for these bases.

- When the balance of a single amortization base has an absolute value less than $250, the amortization period is reduced to one year.
- When the entire unfunded liability is a small amount, the actuary may perform a Fresh Start and use an appropriate amortization period.

Exceptions for Inactive Plans

The following exceptions apply to plans classified as Inactive. These plans have no active members and no expectation to have active members in the future.

- Amortization of the unfunded liability is on a "level dollar" basis rather than a "level percent of pay" basis. For amortization layers, which utilize a ramp up and ramp down, the "ultimate" payment is constant.
- Actuarial judgment will be used to shorten amortization periods for Inactive plans with existing periods that are deemed too long given the duration of the liability. The specific demographics of the plan will be used to determine if shorter periods may be more appropriate.

Exceptions for Inactive Agencies

For a public agency with no active members in any CalPERS rate plan, the unfunded liability shall be amortized over a closed amortization period of no more than 15 years.

Asset Valuation Method

The Actuarial Value of Assets is set equal to the market value of assets. Asset values include accounts receivable.

PEPRA Normal Cost Rate Methodology

Per Government Code section 7522.30(b), the "normal cost rate" shall mean the annual actuarially determined normal cost for the plan of retirement benefits provided to the new member and shall be established based on actuarial assumptions used to determine the liabilities and costs as part of the annual actuarial valuation. The plan of retirement benefits shall include any elements that would impact the actuarial determination of the normal cost, including, but not limited to, the retirement formula, eligibility and vesting criteria, ancillary benefit provisions, and any automatic cost-of-living adjustments as determined by the public retirement system.

For purposes of setting member rates, it is preferable to determine total normal cost using a large active population so that the rate remains relatively stable. While each CalPERS non-pooled plan has a sufficiently large active population for this purpose, the PEPRA active population by itself may not be sufficiently large. The total PEPRA normal cost will be determined based on the plan's PEPRA membership only if the number of members covered under the PEPRA formula meets either:

1. 50% of the active population, or
2. 25% of the active population and 100 or more PEPRA members

Until one of these conditions is met, the plan's total PEPRA normal cost will be determined using the entire active plan population (both PEPRA and Classic) based on the PEPRA benefit provisions.

Actuarial Assumptions

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

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

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

Economic Assumptions

Discount Rate

The prescribed discount rate assumption, adopted by the board on November 17, 2021, is 6.80% compounded annually (net of investment and administrative expenses) as of June 30, 2022.

Termination Liability Discount Rate

The current discount rate assumption used for termination valuations is a weighted average of the 10-year and 30-year U.S. Treasury yields where the weights are based on matching asset and liability durations as of the termination date.

The accrued liabilities on a termination basis in this report are calculated using an observed range of market interest rates. This range is based on the lowest and highest 20-year Treasury bond observed during an approximate 19-month period from 12 months before the valuation date to seven months after. The 20-year Treasury bond has a similar duration to most plan liabilities and serves as a good proxy for the termination discount rate. The 20-year Treasury yield was 3.38% on June 30, 2022.

Salary Growth

Annual increases vary by category, entry age, and duration of service. A sample of assumed increases are shown below. Wage inflation assumption in the valuation year (2.80% for 2022) is added to these factors for total salary growth.

Public Agency Miscellaneous

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.0764	0.0621	0.0521
1	0.0663	0.0528	0.0424
2	0.0576	0.0449	0.0346
3	0.0501	0.0381	0.0282
4	0.0435	0.0324	0.0229
5	0.0378	0.0276	0.0187
10	0.0201	0.0126	0.0108
15	0.0155	0.0102	0.0071
20	0.0119	0.0083	0.0047
25	0.0091	0.0067	0.0031
30	0.0070	0.0054	0.0020

Public Agency Fire

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1517	0.1549	0.0631
1	0.1191	0.1138	0.0517
2	0.0936	0.0835	0.0423
3	0.0735	0.0613	0.0346
4	0.0577	0.0451	0.0284
5	0.0453	0.0331	0.0232
10	0.0188	0.0143	0.0077
15	0.0165	0.0124	0.0088
20	0.0145	0.0108	0.0101
25	0.0127	0.0094	0.0115
30	0.0112	0.0082	0.0132

Public Agency Police

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1181	0.1051	0.0653
1	0.0934	0.0812	0.0532
2	0.0738	0.0628	0.0434
3	0.0584	0.0485	0.0353
4	0.0462	0.0375	0.0288
5	0.0365	0.0290	0.0235
10	0.0185	0.0155	0.0118
15	0.0183	0.0150	0.0131
20	0.0181	0.0145	0.0145
25	0.0179	0.0141	0.0161
30	0.0178	0.0136	0.0179

Salary Growth (continued)

Public Agency County Peace Officers

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1238	0.1053	0.0890
1	0.0941	0.0805	0.0674
2	0.0715	0.0616	0.0510
3	0.0544	0.0471	0.0387
4	0.0413	0.0360	0.0293
5	0.0314	0.0276	0.0222
10	0.0184	0.0142	0.0072
15	0.0174	0.0124	0.0073
20	0.0164	0.0108	0.0074
25	0.0155	0.0094	0.0075
30	0.0147	0.0083	0.0077

Schools

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.0275	0.0275	0.0200
1	0.0422	0.0373	0.0298
2	0.0422	0.0373	0.0298
3	0.0422	0.0373	0.0298
4	0.0388	0.0314	0.0245
5	0.0308	0.0239	0.0179
10	0.0236	0.0160	0.0121
15	0.0182	0.0135	0.0103
20	0.0145	0.0109	0.0085
25	0.0124	0.0102	0.0058
30	0.0075	0.0053	0.0019

- The Miscellaneous salary scale is used for Local Prosecutors.
- The Police salary scale is used for Other Safety, Local Sheriff, and School Police.

Price Inflation

2.30% compounded annually.

Wage Inflation

2.80% compounded annually (used in projecting individual salary increases).

Payroll Growth

2.80% compounded annually (used in projecting the payroll over which the unfunded liability is amortized for level percent of payroll bases). This assumption is used for all plans with active members.

Non-valued Potential Additional Liabilities

The potential liability loss for a cost-of-living increase exceeding the 2.30% price inflation assumption and any potential liability loss from future member service purchases that are not reflected in the valuation.

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1% for those plans that have adopted the provision of providing Credit for Unused Sick Leave.

Conversion of Employer Paid Member Contributions (EPMC)

Total years of service is increased by the Employee Contribution Rate for those plans with the provision providing for the Conversion of Employer Paid Member Contributions (EPMC) during the final compensation period.

Norris Decision (Best Factors)

Employees hired prior to July 1, 1982 have projected benefit amounts increased in order to reflect the use of “Best Factors” in the calculation of optional benefit forms. This is due to a 1983 Supreme Court decision, known as the Norris decision, which required males and females to be treated equally in the determination of benefit amounts. Consequently, anyone already employed at that time is given the best possible conversion factor when optional benefits are determined. No loading is necessary for employees hired after July 1, 1982.

Termination Liability

The termination liabilities include a 5% contingency load. This load is for unforeseen improvements in mortality.

Demographic Assumptions

Pre-Retirement Mortality

The mortality assumptions are based on mortality rates resulting from the most recent CalPERS Experience Study adopted by the CalPERS Board in November 2021. For purposes of the mortality rates, the rates incorporate generational mortality to capture on-going mortality improvement. Generational mortality explicitly assumes that members born more recently will live longer than the members born before them thereby capturing the mortality improvement seen in the past and expected continued improvement. For more details, please refer to the 2021 experience study report that can be found on the CalPERS website.

Rates vary by age and gender are shown in the table below. This table only contains a sample of the 2017 base table rates for illustrative purposes. The non-industrial death rates are used for all plans. The industrial death rates are used for Safety plans (except for local Safety members described in Section 20423.6 where the agency has not specifically contracted for industrial death benefits.)

	Miscellaneous		**Safety**			
	Non-Industrial Death (Not Job-Related)		**Non-Industrial Death (Not Job-Related)**		**Industrial Death (Job-Related)**	
Age	Male	Female	Male	Female	Male	Female
20	0.00039	0.00014	0.00038	0.00014	0.00004	0.00002
25	0.00033	0.00013	0.00034	0.00018	0.00004	0.00002
30	0.00044	0.00019	0.00042	0.00025	0.00005	0.00003
35	0.00058	0.00029	0.00048	0.00034	0.00005	0.00004
40	0.00075	0.00039	0.00055	0.00042	0.00006	0.00005
45	0.00093	0.00054	0.00066	0.00053	0.00007	0.00006
50	0.00134	0.00081	0.00092	0.00073	0.00010	0.00008
55	0.00198	0.00123	0.00138	0.00106	0.00015	0.00012
60	0.00287	0.00179	0.00221	0.00151	0.00025	0.00017
65	0.00403	0.00250	0.00346	0.00194	0.00038	0.00022
70	0.00594	0.00404	0.00606	0.00358	0.00067	0.00040
75	0.00933	0.00688	0.01099	0.00699	0.00122	0.00078
80	0.01515	0.01149	0.02027	0.01410	0.00225	0.00157

- The pre-retirement mortality rates above are for 2017 and are projected generationally for future years using 80% of the Society of Actuaries’ Scale MP-2020.
- Miscellaneous plans usually have industrial death rates set to zero unless the agency has specifically contracted for industrial death benefits. If so, each non-industrial death rate shown above will be split into two components: 99% will become the non-industrial death rate and 1% will become the industrial death rate.

Post-Retirement Mortality

Rates vary by age, type of retirement, and gender. See sample rates in table below. These rates are used for all plans.

	Service Retirement		Non-Industrial Disability (Not Job-Related)		Industrial Disability (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
50	0.00267	0.00199	0.01701	0.01439	0.00430	0.00311
55	0.00390	0.00325	0.02210	0.01734	0.00621	0.00550
60	0.00578	0.00455	0.02708	0.01962	0.00944	0.00868
65	0.00857	0.00612	0.03334	0.02276	0.01394	0.01190
70	0.01333	0.00996	0.04001	0.02910	0.02163	0.01858
75	0.02391	0.01783	0.05376	0.04160	0.03446	0.03134
80	0.04371	0.03403	0.07936	0.06112	0.05853	0.05183
85	0.08274	0.06166	0.11561	0.09385	0.10137	0.08045
90	0.14539	0.11086	0.16608	0.14396	0.16584	0.12434
95	0.24665	0.20364	0.24665	0.20364	0.24665	0.20364
100	0.36198	0.31582	0.36198	0.31582	0.36198	0.31582
105	0.52229	0.44679	0.52229	0.44679	0.52229	0.44679
110	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

The post-retirement mortality rates above are for 2017 and are projected generationally for future years using 80% of the Society of Actuaries' Scale MP-2020.

Marital Status

For active members, a percentage who are married upon retirement is assumed according to the member category as shown in the following table.

Member Category	Percent Married
Miscellaneous Member	70%
Local Police	85%
Local Fire	85%
Other Local Safety	70%
School Police	85%
Local County Peace Officers	75%

Age of Spouse

It is assumed that female spouses are 3 years younger than male spouses. This assumption is used for all plans.

Separated Members

It is assumed that separated members refund immediately if non-vested. Separated members who are vested are assumed to retire at age 59 for Miscellaneous members and age 54 for Safety members.

Termination with Refund

Rates vary by entry age and service for Miscellaneous plans. Rates vary by service for Safety plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20		Entry Age 25		Entry Age 30		Entry Age 35		Entry Age 40		Entry Age 45	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	0.1851	0.1944	0.1769	0.1899	0.1631	0.1824	0.1493	0.1749	0.1490	0.1731	0.1487	0.1713
1	0.1531	0.1673	0.1432	0.1602	0.1266	0.1484	0.1101	0.1366	0.1069	0.1323	0.1037	0.1280
2	0.1218	0.1381	0.1125	0.1307	0.0970	0.1183	0.0815	0.1058	0.0771	0.0998	0.0726	0.0938
3	0.0927	0.1085	0.0852	0.1020	0.0727	0.0912	0.0601	0.0804	0.0556	0.0737	0.0511	0.0669
4	0.0672	0.0801	0.0616	0.0752	0.0524	0.0670	0.0431	0.0587	0.0392	0.0523	0.0352	0.0459
5	0.0463	0.0551	0.0423	0.0517	0.0358	0.0461	0.0292	0.0404	0.0261	0.0350	0.0230	0.0296
10	0.0112	0.0140	0.0101	0.0129	0.0083	0.0112	0.0064	0.0094	0.0048	0.0071	0.0033	0.0049
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire		Police		County Peace Officer	
	Male	Female	Male	Female	Male	Female
0	0.1022	0.1317	0.1298	0.1389	0.1086	0.1284
1	0.0686	0.1007	0.0789	0.0904	0.0777	0.0998
2	0.0441	0.0743	0.0464	0.0566	0.0549	0.0759
3	0.0272	0.0524	0.0274	0.0343	0.0385	0.0562
4	0.0161	0.0349	0.0170	0.0206	0.0268	0.0402
5	0.0092	0.0214	0.0113	0.0128	0.0186	0.0276
10	0.0015	0.0000	0.0032	0.0047	0.0046	0.0038
15	0.0000	0.0000	0.0000	0.0000	0.0023	0.0036
20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
30	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

- The police termination and refund rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

Termination with Refund (continued)

Schools

Duration of Service	Entry Age 20		Entry Age 25		Entry Age 30		Entry Age 35		Entry Age 40		Entry Age 45	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
0	0.2054	0.2120	0.1933	0.1952	0.1730	0.1672	0.1527	0.1392	0.1423	0.1212	0.1318	0.1032
1	0.1922	0.2069	0.1778	0.1883	0.1539	0.1573	0.1300	0.1264	0.1191	0.1087	0.1083	0.0910
2	0.1678	0.1859	0.1536	0.1681	0.1298	0.1383	0.1060	0.1086	0.0957	0.0934	0.0853	0.0782
3	0.1384	0.1575	0.1256	0.1417	0.1042	0.1155	0.0829	0.0893	0.0736	0.0774	0.0643	0.0656
4	0.1085	0.1274	0.0978	0.1143	0.0800	0.0925	0.0622	0.0707	0.0542	0.0620	0.0462	0.0533
5	0.0816	0.0991	0.0732	0.0887	0.0590	0.0713	0.0449	0.0539	0.0383	0.0476	0.0317	0.0413
10	0.0222	0.0248	0.0200	0.0221	0.0163	0.0174	0.0125	0.0128	0.0094	0.0100	0.0063	0.0072
15	0.0106	0.0132	0.0095	0.0113	0.0077	0.0083	0.0058	0.0052	0.0040	0.0039	0.0021	0.0026
20	0.0059	0.0065	0.0050	0.0054	0.0035	0.0036	0.0021	0.0019	0.0010	0.0009	0.0000	0.0000
25	0.0029	0.0034	0.0025	0.0029	0.0018	0.0020	0.0010	0.0012	0.0005	0.0006	0.0000	0.0000
30	0.0012	0.0015	0.0011	0.0013	0.0011	0.0011	0.0010	0.0009	0.0005	0.0005	0.0000	0.0000
35	0.0006	0.0007	0.0006	0.0007	0.0005	0.0006	0.0005	0.0005	0.0003	0.0002	0.0000	0.0000

Termination with Vested Benefits

Rates vary by entry age and service for Miscellaneous plans. Rates vary by service for Safety plans. See sample rates in tables below.

Public Agency Miscellaneous

Duration of Service	Entry Age 20		Entry Age 25		Entry Age 30		Entry Age 35		Entry Age 40	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
5	0.0381	0.0524	0.0381	0.0524	0.0358	0.0464	0.0334	0.0405	0.0301	0.0380
10	0.0265	0.0362	0.0265	0.0362	0.0254	0.0334	0.0244	0.0307	0.0197	0.0236
15	0.0180	0.0252	0.0180	0.0252	0.0166	0.0213	0.0152	0.0174	0.0119	0.0132
20	0.0141	0.0175	0.0141	0.0175	0.0110	0.0131	0.0079	0.0087	0.0000	0.0000
25	0.0084	0.0108	0.0084	0.0108	0.0064	0.0076	0.0000	0.0000	0.0000	0.0000
30	0.0047	0.0056	0.0047	0.0056	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
35	0.0038	0.0041	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire		Police		County Peace Officer	
	Male	Female	Male	Female	Male	Female
5	0.0089	0.0224	0.0156	0.0272	0.0177	0.0266
10	0.0066	0.0164	0.0113	0.0198	0.0126	0.0189
15	0.0048	0.0120	0.0083	0.0144	0.0089	0.0134
20	0.0035	0.0088	0.0060	0.0105	0.0063	0.0095
25	0.0024	0.0061	0.0042	0.0073	0.0042	0.0063
30	0.0012	0.0031	0.0021	0.0037	0.0021	0.0031
35	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

- After termination with vested benefits, a Miscellaneous member is assumed to retire at age 59 and a Safety member at age 54.
- The Police termination with vested benefits rates are also used for Public Agency Local Prosecutors, Other Safety, Local Sheriff, and School Police.

Schools

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

Non-Industrial (Not Job-Related) Disability

Rates vary by age and gender for Miscellaneous plans. Rates vary by age and category for Safety plans.

	Miscellaneous		Fire	Police	County Peace Officer	Schools	
Age	Male	Female	Male and Female	Male and Female	Male and Female	Male	Female
20	0.0001	0.0000	0.0001	0.0001	0.0001	0.0000	0.0002
25	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0002
30	0.0002	0.0003	0.0001	0.0001	0.0001	0.0002	0.0002
35	0.0004	0.0007	0.0001	0.0002	0.0003	0.0005	0.0004
40	0.0009	0.0012	0.0001	0.0002	0.0006	0.0010	0.0008
45	0.0015	0.0019	0.0002	0.0003	0.0011	0.0019	0.0015
50	0.0015	0.0019	0.0004	0.0005	0.0016	0.0027	0.0021
55	0.0014	0.0013	0.0006	0.0007	0.0009	0.0024	0.0017
60	0.0012	0.0009	0.0006	0.0011	0.0005	0.0020	0.0010

- The Miscellaneous non-industrial disability rates are used for Local Prosecutors.
- The police non-industrial disability rates are also used for Other Safety, Local Sheriff, and School Police.

Industrial (Job-Related) Disability

Rates vary by age and category.

Age	Fire	Police	County Peace Officer
20	0.0001	0.0000	0.0004
25	0.0002	0.0017	0.0013
30	0.0006	0.0048	0.0025
35	0.0012	0.0079	0.0037
40	0.0023	0.0110	0.0051
45	0.0040	0.0141	0.0067
50	0.0208	0.0185	0.0092
55	0.0307	0.0479	0.0151
60	0.0438	0.0602	0.0174

- The police industrial disability rates are also used for Local Sheriff and Other Safety.
- 50% of the police industrial disability rates are used for School Police.
- 1% of the police industrial disability rates are used for Local Prosecutors.
- Normally, rates are zero for Miscellaneous plans unless the agency has specifically contracted for industrial disability benefits. If so, each Miscellaneous non-industrial disability rate will be split into two components: 50% will become the non-industrial disability rate and 50% will become the industrial disability rate.

Service Retirement

Retirement rates vary by age, service, and formula, except for the Safety Half Pay at 55 and 2% at 55 formulas, where retirement rates vary by age only.

Public Agency Miscellaneous 1.5% at 65

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.008	0.011	0.013	0.015	0.017	0.019
51	0.007	0.010	0.012	0.013	0.015	0.017
52	0.010	0.014	0.017	0.019	0.021	0.024
53	0.008	0.012	0.015	0.017	0.019	0.022
54	0.012	0.016	0.019	0.022	0.025	0.028
55	0.018	0.025	0.031	0.035	0.038	0.043
56	0.015	0.021	0.025	0.029	0.032	0.036
57	0.020	0.028	0.033	0.038	0.043	0.048
58	0.024	0.033	0.040	0.046	0.052	0.058
59	0.028	0.039	0.048	0.054	0.060	0.067
60	0.049	0.069	0.083	0.094	0.105	0.118
61	0.062	0.087	0.106	0.120	0.133	0.150
62	0.104	0.146	0.177	0.200	0.223	0.251
63	0.099	0.139	0.169	0.191	0.213	0.239
64	0.097	0.136	0.165	0.186	0.209	0.233
65	0.140	0.197	0.240	0.271	0.302	0.339
66	0.092	0.130	0.157	0.177	0.198	0.222
67	0.129	0.181	0.220	0.249	0.277	0.311
68	0.092	0.129	0.156	0.177	0.197	0.221
69	0.092	0.130	0.158	0.178	0.199	0.224
70	0.103	0.144	0.175	0.198	0.221	0.248

Public Agency Miscellaneous 2% at 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.010	0.011	0.014	0.014	0.017	0.017
51	0.017	0.013	0.014	0.010	0.010	0.010
52	0.014	0.014	0.018	0.015	0.016	0.016
53	0.015	0.012	0.013	0.010	0.011	0.011
54	0.006	0.010	0.017	0.016	0.018	0.018
55	0.012	0.016	0.024	0.032	0.036	0.036
56	0.010	0.014	0.023	0.030	0.034	0.034
57	0.006	0.018	0.030	0.040	0.044	0.044
58	0.022	0.023	0.033	0.042	0.046	0.046
59	0.039	0.033	0.040	0.047	0.050	0.050
60	0.063	0.069	0.074	0.090	0.137	0.116
61	0.044	0.058	0.066	0.083	0.131	0.113
62	0.084	0.107	0.121	0.153	0.238	0.205
63	0.173	0.166	0.165	0.191	0.283	0.235
64	0.120	0.145	0.164	0.147	0.160	0.172
65	0.138	0.160	0.214	0.216	0.237	0.283
66	0.198	0.228	0.249	0.216	0.228	0.239
67	0.207	0.242	0.230	0.233	0.233	0.233
68	0.201	0.234	0.225	0.231	0.231	0.231
69	0.152	0.173	0.164	0.166	0.166	0.166
70	0.200	0.200	0.200	0.200	0.200	0.200

Service Retirement

Public Agency Miscellaneous 2% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.014	0.017	0.021	0.023	0.024
51	0.013	0.017	0.017	0.018	0.018	0.019
52	0.013	0.018	0.018	0.020	0.020	0.021
53	0.013	0.019	0.021	0.024	0.025	0.026
54	0.017	0.025	0.028	0.032	0.033	0.035
55	0.045	0.042	0.053	0.086	0.098	0.123
56	0.018	0.036	0.056	0.086	0.102	0.119
57	0.041	0.046	0.056	0.076	0.094	0.120
58	0.052	0.044	0.048	0.074	0.106	0.123
59	0.043	0.058	0.073	0.092	0.105	0.126
60	0.059	0.064	0.083	0.115	0.154	0.170
61	0.087	0.074	0.087	0.107	0.147	0.168
62	0.115	0.123	0.151	0.180	0.227	0.237
63	0.116	0.127	0.164	0.202	0.252	0.261
64	0.084	0.138	0.153	0.190	0.227	0.228
65	0.167	0.187	0.210	0.262	0.288	0.291
66	0.187	0.258	0.280	0.308	0.318	0.319
67	0.195	0.235	0.244	0.277	0.269	0.280
68	0.228	0.248	0.250	0.241	0.245	0.245
69	0.188	0.201	0.209	0.219	0.231	0.231
70	0.229	0.229	0.229	0.229	0.229	0.229

Public Agency Miscellaneous 2.5% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.014	0.017	0.027	0.035	0.046	0.050
51	0.019	0.021	0.025	0.030	0.038	0.040
52	0.018	0.020	0.026	0.034	0.038	0.037
53	0.013	0.021	0.031	0.045	0.052	0.053
54	0.025	0.025	0.030	0.046	0.057	0.068
55	0.029	0.042	0.064	0.109	0.150	0.225
56	0.036	0.047	0.068	0.106	0.134	0.194
57	0.051	0.047	0.060	0.092	0.116	0.166
58	0.035	0.046	0.062	0.093	0.119	0.170
59	0.029	0.053	0.072	0.112	0.139	0.165
60	0.039	0.069	0.094	0.157	0.177	0.221
61	0.080	0.077	0.086	0.140	0.167	0.205
62	0.086	0.131	0.149	0.220	0.244	0.284
63	0.135	0.135	0.147	0.214	0.222	0.262
64	0.114	0.128	0.158	0.177	0.233	0.229
65	0.112	0.174	0.222	0.209	0.268	0.273
66	0.235	0.254	0.297	0.289	0.321	0.337
67	0.237	0.240	0.267	0.249	0.267	0.277
68	0.258	0.271	0.275	0.207	0.210	0.212
69	0.117	0.208	0.266	0.219	0.250	0.270
70	0.229	0.229	0.229	0.229	0.229	0.229

Service Retirement

Public Agency Miscellaneous 2.7% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.011	0.016	0.022	0.033	0.034	0.038
51	0.018	0.019	0.023	0.032	0.031	0.031
52	0.019	0.020	0.026	0.035	0.034	0.037
53	0.020	0.020	0.025	0.043	0.048	0.053
54	0.018	0.030	0.040	0.052	0.053	0.070
55	0.045	0.058	0.082	0.138	0.208	0.278
56	0.057	0.062	0.080	0.121	0.178	0.222
57	0.045	0.052	0.071	0.106	0.147	0.182
58	0.074	0.060	0.074	0.118	0.163	0.182
59	0.058	0.067	0.086	0.123	0.158	0.187
60	0.087	0.084	0.096	0.142	0.165	0.198
61	0.073	0.084	0.101	0.138	0.173	0.218
62	0.130	0.133	0.146	0.187	0.214	0.249
63	0.122	0.140	0.160	0.204	0.209	0.243
64	0.104	0.124	0.154	0.202	0.214	0.230
65	0.182	0.201	0.242	0.264	0.293	0.293
66	0.272	0.249	0.273	0.285	0.312	0.312
67	0.182	0.217	0.254	0.249	0.264	0.264
68	0.223	0.197	0.218	0.242	0.273	0.273
69	0.217	0.217	0.217	0.217	0.217	0.217
70	0.227	0.227	0.227	0.227	0.227	0.227

Public Agency Miscellaneous 3% at 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.015	0.020	0.025	0.039	0.040	0.044
51	0.041	0.034	0.032	0.041	0.036	0.037
52	0.024	0.020	0.022	0.039	0.040	0.041
53	0.018	0.024	0.032	0.047	0.048	0.057
54	0.033	0.033	0.035	0.051	0.049	0.052
55	0.137	0.043	0.051	0.065	0.076	0.108
56	0.173	0.038	0.054	0.075	0.085	0.117
57	0.019	0.035	0.059	0.088	0.111	0.134
58	0.011	0.040	0.070	0.105	0.133	0.162
59	0.194	0.056	0.064	0.081	0.113	0.163
60	0.081	0.085	0.133	0.215	0.280	0.333
61	0.080	0.090	0.134	0.170	0.223	0.292
62	0.137	0.153	0.201	0.250	0.278	0.288
63	0.128	0.140	0.183	0.227	0.251	0.260
64	0.174	0.147	0.173	0.224	0.239	0.264
65	0.152	0.201	0.262	0.299	0.323	0.323
66	0.272	0.273	0.317	0.355	0.380	0.380
67	0.218	0.237	0.268	0.274	0.284	0.284
68	0.200	0.228	0.269	0.285	0.299	0.299
69	0.250	0.250	0.250	0.250	0.250	0.250
70	0.245	0.245	0.245	0.245	0.245	0.245

Service Retirement

Public Agency Miscellaneous 2% at 62

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.000	0.000	0.000	0.000	0.000	0.000
51	0.000	0.000	0.000	0.000	0.000	0.000
52	0.005	0.008	0.012	0.015	0.019	0.031
53	0.007	0.011	0.014	0.018	0.021	0.032
54	0.007	0.011	0.015	0.019	0.023	0.034
55	0.010	0.019	0.028	0.036	0.061	0.096
56	0.014	0.026	0.038	0.050	0.075	0.108
57	0.018	0.029	0.039	0.050	0.074	0.107
58	0.023	0.035	0.048	0.060	0.073	0.099
59	0.025	0.038	0.051	0.065	0.092	0.128
60	0.031	0.051	0.071	0.091	0.111	0.138
61	0.038	0.058	0.079	0.100	0.121	0.167
62	0.044	0.074	0.104	0.134	0.164	0.214
63	0.077	0.105	0.134	0.163	0.192	0.237
64	0.072	0.101	0.129	0.158	0.187	0.242
65	0.108	0.141	0.173	0.206	0.239	0.300
66	0.132	0.172	0.212	0.252	0.292	0.366
67	0.132	0.172	0.212	0.252	0.292	0.366
68	0.120	0.156	0.193	0.229	0.265	0.333
69	0.120	0.156	0.193	0.229	0.265	0.333
70	0.120	0.156	0.193	0.229	0.265	0.333

Service Retirement

Public Agency Fire Half Pay at 55 and 2% at 55

Age	Rate	Age	Rate
50	0.016	56	0.111
51	0.000	57	0.000
52	0.034	58	0.095
53	0.020	59	0.044
54	0.041	60	1.000
55	0.075		

Public Agency Police Half Pay at 55 and 2% at 55

Age	Rate	Age	Rate
50	0.026	56	0.069
51	0.000	57	0.051
52	0.016	58	0.072
53	0.027	59	0.070
54	0.010	60	0.300
55	0.167		

Service Retirement

Public Agency Police 2% at 50

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.018	0.077	0.056	0.046	0.043	0.046
51	0.022	0.087	0.060	0.048	0.044	0.047
52	0.020	0.102	0.081	0.071	0.069	0.075
53	0.016	0.072	0.053	0.045	0.042	0.046
54	0.006	0.071	0.071	0.069	0.072	0.080
55	0.009	0.040	0.099	0.157	0.186	0.186
56	0.020	0.051	0.108	0.165	0.194	0.194
57	0.036	0.072	0.106	0.139	0.156	0.156
58	0.001	0.046	0.089	0.130	0.152	0.152
59	0.066	0.094	0.119	0.143	0.155	0.155
60	0.177	0.177	0.177	0.177	0.177	0.177
61	0.134	0.134	0.134	0.134	0.134	0.134
62	0.184	0.184	0.184	0.184	0.184	0.184
63	0.250	0.250	0.250	0.250	0.250	0.250
64	0.177	0.177	0.177	0.177	0.177	0.177
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2% at 50

Age	Duration of Service					
	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.054	0.054	0.056	0.080	0.064	0.066
51	0.020	0.020	0.021	0.030	0.024	0.024
52	0.037	0.037	0.038	0.054	0.043	0.045
53	0.051	0.051	0.053	0.076	0.061	0.063
54	0.082	0.082	0.085	0.121	0.097	0.100
55	0.139	0.139	0.139	0.139	0.139	0.139
56	0.129	0.129	0.129	0.129	0.129	0.129
57	0.085	0.085	0.085	0.085	0.085	0.085
58	0.119	0.119	0.119	0.119	0.119	0.119
59	0.167	0.167	0.167	0.167	0.167	0.167
60	0.152	0.152	0.152	0.152	0.152	0.152
61	0.179	0.179	0.179	0.179	0.179	0.179
62	0.179	0.179	0.179	0.179	0.179	0.179
63	0.179	0.179	0.179	0.179	0.179	0.179
64	0.179	0.179	0.179	0.179	0.179	0.179
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.019	0.053	0.045	0.054	0.057	0.061
51	0.002	0.017	0.028	0.044	0.053	0.060
52	0.002	0.031	0.037	0.051	0.059	0.066
53	0.026	0.049	0.049	0.080	0.099	0.114
54	0.019	0.034	0.047	0.091	0.121	0.142
55	0.006	0.115	0.141	0.199	0.231	0.259
56	0.017	0.188	0.121	0.173	0.199	0.199
57	0.008	0.137	0.093	0.136	0.157	0.157
58	0.017	0.126	0.105	0.164	0.194	0.194
59	0.026	0.146	0.110	0.167	0.195	0.195
60	0.155	0.155	0.155	0.155	0.155	0.155
61	0.210	0.210	0.210	0.210	0.210	0.210
62	0.262	0.262	0.262	0.262	0.262	0.262
63	0.172	0.172	0.172	0.172	0.172	0.172
64	0.227	0.227	0.227	0.227	0.227	0.227
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 3% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.003	0.006	0.013	0.019	0.025	0.028
51	0.004	0.008	0.017	0.026	0.034	0.038
52	0.005	0.011	0.022	0.033	0.044	0.049
53	0.005	0.034	0.024	0.038	0.069	0.138
54	0.007	0.047	0.032	0.051	0.094	0.187
55	0.010	0.067	0.046	0.073	0.134	0.266
56	0.010	0.063	0.044	0.069	0.127	0.253
57	0.135	0.100	0.148	0.196	0.220	0.220
58	0.083	0.062	0.091	0.120	0.135	0.135
59	0.137	0.053	0.084	0.146	0.177	0.177
60	0.162	0.063	0.099	0.172	0.208	0.208
61	0.598	0.231	0.231	0.231	0.231	0.231
62	0.621	0.240	0.240	0.240	0.240	0.240
63	0.236	0.236	0.236	0.236	0.236	0.236
64	0.236	0.236	0.236	0.236	0.236	0.236
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% at 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.124	0.103	0.113	0.143	0.244	0.376
51	0.060	0.081	0.087	0.125	0.207	0.294
52	0.016	0.055	0.111	0.148	0.192	0.235
53	0.072	0.074	0.098	0.142	0.189	0.237
54	0.018	0.049	0.105	0.123	0.187	0.271
55	0.069	0.074	0.081	0.113	0.209	0.305
56	0.064	0.108	0.113	0.125	0.190	0.288
57	0.056	0.109	0.160	0.182	0.210	0.210
58	0.108	0.129	0.173	0.189	0.214	0.214
59	0.093	0.144	0.204	0.229	0.262	0.262
60	0.343	0.180	0.159	0.188	0.247	0.247
61	0.221	0.221	0.221	0.221	0.221	0.221
62	0.213	0.213	0.213	0.213	0.213	0.213
63	0.233	0.233	0.233	0.233	0.233	0.233
64	0.234	0.234	0.234	0.234	0.234	0.234
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 3% at 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.095	0.048	0.053	0.093	0.134	0.175
51	0.016	0.032	0.053	0.085	0.117	0.149
52	0.013	0.032	0.054	0.087	0.120	0.154
53	0.085	0.044	0.049	0.089	0.129	0.170
54	0.038	0.065	0.074	0.105	0.136	0.167
55	0.042	0.043	0.049	0.085	0.132	0.215
56	0.133	0.103	0.075	0.113	0.151	0.209
57	0.062	0.048	0.060	0.124	0.172	0.213
58	0.124	0.097	0.092	0.153	0.194	0.227
59	0.092	0.071	0.078	0.144	0.192	0.233
60	0.056	0.044	0.061	0.131	0.186	0.233
61	0.282	0.219	0.158	0.198	0.233	0.260
62	0.292	0.227	0.164	0.205	0.241	0.269
63	0.196	0.196	0.196	0.196	0.196	0.196
64	0.197	0.197	0.197	0.197	0.197	0.197
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.040	0.040	0.040	0.040	0.040	0.080
51	0.028	0.028	0.028	0.028	0.040	0.066
52	0.028	0.028	0.028	0.028	0.043	0.061
53	0.028	0.028	0.028	0.028	0.057	0.086
54	0.028	0.028	0.028	0.032	0.069	0.110
55	0.050	0.050	0.050	0.067	0.099	0.179
56	0.046	0.046	0.046	0.062	0.090	0.160
57	0.054	0.054	0.054	0.072	0.106	0.191
58	0.060	0.060	0.060	0.066	0.103	0.171
59	0.060	0.060	0.060	0.069	0.105	0.171
60	0.113	0.113	0.113	0.113	0.113	0.171
61	0.108	0.108	0.108	0.108	0.108	0.128
62	0.113	0.113	0.113	0.113	0.113	0.159
63	0.113	0.113	0.113	0.113	0.113	0.159
64	0.113	0.113	0.113	0.113	0.113	0.239
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.005	0.005	0.005	0.005	0.008	0.012
51	0.006	0.006	0.006	0.006	0.009	0.013
52	0.012	0.012	0.012	0.012	0.019	0.028
53	0.033	0.033	0.033	0.033	0.050	0.075
54	0.045	0.045	0.045	0.045	0.069	0.103
55	0.061	0.061	0.061	0.061	0.094	0.140
56	0.055	0.055	0.055	0.055	0.084	0.126
57	0.081	0.081	0.081	0.081	0.125	0.187
58	0.059	0.059	0.059	0.059	0.091	0.137
59	0.055	0.055	0.055	0.055	0.084	0.126
60	0.085	0.085	0.085	0.085	0.131	0.196
61	0.085	0.085	0.085	0.085	0.131	0.196
62	0.085	0.085	0.085	0.085	0.131	0.196
63	0.085	0.085	0.085	0.085	0.131	0.196
64	0.085	0.085	0.085	0.085	0.131	0.196
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.5% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.050	0.050	0.100
51	0.038	0.038	0.038	0.038	0.055	0.089
52	0.038	0.038	0.038	0.038	0.058	0.082
53	0.036	0.036	0.036	0.036	0.073	0.111
54	0.036	0.036	0.036	0.041	0.088	0.142
55	0.061	0.061	0.061	0.082	0.120	0.217
56	0.056	0.056	0.056	0.075	0.110	0.194
57	0.060	0.060	0.060	0.080	0.118	0.213
58	0.072	0.072	0.072	0.079	0.124	0.205
59	0.072	0.072	0.072	0.083	0.126	0.205
60	0.135	0.135	0.135	0.135	0.135	0.205
61	0.130	0.130	0.130	0.130	0.130	0.153
62	0.135	0.135	0.135	0.135	0.135	0.191
63	0.135	0.135	0.135	0.135	0.135	0.191
64	0.135	0.135	0.135	0.135	0.135	0.287
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2.5% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.007	0.007	0.007	0.007	0.010	0.015
51	0.008	0.008	0.008	0.008	0.012	0.018
52	0.016	0.016	0.016	0.016	0.025	0.038
53	0.042	0.042	0.042	0.042	0.064	0.096
54	0.057	0.057	0.057	0.057	0.088	0.132
55	0.074	0.074	0.074	0.074	0.114	0.170
56	0.066	0.066	0.066	0.066	0.102	0.153
57	0.090	0.090	0.090	0.090	0.139	0.208
58	0.071	0.071	0.071	0.071	0.110	0.164
59	0.066	0.066	0.066	0.066	0.101	0.151
60	0.102	0.102	0.102	0.102	0.157	0.235
61	0.102	0.102	0.102	0.102	0.157	0.236
62	0.102	0.102	0.102	0.102	0.157	0.236
63	0.102	0.102	0.102	0.102	0.157	0.236
64	0.102	0.102	0.102	0.102	0.157	0.236
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2.7% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.050	0.050	0.100
51	0.040	0.040	0.040	0.040	0.058	0.094
52	0.038	0.038	0.038	0.038	0.058	0.083
53	0.038	0.038	0.038	0.038	0.077	0.117
54	0.038	0.038	0.038	0.044	0.093	0.150
55	0.068	0.068	0.068	0.091	0.134	0.242
56	0.063	0.063	0.063	0.084	0.123	0.217
57	0.060	0.060	0.060	0.080	0.118	0.213
58	0.080	0.080	0.080	0.088	0.138	0.228
59	0.080	0.080	0.080	0.092	0.140	0.228
60	0.150	0.150	0.150	0.150	0.150	0.228
61	0.144	0.144	0.144	0.144	0.144	0.170
62	0.150	0.150	0.150	0.150	0.150	0.213
63	0.150	0.150	0.150	0.150	0.150	0.213
64	0.150	0.150	0.150	0.150	0.150	0.319
65	1.000	1.000	1.000	1.000	1.000	1.000

- These rates also apply to County Peace officers, Local Prosecutors, Local Sheriff, School Police, and Other Safety.

Service Retirement

Public Agency Fire 2.7% at 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.007	0.007	0.007	0.007	0.010	0.015
51	0.008	0.008	0.008	0.008	0.013	0.019
52	0.016	0.016	0.016	0.016	0.025	0.038
53	0.044	0.044	0.044	0.044	0.068	0.102
54	0.061	0.061	0.061	0.061	0.093	0.140
55	0.083	0.083	0.083	0.083	0.127	0.190
56	0.074	0.074	0.074	0.074	0.114	0.171
57	0.090	0.090	0.090	0.090	0.139	0.208
58	0.079	0.079	0.079	0.079	0.122	0.182
59	0.073	0.073	0.073	0.073	0.112	0.168
60	0.114	0.114	0.114	0.114	0.175	0.262
61	0.114	0.114	0.114	0.114	0.175	0.262
62	0.114	0.114	0.114	0.114	0.175	0.262
63	0.114	0.114	0.114	0.114	0.175	0.262
64	0.114	0.114	0.114	0.114	0.175	0.262
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Schools 2% at 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.003	0.004	0.006	0.007	0.010	0.010
51	0.004	0.005	0.007	0.008	0.011	0.011
52	0.005	0.007	0.008	0.009	0.012	0.012
53	0.007	0.008	0.010	0.012	0.015	0.015
54	0.006	0.009	0.012	0.015	0.020	0.021
55	0.011	0.023	0.034	0.057	0.070	0.090
56	0.012	0.027	0.036	0.056	0.073	0.095
57	0.016	0.027	0.036	0.055	0.068	0.087
58	0.019	0.030	0.040	0.062	0.078	0.103
59	0.023	0.034	0.046	0.070	0.085	0.109
60	0.022	0.043	0.062	0.095	0.113	0.141
61	0.030	0.051	0.071	0.103	0.124	0.154
62	0.065	0.098	0.128	0.188	0.216	0.248
63	0.075	0.112	0.144	0.197	0.222	0.268
64	0.091	0.116	0.138	0.180	0.196	0.231
65	0.163	0.164	0.197	0.232	0.250	0.271
66	0.208	0.204	0.243	0.282	0.301	0.315
67	0.189	0.185	0.221	0.257	0.274	0.287
68	0.127	0.158	0.200	0.227	0.241	0.244
69	0.168	0.162	0.189	0.217	0.229	0.238
70	0.191	0.190	0.237	0.250	0.246	0.254

Schools 2% at 62

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.000	0.000	0.000	0.000	0.000	0.000
51	0.000	0.000	0.000	0.000	0.000	0.000
52	0.004	0.007	0.010	0.011	0.013	0.015
53	0.004	0.008	0.010	0.013	0.014	0.016
54	0.005	0.011	0.015	0.018	0.020	0.022
55	0.014	0.027	0.038	0.045	0.050	0.056
56	0.013	0.026	0.037	0.043	0.048	0.055
57	0.013	0.027	0.038	0.045	0.050	0.055
58	0.017	0.034	0.047	0.056	0.062	0.069
59	0.019	0.037	0.052	0.062	0.068	0.076
60	0.026	0.053	0.074	0.087	0.097	0.108
61	0.030	0.058	0.081	0.095	0.106	0.119
62	0.053	0.105	0.147	0.174	0.194	0.217
63	0.054	0.107	0.151	0.178	0.198	0.222
64	0.053	0.105	0.147	0.174	0.194	0.216
65	0.072	0.142	0.199	0.235	0.262	0.293
66	0.077	0.152	0.213	0.252	0.281	0.314
67	0.070	0.139	0.194	0.229	0.255	0.286
68	0.063	0.124	0.173	0.205	0.228	0.255
69	0.066	0.130	0.183	0.216	0.241	0.270
70	0.071	0.140	0.196	0.231	0.258	0.289

Miscellaneous

Internal Revenue Code Section 415

The limitations on benefits imposed by Internal Revenue Code Section 415 are taken into account in this valuation. Each year the impact of any changes in this limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. This results in lower contributions for those employers contributing to the Replacement Benefit Fund and protects CalPERS from prefunding expected benefits in excess of limits imposed by federal tax law. The Section 415(b) dollar limit for the 2022 calendar year is $245,000.

Internal Revenue Code Section 401(a)(17)

The limitations on compensation imposed by Internal Revenue Code Section 401(a)(17) are taken into account in this valuation. Each year, the impact of any changes in the compensation limitation since the prior valuation is included and amortized as part of the actuarial gain or loss base. The compensation limit for classic members for the 2022 calendar year is $305,000.

Appendix B

Principal Plan Provisions

The following is a description of the principal plan provisions used in calculating costs and liabilities. We have indicated whether a plan provision is standard or optional. Standard benefits are applicable to all members while optional benefits vary among employers. Optional benefits that apply to a single period of time, such as Golden Handshakes, have not been included. Many of the statements in this summary are general in nature, and are intended to provide an easily understood summary of the Public Employees' Retirement Law and the California Public Employees' Pension Reform Act of 2013. The law itself governs in all situations.

Service Retirement

Eligibility

A classic CalPERS member or PEPRA Safety member becomes eligible for Service Retirement upon attainment of age 50 with at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements). For employees hired into a plan with the 1.5% at age 65 formula, eligibility for service retirement is age 55 with at least 5 years of service. PEPRA Miscellaneous members become eligible for service retirement upon attainment of age 52 with at least 5 years of service.

Benefit

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

· The *benefit factor* depends on the benefit formula specified in the agency's contract. The table below shows the factors for each of the available formulas. Factors vary by the member's age at retirement. Listed are the factors for retirement at whole year ages:

Miscellaneous Plan Formulas

Retirement Age	1.5% at 65	2% at 60	2% at 55	2.5% at 55	2.7% at 55	3% at 60	PEPRA 2% at 62
50	0.5000%	1.092%	1.426%	2.000%	2.000%	2.000%	N/A
51	0.5667%	1.156%	1.522%	2.100%	2.140%	2.100%	N/A
52	0.6334%	1.224%	1.628%	2.200%	2.280%	2.200%	1.000%
53	0.7000%	1.296%	1.742%	2.300%	2.420%	2.300%	1.100%
54	0.7667%	1.376%	1.866%	2.400%	2.560%	2.400%	1.200%
55	0.8334%	1.460%	2.000%	2.500%	2.700%	2.500%	1.300%
56	0.9000%	1.552%	2.052%	2.500%	2.700%	2.600%	1.400%
57	0.9667%	1.650%	2.104%	2.500%	2.700%	2.700%	1.500%
58	1.0334%	1.758%	2.156%	2.500%	2.700%	2.800%	1.600%
59	1.1000%	1.874%	2.210%	2.500%	2.700%	2.900%	1.700%
60	1.1667%	2.000%	2.262%	2.500%	2.700%	3.000%	1.800%
61	1.2334%	2.134%	2.314%	2.500%	2.700%	3.000%	1.900%
62	1.3000%	2.272%	2.366%	2.500%	2.700%	3.000%	2.000%
63	1.3667%	2.418%	2.418%	2.500%	2.700%	3.000%	2.100%
64	1.4334%	2.418%	2.418%	2.500%	2.700%	3.000%	2.200%
65	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.300%
66	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.400%
67 & up	1.5000%	2.418%	2.418%	2.500%	2.700%	3.000%	2.500%

Safety Plan Formulas

Retirement Age	Half Pay at 55*	2% at 55	2% at 50	3% at 55	3% at 50
50	1.783%	1.426%	2.000%	2.400%	3.000%
51	1.903%	1.522%	2.140%	2.520%	3.000%
52	2.035%	1.628%	2.280%	2.640%	3.000%
53	2.178%	1.742%	2.420%	2.760%	3.000%
54	2.333%	1.866%	2.560%	2.880%	3.000%
55 & Up	2.500%	2.000%	2.700%	3.000%	3.000%

* For this formula, the benefit factor also varies by entry age. The factors shown are for members with an entry age of 35 or greater. If entry age is less than 35, then the age 55 benefit factor is 50% divided by the difference between age 55 and entry age. The benefit factor for ages prior to age 55 is the same proportion of the age 55 benefit factor as in the above table.

PEPRA Safety Plan Formulas

Retirement Age	2% at 57	2.5% at 57	2.7% at 57
50	1.426%	2.000%	2.000%
51	1.508%	2.071%	2.100%
52	1.590%	2.143%	2.200%
53	1.672%	2.214%	2.300%
54	1.754%	2.286%	2.400%
55	1.836%	2.357%	2.500%
56	1.918%	2.429%	2.600%
57 & Up	2.000%	2.500%	2.700%

- The *years of service* is the amount credited by CalPERS to a member while he or she is employed in this group (or for other periods that are recognized under the employer's contract with CalPERS). For a member who has earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance. An agency may contract for an optional benefit where any unused sick leave accumulated at the time of retirement will be converted to credited service at a rate of 0.004 years of service for each day of sick leave.

- The *final compensation* is the monthly average of the member's highest 36 or 12 consecutive months' full-time equivalent monthly pay (no matter which CalPERS employer paid this compensation). The standard benefit is 36 months. Employers had the option of providing a final compensation equal to the highest 12 consecutive months for classic plans only. Final compensation must be defined by the highest 36 consecutive months' pay under the 1.5% at 65 formula. PEPRA members have a cap on the annual salary that can be used to calculate final compensation for all new members based on the Social Security contribution and benefit base. For employees that participate in Social Security this cap is $134,974 for 2022 and for those employees that do not participate in Social Security the cap for 2022 is $161,969. Adjustments to the caps are permitted annually based on changes to the CPI for all urban consumers.

- PEPRA benefit formulas have no Social Security offsets and Social Security coverage is optional. For Classic benefit formulas, employees must be covered by Social Security with the 1.5% at 65 formula. Social Security is optional for all other Classic benefit formulas. For employees covered by Social Security, the modified formula is the standard benefit. Under this type of formula, the final compensation is offset by $133.33 (or by one third if the final compensation is less than $400). Employers may contract for the full benefit with Social Security that will eliminate the offset applicable to the final compensation. For employees not covered by Social Security, the full benefit is paid with no offsets. Auxiliary organizations of the CSUC system may elect reduced contribution rates, in which case the offset is $317 if members are not covered by Social Security or $513 if members are covered by Social Security.

- The Miscellaneous and PEPRA Safety service retirement benefit is not capped. The Classic Safety service retirement benefit is capped at 90% of final compensation.

Vested Deferred Retirement

Eligibility for Deferred Status

A CalPERS member becomes eligible for a deferred vested retirement benefit when he or she leaves employment, keeps his or her contribution account balance on deposit with CalPERS, **and** has earned at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements).

Eligibility to Start Receiving Benefits

The CalPERS classic members and PEPRA Safety members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for deferred status and upon attainment of age 50 (55 for employees hired into a 1.5% at 65 plan). PEPRA Miscellaneous members become eligible to receive the deferred retirement benefit upon satisfying the eligibility requirements for deferred status and upon attainment of age 52.

Benefit

The vested deferred retirement benefit is the same as the service retirement benefit, where the benefit factor is based on the member's age at allowance commencement. For members who have earned service with multiple CalPERS employers, the benefit from each employer is calculated separately according to each employer's contract, and then added together for the total allowance.

Non-Industrial (Non-Job Related) Disability Retirement

Eligibility

A CalPERS member is eligible for Non-Industrial Disability Retirement if he or she becomes *disabled* and has at least 5 years of credited service (total service across all CalPERS employers, and with certain other retirement systems with which CalPERS has reciprocity agreements). There is no special age requirement. *Disabled* means the member is unable to perform his or her job because of an illness or injury, which is expected to be permanent or to last indefinitely. The illness or injury does not have to be job related. A CalPERS member must be actively employed by any CalPERS employer at the time of disability in order to be eligible for this benefit.

Standard Benefit

The standard Non-Industrial Disability Retirement benefit is a monthly allowance equal to 1.8% of final compensation, multiplied by *service*, which is determined as follows:

- *Service* is CalPERS credited service, for members with less than 10 years of service or greater than 18.518 years of service; or

- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33⅓% of final compensation.

Improved Benefit

Employers have the option of providing the improved Non-Industrial Disability Retirement benefit. This benefit provides a monthly allowance equal to 30% of final compensation for the first 5 years of service, plus 1% for each additional year of service to a maximum of 50% of final compensation.

Members who are eligible for a larger service retirement benefit may choose to receive that benefit in lieu of a disability benefit. Members eligible to retire, and who have attained the normal retirement age determined by their service retirement benefit formula, will receive the same dollar amount for disability retirement as that payable for service retirement. For members who have earned service with multiple CalPERS employers, the benefit attributed to each employer is the total disability allowance multiplied by the ratio of service with a particular employer to the total CalPERS service.

Industrial (Job Related) Disability Retirement

This is a standard benefit for Safety members except those described in Section 20423.6. For excluded Safety members and all Miscellaneous members, employers have the option of providing this benefit. An employer may choose to provide the increased benefit option or the improved benefit option.

Eligibility

An employee is eligible for Industrial Disability Retirement if he or she becomes disabled while working, where disabled means the member is unable to perform the duties of the job because of a work-related illness or injury, which is expected to be permanent or to last indefinitely. A CalPERS member who has left active employment within this group is not eligible for this benefit, except to the extent described below.

Standard Benefit

The standard Industrial Disability Retirement benefit is a monthly allowance equal to 50% of final compensation.

Increased Benefit (75% of Final Compensation)

The increased Industrial Disability Retirement benefit is a monthly allowance equal to 75% of final compensation for total disability.

Improved Benefit (50% to 90% of Final Compensation)

The improved Industrial Disability Retirement benefit is a monthly allowance equal to the Workman's Compensation Appeals Board permanent disability rate percentage (if 50% or greater, with a maximum of 90%) times the final compensation.

For a CalPERS member not actively employed in this group who became disabled while employed by some other CalPERS employer, the benefit is a return of accumulated member contributions with respect to employment in this group. With the standard or increased benefit, a member may also choose to receive the annuitization of the accumulated member contributions.

If a member is eligible for service retirement and if the service retirement benefit is more than the industrial disability retirement benefit, the member may choose to receive the larger benefit.

Post-Retirement Death Benefit

Standard Lump Sum Payment

Upon the death of a retiree, a one-time lump sum payment of $500 will be made to the retiree's designated survivor(s), or to the retiree's estate. The lump sum payment amount increases to $2,000 for any death occurring on or after July 1, 2023 due to SB 1168.

Optional Lump Sum Payment

In lieu of the standard lump sum death benefit, employers have the option of providing a lump sum death benefit of $600, $3,000, $4,000 or $5,000.

Form of Payment for Retirement Allowance

Standard Form of Payment

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

Improved Form of Payment (Post-Retirement Survivor Allowance)

Employers have the option to contract for the post-retirement survivor allowance.

For retirement allowances with respect to service subject to a modified Classic formula, 25% of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. For retirement allowances with respect to service subject to a PEPRA formula or a full or supplemental Classic formula, 50% of the retirement allowance will automatically be continued to certain statutory beneficiaries upon the death of the retiree, without a reduction in the retiree's allowance. This additional benefit is referred to as post-retirement survivor allowance (PRSA) or simply as survivor continuance.

In other words, 25% or 50% of the allowance, the continuance portion, is paid to the retiree for as long as he or she is alive, and that same amount is continued to the retiree's spouse (or if no eligible spouse, to unmarried child(ren) until they attain age 18; or, if no eligible child(ren), to a qualifying dependent parent) for the rest of his or her lifetime. This benefit will not be discontinued in the event the spouse remarries.

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

Pre-Retirement Death Benefits

Basic Death Benefit

This is a standard benefit.

Eligibility

An employee's beneficiary (or estate) may receive the basic death benefit if the member dies while actively employed. A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this basic death benefit.

Benefit

The basic death benefit is a lump sum in the amount of the member's accumulated contributions, where interest is credited annually at the greater of 6% or the prevailing discount rate through the date of death, plus a lump sum in the amount of one month's salary for each completed year of current service, up to a maximum of six months' salary. For purposes of this benefit, one month's salary is defined as the member's average monthly full-time rate of compensation during the 12 months preceding death.

1957 Survivor Benefit

This is a standard benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the 1957 Survivor benefit if the member dies while actively employed, has attained at least age 50 for classic and PEPRA Safety members and age 52 for PEPRA Miscellaneous members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other retirement systems with which CalPERS has reciprocity agreements). A CalPERS member must be actively employed with the CalPERS employer providing this benefit to be eligible for this benefit. An eligible survivor means the surviving spouse to whom the member was married at least one year before death or, if there is no eligible spouse, to the member's unmarried child(ren) under age 18. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this 1957 Survivor benefit.

Benefit

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

Optional Settlement 2 Death Benefit

This is an optional benefit.

Eligibility

An employee's *eligible survivor* may receive the Optional Settlement 2 Death benefit if the member dies while actively employed, has attained at least age 50 for classic and PEPRA Safety members and age 52 for PEPRA Miscellaneous members, and has at least 5 years of credited service (total service across all CalPERS employers and with certain other retirement systems with which CalPERS has reciprocity agreements). A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married at least one year before death. A member's survivor who is eligible for any other pre-retirement death benefit may choose to receive that death benefit instead of this Optional Settlement 2 Death benefit.

Benefit

The Optional Settlement 2 Death benefit is a monthly allowance equal to the service retirement benefit that the member would have received had the member retired on the date of his or her death and elected 100% to continue to the eligible survivor after the member's death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried child(ren) under age 18, if applicable. The total amount paid will be at least equal to the basic death benefit.

Special Death Benefit

This is a standard benefit for Safety members except those described in Section 20423.6. For excluded Safety members and all Miscellaneous members, employers have the option of providing this benefit.

Eligibility

An employee's *eligible survivor(s)* may receive the special death benefit if the member dies while actively employed and the death is job-related. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried child(ren) under age 22. An eligible survivor who chooses to receive this benefit will not receive any other death benefit.

Benefit

The special death benefit is a monthly allowance equal to 50% of final compensation and will be increased whenever the compensation paid to active employees is increased but ceasing to increase when the member would have attained age 50. The allowance is payable to the surviving spouse until death at which time the allowance is continued to any unmarried child(ren) under age 22. There is a guarantee that the total amount paid will at least equal the basic death benefit.

If the member's death is the result of an accident or injury caused by external violence or physical force incurred in the performance of the member's duty, and there are *eligible* surviving child(ren) (*eligible* means unmarried child(ren) under age 22) in addition to an eligible spouse, then an **additional monthly allowance** is paid equal to the following:

- if 1 eligible child: 12.5% of final compensation
- if 2 eligible children: 20.0% of final compensation
- if 3 or more eligible children: 25.0% of final compensation

Alternate Death Benefit for Local Fire Members

This is an optional benefit available only to local fire members.

Eligibility

An employee's *eligible survivor(s)* may receive the alternate death benefit in lieu of the basic death benefit or the 1957 Survivor benefit if the member dies while actively employed and has at least 20 years of total CalPERS service. A CalPERS member who is no longer actively employed with **any** CalPERS employer is not eligible for this benefit. An *eligible survivor* means the surviving spouse to whom the member was married prior to the onset of the injury or illness that resulted in death. If there is no eligible spouse, an eligible survivor means the member's unmarried child(ren) under age 18.

Benefit

The Alternate Death benefit is a monthly allowance equal to the service retirement benefit that the member would have received had the member retired on the date of his or her death and elected Optional Settlement 2. (A retiree who elects Optional Settlement 2 receives an allowance that has been reduced so that it will continue to be paid after his or her death to a surviving beneficiary.) If the member has not yet attained age 50, the benefit is equal to that which would be payable if the member had retired at age 50, based on service credited at the time of death. The allowance is payable as long as the surviving spouse lives, at which time it is continued to any unmarried child(ren) under age 18, if applicable. The total amount paid will be at least equal to the basic death benefit.

Cost-of-Living Adjustments (COLA)

Standard Benefit

Retirement and survivor allowances are adjusted each year in May for cost of living, beginning the second calendar year after the year of retirement. The standard cost-of-living adjustment (COLA) is 2%. Annual adjustments are calculated by first determining the lesser of 1) 2% compounded from the end of the year of retirement or 2) actual rate of price inflation. The resulting increase is divided by the total increase provided in prior years. For any given year, the COLA adjustment may be less than 2% (when the rate of price inflation is low), may be greater than the rate of price inflation (when the rate of price inflation is low after several years of high price inflation) or may even be greater than 2% (when price inflation is high after several years of low price inflation).

Improved Benefit

Employers have the option of providing a COLA of 3%, 4%, or 5%, determined in the same manner as described above for the standard 2% COLA. An improved COLA is not available with the 1.5% at 65 formula.

Purchasing Power Protection Allowance (PPPA)

Retirement and survivor allowances are protected against price inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 80% of the initial allowance at retirement adjusted for price inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan.

Employee Contributions

Each employee contributes toward his or her retirement based upon the retirement formula. The standard employee contribution is as described below.

- The percent contributed below the monthly compensation breakpoint is 0%.
- The monthly compensation breakpoint is $0 for full and supplemental formula members and $133.33 for employees covered by the modified formula.
- The percent contributed above the monthly compensation breakpoint depends upon the benefit formula, as shown in the table below.

Benefit Formula	Percent Contributed above the Breakpoint
Miscellaneous, 1.5% at 65	2%
Miscellaneous, 2% at 60	7%
Miscellaneous, 2% at 55	7%
Miscellaneous, 2.5% at 55	8%
Miscellaneous, 2.7% at 55	8%
Miscellaneous, 3% at 60	8%
Miscellaneous, 2% at 62	50% of the Total Normal Cost
Miscellaneous, 1.5% at 65	50% of the Total Normal Cost
Safety, Half Pay at 55	Varies by entry age
Safety, 2% at 55	7%
Safety, 2% at 50	9%
Safety, 3% at 55	9%
Safety, 3% at 50	9%
Safety, 2% at 57	50% of the Total Normal Cost
Safety, 2.5% at 57	50% of the Total Normal Cost
Safety, 2.7% at 57	50% of the Total Normal Cost

The employer may choose to “pick-up” these contributions for classic members (Employer Paid Member Contributions or EPMC). EPMC is prohibited for new PEPRA members.

An employer may also include Employee Cost Sharing in the contract, where employees agree to share the cost of the employer contribution. These contributions are paid in addition to the member contribution.

Auxiliary organizations of the CSU system may elect reduced contribution rates, in which case the offset is $317 and the contribution rate is 6% if members are not covered by Social Security. If members are covered by Social Security, the offset is $513 and the contribution rate is 5%.

Refund of Employee Contributions

If the member’s service with the employer ends, and if the member does not satisfy the eligibility conditions for any of the retirement benefits above, the member may elect to receive a refund of his or her employee contributions, which are credited with 6% interest compounded annually.

1959 Survivor Benefit

This is a pre-retirement death benefit available only to members not covered by Social Security. Any agency joining CalPERS subsequent to 1993 is required to provide this benefit if the members are not covered by Social Security. The benefit is optional for agencies joining CalPERS prior to 1994. Levels 1, 2, and 3 are now closed. Any new agency or any agency wishing to add this benefit or increase the current level may only choose the 4th or Indexed Level.

This benefit is not included in the results presented in this valuation. More information on this benefit is available on the CalPERS website.

Appendix C

Participant Data

- **Summary of Valuation Data**
- **Active Members**
- **Transferred and Separated Members**
- **Retired Members and Beneficiaries**

Summary of Valuation Data

	June 30, 2021	June 30, 2022
1. **Active Members**		
a) Counts	3,370	3,421
b) Average Attained Age	40.11	39.82
c) Average Entry Age to Rate Plan	28.39	28.28
d) Average Years of Credited Service	11.74	11.55
e) Average Annual Covered Pay	$96,045	$97,615
f) Annual Covered Payroll	323,672,580	333,941,947
g) Projected Annual Payroll for Contribution Year	351,629,460	362,785,833
h) Present Value of Future Payroll	3,070,262,325	3,187,843,971
2. **Transferred Members**		
a) Counts	689	705
b) Average Attained Age	40.71	40.87
c) Average Years of Credited Service	3.69	3.70
d) Average Annual Covered Pay	$96,306	$98,836
3. **Separated Members**		
a) Counts	786	891
b) Average Attained Age	41.79	41.25
c) Average Years of Credited Service	3.64	3.69
d) Average Annual Covered Pay	$54,630	$56,077
4. **Retired Members and Beneficiaries**		
a) Counts	3,126	3,256
b) Average Attained Age	64.04	64.37
c) Average Annual Benefits	$54,695	$57,018
d) Total Annual Benefits	$170,975,908	$185,649,790
5. **Active to Retired Ratio** [(1a) / (4a)]	1.08	1.05

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Average Annual Benefits represents benefit amounts payable by this plan only. Some members may have service with another agency and would therefore have a larger total benefit than would be included as part of the average shown here.

Active Members

Counts of members included in the valuation are counts of the records processed by the valuation. Multiple records may exist for those who have service in more than one valuation group. This does not result in double counting of liabilities.

Distribution of Active Members by Age and Service

	Years of Service at Valuation Date						
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**
15-24	212	1	0	0	0	0	213
25-29	332	60	4	0	0	0	396
30-34	205	208	75	8	0	0	496
35-39	103	168	205	116	1	0	593
40-44	59	63	163	263	84	1	633
45-49	24	29	109	200	197	51	610
50-54	16	17	42	80	93	56	304
55-59	9	11	17	38	31	24	130
60-64	1	4	9	12	8	5	39
65 and Over	0	0	2	3	1	1	7
All Ages	**961**	**561**	**626**	**720**	**415**	**138**	**3,421**

Distribution of Average Annual Salaries by Age and Service

	Years of Service at Valuation Date						
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Average Salary**
15-24	$55,249	$76,384	$0	$0	$0	$0	$55,348
25-29	64,148	73,154	80,541	0	0	0	65,678
30-34	70,229	79,597	93,105	102,369	0	0	78,135
35-39	77,769	83,598	101,369	113,959	118,544	0	94,727
40-44	91,375	88,728	108,535	120,350	123,231	162,698	111,909
45-49	88,363	91,541	107,938	116,849	125,222	146,021	118,076
50-54	106,876	79,027	108,467	120,184	130,122	158,360	125,636
55-59	91,204	113,759	93,745	118,389	112,036	155,252	118,183
60-64	65,676	101,201	96,736	108,735	126,831	119,503	109,182
65 and Over	0	0	111,836	74,125	69,508	20,553	76,587
Average	**$68,185**	**$82,550**	**$103,492**	**$117,640**	**$124,813**	**$150,884**	**$97,615**

Transferred and Separated Members

Distribution of Transfers to Other CalPERS Plans by Age, Service, and average Salary

	Years of Service at Valuation Date							
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**	**Average Salary**
15-24	10	0	0	0	0	0	10	$50,047
25-29	45	3	0	0	0	0	48	68,928
30-34	117	26	1	0	0	0	144	91,497
35-39	113	28	11	2	0	0	154	104,165
40-44	91	23	13	2	0	0	129	103,548
45-49	83	17	4	2	0	0	106	113,541
50-54	50	8	5	4	0	0	67	106,498
55-59	17	8	4	3	0	0	32	94,253
60-64	11	1	2	0	0	0	14	77,210
65 and Over	1	0	0	0	0	0	1	28,028
All Ages	**538**	**114**	**40**	**13**	**0**	**0**	**705**	**$98,836**

Distribution of Separated Participants with Funds on Deposit by Age, Service, and average Salary

	Years of Service at Valuation Date							
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**	**Average Salary**
15-24	41	0	0	0	0	0	41	$42,712
25-29	66	1	0	0	0	0	67	50,730
30-34	110	38	5	0	0	0	153	55,415
35-39	104	50	19	1	0	0	174	61,157
40-44	92	44	19	8	2	0	165	62,040
45-49	78	13	13	13	6	0	123	64,051
50-54	53	13	2	1	0	0	69	52,069
55-59	51	2	3	0	0	0	56	44,139
60-64	23	3	1	0	0	0	27	37,195
65 and Over	15	1	0	0	0	0	16	31,925
All Ages	**633**	**165**	**62**	**23**	**8**	**0**	**891**	**$56,077**

Retired Members and Beneficiaries

Distribution of Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	0	0	0	0	2	13	15
30-34	0	0	4	0	0	4	8
35-39	0	1	16	0	1	4	22
40-44	0	2	42	0	1	4	49
45-49	0	4	47	1	1	2	55
50-54	293	7	84	1	3	7	395
55-59	456	8	86	2	6	23	581
60-64	479	3	87	1	4	35	609
65-69	449	3	108	4	5	30	599
70-74	302	3	77	2	2	50	436
75-79	176	0	53	1	1	46	277
80-84	67	1	28	2	0	25	123
85 and Over	36	0	12	0	1	38	87
All Ages	**2,258**	**32**	**644**	**14**	**27**	**281**	**3,256**

Distribution of Average Annual Disbursements to Retirees and Beneficiaries by Age and Retirement Type*

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 30	$0	$0	$0	$0	$45,578	$9,732	$14,511
30-34	0	0	31,237	0	0	5,816	18,527
35-39	0	29,611	34,447	0	35,280	13,410	30,440
40-44	0	5,136	31,936	0	59,207	25,904	30,906
45-49	0	22,907	41,113	54,673	74,177	11,351	39,554
50-54	74,544	17,055	41,070	54,017	51,923	36,496	65,509
55-59	77,266	15,712	41,587	27,526	57,911	45,784	69,520
60-64	66,438	23,066	40,960	20,616	51,585	44,885	61,173
65-69	61,147	16,482	33,069	43,010	47,042	31,965	54,160
70-74	60,630	10,434	30,435	39,098	37,859	38,971	52,265
75-79	57,347	0	36,288	12,914	25,281	36,626	49,600
80-84	46,184	25,861	38,800	37,301	0	47,060	44,371
85 and Over	37,516	0	33,484	0	39,127	31,183	34,212
All Ages	**$66,077**	**$17,262**	**$37,059**	**$37,293**	**$49,805**	**$36,167**	**$57,018**

Retired Members and Beneficiaries (continued)

Distribution of Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Yrs	678	5	127	3	3	116	932
5-9	501	8	95	2	2	77	685
10-14	535	6	74	2	4	38	659
15-19	329	3	66	3	12	22	435
20-24	144	6	85	3	2	11	251
25-29	53	4	73	0	1	9	140
30 and Over	18	0	124	1	3	8	154
All Years	**2,258**	**32**	**644**	**14**	**27**	**281**	**3,256**

Distribution of Average Annual Disbursements to Retirees and Beneficiaries by Years Retired and Retirement Type*

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Average
Under 5 Yrs	$70,931	$2,617	$50,005	$51,699	$70,103	$40,144	$63,816
5-9	68,271	25,616	40,291	38,839	54,143	40,335	60,625
10-14	68,400	19,604	37,872	55,983	56,299	27,294	62,046
15-19	58,193	13,735	42,114	20,810	47,686	32,914	53,621
20-24	56,884	19,591	34,712	30,829	53,279	32,089	47,057
25-29	41,229	14,503	29,545	0	34,944	19,376	32,924
30 and Over	43,939	0	24,180	22,451	29,068	13,976	26,043
All Years	**$66,077**	**$17,262**	**$37,059**	**$37,293**	**$49,805**	**$36,167**	**$57,018**

* Counts of members do not include alternate payees receiving benefits while the member is still working. Therefore, the total counts may not match information on C-1 of the report. Multiple records may exist for those who have service in more than one coverage group. This does not result in double counting of liabilities.

Appendix D

Glossary

Glossary

Accrued Liability (Actuarial Accrued Liability)
The Present Value of Benefits minus the present value of future Normal Cost or the Present Value of Benefits allocated to prior years. Different actuarial cost methods and different assumptions will lead to different measures of Accrued Liability.

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

Actuarial Methods
Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include an actuarial cost method, an amortization policy, and an asset valuation method.

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

Actuary
A business professional proficient in mathematics and statistics who measures and manages risk. A public retirement system actuary in California performs actuarial valuations necessary to properly fund a pension plan and disclose its liabilities and must satisfy the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States* with regard to pensions.

Amortization Bases
Separate payment schedules for different portions of the Unfunded Accrued Liability (UAL). The total UAL of a rate plan can be segregated by cause. The impact of such individual causes on the UAL are quantified at the time of their occurrence, resulting in new amortization bases. Each base is separately amortized and paid for over a specific period of time. Generally, in an actuarial valuation, the separate bases consist of changes in UAL due to contract amendments, actuarial assumption changes, method changes, and/or gains and losses.

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

Classic Member (under PEPRA)
A member who joined a public retirement system prior to January 1, 2013 and who is not defined as a new member under PEPRA. (See definition of New Member below.)

Discount Rate
This is the rate used to discount the expected future benefit payments to the valuation date to determine the Projected Value of Benefits. Different discount rates will produce different measures of the Projected Value of Benefits. The discount rate for funding purposes is based on the assumed long-term rate of return on plan assets, net of investment and administrative expenses. This rate is called the “actuarial interest rate” in Section 20014 of the California Public Employees’ Retirement Law.

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

Entry Age Actuarial Cost Method
An actuarial cost method that allocates the cost of the projected benefits on an individual basis as a level percent of earnings for the individual between entry age and retirement age. This method yields a total normal cost rate, expressed as a percentage of payroll, which is designed to remain level throughout the member’s career.

Fresh Start
A Fresh Start is when multiple amortization bases are combined into a single base and amortized over a new Amortization Period.

Glossary (continued)

Funded Ratio
Defined as the Market Value of Assets divided by the Accrued Liability. Different actuarial cost methods and different assumptions will lead to different measures of Funded Ratio. The Funded Ratio with the Accrued Liability equal to the funding target is a measure of how well funded a rate plan is. A ratio greater than 100% means the rate plan has more assets than the funding target and the employer need only contribute the Normal Cost. A ratio less than 100% means assets are less than the funding target and contributions in addition to Normal Cost are required.

Funded Status
Any comparison of a particular measure of plan assets to a particular measure of pension obligations. The methods and assumptions used to calculate a funded status should be consistent with the purpose of the measurement.

Funding Target
The Accrued Liability measure upon which the funding requirements are based. The funding target is the Accrued Liability under the Entry Age Actuarial Cost Method using the assumptions adopted by the board.

GASB 68
Statement No. 68 of the Governmental Accounting Standards Board. The accounting standard governing a state or local governmental employer's accounting and financial reporting for pensions.

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

Normal Cost
The portion of the Present Value of Benefits allocated to the upcoming fiscal year for active employees. Different actuarial cost methods and different assumptions will lead to different measures of Normal Cost. The Normal Cost under the Entry Age Actuarial Cost Method, using the assumptions adopted by the board, plus the required amortization of the UAL, if any, make up the required contributions.

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

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

Traditional Unit Credit Actuarial Cost Method
An actuarial cost method that sets the Accrued Liability equal to the Present Value of Benefits assuming no future pay increases or service accruals. The Traditional Unit Credit Cost Method is used to measure the accrued liability on a termination basis.

Unfunded Accrued Liability (UAL)
The Accrued Liability minus the Market Value of Assets. If the UAL for a rate plan is positive, the employer is required to make contributions in excess of the Normal Cost.

DRAFT
11/2/2023

Actuarial Valuation Report

County of Riverside

County of Riverside Postretirement Benefits Plan

As of June 30, 2023

AON
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Executive Summary

Background

The County of Riverside provides retiree medical benefits for eligible retirees enrolled in County sponsored plans. The benefits are provided in the form of:

- Monthly County contributions toward the retiree's premium,
- Access to CalPERS health plan coverage at subsidized premium levels, and
- $25 per month to the RSA Trust for RSA law enforcement retirees.

County Contributions

The County of Riverside makes contributions to eligible retirees for their medical plan premiums when the retiree enrolls in a County sponsored health plan. The current monthly amount paid by the County ranges from $25 – $256, depending on the retiree's bargaining unit at retirement. The County provided amounts are detailed in the Summary of Principal Plan Provisions and outlined as follows:

- **CalPERS Health Benefits program retirees** (includes all bargaining units except RSA) are eligible for the greater of the stated Public Employees' Medical and Hospital Care Act (PEMHCA) amounts and the bargaining unit's negotiated amount. The PEMHCA monthly amounts are $151.00 and $157.00 in 2023 and 2024, respectively, and increase annually thereafter by Medical CPI. The negotiated benefit amounts are not inflation-indexed.
- **RSA Law Enforcement retirees** are eligible for benefits from the RSA Benefit Trust to which the County contributes $25.00 per month (does not increase in future years to account for inflation). The County contribution is included in Plan liabilities.

As described above, the majority of participants are eligible to receive CalPERS health benefits, including PEMHCA benefits that are subject to inflation adjustments. The long-term benefit under PEMHCA could be more than 10 times greater than certain fixed benefit amounts in 15 years, as illustrated in Appendix A.

Implicit Subsidy

Under CalPERS health plans, retirees receive benefits prior to age 65 by paying premiums that are developed by blending active and retiree costs. Since retirees are older and generally cost more than actives, the premium paid by the retiree is less than the "true cost" of coverage for retirees. For example, under the Blue Shield Access Plus, the estimated "true cost" for an age 60 retiree is $1,139.74 per month, while the required premium is only $756.65 per month in 2024. Subsidization can also occur for post 65 benefits due to demographic differences between the County retirees and the CalPERS population used to develop premiums. This implicit subsidy is considered an employer obligation under the Actuarial Standards of Practice (ASOP) No. 6 requirements (see below) and is included in this valuation.

ASOP 6

The Actuarial Standards Board (ASB) amended Actuarial Standards of Practice (ASOP) No. 6 – Measuring Retiree Group Benefit Obligations, effective for measurement dates after March 31, 2015. This amendment requires plans to recognize certain additional healthcare costs (i.e., implicit subsidy) for pooled health plans. Since CalPERS plans are considered pooled health plans, the implicit subsidy is reflected in this actuarial valuation.

GASB 75

In June 2015, GASB released Statement 75, which was initially effective for the FYE June 30, 2018. This July 1, 2023 valuation is based on census data provided as of July 1, 2023 for the purpose of providing GASB 75 financial statement information, including final expense, for FYE June 30, 2024.

The measurement date for results shown in this valuation report is June 30, 2023.

It is important to note that only current active and retired participants are valued in this actuarial study. Future new entrants or any projected growth in the County's employee population are not considered.

Summary of Results

Liabilities

There are a few terms to understand related to the Plan's liabilities. The Present Value of Benefits (PVB) represents the actuarial present value of all future benefits expected to be paid to current employees and retirees. The Actuarial Accrued Liability (AAL) is the portion of the PVB attributable to past service. The Normal Cost is the portion of the PVB that is allocated to the current plan year for active employees.

Each liability is a present value calculated by using a selected discount rate.

Funding results in this report are shown using a 7.00% discount rate and ignore Implicit Subsidy. The table below summarizes the liability results as of July 1, 2023:

	County Contribution
Present Value of Benefits (PVB)	$212,367,074
Actuarial Accrued Liability (AAL)	$157,612,523
Normal Cost	$6,505,710

Accounting results in this report are shown using a 7.80% discount rate and includes Implicit Subsidy. The table below summarizes the liability results as of July 1, 2023:

	County Contribution	**Implicit Subsidy**	**Total Liability**
Present Value of Benefits (PVB)	$187,027,695	$189,892,020	$376,919,715
Actuarial Accrued Liability (AAL)	$143,332,256	$139,978,705	$283,310,961
Normal Cost	$5,491,295	$5,901,421	$11,392,716

Discount Rate

The discount rate can have a considerable impact on the magnitude of the liabilities, with lower discount rates resulting in higher liabilities.

While the County's funding policy is based on a discount rate of 7.00%, GASB 75 prescribes the discount rate methodology to be used. Based on the County's current funding policy, projected cash flows, and the assumed asset return, the plan assets are not projected to be depleted, and the discount rate for GASB disclosures can be based entirely on the assumed asset return, as illustrated in the GASB 75 section of the report. For GASB purposes, the discount rate is 7.80%.

Development of Funding Contribution[1]

The funding contribution is developed based on liabilities **excluding the implicit subsidy** and projected using prior year valuation results**.** For example, the funding contribution for Fiscal Year Ending (FYE) 2024 is $6,437,221 and was developed based on the 2022 valuation.

This valuation develops the funding contribution for FYE 2025, which is $7,421,536 and is based on a projection of the normal cost, amortization of the 2017 initial Unfunded Actuarial Accrued Liability (UAAL) over the period ending June 30, 2037, and amortization of the subsequent unanticipated changes in liability (i.e., actuarial gains / losses and changes in assumptions) over 15-year periods and unanticipated changes in assets over 5-year periods.

The table below shows the contributions for Safety and Miscellaneous for FYE 2024, 2025 and an estimate for FYE 2026.

	2022-2023	**2024-2025**	**2025-2026**[2]
Contribution for Safety	$1,704,652	$1,965,599	$2,020,636
Contribution for Miscellaneous	4,732,569	5,455,937	5,608,703
Total Funding Contribution	**$6,437,221**	**$7,421,536**	**$7,629,339**

The funding contribution increases for FYE 2025 due to higher normal cost, which is mainly driven by active population growth. The allocation of the contribution was updated based on the liability split as of July 1, 2022. Although the assets underperformed for the measurement period ending June 30, 2023, the impact is muted due to asset smoothing. The projected FYE 2026 contribution has been developed based on the same eligibility basis used for all groups as of June 30, 2023.

The current policy amortizes assets and liabilities experience over different periods, which results in a much smaller amortization amount for the next few years, increasing by approximately $10M after 2028.

An alternative amortization of the UAAL that uses a single 15-year amortization period would address the volatility in the 5-year/15-year amortization amounts under the current policy and address the plan's current funded status. Application of the 15-year amortization period leads to a contribution of approximately $12M for 2024-2025 versus $7.4M shown above.

GASB 75 Expense

The OPEB expense for FYE June 30, 2024 is $41,556,065 and is developed using the valuation results in this report, including a Valuation Date of July 1, 2023, Measurement Period of July 1, 2022 to June 30, 2023, and a Measurement Date of June 30, 2023. The final FYE June 30, 2024 expense is higher than estimated in the prior valuation due to premium experience loss and updated healthcare assumptions that reflect higher expected future costs.

[1] Funding contributions are assumed to be in addition to Pay-as-you-go
[2] Estimated assuming funding policy discussed in the report.

Comparison to Prior Valuation

The following table summarizes the prior valuation results using a 7.70% discount rate for accounting and 7.00% for funding and the current valuation using a 7.80% discount rate for accounting and 7.00% for funding:

	July 1, 2022	July 1, 2023
Funding Contribution[1]		
Funding Discount Rate	7.0%	7.0%
Present Value of Benefits (PVB)	$194,781,998	$212,367,074
Actuarial Accrued Liability (AAL)	147,985,399	157,612,523
Normal Cost	5,577,628	6,505,710
Smoothed Value of Assets	86,083,333	104,623,236
Unfunded AAL	61,902,066	52,989,287
Funded Status	58.2%	66.4%
Funding Contribution for FYE 2024 / 2025	6,437,221	7,421,536
% of pay	0.40%	0.41%
Alternative Contribution	0.64%	0.67%
GASB 75 Accounting		
Funding Discount Rate	7.7%	7.8%
Present Value of Benefits (PVB)	$322,377,218	$376,919,715
Actuarial Accrued Liability (AAL)	247,510,972	283,310,961
Normal Cost	9,123,042	11,392,716
Market Value of Assets	76,411,793	96,279,600
Net OPEB Liability	$171,099,179	$187,031,361
Plan Fiduciary Net Position as a percentage of the OPEB Liability	30.9%	34.0%
GASB Annual Expense for FYE 2023 / 2024	$40,708,764	$41,556,065
GASB Annual Expense for FYE 2024 / 2025 (Estimate)	$39,499,000	$45,606,000

[1] ignoring Implicit Subsidy

Overall, the funded status improved compared to the prior valuation. These net results are primarily due to the following factors:

- (GASB only) Expected return on assets was changed from 7.70% to 7.80%, reflecting higher expectations for CERBT Asset Allocation Strategy 1. As a result, the discount rate similarly increased, resulting in a small liability decrease.
- Large prefunding contributions reduced the Unfunded AAL
- Healthcare assumptions were updated to reflect current medical cost growth expectation, resulting in a liability increase
- Healthcare cost increases were higher than projected from the prior year, resulting in a liability loss.
- Investment return was lower than expected (6.5% compared to 7.7% assumed), resulting in a small asset loss.

RCA liabilities are included within this valuation, however, it should be noted that employee groups from Special Districts (Waste, Parks, and Flood) and active Court members were not included in the valuation results presented in this report.

Projected Funding Status

All valuation and projection results on the following pages are based on the assumptions and plan provisions stated in the appendices. Specifically, they only include health plan eligibility (i.e., CalPERS) for bargaining groups as specified as of June 30, 2023. Changes to such associated plan participation assumptions may result in higher liabilities, funding costs, and accounting expense than shown in this report.

80% Funded Status (excluding implicit subsidy)

The County requested a review of maintaining an 80% funded status for the OPEB Plan excluding the implicit subsidy liability. The valuation shows the plan is projected to be below 80% funded for such County Contribution liability as of June 30, 2023.

Projected Actuarial Accrued Liability (AAL), 6/30/2024	$ 167,972,209
Projected Smoothed Value of Assets, 6/30/2024	116,449,075
Projected Shortfall, 6/30/2024	51,523,134
Projected Funded Status, 6/30/2024	69.3%
Shortfall for 80% funding, 6/30/2024	17,928,693
Additional funding in FYE 2024 to achieve 80% as of 6/30/2024[1]	$ 17,332,321

[1] Assumes mid-year funding on 1/1/2024 and is in addition to the proposed FYE 2024 contribution of $6,437,221.

The table below summarizes the estimated additional annual contribution projected to attain a funded status of 80% at various future dates. The total contribution % shown below includes the Actuarially Determined Contribution (ADC) as developed in this report plus the additional amount to attain 80% funded status by the target funding date.

	Additional Payment to Fund 80% by Target Date		**Total Contribution to Fund 80% by Target Date**	
80% Target Funding Date	**Annual Payment in FYE 2025[1]**	**% of Pay**	**Annual Payment in FYE 2025[1,2]**	**% of pay[2]**
6/30/2025	$19,326,705	1.07%	$26,748,241	1.49%
6/30/2026	11,150,717	0.60%	18,572,253	1.03%
6/30/2027	7,337,972	0.39%	14,759,507	0.82%
6/30/2028	5,435,968	0.28%	12,857,503	0.71%
6/30/2029	3,534,866	0.18%	10,956,401	0.61%
6/30/2030	809,984	0.04%	8,231,520	0.46%
6/30/2031	0	0.00%	7,421,536	0.41%

[1] Contributions shown for FYE 2025 are assumed to be made throughout the year based on a level percent of pay and are therefore assumed to increase at 2.80% per year from FYE 2025 to the target funding date.
[2] Includes current FYE 2025 contribution of $7,421,536 (0.41% of pay).

The plan is not projected to be less than 80% after 6/30/2031.

For example, to attain 80% funded (excluding implicit subsidy) by FYE 2026, the County would need to contribute approximately $11.2M in FYE 2025 and $11.5M in FYE 2026 in addition to the current ADC contributions of $7.4M in FYE 2025 and $7.6M in FYE 2026.

Note: The breakdown of results between Safety and Miscellaneous funded status may vary from above.

80% Funded Status (including implicit subsidy)

For illustrative purposes of comparing a contribution policy utilizing total liability (i.e., including the implicit subsidy), we also performed a review of maintaining an 80% funded status for the OPEB Plan, including the implicit subsidy liability. The valuation shows the plan continues to be under 80% funded as of June 30, 2024, as shown below:

Projected Actuarial Accrued Liability (AAL), 6/30/2024	$ 328,355,061
Projected Smoothed Value of Assets, 6/30/2024	116,449,075
Projected Shortfall, 6/30/2024	$ 211,905,986
Projected Funded Status, 6/30/2024	35.5%
Shortfall for 80% funding, 6/30/2024	$ 146,234,974
Additional funding in FYE 2023 to achieve 80% as of 6/30/2024	$ 141,370,686

[1] Assumes mid-year funding on 1/1/2024 and is in addition to the proposed FYE 2024 contribution of $6,437,221.

Effect of Asset Allocation Strategy Selection and the Discount Rate Impact

CalPERS offers three asset allocation strategies for selection by employers who contract to pre-fund their future OPEB costs through CERBT.

The asset allocation and associated expected asset return, and thus the assumed discount rate, have a considerable impact on valuation results and the magnitude of liabilities. CalPERS periodically reviews the expected asset returns and the rates shown below are based on CalPERS revised guidance adopted in October 2021.

A recent review of the long-term expected return rates, based on Aon's June 30, 2023 Capital Market Assumptions and the CERBT target asset allocation for Strategy 1, resulted in a range of reasonable return assumptions below the published CERBT expected return assumptions. More details of the expected return assumption are included in the 2023 assumption rationale document.

The following table summarizes financial characteristics of each of CERBT's Strategies:

	Strategy 1	Strategy 2	Strategy 3
CERBT Expected Return Rate	6.00%	5.50%	5.00%
CERBT Standard Deviation of Expected Returns	12.10%	9.90%	8.40%
Aon's Reasonable Range of Expected Returns	6.14%-7.85%	5.91%-7.26%	5.57%-6.72%%
Hypothetical Expected Return Assumptions	7.80%	7.20%	6.70%

Strategy 1 invests in each of the five asset classes (Global Equity, Domestic Fixed Income, U.S. Inflation Linked Bonds, Global Public Real Estate and Commodities). The portion of assets allocated to each asset class impacts the long term expected rate of return and level of risk of the strategy.

Effective July 1, 2022, all assets have been transferred to Strategy 1. The County selected a 7.80% long term expected return assumption under Strategy 1 for purposes of this valuation and should continue to monitor the return versus risk balance and maintain an asset allocation strategy appropriate for the County's funding and overall financial policies.

In order to understand the impact of strategy selection, we compared valuation results under each Asset Allocation Strategy

	Strategy 1	**Strategy 2**	**Strategy 3**
	7.80%	**7.20%**	**6.70%**
Liabilities			
Present Value of Benefits (PVB)	$376,919,715	$411,383,749	$444,161,123
Actuarial Accrued Liability (AAL)	$283,310,961	$301,733,270	$318,609,903
Normal Cost	$11,392,716	$12,802,166	$14,140,040

Under GASB 75, the expected return will be considered along with the municipal bond index to determine a blended discount rate.

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The following report shows the details of results by participant status and benefits provided, based on a 7.80% discount rate.

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Actuarial Valuation Certificate

This report documents the results of the July 1, 2023 actuarial valuation for the County of Riverside Postretirement Medical Benefits. The information provided in this report is intended strictly for documenting:

- Disclosure items under Governmental Accounting Standards Board (GASB) Statement 75 for Fiscal Year Ending June 30, 2024.
- Funding contribution amounts and the Actuarial Determined Contribution (ADC) for Fiscal Year Ending June 30, 2025.

Determinations for purposes other than the financial accounting requirements may be significantly different from the results in this report. Thus, the use of this report for purposes other than those expressed here may not be appropriate.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board. In addition, the valuation results are based on our understanding of the financial accounting and reporting requirements under U.S. Generally Accepted Accounting Principles as set forth in Government Accounting Standards Board Statement 75 (GASB 75) including any guidance or interpretations provided by the Company and/or its audit partners prior to the issuance of this report. The information in this report is not intended to supersede or supplant the advice and interpretations of the County of Riverside's auditors. Additional disclosures may be required under GASB 74.

A valuation model was used to develop the liabilities for the June 30, 2023 valuation. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC. Experts within Aon selected this software and determined it is appropriate for performing valuations. We coded and reviewed the software for the provisions, assumptions, methods, and data of the Postretirement Health Benefits.

A model was used to develop the appropriate GASB discount rate. The undersigned relied on experts within Aon for the development of the capital market assumptions and the model underlying the expected rate of return.

The valuation model outputs various cost scenarios. The “1% increase” and “1% decrease” interest rate scenarios vary only the discount rate assumption, in order to illustrate the impact of a change in that assumption in isolation. In practice, certain other assumptions, such as the expected or realized asset returns, would also be expected to vary when the discount rate changes. Therefore, the output from these scenarios should be used solely for assessing the impact of the discount rate in isolation and may not represent a realistic set of results for other purposes.

The “1% increase” and “1% decrease” healthcare cost trend scenarios vary only the healthcare cost trend assumption, in order to illustrate the impact of a change in that assumption in isolation. Therefore, the output from these scenarios should be used solely for assessing the impact of the healthcare cost trend in isolation and may not represent a realistic set of results for other purposes.

Future actuarial measurements may differ significantly from the current measurements presented in this report due (but not limited to) to such factors as the following:

- Plan experience differing from that anticipated by the economic or demographic assumptions;
- Changes in actuarial methods or in economic or demographic assumptions;
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period); and
- Changes in plan provisions or applicable law.

Due to the limited scope of our assignment, we did not perform an analysis of the potential range of such future measurements.

Funded status measurements shown in this report are determined based on various measures of plan assets and liabilities. For entity and plan disclosure and reporting purposes, funded status is determined using plan assets measured at market value. Plan liabilities are measured based on the interest rates and other assumptions summarized in the Actuarial Assumptions and Methods section of this report.

These funded status measurements may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, and funded status measurements for County of Riverside and plan disclosure and reporting purposes may not be appropriate for assessing the need for or the amount of future contributions. In conducting the valuation, we have relied on personnel, plan design, health care claim cost, and asset information supplied by County of Riverside as of the valuation date. While we cannot verify the accuracy of all the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results.

The actuarial assumptions and methods used in this valuation are described in the Actuarial Assumptions and Methods section of this report. County of Riverside selected the economic and demographic assumptions and prescribed them for use for purposes of compliance with GASB 75. Aon provided guidance with respect to these assumptions, and it is our belief that the assumptions represent reasonable expectations of anticipated plan experience.

The undersigned are familiar with the near-term and long-term aspects of OPEB valuations and collectively meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. The information provided in this report is dependent upon various factors as documented throughout this report, which may be subject to change. Each section of this report is considered to be an integral part of the actuarial opinions.

To our knowledge, no colleague of Aon providing services to County of Riverside has any material direct or indirect financial interest in County of Riverside. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this actuarial report for County of Riverside.

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November 2023

Plan Liabilities (Accounting)

The liabilities shown in this exhibit were calculated using a 7.80% discount rate.

The **Present Value of Benefits (PVB)** represents the actuarial present value of all benefits ever to be paid to current employees and retirees. The PVB is as follows:

	Safety Employees	Miscellaneous Employees	Total
PVB			
County Contribution			
Retirees	$16,988,178	$60,445,621	$77,433,799
Actives	$9,107,783	$100,486,113	$109,593,896
Subtotal	$26,095,961	$160,931,734	$187,027,695
Implicit Subsidy			
Retirees	$16,289,287	$37,167,722	$53,457,009
Actives	$13,234,442	$123,200,569	$136,435,011
Subtotal	$29,523,729	$160,368,291	$189,892,020
All Benefits			
Retirees	$33,277,465	$97,613,343	$130,890,808
Actives	$22,342,225	$223,686,682	$246,028,907
Total PVB	**$55,619,690**	**$321,300,025**	**$376,919,715**
Number of Retirees as of 7/1/2023[1]	948	2,280	3,228
Number of Actives as of 7/1/2023	3,629	18,038	21,667
PVB Per Retiree[2]	$23,225	$28,886	$27,223
PVB Per Active	$6,157	$12,401	$11,355

[1] Deferred retirees (former employees who did not elect medical benefits at the time of their retirement and are eligible to elect the benefits at a later date) are not explicitly included in the count, but their future benefits are valued based on the election assumption developed in the experience study carried out in 2021 and reviewed in 2022 and 2023.
[2] Average liability excluding deferred retirees; Average liability for eligible deferred retirees is approximately $10,600.

The **Actuarial Accrued Liability (AAL)** is a portion of the PVB attributable to past service. For retirees and fully eligible active employees, the AAL is equal to the PVB. For other active employees, the AAL is the portion of the PVB deemed to be accrued to date. The **Normal Cost** is the portion of the PVB that is allocated to the current plan year for only active employees.

The AAL in this report is based on the Entry Age Normal cost method and has been developed by spreading costs as a level percentage of payrolls.

	Safety Employees	**Miscellaneous Employees**	**Total**
AAL			
County Contribution			
Retirees	$16,988,178	$60,445,621	$77,433,799
Actives	$6,397,282	$59,501,175	$65,898,457
Subtotal	$23,385,460	$119,946,796	$143,332,256
Implicit Subsidy			
Retirees	$16,289,287	$37,167,722	$53,457,009
Actives	$10,390,908	$76,130,788	$86,521,696
Subtotal	$26,680,195	$113,298,510	$139,978,705
All Benefits			
Retirees	$33,277,465	$97,613,343	$130,890,808
Actives	$16,788,190	$135,631,963	$152,420,153
Total AAL	**$50,065,655**	**$233,245,306**	**$283,310,961**
Number of Retirees as of 7/1/2023 [1]	948	2,280	3,228
Number of Actives as of 7/1/2023	3,629	18,038	21,667
AAL Per Retiree [2]	$23,225	$28,886	$27,223
AAL Per Active	$4,626	$7,519	$7,035
Normal Cost			
County Contribution	$354,194	$5,137,101	$5,491,295
Implicit Subsidy	$373,064	$5,528,357	$5,901,421
Total Normal Cost	**$727,258**	**$10,665,458**	**$11,392,716**
Normal Cost per Active	$200	$591	$526

[1] Deferred retirees (former employees who did not elect medical benefits at the time of their retirement and are eligible to elect the benefits at a later date) are not explicitly included in the count, but their future benefits are valued based on the election assumption developed in the experience study carried out in 2021 and reviewed in 2022 and 2023.
[2] Average liability excluding deferred retirees; Average liability for eligible deferred retirees is approximately $10,600.

Plan Liabilities (Funding)

The liabilities shown in this exhibit were calculated using a 7.00% discount rate and ignoring Implicit Subsidy.

	Safety Employees	Miscellaneous Employees	Total
PVB			
County Contribution			
Retirees	$18,364,814	$64,818,143	$83,182,957
Actives	$10,472,041	$118,712,076	$129,184,117
Total PVB	**$28,836,855**	**$183,530,219**	**$212,367,074**
Number of Retirees as of 7/1/2023[1]	948	2,280	3,228
Number of Actives as of 7/1/2023	3,629	18,038	21,667
PVB Per Retiree[2]	$13,400	$20,377	$18,328
PVB Per Active	$2,886	$6,581	$5,962

	Safety Employees	Miscellaneous Employees	Total
AAL			
County Contribution			
Retirees	$18,364,814	$64,818,143	$83,182,957
Actives	$7,121,198	$67,308,368	$74,429,566
Total AAL	**$25,486,012**	**$132,126,511**	**$157,612,523**
Number of Retirees as of 7/1/2023[1]	948	2,280	3,228
Number of Actives as of 7/1/2023	3,629	18,038	21,667
AAL Per Retiree[2]	$13,400	$20,377	$18,328
AAL Per Active	$1,962	$3,731	$3,435
Normal Cost			
County Contribution	**$417,502**	**$6,088,208**	**$6,505,710**
Normal Cost per Active	$115	$338	$300

[1] Deferred retirees (former employees who did not elect medical benefits at the time of their retirement and are eligible to elect the benefits at a later date) are not explicitly included in the count, but their future benefits are valued based on the election assumption developed in the experience study carried out in 2021 and reviewed in 2022 and 2023.
[2] Average liability excluding deferred retirees; Average liability for eligible deferred retirees (excluding the implicit subsidy) is approximately $5,900.

Plan Assets

The County of Riverside participates in CalPERS' CERBT trust fund. The following table shows the development of assets since the prior valuation.

Reconciliation of Plan Assets	**July 1, 2022 to June 30, 2023**
Market Value of Assets, Beginning of Year	$76,411,793
Contributions	
Retiree Premiums	$6,003,974
Reimbursement from CERBT	$0
Implicit Subsidy	$6,031,915
Pre-Funding	$14,465,000
Total Contributions	$26,500,889
Investment Earnings	$5,443,316
Administrative Expense	($40,509)
Benefit Payments	
Retiree Premiums	($6,003,974)
Implicit Subsidy	($6,031,915)
Total Benefit Payments	($12,035,889)
Market Value of Assets at Valuation Date	$96,279,600
Return on Assets	6.51%
Development of (Gain)/Loss	
Expected Investment Earnings (assumed 7.70%)	$6,428,753
Actual Investment Earnings	$5,443,316
(Gain)/Loss on Assets	$985,437
Smoothed Value of Assets at Valuation Date	
Market Value of Assets at Valuation Date	$96,279,600
Unrecognized (Gain)/Loss[1]	$8,343,636
Preliminary Smoothed Value of Assets at Valuation Date	$104,623,236
Lower Corridor (80% of Market Value)	$77,023,680
Upper Corridor (120% of Market Value)	$115,535,520
Smoothed Value of Assets	$104,623,236

[1] Schedule of the Current and Prior Asset (Gain)/Losses as of June 30, 2023.

Date Established	**Original (Gain)/Loss**	**Years Remaining As of 6/30/2023**	**Amount Recognized**	**Total Amount Unrecognized**
6/30/2020	$813,300	1	$650,640	$162,660
6/30/2021	($7,491,819)	2	($4,495,092)	($2,996,727)
6/30/2022	$17,315,587	3	$6,926,234)	$10,389,353
6/30/2023	$985,437	4	$197,087	$788,350
Total			$3,278,869	$8,343,636

Plan Funded Status

The Plan's funded status as of July 1, 2023 is developed based on the Actuarial Accrued Liability (excluding implicit subsidy) and the smoothed value of Plan assets.

The following table shows the development of the Plan's funded status as of July 1, 2023:

Funding Methodology	Entry Age Normal
Discount Rate	7.00%
Actuarial Accrued Liability	$157,612,523
Smoothed Value of Plan Assets	104,623,236
Unfunded Liability	$52,989,287
Funded Percentage	66.4%

Development of Funding Contribution

Effective July 1, 2020 (contributions developed for FYE June 30, 2022), the County's funding policy ignores implicit subsidy liabilities and determines amounts on a level percentage of pay based on the sum of:

a) Normal Cost with interest, plus
b) Amortization of July 1, 2017 Unfunded Actuarial Accrued Liability (UAAL) over the period ending June 30, 2037, plus
c) Amortization of subsequent unanticipated liability changes (i.e., actuarial gains / losses and changes in assumptions) over 15-year period, plus
d) Amortization of subsequent unanticipated asset changes (i.e., unexpected gains / losses on assets) over 5-year period.

Amortization amounts are calculated based on the discount rate and payroll increase assumption appropriate for the valuation date.

The following table shows the development of the funding contribution as a level percentage of pay, assuming middle of year payment, for FYE June 30, 2025:

	Safety	Miscellaneous	Total
Funding Contribution, FYE June 30, 2025[1]			
Normal Cost, plus interest	$443,960	$6,474,027	$6,917,987
Amortization of UAAL, plus interest[2]	1,521,639	(1,018,090)	503,549
Funding Contribution	$1,965,599	$5,455,937	$7,421,536
% of Pay			0.41%

The following table shows the development of the liability (gain)/loss as of June 30, 2023

	Safety	Miscellaneous	Total
Liability as of June 30, 2022	$22,776,343	$125,209,056	$147,985,399
Service Cost	385,817	5,191,811	5,577,628
Interest on Liability	1,580,026	8,938,239	10,518,265
Plan Change	0	0	0
Assumption Changes	**0**	**0**	**0**
Expected Benefit Payments	(1,201,027)	(5,516,817)	(6,717,844)
Expected Liability as of June 30, 2023	23,541,159	133,822,289	157,363,448
Actual Liability as of June 30, 2023	25,486,012	132,126,511	157,612,523
Liability (Gain)/Loss	**$1,944,853**	**($1,695,778)**	**$249,075**

The following table shows the development of the asset (gain)/loss as of June 30, 2023

	Safety	Miscellaneous	Total
Market Value of Assets (MVA) as of June 30, 2022[3]	$11,760,493	$64,651,300	$76,411,793
Total Expected Contributions[4]	1,339,655	19,486,970	20,826,625
Administrative Expense	(6,081)	(33,429)	(39,510)
Expected Benefit Payments[3]	(1,201,027)	(5,516,817)	(6,717,844)
Expected Investment Earnings	910,796	5,506,028	6,416,824
Expected MVA as of June 30, 2023	12,803,836	84,094,052	96,897,888
Expected Unrecognized (gain)/loss[3]	1,162,829	6,392,455	7,555,284
Expected Smoothed Value as of June 30, 2023	13,966,665	90,486,507	104,453,172
Actual Smoothed Value as of June 30, 2023	13,950,426	90,672,810	104,623,236
Asset (Gain)/Loss	**16,239**	**(186,303)**	**(170,064)**

[1] Excludes the implicit subsidy liability/service cost. Prior to July 1, 2020, funding was based on liabilities including the implicit subsidy

[2] Amortization allocation shown on next page.

[3] Re-allocation based on liability weighting as of June 30, 2022

[4] County contributions only, excluding the implicit subsidy.

Amortization Schedule

The following table shows the amortization of Unfunded Actuarial Accrued Liability excluding the implicit subsidy as of July 1, 2024. Amortization of bases is first recognized in the fiscal year subsequent to the date established.

Date Established	Type of Base	Original Period	Remaining Period as of June 30, 2024	Original Balance	Balance Remaining as of June 30, 2024[1]	Total Amortization Recognized in FYE June 30, 2025	Safety Amortization Recognized in FYE June 30, 2025[2]	Miscellaneous Amortization Recognized in FYE June 30, 2025[1]
7/1/2023	Liability (Gain)/Loss	15	15	$249,075	$266,510	$23,167	$180,898	$(157,731)
7/1/2023	Assets (Gain)/Loss	5	5	(170,064)	(181,968)	(39,365)	3,759	(43,124)
7/1/2022	Liability (Gain)/Loss	15	14	(5,657,250)	(5,913,949)	(540,936)	(40,916)	(500,020)
7/1/2022	Assets (Gain)/Loss[3]	5	4	(37,826,509)	(33,938,875)	(9,000,950)	673,861	(9,674,811)
7/1/2022	Assumptions	15	14	(878,395)	(918,253)	(83,990)	1,375	(85,365)
7/1/2021	Liability (Gain)/Loss	15	13	1,830,883	1,860,077	179,915	(4,296)	184,211
7/1/2021	Assumptions	15	13	(8,136,380)	(8,266,119)	(799,537)	(940,793)	141,256
7/1/2020	Liability (Gain)/Loss	15	12	3,731,444	3,621,880	372,615	(44,519)	417,134
7/1/2020	Assumptions	15	12	74,063,338	71,888,656	7,395,823	338,351	7,057,472
7/1/2019	Liability (Gain)/Loss	15	11	115,351	108,316	11,934	12,071	(137)
7/1/2019	Assumptions	15	11	10,726,730	10,072,476	1,109,738	149,680	960,058
7/1/2018	Liability (Gain)/Loss	15	10	2,657,510	2,363,940	281,207	172,737	108,470
7/1/2018	Assumptions	15	10	5,348,501	4,757,669	565,958	347,652	218,306
7/1/2017	7/1/2017 UAAL[4]	20	13	11,733,484	10,454,634	1,011,220	621,164	390,056
	Total Charges			$57,787,718	$52,989,287	$486,799	$1,471,024	$(984,225)

[1] Reflecting experience through 6/30/2023.
[2] Amortization allocation by classification is based on proportionate share of AAL prior to 7/1/2018 and estimated safety/miscellaneous gain/loss since 7/1/2018.
[3] Re-established amount includes prior outstanding Asset (Gain)/Loss bases established prior to 6/30/2022 (gain of $6,138,463), FYE 2022 AVA Asset (Gain)/Loss plus other adjustments to reflect funded status.
[4] Includes Asset (Gain)/Loss as of 6/30/2017.

Projected Benefit Payments[1]

The following table shows the estimated projected net County benefit payments based on the current plan provisions, current plan participants, and the valuation assumptions used in this report. The County Contributions would be equivalent to funding the liabilities on a pay-as-you-go basis.

Fiscal Year Ending June 30	Safety		Miscellaneous		Total
	County Contribution	Implicit Subsidy	County Contribution	Implicit Subsidy	
2024	$1,404,434	$1,882,631	$5,975,921	$5,996,376	$15,259,362
2025	$1,505,048	$2,111,473	$6,529,280	$7,170,163	$17,315,963
2026	$1,609,737	$2,197,477	$7,068,625	$8,081,382	$18,957,222
2027	$1,711,762	$2,333,274	$7,594,408	$8,735,062	$20,374,507
2028	$1,814,206	$2,446,696	$8,138,812	$9,397,114	$21,796,828
2029	$1,911,598	$2,552,227	$8,677,812	$9,615,483	$22,757,120
2030	$1,999,573	$2,651,368	$9,222,470	$10,489,411	$24,362,822
2031	$2,079,607	$2,847,877	$9,773,977	$11,227,952	$25,929,413
2032	$2,154,709	$2,755,634	$10,335,029	$11,825,329	$27,070,701
2033	$2,219,016	$2,759,799	$10,907,033	$12,604,222	$28,490,070
2034	$2,271,264	$2,688,445	$11,476,315	$13,347,596	$29,783,620
2035	$2,316,646	$2,692,362	$12,060,953	$13,994,850	$31,064,811
2036	$2,354,196	$2,675,928	$12,658,906	$14,390,500	$32,079,529
2037	$2,379,507	$2,627,427	$13,298,200	$14,781,322	$33,086,457
2038	$2,398,788	$2,636,158	$14,006,154	$15,269,469	$34,310,569
2039	$2,412,738	$2,599,426	$14,726,425	$16,095,655	$35,834,243
2040	$2,420,521	$2,576,150	$15,438,778	$16,717,760	$37,153,209
2041	$2,419,482	$2,538,013	$16,147,730	$17,407,380	$38,512,605
2042	$2,416,341	$2,465,241	$16,836,800	$18,156,372	$39,874,755
2043	$2,411,737	$2,334,853	$17,527,081	$18,685,290	$40,958,960
2044	$2,405,865	$2,209,976	$18,194,459	$19,129,240	$41,939,540
2045	$2,396,633	$2,148,187	$18,842,922	$19,376,335	$42,764,076
2046	$2,390,825	$2,049,727	$19,478,213	$19,433,538	$43,352,303
2047	$2,380,574	$1,961,244	$20,089,364	$19,536,279	$43,967,461
2048	$2,367,658	$1,898,673	$20,674,033	$19,389,083	$44,329,448
2049	$2,348,944	$1,894,952	$21,225,647	$19,463,204	$44,932,748
2050	$2,325,352	$1,799,617	$21,727,906	$19,256,053	$45,108,928
2051	$2,297,267	$1,671,522	$22,192,343	$19,111,308	$45,272,440
2052	$2,262,846	$1,681,032	$22,589,315	$18,956,825	$45,490,018
2053	$2,226,678	$1,583,628	$22,918,744	$18,761,439	$45,490,489

[1] Include the estimated benefit payments for the deferred retirees.

GASB 75 Reporting and Disclosure Information for Fiscal Year Ending June 30, 2024

Calculation Details

The following table illustrates the Net OPEB Liability under GASB 75.

	Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1) OPEB Liability		
(a) Retired Participants and Beneficiaries Receiving Payment	$ 115,099,850	$ 130,890,808
(b) Active Participants	132,411,122	152,420,153
(c) Total	$ 247,510,972	$ 283,310,961
(2) Plan Fiduciary Net Position	(76,411,793)	(96,279,600)
(3) Net OPEB Liability	$ 171,099,179	$ 187,031,361
(4) Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	30.87%	33.98%
(5) Deferred Outflow of Resources for Contributions Made After Measurement Date	$ 26,500,889	TBD

Expense

The following table illustrates the OPEB expense under GASB 75.

	Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1) Service Cost	$ 10,290,320	$ 9,123,044
(2) Interest Cost	18,571,115	19,306,030
(3) Expected Investment Return	(5,650,994)	(6,428,753)
(4) Employee Contributions	0	0
(5) Administrative Expense	38,622	40,509
(6) Plan Changes	0	0
(7) Amortization of Unrecognized		
(a) Liability (Gain)/Loss	56,065	855,718
(b) Asset (Gain)/Loss	2,149,310	2,313,342
(c) Assumption Change (Gain)/Loss	15,254,326	16,346,175
(8) Total Expense	$ 40,708,764	$ 41,556,065

Shown below are details regarding the calculation of Service, Interest Cost and Expected Investment Return components of the Expense.

	Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1) Development of Service Cost:		
(a) Normal Cost at Beginning of Measurement Period	$ 10,290,320	$ 9,123,044
(2) Development of Interest Cost:		
(a) Total OPEB Liability at Beginning of Measurement Period	$ 260,209,245	$ 247,510,972
(b) Normal Cost at Beginning of Measurement Period	10,290,320	9,123,044
(c) Actual Benefit Payments	(10,574,698)	(12,035,889)
(d) Discount Rate	7.00%	7.70%
(e) Interest Cost	$ 18,571,115	$ 19,306,030
(3) Development of Expected Investment Return:		
(a) Plan Fiduciary Net Position at Beginning of Measurement Period	$ 73,625,008	$ 76,411,793
(b) Actual Contributions—Employer	25,064,698	26,500,889
(c) Actual Contributions—Employee	0	0
(d) Actual Benefit Payments	(10,574,698)	(12,035,889)
(e) Administrative Expenses	(38,622)	(40,509)
(f) Other	0	0
(g) Expected Return on Assets	7.00%	7.70%
(h) Expected Return	$ 5,650,994	$ 6,428,753

Reconciliation of Net OPEB Liability

Shown below are details regarding the Total OPEB Liability, Plan Fiduciary Net Position, and Net OPEB Liability for the Measurement Period from June 30, 2022 to June 30, 2023:

	Increase (Decrease)		
	Total OPEB Liability (a)	**Plan Fiduciary Net Position (b)**	**Net OPEB Liability (c) = (a) – (b)**
Balance Recognized at 6/30/2023 (Based on 6/30/2022 Measurement Date)	$ 247,510,972	$ 76,411,793	$ 171,099,179
Changes Recognized for the Fiscal Year:			
Service Cost	$ 9,123,044	N/A	$ 9,123,044
Interest on the Total OPEB Liability	19,306,030	N/A	19,306,030
Changes of Benefit Terms	0	N/A	0
Differences Between Expected and Actual Experience	8,204,436	N/A	8,204,436
Changes of Assumptions	11,202,368	N/A	11,202,368
Benefit Payments	(12,035,889)	(12,035,889)	0
Contributions From the Employer	N/A	26,500,889	(26,500,889)
Contributions From the Employee	N/A	0	0
Net Investment Income	N/A	5,443,316	(5,443,316)
Administrative Expense	N/A	(40,509)	40,509
Net Changes	$ 35,799,989	$ 19,867,807	$ 15,932,182
Balance Recognized at 6/30/2024 (Based on 6/30/2023 Measurement Date)	$ 283,310,961	$ 96,279,600	$ 187,031,361

Liability (Gain)/Loss

The following table illustrates the liability gain/loss under GASB 75.

		Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1)	OPEB Liability at Beginning of Measurement Period	$ 260,209,245	$ 247,510,972
(2)	Service Cost	10,290,320	9,123,044
(3)	Interest on the Total OPEB Liability	18,571,115	19,306,030
(4)	Changes of Benefit Terms	0	0
(5)	Changes of Assumptions	(21,067,061)	11,202,368
(6)	Benefit Payments	(10,574,698)	(12,035,889)
(7)	Expected OPEB Liability at End of Measurement Period	$ 257,428,921	$ 275,106,525
(8)	Actual OPEB Liability at End of Measurement Period	247,510,972	283,310,961
(9)	OPEB Liability (Gain)/Loss	$ (9,917,949)	$ 8,204,436
(10)	Average Future Working Life Expectancy	10.43	10.26
(11)	OPEB Liability (Gain)/Loss Amortization	$ (950,906)	$ 799,653

Asset (Gain)/Loss

The following table illustrates the asset gain/loss under GASB 75.

		Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1)	OPEB Asset at Beginning of Measurement Period	$ 73,625,008	$ 76,411,793
(2)	Contributions—Employer	25,064,698	26,500,889
(3)	Contributions—Employee	0	0
(4)	Expected Investment Income	5,650,994	6,428,753
(5)	Benefit Payments	(10,574,698)	(12,035,889)
(6)	Administrative Expense	(38,622)	(40,509)
(7)	Other	0	0
(8)	Expected OPEB Asset at End of Measurement Period	$ 93,727,380	$ 97,265,037
(9)	Actual OPEB Asset at End of Measurement Period	76,411,793	96,279,600
(10)	OPEB Asset (Gain)/Loss	$ 17,315,587	$ 985,437
(11)	Amortization Factor	5.00	5.00
(12)	OPEB Asset (Gain)/Loss Amortization	$ 3,463,117	$ 197,087

Deferred Outflows/Inflows

The following table illustrates the Deferred Inflows and Outflows as of June 30, 2024 under GASB 75.

	Deferred Outflows	Deferred Inflows
(1) Difference Between Actual and Expected Experience	$ 14,949,852	$ 12,649,649
(2) Net Difference Between Expected and Actual Earnings on OPEB Plan Investments	8,343,636	0
(3) Assumption Changes	115,671,339	17,027,357
(4) Sub Total	$ 138,964,827	$ 29,677,006
(5) Contributions Made in Fiscal Year Ending 6/30/2024 After Measurement Date	TBD	N/A
(6) Total	$ TBD	$ 29,677,006

Amortization of Deferred Inflows/Outflows

The table below lists the amortization bases included in the deferred inflows/outflows as of June 30, 2024.

Date		Period		Balance		Annual
Established	Type of Base	Original	Remaining	Original	Remaining	Payment
6/30/2023	Liability (Gain)/Loss	10.26	9.26	$8,204,436	$7,404,783	799,653
6/30/2023	Asset (Gain)/Loss	5.00	4.00	985,437	788,350	197,087
6/30/2023	Assumptions	10.26	9.26	11,202,368	10,110,519	1,091,849
6/30/2022	Liability (Gain)/Loss	10.43	8.43	(9,917,949)	(8,016,137)	(950,906)
6/30/2022	Asset (Gain)/Loss	5.00	3.00	17,315,587	10,389,353	3,463,117
6/30/2022	Assumptions	10.43	8.43	(21,067,061)	(17,027,357)	(2,019,852)
6/30/2021	Liability (Gain)/Loss	10.48	7.48	4,517,303	3,224,183	431,040
6/30/2021	Asset (Gain)/Loss	5.00	2.00	(7,491,819)	(2,996,727)	(1,498,364)
6/30/2021	Assumptions	10.48	7.48	2,506,034	1,788,659	239,125
6/30/2020	Liability (Gain)/Loss	10.54	6.54	(7,467,464)	(4,633,512)	(708,488)
6/30/2020	Asset (Gain)/Loss	5.00	1.00	813,300	162,660	162,660
6/30/2020	Assumptions	10.54	6.54	133,909,170	83,089,750	12,704,855
6/30/2019	Liability (Gain)/Loss	10.63	5.63	2,528,861	1,339,371	237,898
6/30/2019	Asset (Gain)/Loss	5.00	0.00	(55,790)	0	(11,158)
6/30/2019	Assumptions	10.63	5.63	29,685,609	15,722,484	2,792,625
6/30/2018	Liability (Gain)/Loss	9.45	3.45	4,062,300	1,483,062	429,873
6/30/2018	Assumptions	9.45	3.45	11,336,502	4,138,722	1,199,630
6/30/2017	Liability (Gain)/Loss	9.43	2.43	5,814,989	1,498,453	616,648
6/30/2017	Assumptions	9.43	2.43	3,186,806	821,205	337,943
	Total Charges				109,287,821	19,515,235

Amounts Recognized in the deferred outflows of resources and deferred inflows of resources related to OPEB will be recognized in the OPEB expense as follows:

Year End June 30:

2025	$ 19,526,393
2026	$ 19,363,734
2027	$ 20,317,984
2028	$ 15,548,163
2029	$ 14,617,799
Thereafter	$ 19,913,748
Total	$ 109,287,821

Plan Fiduciary Net Position Projection

The following table illustrates the projection of the fiduciary net position for use in the calculation of the discount rate as of June 30, 2024.

($ in thousands)

Year Ending June 30[2]	**Beginning Fiduciary Net Position (a)**	**Total Contributions (b)**	**Benefit Payments (c)**	**Administrative Expenses (d)**	**Investment Earnings (e)**	**Ending Fiduciary Net Position**[1] **(f)**
2024	$96,280	$21,697	$15,259	$41	$7,770	$110,446
2025	110,446	24,721	17,316	43	8,915	126,723
2026	126,723	26,569	18,957	44	10,193	144,484
2027	144,484	25,736	20,375	46	11,492	161,291
2028	161,291	26,951	21,797	49	12,796	179,193
2029	179,193	37,764	22,757	51	14,577	208,726
2030	208,726	39,500	24,363	53	16,887	240,696
2031	240,696	41,174	25,929	56	19,386	275,270
2032	275,270	42,434	27,071	59	22,088	312,663
2033	312,663	43,979	28,490	62	25,010	353,100
2034	353,100	45,410	29,784	65	28,171	396,833
2035	396,833	45,720	31,065	68	31,545	442,964
2036	442,964	45,332	32,080	71	35,089	491,234
2037	491,234	35,612	33,086	75	38,436	532,121
2038	532,121	36,076	34,311	78	41,596	575,405
2039	575,405	38,307	35,834	81	45,001	622,798
2040	622,798	39,412	37,153	85	48,690	673,662
2041	673,662	40,598	38,513	88	52,652	728,311
2042	728,311	41,790	39,875	91	56,909	787,044
2043	787,044	42,710	40,959	94	61,484	850,185
2044	850,185	43,531	41,940	97	66,403	918,083
2045	918,083	44,203	42,764	100	71,694	991,115
2046	991,115	44,644	43,352	103	77,385	1,069,689
2047	1,069,689	45,119	43,967	107	83,509	1,154,243
2048	1,154,243	45,348	44,329	110	90,099	1,245,251
2049	1,245,251	45,826	44,933	114	97,193	1,343,223
2050	1,343,223	45,884	45,109	118	104,830	1,448,711
2051	1,448,711	45,937	45,272	122	113,054	1,562,307
2052	1,562,307	46,052	45,490	126	121,910	1,684,654
2053	1,684,654	45,958	45,490	131	131,450	1,816,440

[1] (f)=(a) + (b) – (c) – (d) + (e)
[2] Years later than 2052 were omitted from this table.

Plan Fiduciary Net Position

The last year in which projected benefit payments are due from the Plan is 2122.

The Plan's projected fiduciary net position is not projected to reach $0.

As such, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "depletion date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 7.80% per annum was applied to all periods of projected benefit payments to determine the total OPEB liability as of June 30, 2024 shown earlier in this report, pursuant to paragraph 48 of GASB Statement No. 74 and paragraph 36 of GASB Statement No. 75.

In projecting the Plan's fiduciary net position the following assumptions were made:

1. Interest rate for discounting was 7.80% per annum.

2. Projected total contributions are Actuarially Determined Contribution (ADC) and pay-as-you-go. Contributions are assumed to be paid mid-year.

3. Assumed contributions are based on the County of Riverside continuing to follow the current funding policy of normal cost plus 20-year closed period amortization of the 2017 unfunded liability and amortization of subsequent unanticipated changes in actuarial accrued liability over the 15-year period from date established and 5-years for any unexpected asset gains/losses. For funding purposes, implicit subsidy liability and normal cost are not considered.

4. The County has a history of contributing more than the Actuarially Determined Contribution (ADC). We have not recognized contributions in excess of the ADC in the above projection. Allowance for any such contributions would not result in a different discount rate.

5. Projected benefit payments have been determined in accordance with Paragraphs 30-35 of GASB Statement No. 75, and are based on the closed group of active, retired members and beneficiaries as of June 30, 2023. Benefit payments are assumed to be paid beginning of year.

6. Administrative expenses are $41 thousand for 2024, and are projected with 2.30% inflation. Expenses are assumed to be paid mid-year.

7. Projected investment earnings are based on the assumed investment rate of return of 7.80% per annum.

Discount Rate Sensitivity

The following table illustrates the impact of interest rate sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2023:

	1% Decrease (6.70%)	Current Rate (7.70%)	1% Increase (8.70%)
(1) Total OPEB Liability	$ 277,087,564	$ 247,510,972	$ 222,733,216
(2) Plan Fiduciary Net Position	(76,411,793)	(76,411,793)	(76,411,793)
(3) Net OPEB Liability (Asset)	$ 200,675,771	$ 171,099,179	$ 146,321,423

The following table illustrates the impact of interest rate sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2024:

	1% Decrease (6.80%)	Current Rate (7.80%)	1% Increase (8.80%)
(1) Total OPEB Liability	$ 315,115,152	$ 283,310,961	$ 256,414,224
(2) Plan Fiduciary Net Position	(96,279,600)	(96,279,600)	(96,279,600)
(3) Net OPEB Liability (Asset)	$ 218,835,552	$ 187,031,361	$ 160,134,624

Healthcare Cost Trend Sensitivity

The following table illustrates the impact of healthcare cost trend sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2023:

	1% Decrease	Trend Rate	1% Increase
(1) Total OPEB Liability	$ 219,527,294	$ 247,510,972	$ 281,600,147
(2) Plan Fiduciary Net Position	(76,411,793)	(76,411,793)	(76,411,793)
(3) Net OPEB Liability (Asset)	$ 143,115,501	$ 171,099,179	$ 205,188,354

The following table illustrates the impact of healthcare cost trend sensitivity on the Net OPEB Liability for fiscal year ending June 30, 2024:

	1% Decrease	Trend Rate	1% Increase
(1) Total OPEB Liability	$ 252,792,300	$ 283,310,961	$ 320,182,939
(2) Plan Fiduciary Net Position	(96,279,600)	(96,279,600)	(96,279,600)
(3) Net OPEB Liability (Asset)	$ 156,512,700	$ 187,031,361	$ 223,903,339

Disclosure—Changes in the Net OPEB Liability and Related Ratios

Changes in the Net OPEB Liability and Related Ratios[1]

	Fiscal Year Ending					
	2019	2020	2021	2022	2023	2024
Total OPEB Liability						
Service Cost	$ 882,148	$ 1,433,883	$ 2,966,332	$ 10,521,825	$ 10,290,320	$ 9,123,044
Interest Cost	3,446,096	4,583,381	7,282,813	14,891,381	18,571,115	19,306,030
Changes of Benefit Terms	0	0	0	0	0	0
Differences Between Expected and Actual Experiences	4,062,300	2,528,861	(7,467,464)	4,517,303	(9,917,949)	8,204,436
Changes of Assumptions	11,336,502	29,685,609	133,909,170	2,506,034	(21,067,061)	11,202,368
Benefit Payments	(3,263,258)	(3,500,687)	(4,470,321)	(7,570,569)	(10,574,698)	(12,035,889)
Net Change in Total OPEB Liability	$ 16,463,788	$ 34,731,047	$ 132,220,530	$ 24,865,974	$ (12,698,273)	$ 35,799,989
Total OPEB Liability (Beginning)	51,927,906	68,391,694	103,122,741	235,343,271	260,209,245	247,510,972
Total OPEB Liability (Ending)	$ 68,391,694	$ 103,122,741	$ 235,343,271	$ 260,209,245	$ 247,510,972	$ 283,310,961
Plan Fiduciary Net Position						
Contributions—Employer	$ 4,263,258	$ 5,500,687	$ 10,070,321	$ 17,170,569	$ 25,064,698	$ 26,500,889
Contributions—Member	0	0	0	0	0	0
Net Investment Income	2,342,895	2,820,756	2,526,296	11,041,124	(11,664,593)	5,443,316
Benefit Payments	(3,263,258)	(3,500,687)	(4,470,321)	(7,570,569)	(10,574,698)	(12,035,889)
Administrative Expense	(18,325)	(19,822)	(23,282)	(30,288)	(38,622)	(40,509)
Other	0	0	0	0	0	0
Net Change in Plan Fiduciary Net Position	$ 3,324,570	$ 4,800,934	$ 8,103,014	$ 20,610,836	$ 2,786,785	$ 19,867,807
Plan Fiduciary Net Position (Beginning)	36,785,654	40,110,224	44,911,158	53,014,172	73,625,008	76,411,793
Plan Fiduciary Net Position (Ending)	$ 40,110,224	$ 44,911,158	$ 53,014,172	$ 73,625,008	$ 76,411,793	$ 96,279,600
Net OPEB Liability (Ending)	$ 28,281,470	$ 58,211,583	$ 182,329,099	$ 186,584,237	$ 171,099,179	$ 187,031,361
Net Position as a Percentage of OPEB Liability	58.65%	43.55%	22.53%	28.29%	30.87%	33.98%
Covered-Employee Payroll	$ 1,374,752,875	$ 1,399,892,784	$ 1,445,184,896	$ 1,487,790,582	$ 1,561,286,528	$ 1,750,070,558
Net OPEB Liability as a Percentage of Payroll	2.06%	4.16%	12.62%	12.54%	10.96%	10.69%

[1] GASB 75 was effective first for employer fiscal years beginning after June 15, 2017.

Disclosure—Contribution Schedule

Contributions

	Fiscal Year Ending					
	2019	2020	2021	2022	2023	2024
Actuarially Determined Contribution	$ 2,141,196	$ 4,254,133	$ 9,061,596	$ 16,339,607	$ 14,108,781	$ 6,437,221
Contributions Made in Relation to the Actuarially Determined Contribution	5,500,687	10,070,321	17,170,569	25,064,698	26,500,889	TBD
Contribution Deficiency (Excess)	(3,246,554)	(5,816,188)	(8,108,973)	(8,725,091)	(12,392,108)	TBD
Covered-Employee Payroll	$ 1,399,892,784	$ 1,445,184,896	$ 1,487,790,582	$ 1,561,286,528	$ 1,750,070,558	TBD
Contributions as a Percentage of Payroll	0.39%	0.70%	1.15%	1.61%	1.51%	TBD

Notes to Schedule:

Valuation Date: Actuarially Determined Contribution rates are calculated as of June 30, one year prior to the beginning of the fiscal year in which contributions are reported.

Methods and assumptions used to determine contribution rates:

Actuarial Cost Method	Entry Age Normal with Amortization of 7/1/2017 unfunded liability over a period ending 6/30/2037 and amortization of subsequent unanticipated changes in liability over 15-year periods and any asset gain/loss over 5-year periods.
Asset Valuation Method	Smoothed Market Value
Salary Increases	2.80%
Discount Rate	7.00%
Investment Rate of Return	7.70% as of July 1, 2022, net of OPEB plan investment expense, including inflation.
Retirement Age	Retirement rates developed in the 2021 CalPERS Experience Study
Mortality	Pub-2010 Public Retirement Plans Mortality Tables using Scale MP-2021

Participant Information

These exhibit summaries contain participant demographic information.

Active Employee Age/Service Distribution

	Years of Service								
Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25-29**	**30-34**	**>35**	**Total**
<25	715	1	0	0	0	0	0	0	716
25-29	2,011	159	7	0	0	0	0	0	2,177
30-34	1,979	763	225	22	0	0	0	0	2,989
35-39	1,539	815	552	434	7	0	0	0	3,347
40-44	1,111	659	500	943	244	2	0	0	3,459
45-49	844	495	359	761	578	119	1	0	3,157
50-54	637	412	306	574	493	220	49	2	2,693
55-59	363	295	216	369	306	136	75	20	1,780
60-64	195	197	140	210	169	48	21	16	996
>65	59	71	54	71	63	12	12	11	353
Total	9,453	3,867	2,359	3,384	1,860	537	158	49	21,667

Participant Statistics[1]

	Safety Employees	Miscellaneous Employees	Total
Retirees			
Number of retirees	948	2,280	3,228
Average age	65.3	69.1	68.0
Number of retiree spouses	495	544	1,039
Actives			
Number of actives	3,629	18,038	21,667
Average age	39.2	43.5	42.8
Average past service (years)	11.1	8.7	9.1

[1] As of July 1, 2023, there are approximately 4,000 deferred retirees are eligible to elect benefits, although are not explicitly included in the participant counts.

Development of GASB 75 Amortization Period for Changes in Liability

	July 1, 2022		July 1, 2023	
Status	**2022 Count**	**Average Future Working Life**	**2023 Count**	**Average Future Working Life**[1]
Actives	20,048	11.81	21,667	11.88
Retirees[2]	3,028	0.00	3,228	0.00
Total/Weighted Average	23,076	10.26	24,895	10.34

Active Participant Benefit Summary

The table below summarizes the number of participants by bargaining units and the benefits valued. As described in the plan summary and actuarial assumptions sections, certain groups are eligible for PEMHCA benefits not shown in this summary.

Union Code	Description	Bargaining Unit (used to determine contribution)	# Records	2023 Monthly County Contribution*	Health Plan**	CalPERS Retirement Program
CNF	Confidential	Confidential	250	$ 256.00	CalPERS	Misc
LEM	Law Enforcement Management	LEMU	480	$ 151.00	CalPERS	Safety
MGT	Management (General)	Management	1,175	$ 256.00	CalPERS	Misc
MLX	Law Enforcement Exec Staff	LE Exec Staff	15	$ 256.00	CalPERS	Safety
PD7	Public Defender, Prosecution (District Attorney's)	DDAA	398	$ 256.00	CalPERS	Misc
RSA	RSA Law Enforcement	RSA	2,632	$ 25.00	RSA	Safety
RSP	RSA Public Safety	RSA Public Safety	502	$ 151.00	CalPERS	Safety
SE2	SEIU Professional	SEIU	3,993	$ 151.00	CalPERS	Misc
SE8	SEIU Registered Nurses	SEIU	1,455	$ 151.00	CalPERS	Misc
SE9	SEIU Para Professional	SEIU	1,307	$ 151.00	CalPERS	Misc
SES	SEIU Supervisory	SEIU	1,674	$ 151.00	CalPERS	Misc
SPD	SEIU Temporary Assistant	SEIU	10	$ 151.00	CalPERS	Misc
UNC	Unrepresented Confidential	Confidential	148	$ 256.00	CalPERS	Misc
UNR	Unrepresented Management	Management	17	$ 256.00	CalPERS	Misc
UP4	LIUNA Inspection and Technical	LIUNA	1,552	$ 151.00	CalPERS	Misc
UP5	LIUNA Trades, Crafts and Labor	LIUNA	909	$ 151.00	CalPERS	Misc
UP6	LIUNA Supporting Services	LIUNA	5,150	$ 151.00	CalPERS	Misc
		County Total	21,667			

* Other than RSA Law Enforcement, all Bargaining Units are eligible to receive the greater of the PEMHCA amount or the bargained amount. Currently, Confidential, DDAA, Management (General), Law Enforcement Executive Staff, Unrepresented Confidential, and Unrepresented management are above the PEMHCA amount, LEMU, RSA Public Safety, SEIU, and LIUNA are at the PEMHCA amount.

Special District (Waste, Parks, and Flood) employees are not included in this valuation.

[1] Based on demographic assumptions set out in the Actuarial Assumption and Methods section of this report.
[2] Excludes deferred retirees. Including this group would decrease the Average Future Working Life by 0.5.

Retired Participant Benefit Summary

The table below summarizes the number of current retirees receiving various monthly County contribution amounts:

Age	$25.00	$151.00	$256.00	Total
<40	3	0	0	3
40-44	2	1	1	4
45-49	7	3	2	12
50-54	52	91	29	172
55-59	58	230	70	358
60-64	78	526	160	764
65-69	64	427	171	662
70-74	39	333	197	569
75-79	19	236	120	375
80-84	9	143	48	200
85-89	3	48	8	59
90-95	4	25	14	43
>95	0	5	2	7
Total	338	2,068	822	3,228

Summary of Principal Plan Provisions

The following plan provisions are the basis for the calculations in this actuarial valuation.

1. **Benefit Eligibility**
   All employees who retire from active employment within 120 days of separation are eligible for participation. Participants are eligible for service retirement at or after age 50, or disability retirement at an age younger than 50, with at least 5 years of service. Former employees who become eligible for CalPERS pension benefits more than 120 days after separation are not eligible for retiree health benefits.

2. **Benefits / Plans Covered**
   The County contributes a portion of an eligible retiree's medical plan premium under a County sponsored health plan (either at retirement or during a subsequent annual enrollment) for the retiree's lifetime. Contributions are based on the employee's bargaining unit at the time of retirement; as follows:

Bargaining Unit at Retirement	***Monthly Contribution***				
	2020	**2021**	**2022**	**2023**	**2024**
Confidential**	$256.00	$256.00	$256.00	$256.00	$256.00
LEMU (Management)*	$139.00	$143.00	$149.00	$151.00	$157.00
MLX (Executive Staff)**	$256.00	$256.00	$256.00	$256.00	$256.00
LIUNA	$25.00	$25.00	$149.00	$151.00	$157.00
Management**	$256.00	$256.00	$256.00	$256.00	$256.00
District Attorneys (DDAA)*	$256.00	$256.00	$256.00	$256.00	$256.00
RSA Law Enforcement	$25.00	$25.00	$25.00	$25.00	$25.00
RSA Public Safety*	$139.00	$143.00	$149.00	$151.00	$157.00
SEIU	$139.00	$143.00	$149.00	$151.00	$157.00
Unrepresented**	$256.00	$256.00	$256.00	$256.00	$256.00

* Other than RSA Law Enforcement, all Bargaining units are eligible to receive the greater of the PEMHCA amount or the bargained amount. Currently, Confidential, MLX (Executive Staff), Management, Prosecution (Deputy DAs), and Unrepresented are above the PEMHCA amount, LEMU, RSA Public Safety, SEIU, and LIUNA are at the PEMHCA amount.

** Confidential, MLX (Executive Staff), Management and Unrepresented retired before 11/1/2005 receive a monthly contribution of $128 and after 11/1/2005 receive a monthly contribution of $256.

Future PEMHCA amounts increase at the same rate as Medical CPI. See Appendix A for a projection of the monthly PEMHCA contribution amounts.

RSA – The County contributes $25.00 per month to the RSA Benefit Trust for RSA Law Enforcement retirees. Although the Trust is responsible for providing a benefit with a much larger premium, the County is responsible for the $25.00 monthly contribution and this benefit is included in Plan liabilities.

Implicit Subsidy – Under CalPERS plans, retirees can receive coverage at premium rates that are subsidized due to demographic differences between those receiving benefits and the population used to develop premiums (e.g., blended active and retiree premiums.)

3. **Survivor Coverage Benefits**
   Upon the death of the retiree, the eligible surviving spouse receives the same monthly benefit amount for their lifetime.

Actuarial Assumptions and Methods

1. Actuarial Cost Method

The costs shown in the report were developed using the Entry Age Normal cost method.

The Entry Age Normal (EAN) cost method spreads plan costs for each participant from entry date (assuming the plan existed on the employee's hire date) to the expected retirement date. Under the EAN cost method, the plan's normal cost is developed as a level percentage of pay spread over the participants' working lifetime. For this purpose, pay is assumed to increase 2.80% per annum. The AAL is the cumulative value, on the valuation date, of prior service costs. For retirees, the AAL is the present value of all projected benefits.

The Plan costs are derived by making certain specific assumptions as to the rates of interest, mortality, turnover and other demographic events, which are assumed to hold for many years into the future. Actual experience may differ somewhat from the assumptions and the effect of such differences is spread over all periods. Due to these differences, the costs determined by the valuation must be regarded as estimates of the true Plan costs.

2. Funding Policy and Actuarially Determined Contribution (ADC)

The County's funding policy is to contribute the normal cost plus the amortization of unfunded liability based on the following:

- Amortization of the 2017 unfunded liability over the period ending June 30, 2037, plus
- 15-year amortization of subsequent unanticipated changes in liability (i.e., actuarial gains/losses and assumption changes), plus
- 5-year amortization of subsequent unanticipated changes in assets (i.e., asset gains/losses).

The amortization is calculated based on a level percentage of future payroll amounts

Effective July 1, 2020 (ADC for Fiscal Year Ending June 30, 2022), the County elected to exclude the implicit subsidy liability in the funding contribution development.

3. GASB Discount Rate

7.80% - as of 7/1/2023
7.70% - as of 7/1/2022

Under GASB 75, the discount rate is based on a single equivalent rate that reflects a blend of:

- Expected return on assets during the period such that assets are projected to be sufficient to pay benefits of current participants; and
- 20-year, municipal bond yields / index for periods beyond the depletion of the assets.

Based on the current funding policy, projected cash flows, and the assumed asset return, the plan assets are not projected to be depleted, and the discount rate can be based on the expected asset return.

4. Funding Discount Rate

7.00% - Funding policy selected by the County

5. Expected Return on Assets

7.80% - Selected by the County based on CalPERS CERBT Asset Allocation Strategy 1.

6. Payroll Increases

2.80% - This is the annual rate at which total payroll is expected to increase and is used in the funding method to calculate the funding contribution as a level percent of payroll.

7. Inflation

2.30% - This is the assumed annual rate of inflation for future years.

For demographic assumptions:

Public Agency Police consists of Law Enforcement Management and Law Enforcement Executive Staff;

Public Agency County Peace Officer consists of RSA Law Enforcement and RSA Public Safety, and;

Miscellaneous consists of all other bargaining units.

8. Mortality

Mortality rates are based on the Pub-2010 headcount-weighted tables for general employees of all income levels, with generational future improvement scale MP-2021. Sample rates for the 2010 base year mortality are as follows:

Age	Male	Female
30	0.05%	0.02%
40	0.08%	0.04%
50	0.18%	0.10%
60	0.38%	0.21%
70	0.82%	0.53%
80	2.03%	1.41%
90	15.78%	12.12%

9. Termination

Termination rates developed in the 2021 CalPERS Experience Study were used in the valuation. The following sample rates are based on age and service:

Public Agency Police and County Peace Officer - Male

Attained	Years of Service						
Age	0 – 1	5	10	15	20	25	30
30	12.98%	2.69%	1.45%	0.83%	0.00%	0.00%	0.00%
35	12.98%	2.69%	1.45%	0.83%	0.60%	0.00%	0.00%
40	12.98%	2.69%	1.45%	0.83%	0.60%	0.42%	0.00%
45	12.98%	2.69%	1.45%	0.83%	0.60%	0.42%	0.21%
50	12.98%	2.69%	1.45%	0.83%	0.60%	0.42%	0.21%
55	12.98%	1.13%	0.32%	0.00%	0.00%	0.00%	0.00%

Termination (cont.)

Public Agency Police and County Peace Officer - Female

Attained	Years of Service						
Age	0 – 1	5	10	15	20	25	30
30	13.89%	4.00%	2.46%	1.44%	0.00%	0.00%	0.00%
35	13.89%	4.00%	2.46%	1.44%	1.05%	0.00%	0.00%
40	13.89%	4.00%	2.46%	1.44%	1.05%	0.73%	0.00%
45	13.89%	4.00%	2.46%	1.44%	1.05%	0.73%	0.37%
50	13.89%	4.00%	2.46%	1.44%	1.05%	0.73%	0.37%
55	13.89%	1.28%	0.47%	0.00%	0.00%	0.00%	0.00%

Miscellaneous - Male

Attained	Years of Service						
Age	0 – 1	5	10	15	20	25	30
30	16.31%	8.04%	3.77%	1.80%	0.00%	0.00%	0.00%
35	14.93%	7.15%	3.66%	1.80%	1.41%	0.00%	0.00%
40	14.90%	6.27%	3.37%	1.80%	1.41%	0.84%	0.00%
45	14.87%	5.62%	3.09%	1.66%	1.41%	0.84%	0.47%
50	15.09%	4.97%	2.45%	1.52%	1.10%	0.84%	0.47%
55	15.30%	4.61%	1.81%	1.19%	0.79%	0.64%	0.47%

Miscellaneous - Female

Attained	Years of Service						
Age	0 – 1	5	10	15	20	25	30
30	18.24%	10.41%	5.02%	2.52%	0.00%	0.00%	0.00%
35	17.49%	9.25%	4.91%	2.52%	1.75%	0.00%	0.00%
40	17.31%	8.09%	4.46%	2.52%	1.75%	1.08%	0.00%
45	17.13%	7.30%	4.01%	2.13%	1.75%	1.08%	0.56%
50	17.41%	6.50%	3.08%	1.74%	1.31%	1.08%	0.56%
55	17.69%	5.80%	2.15%	1.32%	0.87%	0.76%	0.56%

10. Disability

Disability rates developed in the 2021 CalPERS Experience Study were used in the valuation. Sample rates are as follows:

	Public Agency Police & County Peace Officer		CalPERS Miscellaneous	
Age	Male	Female	Male	Female
25	0.17%	0.17%	0.01%	0.01%
30	0.49%	0.49%	0.02%	0.03%
35	0.81%	0.81%	0.04%	0.07%
40	1.12%	1.12%	0.09%	0.12%
45	1.44%	1.44%	0.15%	0.19%
50	0.00%	0.00%	0.15%	0.19%
55	0.00%	0.00%	0.14%	0.13%

11. Retirement Age

Retirement rates developed in the 2021 CalPERS Experience Study are used in the valuation. Sample rates are provided below.

- Hire date prior to August 24, 2012:
  - Police 3% @ 50 were used for safety employees (including County Peace Officers)
  - Miscellaneous 3% @ 60 rates were used for all other employees.
- Hire date August 24, 2012 to December 31, 2012:
  - Police 2% @ 50 were used for safety employees (including County Peace Officers)
  - Miscellaneous 2% @ 60 rates were used for all other employees.
- Hire date post December 31, 2012:
  - Police 2.7% @ 57 were used for safety employees (including County Peace Officers)
  - Miscellaneous 2% @ 62 rates were used for all other employees.

Miscellaneous 3% @ 60

Attained	Years of Service						
Age	5	10	15	20	25	30	35
50	1.50%	2.00%	2.50%	3.90%	4.00%	4.40%	4.40%
55	13.70%	4.30%	5.10%	6.50%	7.60%	10.80%	13.60%
60	8.10%	8.50%	13.30%	21.50%	28.00%	33.30%	37.80%
65	15.20%	20.10%	26.20%	29.90%	32.30%	32.30%	32.30%
70	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Miscellaneous 2% @ 60

Attained	Years of Service						
Age	5	10	15	20	25	30	35
50	1.00%	1.10%	1.40%	1.40%	1.70%	1.70%	1.70%
55	1.20%	1.60%	2.40%	3.20%	3.60%	3.60%	3.60%
60	6.30%	6.90%	7.40%	9.00%	13.70%	11.60%	12.50%
65	13.80%	16.00%	21.40%	21.60%	23.70%	28.30%	31.30%
70	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Miscellaneous 2% @ 62

Attained	Years of Service						
Age	5	10	15	20	25	30	35
50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
55	1.00%	1.90%	2.80%	3.60%	6.10%	9.60%	15.20%
60	3.10%	5.10%	7.10%	9.10%	11.10%	13.80%	18.30%
65	10.80%	14.10%	17.30%	20.60%	23.90%	30.00%	34.80%
70	12.00%	15.60%	19.30%	22.90%	26.50%	33.30%	38.70%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Police 3% @ 50

Attained Age	Years of Service 5	10	15	20	25	30	35
50	12.40%	10.30%	11.30%	14.30%	24.40%	37.60%	43.80%
55	6.90%	7.40%	8.10%	11.30%	20.90%	30.50%	33.60%
60	34.30%	18.00%	15.90%	18.80%	24.70%	24.70%	24.70%
65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Police 2% @ 50

Attained Age	Years of Service 5	10	15	20	25	30	35
50	1.80%	7.70%	5.60%	4.60%	4.30%	4.60%	4.60%
55	0.90%	4.00%	9.90%	15.70%	18.60%	18.60%	18.60%
60	17.70%	17.70%	17.70%	17.70%	17.70%	17.70%	17.70%
65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Police 2.7% @ 57

Attained Age	Years of Service 5	10	15	20	25	30	35
50	5.00%	5.00%	5.00%	5.00%	5.00%	10.00%	11.00%
55	6.80%	6.80%	6.80%	9.10%	13.40%	24.20%	38.80%
60	15.00%	15.00%	15.00%	15.00%	15.00%	22.80%	35.00%
65	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
70	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

12. Annual Medical Inflation ("Trend")

County Contribution: PEMHCA amounts have been determined through 2024 ($157.00). After 2024, the PEMHCA amounts will increase at the same rate as the Medical CPI. For valuation purposes, this is assumed to be 4% for all years. This applies to RSA Public Safety, Deputy District Attorney, Law Enforcement Management, Confidential, Management, Executive Staff, and Unrepresented who were assumed to participate in CalPERS Health Benefits programs and receive the PEMHCA amounts.

All other County contributions are assumed to remain at their current level.

For purposes of calculating the implicit subsidy, a medical trend rate assumption was used to develop the projected future medical claim amounts. The medical trend rate represents the long-term expected growth of medical benefits paid by the plan, due to non-age-related factors such as general medical inflation, utilization, new technology, and the like. The following table sets forth the trend assumptions used for the valuation:

	Medical	
Year	**Pre Medicare**	**Post Medicare**
2023	11.02%	11.12%
2024	7.10%	8.05%
2025	6.78%	7.62%
2026	6.46%	7.19%
2027	6.14%	6.75%
2028	5.82%	6.30%
2029	5.49%	5.86%
2030	5.16%	5.41%
2031	4.83%	4.95%
2032+	4.50%	4.50%

The rates shown above for 2023 are the actual increase in premium rates from 2023 to 2024 based on the published 2024 premiums shown below.

13. Monthly Medical Costs (for Implicit Subsidy calculations)

The table below shows 2024 premiums as of the valuation date based on Region 3 (Los Angeles, Riverside, San Bernardino).

Plan	HMO/PPO	Employee Only	Employee & 1 Dep.
Basic			
Anthem Select	HMO	$841.93	$1,682.26
Anthem Traditional	HMO	1,012.67	2,025.34
Blue Shield Access +	HMO	756.65	1,513.30
Blue Shield Trio	HMO	704.69	1,409.38
Health Net Salud y Más	HMO	630.13	1,260.26
Kaiser	HMO	865.41	1,730.82
PERS Gold	PPO	785.28	1,570.56
PERS Platinum	PPO	1,131.47	2,262.94
PORAC	PPO	926.00	1,402.00
United Healthcare Alliance	HMO	826.44	1,192.45
United Healthcare Harmony	HMO	734.76	1,469.52
Supplemental/Managed Medicare			
Anthem	HMO	405.83	811.66
Blue Shield	HMO	392.68	785.36
Kaiser	HMO	324.79	649.58
PERS Gold	PPO	406.60	813.20
PERS Platinum	PPO	448.15	896.30
PORAC	PPO	465.00	1,030.00
United Healthcare	PPO	341.72	683.44

Monthly Medical costs were developed by applying age adjustments to the above premiums to reflect the implicit subsidy. These age adjustments are based on statewide information provided by CalPERS (updated in 2023). Single rate age adjustment factors are used for retirees and spouses. A sampling of the factors used is included below:

Aging Factors

Age	HMO Plans	PPO Plans
20	0.36	0.34
30	0.53	0.52
40	0.67	0.63
50	1.00	0.93
60	1.51	1.37
64	1.73	1.58
65	0.82	0.80
70	0.92	0.90
80	1.12	1.10
90+	1.15	1.15

14. Retiree Contributions

Retirees pay the premiums in excess of the County contributions.

15. Dental Benefits

Retirees are eligible for dental benefits if they pay the entire premium. Since dental claims are not assumed to vary with age, costs are expected to be fully paid by retirees and no County liabilities exist.

16. Lapse Rates

The lapse rate represents the annual rate at which retirees elect not to renew coverage. Assumed lapse rates of future and current retirees are included below:

Age	Lapse Rate
50-59	6.5%
60-64	6.5%
65-69	5.0%
70-74	4.0%
75-79	3.5%
80-84	3.0%
85+	0.0%

17. Participants Valued

Only current active and retired participants are directly valued. No future entrants are considered in this valuation except for the participants listed below.

Certain employees who do not immediately elect coverage at retirement are eligible to elect retiree coverage at a later date. Currently, there are approximately 4,000 such deferred retirees. These deferred retirees' liabilities are estimated using recent experience and July 1, 2023 census data. Future deferred election rates are included below:

Age	Election Rate
50-54	3.5%
55-59	6.0%
60-64	10.5%
65-69	4.0%
70+	0.0%

For RSA, it is anticipated that a significant number of retirees will defer benefits to later years. The RSA retiree liability was loaded 15% to account for such current "deferred" retirees that are not included in the census data.

18. Plan Participation

Assumed plan participation rates of future retirees is as set out in the following table:

Health Plan / Benefit Eligibility	Assumed Participation Rate
CalPERS health plans	60% immediate / 10% defer to age 68
RSA health plans	60% immediate / 20% defer to age 65

These percentages were developed based on a review of the County's recent experience.

Future retirees are assumed to elect health plans in the same proportions as the current allocation

19. Spousal Coverage Assumption

50% of future eligible retirees are assumed to cover their spouses. Males are assumed to be three years older than their female spouses. Current spousal coverage is used for current retirees.

20. Participants Excluded

Special District (Waste, Parks, and Flood) employees, along with active Court members, were not included in this valuation.

21. Changes in Valuation Assumptions

The following assumptions were changed from the prior valuation:

1) Expected return on assets was updated from 7.70% to 7.80%.
2) GASB discount rate was updated from 7.70% to 7.80%, in light of change in expected return assumption. No change in the funding discount rate, 7.00%.
3) The claim tables were updated to reflect most recent CalPERS monthly premiums available for 2024.
4) The medical trend rates were updated to reflect the current medical cost growth expectation
5) The aging factors were updated to reflect most recent CalPERS demographic experience.
6) Removed 3% County Health Plans election assumption

Appendix A—Comparison of County Contribution to PEMHCA

The following table compares the projected monthly benefit per participant under the current plan to the projected monthly benefit per participant under PEMHCA. The PEMHCA amounts are assumed to increase at the same rate as medical inflation each year after 2024.

	Current Benefits		
Year	**Low - $25/month**	**High - $256/month**	**PEMHCA Benefit**
2023	$25.00	$256.00	$154.00
2024	$25.00	$256.00	$160.14
2025	$25.00	$256.00	$166.55
2026	$25.00	$256.00	$173.21
2027	$25.00	$256.00	$180.14
2028	$25.00	$256.00	$187.34
2029	$25.00	$256.00	$194.83
2030	$25.00	$256.00	$202.63
2031	$25.00	$256.00	$210.73
2032	$25.00	$256.00	$219.16
2033	$25.00	$256.00	$227.93
2034	$25.00	$256.00	$237.05
2035	$25.00	$256.00	$246.53
2036	$25.00	$256.00	$256.39
2037	$25.00	$256.00	$266.64
2038	$25.00	$256.00	$277.31
2039	$25.00	$256.00	$288.40
2040	$25.00	$256.00	$299.94
2041	$25.00	$256.00	$311.94
2042	$25.00	$256.00	$324.41
2043	$25.00	$256.00	$337.39
2044	$25.00	$256.00	$350.89

Appendix B—GASB 75 Expense Estimate for Fiscal Year Ending June 30, 2025

The following table illustrates the estimated OPEB expense under GASB 75 for the Fiscal Year ending June 30, 2025. The amounts shown are estimates based on the results of the July 1, 2023 actuarial valuation and a 7.80% discount rate.

	Fiscal Year Ending 6/30/2025[1]
(1) Service Cost	$ 11,393,000
(2) Interest Cost	22,403,000
(3) Expected Investment Return	(7,758,000)
(4) Employee Contributions	0
(5) Administrative Expense	41,000
(6) Plan Changes	0
(7) Amortization of Unrecognized	
(a) Liability (Gain)/Loss	856,000
(b) Asset (Gain)/Loss	2,325,000
(c) Assumption Change (Gain)/Loss	16,346,000
(8) Total Estimated Expense	$ 45,606,000
(9) Total Expense as a Percentage of Payroll[2]	2.53%

[1] Final FYE 2025 expense information will be provided in the actuarial valuation based on a June 30, 2024 measurement date reflecting updated census, assumptions, plan provisions and actual asset values, in addition to any asset, liability, or assumption gains/losses initially recognized over the period June 30, 2023 to June 30, 2024.
[2] Based on estimated payroll.

Appendix C—Pre-65 / Post-65 Breakdown

Alternate breakdown of AAL is shown below to help understand the source of costs. The liabilities shown in this exhibit were calculated using a 7.80% discount rate.

	Pre-65	Post-65	Total
All Benefits			
County Contribution - Flat Dollar (RSA)			
Retirees	$301,842	$588,538	$890,380
Actives	$477,021	$305,323	$782,344
Subtotal	$778,863	$893,861	$1,672,724
County Contribution - CalPERS Benefits			
Retirees	$13,036,097	$63,507,322	$76,543,419
Actives	$20,565,266	$44,550,847	$65,116,113
Subtotal	$33,601,363	$108,058,169	$141,659,532
CalPERS - Implicit Subsidy			
Retirees	$50,371,394	$3,085,615	$53,457,009
Actives	$87,682,179	($1,160,483)	$86,521,696
Subtotal	$138,053,573	$1,925,132	$139,978,705
Total AAL	**$172,433,799**	**$110,877,162**	**$283,310,961**
Number of Retirees as of 7/1/2023[1]	1,313	3,228	3,228
Number of Actives as of 7/1/2023[1]	21,314	21,667	21,667
AAL Per Retiree[2]	$27,836	$15,901	$27,223
AAL Per Active	$5,101	$2,017	$7,035
Normal Cost			
Flat Dollar (RSA)	$48,047	$19,992	$68,039
CalPERS Benefits	$1,493,295	$3,929,961	$5,423,256
CalPERS - Implicit Subsidy	$5,887,852	$13,569	$5,901,421
Total Normal Cost	**$7,429,194**	**$3,963,522**	**$11,392,716**

[1] For purpose of illustrating per participant AAL, counts reflect number of participants eligible for pre-65 and post-65 benefits, respectively. Deferred retirees are not explicitly included in the count, but their future benefits are valued based on the election assumption developed in the experience study carried out in 2021 and reviewed in 2022 and 2023.

[2] Average liability excluding deferred retirees; Average liability for eligible deferred retirees is approximately $10,600.

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11/2/2023

Actuarial Valuation Report

County of Riverside

Part-time and Temporary Employees' Retirement Plan

As of July 1, 2023

Empower Results®

Executive Summary

Background

The County of Riverside established the Part-Time and Temporary Employees' Retirement Plan to provide retirement benefits to eligible employees as a substitute for benefits under Social Security, as allowed under OBRA '90. The Plan is an IRS Section 401(a) defined benefit plan.

The County's current funding policy is to contribute a level percentage of pay based on the sum of

<u>Ongoing accruals</u>

a) Normal Cost with interest and administrative expense, less
b) Expected Employee Contributions

<u>Plus, Amortization of unfunded liabilities</u>

c) Amortization of July 1, 2017 Unfunded Actuarial Accrued Liability (UAAL) over the period ending June 30, 2037, plus
d) Amortization of subsequent unanticipated changes in liability (i.e., actuarial gains / losses and changes in assumptions) over 15-year periods and unanticipated changes in assets over 5-year periods.

Amortization amounts are calculated based on the discount rate and payroll increase assumption appropriate for the valuation date.

Summary of Results

Funding Contribution

The funding contribution for Fiscal Year Ending (FYE) 2024 is $0 and was developed based on the prior year valuation. The funding contribution for FYE 2025 is $0 and is developed based on the funding policy described in the Background section above and reflecting the funded status of the plan.

Although the funding contribution methodology results in a current and near term $0 contribution amount, the plan has a shortfall and hence, the County may wish to consider an alternative funding amount.

The current policy amortizes assets and liabilities experience over different periods, which results in a negative net amortization in the next few years, switching to highly positive net amortization amounts after 2028. This negative amortization is larger than the cost of accruals, resulting in a $0 contribution.

An alternative amortization of the UAAL that uses a single 15-year amortization period would address the volatility in the 5-year/15-year amortization amounts under the current policy and address the plan's current funded status. In addition, due to the high turnover of this plan's participants, the County may want to base the contribution amount (as a % of pay) on the total expected payroll for the year, rather than just a snapshot of the compensation earned for the active population as of the valuation date.

Application of the 15-year amortization period leads to a contribution of 2.32% of total expected payroll. More information regarding both the standard and alternative funding scenarios is provided in the Development of Funding Contribution section of the report.

GASB 68

This valuation is based on census data provided as of July 1, 2023 for the purpose of providing GASB 68 financial statement information, including expense, for FYE June 30, 2024. The final FYE June 30, 2024 expense/(income) is $3,016,542, which is lower than that estimated in the prior valuation primarily due to higher than expected employee contributions.

The estimated FYE 2025 expense is $2,282,000. The decrease from FYE 2024 expense is a result of prior amortization bases being fully recognizedand higher expected return on assets (due to the higher asset value), offset by higher interest cost. The final FYE 2025 expense will be updated to reflect actual cash flows, actual employee contributions and any unexpected gains or losses on the assets and liability during the measurement period ending June 2024.

The measurement date for results shown in this valuation report is June 30, 2023.

ASOP 51

In September 2017, the Actuarial Standards Board (ASB) introduced Actuarial Standard of Practice (ASOP) No. 51, *Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions*, which is effective for any actuarial work product with a measurement date on or after November 1, 2018. This ASOP provides guidance to actuaries with regard to the assessment and disclosure of the risk that actual future measurements may differ significantly from expected future measurements. Examples of future measurements include pension liabilities, actuarially determined contributions, and funded status. A report that addresses the requirements of ASOP 51 will be provided in a report separate to these valuation results.

ASOP 4

For all funding valuations with measurement dates on or after February 15, 2023, and for which an actuarial report is issued on or after February 15, 2023, ASOP 4 now requires the calculation and disclosure of an additional measure of the plan's liability using a discount rate or discount rates derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future. This additional liability measure is referred to as the Low-Default-Risk Obligation Measure (LDROM). The LDROM is documented in Appendix B of the report.

The actuarially determined contribution (ADC) in this report is considered reasonable because it meets the criteria of Section 3.21 of Actuarial Standard of Practice No. 4, *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions* (ASOP 4):

- All significant assumptions are reasonable
- Combined impact of assumptions are projected to have no significant bias
- The actuarial cost method allocates cost in a reasonable way over employees' careers
- Amortizations are projected to either fully amortize the unfunded liability or reduce the unfunded accrued liability by a reasonable amount within a reasonable period.
- The asset method and output smoothing method (if any) are consistent with actuarial standards.

Comparison to Prior Valuation

The purpose of the actuarial valuation of the Plan is to:

- Determine the Plan’s funded status and annual costs; and
- Provide information for Government Accounting Standards Board financial statement disclosure.

The following table summarizes the current valuation results as of July 1, 2023, compared to prior year results:

	July 1, 2022	July 1, 2023
Active participant count	2,282	2,331
Funding Contribution		
Discount Rate	6.00%	6.00%
Actuarial accrued liability (Projected Unit Credit):	$ 68,929,174	$ 73,855,328
Actuarial Value of Assets	56,250,845	61,261,292
Unfunded liability	$ 12,678,329	$ 12,594,036
Funded percentage	81.6%	82.9%
Actuarially Determined Contribution (ADC), FYE 2024 / 2025	$ 0	$ 0
Expected Total Participant Compensation FYE 2024/2025	$ 59,400,000	$ 71,100,000
Contribution as a Percentage of Compensation	0.00%	0.00%
Alternative Contribution	3.21%	2.32%
GASB 68 Expense		
Discount Rate	6.00%	6.00%
Total Pension Liability (Entry Age Normal):	$ 61,184,393	$ 67,876,484
Plan Fiduciary Net Position	51,015,884	59,186,816
Net Pension Liability	$ 10,168,509	$ 8,689,668
GASB 68 Annual Pension Expense/(Income), FYE 2024 final / 2025 estimate	$ 3,016,542	$ 2,282,000

Overall, the plan’s funded status for funding purposes was relatively similar to last year; however, the GASB 68 funded status improved, and Net Pension Liability decreased from the prior valuation. The primary reason for these differing results is the asset gain, which gets spread over five years with the asset smoothing under the funding method but recognized immediately for GASB accounting purposes. Overall, the following offsetting factors impacted plan results:

- Assets were higher than expected due to favorable investment return on plan assets (11.4% actual compared to 6.0% assumed);
- Employer and employee contributions were higher than the actuarially determined contribution;
- Demographic experience was different than expected, primarily due to more terminations than expected, new entrants, and data clarification reflecting actives as part-time (rather than full-time) status, resulting in a net liability loss.

Projected Funding Status

80% Funded Status

The County's target is to maintain an 80% funded status for the plan. The funded status as of July 1, 2023 is above 80% and is projected to be above 80% in future years.

Projected Actuarial Accrued Liability (AAL), 6/30/2024	$ 75,520,383
Projected Actuarial Value of Assets, 6/30/2024[1]	66,567,032
Funding Shortfall, 6/30/2024	$ 8,953,351
Projected Funded Status, 6/30/2024	88.1%

[1]Assumes current FYE 2024 contribution of 5.58% of pay

90% Funded Status

The County also requested review of maintaining an alternative 90% funded status for the Plan. The valuation projects the Plan to be under 90% funded based on the cost method used for funding, as shown below.

Projected Actuarial Accrued Liability (AAL), 6/30/2024	$ 75,520,383
Projected Smoothed Value of Assets, 6/30/2024	66,567,032
Funding Shortfall, 6/30/2024	$ 8,953,351
Projected Funded Status, 6/30/2024	88.1%
Shortfall to achieve 90% as of 6/30/2024	$ 1,401,313
Additional funding in FYE 2024 to achieve 90% as of 6/30/2024[1]	$ 1,361,075

[1] Assumes mid-year funding on 1/1/2024 and is in addition to the anticipated FYE 2024 County contribution of 5.58% of pay.

The table below summarizes the estimated contribution projected in order to attain 90% at various future dates. The total contributions assume the June 30, 2025 ADC rate (0% of pay) plus the additional amount to attain 90% funded status by the target funding date.

	Additional Payment to Fund 90% by Target Date		**Total Contribution to Fund 90% by Target Date**	
90% Target Funding Date	**Annual Payment in FYE 2025[1]**	**% of Pay**	**Annual Payment in FYE 2025[1,2]**	**% of Pay[2]**
6/30/2025	$2,070,000	2.91%	$2,070,000	2.91%
6/30/2026	$2,533,986	3.56%	$2,533,986	3.56%
6/30/2027	$1,706,094	2.40%	$1,706,094	2.40%
6/30/2028	$1,426,645	2.01%	$1,426,645	2.01%
6/30/2029	$811,369	1.14%	$811,369	1.14%
6/30/2030	$726,848	1.02%	$726,848	1.02%
6/30/2031	$11,588	0.02%	$11,588	0.02%

[1] Contributions shown for FYE 2025 are assumed to be made throughout the year based on a level percent of pay and are therefore assumed to increase at 2.80% per year from FYE 2025 to the target funding date.
[2] Includes FYE 2024 contribution of $6.4M (5.58% of pay) and FYE 2025 contribution of $0 (0% of pay).

For example, to attain 90% funded by FYE 2026 the County would need to contribute approximately $2.5M in FYE 2025 in addition to the current ADC contributions of $0M in FYE 2025, plus $2.6M ($2.5M with interest) in FYE 2026.

*　　　*　　　*

This July 1, 2023 valuation is based on census data provided as of June 30, 2023 for the purpose of providing GASB 68 financial statement information, including final expense for the fiscal year ending June 30, 2024, estimated expense for fiscal year ending June 30, 2025 and the funding contribution amount for the fiscal year ending June 30, 2025.

The following report provides details of the results summarized above and the disclosure information for fiscal year ending 2024.

Table of Contents

Actuarial Valuation Certification

This report documents the results of the July 1, 2023 actuarial valuation for the County of Riverside Part-time and Temporary Employee's Retirement Plan. The information provided in this report is intended strictly for documenting the development of the Funding Contribution and disclosure items under Governmental Accounting Standards Board (GASB) Statements No. 68.

Determinations for purposes other than the financial accounting requirements may be significantly different from the results in this report. Thus, the use of this report for purposes other than those expressed here may not be appropriate.

This valuation has been conducted in accordance with generally accepted actuarial principles and practices, including the applicable Actuarial Standards of Practice as issued by the Actuarial Standards Board. In addition, the valuation results are based on our understanding of the financial accounting and reporting requirements under U.S. Generally Accepted Accounting Principles as set forth in Government Accounting Standards Board Statement 68 (GASB 68) including any guidance or interpretations provided by the Company and/or its audit partners prior to the issuance of this report. The information in this report is not intended to supersede or supplant the advice and interpretations of the County of Riverside's auditors.

A valuation model was used to develop the liabilities for the June 30, 2023 valuation. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC. Experts within Aon selected this software and determined it is appropriate for performing valuations. We coded and reviewed the software for the provisions, assumptions, methods, and data of the County of Riverside Part-time and Temporary Employee's Retirement Plan.

A model was used to develop the appropriate GASB discount rate. The undersigned relied on experts within Aon for the development of the capital market assumptions and the model underlying the expected rate of return.

The valuation model outputs various cost scenarios. The "1% increase" and "1% decrease" interest rate scenarios vary only the discount rate assumption, in order to illustrate the impact of a change in that assumption in isolation. In practice, certain other assumptions, such as the expected or realized asset returns, would also be expected to vary when the discount rate changes. Therefore, the output from these scenarios should be used solely for assessing the impact of the discount rate in isolation and may not represent a realistic set of results for other purposes.

The valuation model was used to project certain financial results for the *\liability* projections. The valuation model relies on ProVal software, which was developed by Winklevoss Technologies, LLC and selected, reviewed, and evaluated by experts within Aon as appropriate for use for developing liabilities for *liability* projections.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to (but not limited to) such factors as the following:

- Plan experience differing from that anticipated by the economic or demographic assumptions
- Changes in actuarial methods or in economic or demographic assumptions
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period)

- Changes in plan provisions or applicable law

Due to the limited scope of this valuation report, we have not included an analysis of the potential range of such future measurements. However, an assessment and disclosure of risks pertaining to the funding valuation as required by the actuarial standards of practice is being provided in a separate report.

Actuarial computations under GASB are for purposes of fulfilling plan and employer accounting requirements. The calculations reported herein have been made on a basis consistent with our understanding of these accounting standards. Determinations for purposes other than meeting Employer financial accounting requirements may be different from these results.

This report is intended for the sole use of the County of Riverside. It is intended only to supply information for the County of Riverside to comply with the stated purpose of the report and may not be appropriate for other business purposes. Reliance on information contained in this report by anyone for other than the intended purposes, puts the relying entity at risk of being misled because of confusion or failure to understand applicable assumptions, methodologies, or limitations of the report's conclusions. Accordingly, no person or entity, including the County of Riverside, should base any representations or warranties in any business agreement on any statements or conclusions contained in this report without the written consent of Aon.

Funded status measurements shown in this report may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, and funded status measurements for the employer and plan disclosure and reporting purposes may not be appropriate for assessing the need for or the amount of future contributions.

In determining the annual expense and Funding Contribution for the County of Riverside Part-time and Temporary Employees' Retirement Plan and information relating to plan disclosure and reporting requirements, Aon may be assisting the appropriate plan fiduciary as it performs tasks that are required for the administration of an employee benefit plan. Aon also may be consulting with the employer/plan sponsor (County of Riverside) as it considers alternative strategies for funding the plan, or as it evaluates information relating to employer reporting requirements. Thus, Aon potentially will be providing assistance to County of Riverside (and/or certain of its employees) acting in a fiduciary capacity (for the benefit of plan participants and beneficiaries) and to County of Riverside (and/or its executives) acting in a settlor capacity (for the benefit of the employer sponsoring the County of Riverside Part-time and Temporary Employees' Retirement Plan).

In conducting the valuation, we have relied on personnel, plan design, and asset information supplied by the County of Riverside as of the valuation date. While we cannot verify the accuracy of all the information, the supplied information was reviewed for consistency and reasonableness. As a result of this review, we have no reason to doubt the substantial accuracy or completeness of the information and believe that it has produced appropriate results. We have relied on actual and expected contributions as summarized within this report.

The actuarial assumptions and methods used in this valuation are described in the Actuarial Assumptions and Methods section of this report. Plan Sponsor selected the accounting economic and demographic assumptions and prescribed them for use for purposes of compliance with GASB 68. Plan Sponsor selected the funding economic and demographic assumptions and prescribed them for use for purposes of compliance with the state's funding regulations. Aon provided guidance with respect to these assumptions, and it is our belief that the assumptions represent reasonable expectations of anticipated plan experience and the combined effect of the assumptions have no significant bias.

The undersigned are familiar with the near-term and long-term aspects of pension valuations and collectively meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained herein. The information provided in this report is dependent upon various factors as documented throughout this report, which may be subject to change. Each section of this report is considered to be an integral part of the actuarial opinions.

To our knowledge, no colleague of Aon providing services to the County of Riverside has any material direct or indirect financial interest in the County of Riverside. Thus, we believe there is no relationship existing that might affect our capacity to prepare and certify this actuarial report for the County of Riverside.

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November 2023

Summary of Liabilities

This exhibit shows the plan liabilities as of July 1, 2023 based on census data provided by the County as of June 30, 2023 and the Summary of Plan Provisions and Summary of Actuarial Assumptions described in this report.

The Actuarial Accrued Liability (AAL) is the portion of the actuarial present value of all future benefits to be paid to current plan participants that is attributable to past service.

GASB 68 prescribes use of the Entry Age Normal (EAN) cost method for development of expense and disclosure information. For funding contributions, the Projected Unit Credit (PUC) cost method is used to maintain a more stable contribution level for this plan that experiences high turnover rates.

	Funding Contributions	**GASB 68**
Cost Method	PUC	EAN
Discount Rate	6.00%	6.00%
Actuarial Accrued Liability (AAL), as of July 1, 2023		
Retirees and Beneficiaries	$ 16,942,935	$ 16,942,935
Deferred Vested Terminated	25,811,785	25,811,785
Active Participants		
Part-Time Actives	13,525,641	14,119,405
Full-Time Actives[1]	17,574,967	11,002,359
Subtotal Actives	31,100,608	25,121,764
Total	$ 73,855,328	$ 67,876,484
Normal (Service) Cost, as of July 1, 2023	$ 1,469,717	$ 2,003,914

[1] Participants who become full-time employees and transfer to CalPERS are no longer accruing a benefit under the plan.

Summary of Plan Assets

This exhibit develops the asset values used in the valuation.

Statement of Invested Plan Assets as of June 30, 2023	**2023**
1. Mutual Funds – Equity	$ 41,171,989
2. Mutual Funds – Fixed Income	16,774,536
3. Cash and Equivalents (including receivables)	1,240,291
4. Total Assets held in Trust for Pension Benefits	$ 59,186,816
Reconciliation of Plan Assets	
1. Market Value of Assets at beginning of Plan Year	$ 51,015,884
2. Employer Contributions	3,755,492
3. Employee Contributions	2,523,702
4. Net Investment Income	5,918,612
5. Benefit Payments	(3,628,160)
6. Administrative Expenses	(398,714)
7. Market Value of Assets at end of Plan Year	$ 59,186,816
Rate of Return for 2022/2023 Plan year (net of expenses)	11.35%
Development of (Gain)/Loss	
1. Expected Investment Earnings (assumed 6.00%)	$ 3,127,539
2. Actual Investment Earnings	5,918,612
3. (Gain)/Loss on Assets (1)-(2)	$ (2,791,073)
Actuarial Value of Assets as of June 30, 2023	
1. Market Value of Assets at end of Plan Year	$ 59,186,816
2. Unrecognized (Gain)/Loss[1]	2,074,476
3. Preliminary Actuarial Value of Assets at end of Plan Year (1)+(2)	$ 61,261,292
4. Lower Corridor (80% of Market Value)	$ 47,349,453
5. Upper Corridor (120% of Market Value)	$ 71,024,179
6. Actuarial Value of Assets	$ 61,261,292

[1] Schedule of the Current and Prior Asset (Gains)/Losses as of June 30, 2023.

Date Established	Original (Gain)/Loss	Years Remaining as of 06/30/2023	Amount Recognized	Total Amount Unrecognized
7/1/2023	$ (2,791,073)	4	$ (558,215)	$ (2,232,858)
7/1/2022	14,371,564	3	5,748,626	8,622,938
7/1/2021	(11,287,727)	2	(6,772,635)	(4,515,092)
7/1/2020	997,436	1	797,948	199,488
Total	$ 1,290,200		$ (784,276)	$ 2,074,476

Summary of Funded Status

The Plan's funded status as of July 1, 2023 is developed based on the Actuarial Accrued Liability determined using the Projected Unit Credit methodology and the smoothed value of Plan assets.

The following table shows the development of the Plan's funded status as of July 1, 2023:

Funding Methodology	Projected Unit Credit
Discount Rate	6.00%
Actuarial Accrued Liability	$ 73,855,328
Actuarial Value of Plan Assets	61,261,292
Unfunded Liability	$ 12,594,036
Funded Percentage	83.0%

Development of Funding Contribution

The County's current funding policy is to contribute an amount equal to a level percentage of pay. Note the determination developed below assumes a constant active population over which the unfunded liabilities are amortized. The funding contribution is based on the sum of:

Ongoing accruals

a) Normal Cost with interest and administrative expense, less
b) Expected Employee Contributions

Plus, Amortization of unfunded liabilities

c) Amortization of July 1, 2017 Unfunded Actuarial Accrued Liability (UAAL) over the period ending June 30, 2037, plus
d) Amortization of subsequent unanticipated changes in liability (i.e., actuarial gains / losses and changes in assumptions) over 15-year periods and unanticipated changes in assets over 5-year periods.

The following table shows the development of the funding contribution as a level percentage of payroll, assuming middle of year payment, for the FYE June 30, 2025:

Funding Contribution, FYE June 30, 2025	Total Amount	% of Pay
Ongoing Accruals[1]		
Projected Normal Cost (including expense), plus interest	$ 1,903,956	4.43%
Expected Employee Contributions During Plan Year ending 6/30/2025	(1,611,955)	(3.75%)
Ongoing Accrual Contribution	$ 292,001	0.68%
Amortization of Unfunded Liabilities[2]		
7/1/2017 Unfunded Actuarial Accrued Liabilities, plus interest	$ 626,237	0.88%
Subsequent Unfunded Actuarial Accrued Liabilities, plus interest	(1,115,128)	(1.57%)
Amortization Contribution	$ (488,891)	(0.69%)
Funding Policy Contribution (Ongoing plus Amortization)	**$ 0**	**0.00%**
Considerations for % of Pay Alternatives[2]		
Ongoing Accrual Contribution		0.68%
Alternative Amortization of UAAL over 15 years	$ 1,164,326	1.64%
Alternative Funding Contribution		**2.32%**

[1]Developed based on estimated compensation for active population as of July 1, 2023, $43.0 million
[2]Developed based on estimated total compensation for active population at any time during FY2023, $71.1 million

We understand the County makes plan contributions based on the percentage of pay determined above. To the extent actual funding differs from dollar ***amount*** anticipated, the variation will be reflected in future contribution levels through amortization of unexpected changes in the UAAL.

Discussion of % of Pay Alternatives

Due to the high turnover of this plan's participants, a snapshot of the compensation earned for the active population as of the valuation date does not:

a) reflect a full year of compensation for those hired in the last year, and
b) account for any participants who join and leave the plan during the same plan year.

For example, in 2023 the total compensation earned by all active participants at any time in FYE 2023 was $67.3 million (employee contribution during FY2023 divided by 3.75%), whereas the total compensation earned by those that were still active as of July 1, 2023 was only $40.7 million. Since the County will apply this % of pay to all earnings next year, it may be appropriate to calculate the funding % as a % of the total payroll.

The ongoing funding contribution of 0.68% represents the cost of benefits accruing in the next year for current actives and may be appropriate for the cost of accruals for any new hires. Any variation will be reflected in future contribution levels.

The Alternative Amortization of the UAAL, 1.64%, is based on the % of pay reflecting the total expected earnings for all participants in FYE 2025 (i.e., expected payroll of $71.1M). In addition, the alternative applies a single 15-year amortization period to the UAAL as a threshold to address potential volatility in the 5-year/15-year amounts under the current policy (e.g., current policy: $490K negative amortization in FYE 2025 and $2.3M positive amortization in FYE 2029).

Liability (Gain)/ Loss

The following table shows the development of the liability (gain)/loss as of June 30, 2023.

Liability as of June 30, 2022	$ 68,929,174
Service Cost	980,814
Interest on Liability	4,082,260
Plan Change	0
Assumption Changes	0
Expected Benefit Payments	(3,800,000)
Expected Liability as of June 30, 2023	$ 70,192,248
Actual Liability as of June 30, 2023	73,855,328
FYE 2023 Liability (gain)/loss	$ 3,663,080

Asset (Gain)/Loss

The following table shows the development of the asset (gain)/loss as of June 30, 2023.

Market Value of Assets (MVA) as of June 30, 2022	$ 51,015,884
Expected Contributions	5,391,216
Expected Expenses	(300,000)
Expected Benefit Payments	(3,800,000)
Expected Return on Assets (based on 6%)	3,099,125
Expected MVA as of June 30, 2023	$ 55,406,225
Projected Unrecognized (gain)/loss as of June 30, 2023[1]	4,307,334
Expected Actuarial Value of Assets (AVA) as of June 30, 2023	59,713,559
Actual Actuarial Value of Assets as of June 30, 2023	61,261,292
FYE 2023 AVA Asset (gain)/loss[2]	$ (1,547,733)

[1] Projected based on 2020, 2021 and 2022 unrecognized (gain)/loss for 2023, see page 5
[2] Includes investment performance, differences in contributions and expenses from expected, and interest

Amortization Schedule

The following table shows the amortization of Unfunded Actuarial Accrued Liability as of July 1, 2024. Amortization of bases is first recognized in the fiscal year subsequent to the year established.

Date Established	Type of Base	Original Period	Remaining Period as of June 30, 2024	Original Balance	Balance Remaining as of June 30, 2024[2]	Amortization Recognized in FYE June 30, 2025
6/30/2023	Liability (Gain)/Loss	15	15	3,663,080	3,882,865	318,015
6/30/2023	Assets (Gain)/Loss	5	5	(1,547,733)	(1,640,597)	(348,537)
6/30/2022	Liability (Gain)/Loss	15	14	3,459,710	3,568,948	308,770
6/30/2022	Assets (Gain)/Loss[1]	5	4	(10,555,896)	(9,340,873)	(2,443,665)
6/30/2022	Assumptions	15	14	45,224	46,652	4,036
6/30/2021	Liability (Gain)/Loss	15	13	4,020,672	4,014,995	368,778
6/30/2021	Assumptions	15	13	124,057	123,881	11,379
6/30/2020	Liability (Gain)/Loss	15	12	645,612	620,440	60,857
6/30/2020	Assumptions	15	12	(273,516)	(262,852)	(25,782)
6/30/2019	Liability (Gain)/Loss	15	11	2,675,755	2,457,694	259,215
6/30/2019	Assumptions	15	11	2,564,505	2,355,506	248,437
6/30/2018	Liability (Gain)/Loss	15	10	1,628,720	1,418,105	162,156
6/30/2018	Assumptions	15	10	(67,964)	(59,178)	(6,767)
6/30/2017	7/1/2017 UAAL	20	13	8,013,534	6,622,251	608,255
				$14,395,759	$13,807,837	$ (474,853)

[1] Re-established amount includes prior outstanding Asset (Gain)/Loss bases established prior to 6/30/2022 (gain of $9,374,852), FYE 2022 AVA Asset (Gain)/Loss plus other adjustments to reflect funded status.
[2] Reflecting experience through June 30, 2023

Development of GASB 68 Net Pension Expense

Calculation Details

The expense amounts shown below have been prepared for GASB 68 reporting purposes for the fiscal year ending June 30, 2024 based on a Valuation Date of July 1, 2023 and Measurement period of July 1, 2022 to June 30, 2023

The following table illustrates the Net Pension Liability under GASB 68.

	Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1) Pension Liability		
(a) Retired Participants and Beneficiaries Receiving Payment	$ 15,248,319	$ 16,942,935
(b) Terminated Vested	24,003,797	25,811,785
(c) Active Participants		
(i) Part-time Actives	7,490,720	14,119,405
(ii) Full-time Actives	14,441,557	11,002,359
(iii) Active Subtotal	$ 21,932,277	$ 25,121,764
(d) Total	$ 61,184,393	$ 67,876,484
(2) Plan Fiduciary Net Position	51,015,884	59,186,816
(3) Net Pension Liability	$ 10,168,509	$ 8,689,668
(4) Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	83.38%	87.20%
(5) Deferred Outflow of Resources for Contributions Made After Measurement Date	$ 3,755,492	TBD

Expense

The following table illustrates the Pension expense under GASB 68.

	Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1) Service Cost	$ 1,621,033	$ 2,012,827
(2) Interest Cost	3,557,579	3,684,575
(3) Expected Investment Return	(3,693,443)	(3,127,539)
(4) Employee Contributions	(2,107,867)	(2,523,702)
(5) Administrative Expense	425,459	398,714
(6) Other	0	0
(7) Plan Changes	0	0
(8) Amortization of Unrecognized		
(a) Liability (Gain)/Loss	1,344,429	1,862,736
(b) Asset (Gain)/Loss	650,959	369,412
(c) Assumption Change (Gain)/Loss	499,220	339,519
(9) Total Expense	$ 2,297,369	$ 3,016,542

Shown below are details regarding the calculation of Service Cost, Interest Cost and Expected Investment Return components of the Expense.

	Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1) Development of Service Cost:		
(a) Normal Cost at Beginning of Measurement Period	$ 1,621,033	$ 2,012,827
(2) Development of Interest Cost:		
(a) Total Pension Liability at Beginning of Measurement Period	$ 59,915,382	$ 61,184,393
(b) Normal Cost at Beginning of Measurement Period	1,621,033	2,012,827
(c) Actual Benefit Payments	(4,553,205)	(3,628,160)
(d) Discount Rate	6.00%	6.00%
(e) Interest Cost	$ 3,557,579	$ 3,684,575
(3) Development of Expected Investment Return:		
(a) Plan Fiduciary Net Position at Beginning of Measurement Period	$ 61,424,642	$ 51,015,884
(b) Actual Contributions—Employer	3,140,160	3,755,492
(c) Actual Contributions—Employee	2,107,867	2,523,702
(d) Actual Benefit Payments	(4,553,205)	(3,628,160)
(e) Administrative Expenses	(425,459)	(398,714)
(f) Other	0	0
(g) Expected Return on Assets	6.00%	6.00%
(h) Expected Return	$ 3,693,443	$ 3,127,539

Reconciliation of Net Pension Liability

Shown below are details regarding the Total Pension Liability, Plan Fiduciary Net Position, and Net Pension Liability for the Measurement Period from July 1, 2022 to July 1, 2023:

	Increase (Decrease)		
	Total Pension Liability (a)	**Plan Fiduciary Net Position (b)**	**Net Pension Liability (c) = (a) – (b)**
Balance Recognized at 6/30/2023 (Based on 7/1/2022 Measurement Date)	$ 61,184,393	$ 51,015,884	$ 10,168,509
Changes Recognized for the Fiscal Year:			
Service Cost	$ 2,012,827	N/A	$ 2,012,827
Interest on the Total Pension Liability	3,684,575	N/A	3,684,575
Changes of Benefit Terms	0	N/A	0
Differences Between Expected and Actual Experience	4,622,849	N/A	4,622,849
Changes of Assumptions	0	N/A	0
Benefit Payments	(3,628,160)	(3,628,160)	0
Contributions From the Employer	N/A	3,755,492	(3,755,492)
Contributions From the Employee	N/A	2,523,702	(2,523,702)
Net Investment Income	N/A	5,918,612	(5,918,612)
Administrative Expense	N/A	(398,714)	398,714
Other	N/A	0	0
Net Changes	$ 6,692,091	$ 8,170,932	$ (1,478,841)
Balance Recognized at 6/30/2024 (Based on 7/1/2023 Measurement Date)	$ 67,876,484	$ 59,186,816	$ 8,689,668

Liability (Gain)/Loss

The following table illustrates the liability gain/loss under GASB 68.

		Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1)	Pension Liability at Beginning of Measurement Period	$ 59,915,382	$ 61,184,393
(2)	Service Cost	1,621,033	2,012,827
(3)	Interest on the Total Pension Liability	3,557,579	3,684,575
(4)	Changes of Benefit Terms	0	0
(5)	Changes of Assumptions	(61,072)	0
(6)	Benefit Payments	(4,553,205)	(3,628,160)
(7)	Expected Pension Liability at End of Measurement Period	$ 60,479,717	$ 63,253,635
(8)	Actual Pension Liability at End of Measurement Period	61,184,393	67,876,484
(9)	Pension Liability (Gain)/Loss	$ 704,676	$ 4,622,849
(10)	Average Future Working Life Expectancy	8.25	8.06
(11)	Pension Liability (Gain)/Loss Amortization	$ 85,415	$ 573,554

Asset (Gain)/Loss

The following table illustrates the asset gain/loss under GASB 68.

		Fiscal Year Ending 6/30/2023	Fiscal Year Ending 6/30/2024
(1)	Pension Asset at Beginning of Measurement Period	$ 61,424,642	$ 51,015,884
(2)	Contributions—Employer	3,140,160	3,755,492
(3)	Contributions—Employee	2,107,867	2,523,702
(4)	Expected Investment Income	3,693,443	3,127,539
(5)	Benefit Payments	(4,553,205)	(3,628,160)
(6)	Administrative Expense	(425,459)	(398,714)
(7)	Other	0	0
(8)	Expected Pension Asset at End of Measurement Period	$ 65,387,448	$ 56,395,743
(9)	Actual Pension Asset at End of Measurement Period	51,015,884	59,186,816
(10)	Pension Asset (Gain)/Loss	$ 14,371,564	$ (2,791,073)
(11)	Amortization Factor	5.00	5.00
(12)	Pension Asset (Gain)/Loss Amortization	$ 2,874,313	$ (558,215)

Deferred Outflows/Inflows

The following table illustrates the Deferred Inflows and Outflows as of June 30, 2024 under GASB 68.

		Deferred Outflows	Deferred Inflows
(1)	Difference Between Actual and Expected Experience	$ 8,244,465	$ 208,431
(2)	Net Difference Between Expected and Actual Earnings on Pension Plan Investments	2,074,476	0
(3)	Assumption Changes	1,374,601	284,587
(4)	Sub Total	$ 11,693,542	$ 493,018
(5)	Contributions Made in Fiscal Year Ending 6/30/2024 After Measurement Date	TBD	N/A
(6)	Total	$ TBD	$ 493,018

Amortization of Deferred Inflows/Outflows

The table below lists the amortization bases included in the deferred inflows/outflows as of June 30, 2024.

Date		Period		Balance		Annual
Established	Type of Base	Original	Remaining	Original	Remaining	Payment
6/30/2023	Liability (Gain)/Loss	8.06	7.06	$ 4,622,849	$ 4,049,295	$ 573,554
6/30/2023	Asset (Gain)/Loss	5.00	4.00	(2,791,073)	(2,232,858)	(558,215)
6/30/2022	Liability (Gain)/Loss	8.25	6.25	704,676	533,846	85,415
6/30/2022	Asset (Gain)/Loss	5.00	3.00	14,371,564	8,622,938	2,874,313
6/30/2022	Assumption Change	8.25	6.25	(61,072)	(46,266)	(7,403)
6/30/2021	Liability (Gain)/Loss	9.04	6.04	2,831,731	1,891,996	313,245
6/30/2021	Asset (Gain)/Loss	5.00	2.00	(11,287,727)	(4,515,092)	(2,257,545)
6/30/2021	Assumption Change	9.04	6.04	118,669	79,288	13,127
6/30/2020	Liability (Gain)/Loss	9.31	5.31	(365,443)	(208,431)	(39,253)
6/30/2020	Asset (Gain)/Loss	5.00	1.00	997,436	199,488	199,487
6/30/2020	Assumption Change	9.31	5.31	(258,607)	(147,499)	(27,777)
6/30/2019	Liability (Gain)/Loss	8.78	3.78	2,732,087	1,176,227	311,172
6/30/2019	Asset (Gain)/Loss	5.00	0.00	556,864	0	111,372
6/30/2019	Assumption Change	8.78	3.78	2,985,149	1,285,179	339,994
6/30/2018	Liability (Gain)/Loss	8.07	2.07	1,620,937	415,777	200,860
6/30/2018	Assumption Change	8.07	2.07	39,510	10,134	4,896
6/30/2017	Liability (Gain)/Loss	7.97	0.97	1,456,980	177,324	182,808
6/30/2017	Assumption Change	7.97	0.97	(746,218)	(90,822)	(93,628)
6/30/2016	Liability (Gain)/Loss	7.97	0.00	1,524,469	0	185,537
6/30/2016	Assumption Change	7.97	0.00	(594,082)	0	(72,302)
6/30/2015	Liability (Gain)/Loss	8.53	0.00	795,023	0	49,398
6/30/2015	Assumption Change	8.53	0.00	2,939,020	0	182,612
	Total Charges			$ 22,192,742	$ 11,200,524	$ 2,571,667

Amounts Recognized in the deferred outflows of resources and deferred inflows of resources related to Pension will be recognized in the Pension expense as follows:

Year End June 30:

2025	$	2,112,373
2026	$	1,826,381
2027	$	3,892,570
2028	$	860,603
2029	$	910,908
Thereafter	$	1,597,689
Total	$	11,200,524

Plan Fiduciary Net Position Projection

The following table illustrates the projection of the fiduciary net position for use in the calculation of the discount rate as of June 30, 2024.

($ in thousands)

Year Ending June 30[2]	Beginning Fiduciary Net Position (a)	Total Contributions (b)	Benefit Payments (c)	Administrative Expenses (d)	Investment Earnings (e)	Ending Fiduciary Net Position[1] (f)
2024	$59,187	$6,455	$4,152	$303	$3,613	$64,799
2025	64,799	2,116	3,534	311	3,838	66,908
2026	66,908	2,005	3,467	321	3,963	69,088
2027	69,088	1,769	3,620	330	4,082	70,987
2028	70,987	1,701	3,752	339	4,189	72,787
2029	72,787	2,729	3,914	349	4,323	75,576
2030	75,576	3,169	4,044	360	4,499	78,840
2031	78,840	3,229	4,129	371	4,694	82,264
2032	82,264	3,306	4,158	383	4,901	85,929
2033	85,929	3,389	4,256	395	5,120	89,787
2034	89,787	3,478	4,327	408	5,352	93,881
2035	93,881	3,362	4,498	422	5,588	97,912
2036	97,912	2,748	4,625	436	5,808	101,406
2037	101,406	2,775	4,694	450	6,016	105,052
2038	105,052	2,037	4,825	464	6,208	108,006
2039	108,006	2,084	4,900	479	6,384	111,095
2040	111,095	2,166	4,998	495	6,568	114,336
2041	114,336	2,254	5,070	511	6,763	117,772
2042	117,772	2,293	5,307	527	6,963	121,193
2043	121,193	2,404	5,354	543	7,169	124,870
2044	124,870	2,492	5,428	561	7,390	128,762
2045	128,762	2,560	5,461	579	7,624	132,907
2046	132,907	2,637	5,575	598	7,871	137,243
2047	137,243	2,742	5,646	616	8,132	141,854
2048	141,854	2,811	5,789	637	8,406	146,644
2049	146,644	2,907	5,837	658	8,694	151,751
2050	151,751	3,036	5,913	680	9,001	157,195
2051	157,195	3,176	6,030	702	9,328	162,967
2052	162,967	3,287	6,081	725	9,675	169,123
2053	169,123	3,391	6,208	749	10,043	175,601

[1] (f)=(a) + (b) – (c) – (d) + (e)
[2] Years later than 2053 were omitted from this table.

Plan Fiduciary Net Position

The last year in which projected benefit payments are due from the Plan is 2121.

The Plan's projected fiduciary net position is not projected to reach $0.

As such, the Plan's fiduciary net position was projected to be available to make all projected future benefit payments for current Plan members. In other words, there is no projected "depletion date" when projected benefits are not covered by projected assets. Therefore, the long-term expected rate of return on Plan investments of 6.00% per annum was applied to all periods of projected benefit payments to determine the total Pension liability as of June 30, 2024 shown earlier in this report, pursuant to paragraph 30 of GASB Statement No. 68.

Asset Projection Basis

In projecting the Plan's fiduciary net position, the following assumptions were made:

1. Interest rate for discounting was 6.00% per annum.

2. Projected total contributions are employer and employee contributions to the unfunded actuarial accrued liability and normal cost (for the current active population only). Contributions are assumed to be paid mid-year.

3. Projected employee contributions to the plan are 3.75% of compensation.

4. Assumed contributions are based on the County of Riverside continuing to follow the current funding policy.

5. Projected benefit payments have been determined in accordance with Paragraph 39 of GASB Statement No. 67, and are based on the closed group of active, inactive vested, retired members and beneficiaries as of June 30, 2023. Benefit payments are assumed to be paid mid-year.

6. Administrative expenses are assumed to be $303,000 per year increased with inflation at 2.3% per year and pro-rated based on projected proportion of headcount that relates to current population.

Interest Rate Sensitivity

The following table illustrates the impact of interest rate sensitivity on the Net Pension Liability for fiscal year ending June 30, 2023:

	1% Decrease (5.00%)	Current Rate (6.00%)	1% Increase (7.00%)
(1) Total Pension Liability	$ 71,135,113	$ 61,184,393	$ 53,346,979
(2) Plan Fiduciary Net Position	51,015,884	51,015,884	51,015,884
(3) Net Pension Liability	$ 20,119,229	$ 10,168,509	$ 2,331,095

The following table illustrates the impact of interest rate sensitivity on the Net Pension Liability for fiscal year ending June 30, 2024:

	1% Decrease (5.00%)	Current Rate (6.00%)	1% Increase (7.00%)
(1) Total Pension Liability	$ 79,300,347	$ 67,876,484	$ 58,964,588
(2) Plan Fiduciary Net Position	59,186,816	59,186,816	59,186,816
(3) Net Pension Liability	$ 20,113,531	$ 8,689,668	$ (222,228)

Disclosure—Changes in the Net Pension Liability and Related Ratios

Changes in the Net Pension Liability and Related Ratios[1]

	Fiscal Year Ending				
	2015	2016	2017	2018	2019
Total Pension Liability					
Service Cost	$ 1,556,594	$ 1,511,755	$ 1,717,422	$ 1,913,998	$ 1,299,918
Interest Cost	1,800,053	1,983,322	2,186,254	2,358,408	2,547,913
Changes of Benefit Terms	0	0	0	0	0
Differences Between Expected and Actual Experiences	1,146,168	795,023	1,524,469	1,456,980	1,620,937
Changes of Assumptions	0	2,939,020	(594,082)	(746,218)	39,510
Benefit Payments	(1,761,676)	(1,511,284)	(1,506,614)	(1,757,166)	(1,726,399)
Net Change in Total Pension Liability	$ 2,741,139	$ 5,717,836	$ 3,327,449	$ 3,226,002	$ 3,781,879
Total Pension Liability (Beginning)	27,003,504	29,744,643	35,462,479	38,789,928	42,015,930
Total Pension Liability (Ending)	$ 29,744,643	$ 35,462,479	$ 38,789,928	$ 42,015,930	$ 45,797,809
Plan Fiduciary Net Position					
Contributions—Employer	$ 955,554	$ 606,694	$ 667,952	$ 1,341,340	$ 815,531
Contributions—Member	1,394,450	1,266,962	1,399,254	1,674,410	1,632,926
Net Investment Income	4,437,066	131,206	(116,966)	4,288,900	3,647,640
Benefit Payments	(1,761,676)	(1,511,284)	(1,506,614)	(1,757,166)	(1,726,399)
Administrative Expense	(227,581)	(217,041)	(188,657)	(127,973)	(347,081)
Other	0	0	0	0	0
Net Change in Plan Fiduciary Net Position	$ 4,797,813	$ 276,537	$ 254,969	$ 5,419,511	$ 4,022,617
Plan Fiduciary Net Position (Beginning)	26,804,528	31,602,341	31,878,878	32,133,847	37,553,358
Plan Fiduciary Net Position (Ending)	$ 31,602,341	$ 31,878,878	$ 32,133,847	$ 37,553,358	$ 41,575,975
Net Pension Liability (Ending)	$ (1,857,698)	$ 3,583,601	$ 6,656,081	$ 4,462,572	$ 4,221,834
Net Position as a Percentage of Pension Liability	106.25%	89.89%	82.84%	89.38%	90.78%
Covered-Employee Payroll	$ 29,516,733	$ 23,120,653	$ 33,058,770	$ 34,610,720	$ 29,381,080
Net Pension Liability as a Percentage of Payroll	6.29%	15.50%	20.13%	12.89%	14.37%

[1] GASB 68 was effective first for employer fiscal years beginning after June 15, 2014.

Disclosure—Changes in the Net Pension Liability and Related Ratios

Changes in the Net Pension Liability and Related Ratios[1]

	Fiscal Year Ending				
	2020	2021	2022	2023	2024
Total Pension Liability					
Service Cost	$ 1,082,026	$ 1,255,013	$ 1,099,119	$ 1,621,033	$ 2,012,827
Interest Cost	2,747,097	3,200,332	3,289,615	3,557,579	3,684,575
Changes of Benefit Terms	0	0	0	0	0
Differences Between Expected and Actual Experiences	2,732,087	(365,443)	2,831,731	704,676	4,622,849
Changes of Assumptions	2,985,149	(258,607)	118,669	(61,072)	0
Benefit Payments	(2,222,152)	(2,107,016)	(2,270,047)	(4,553,205)	(3,628,160)
Net Change in Total Pension Liability	$ 7,324,207	$ 1,724,279	$ 5,069,087	$ 1,269,011	$ 6,692,091
Total Pension Liability (Beginning)	45,797,809	53,122,016	54,846,295	59,915,382	61,184,393
Total Pension Liability (Ending)	$ 53,122,016	$ 54,846,295	$ 59,915,382	$ 61,184,393	$ 67,876,484
Plan Fiduciary Net Position					
Contributions—Employer	$ 831,825	$ 811,519	$ 2,281,929	$ 3,140,160	$ 3,755,492
Contributions—Member	1,701,351	1,722,324	2,268,481	2,107,867	2,523,702
Net Investment Income	1,939,447	1,622,054	14,068,526	(10,678,121)	5,918,612
Benefit Payments	(2,222,152)	(2,107,016)	(2,270,047)	(4,553,205)	(3,628,160)
Administrative Expense	(251,756)	(257,402)	(290,416)	(425,459)	(398,714)
Other	0	0	0	0	0
Net Change in Plan Fiduciary Net Position	$ 1,998,715	$ 1,791,479	$ 16,058,473	$ (10,408,758)	$ 8,170,932
Plan Fiduciary Net Position (Beginning)	41,575,975	43,574,690	45,366,169	61,424,642	51,015,884
Plan Fiduciary Net Position (Ending)	$ 43,574,690	$ 45,366,169	$ 61,424,642	$ 51,015,884	$ 59,186,816
Net Pension Liability (Ending)	$ 9,547,326	$ 9,480,126	$ (1,509,260)	$ 10,168,509	$ 8,689,668
Net Position as a Percentage of Pension Liability	82.03%	82.72%	102.52%	83.38%	87.20%
Covered-Employee Payroll	$ 32,096,397	$ 27,012,910	$ 32,217,343	$ 23,507,247	$ 40,675,747
Net Pension Liability as a Percentage of Payroll	29.75%	35.09%	-4.68%	43.26%	21.36%

[1] GASB 68 was effective first for employer fiscal years beginning after June 15, 2014.

Disclosure—Contribution Schedule

Contributions

	Fiscal Year Ending				
	2015	2016	2017	2018	2019
Actuarially Determined Contribution	$ 252,273	$ 122,127	$ 727,119	$ 656,930	$ 610,522
Contributions Made in Relation to the Actuarially Determined Contribution	$ 606,694	$ 667,952	$ 1,341,340	$ 815,531	$ 831,825
Contribution Deficiency (Excess)	$ (354,421)	$ (545,825)	$ (585,457)	$ (158,601)	$ (221,303)
Covered-Employee Payroll[1]	$ 37,918,375	$ 41,747,000	$ 44,650,933	$ 43,544,693	$ 50,109,940
Contributions as a Percentage of Payroll	1.60%	1.60%	3.00%	1.87%	1.66%

	Fiscal Year Ending				
	2020	2021	2022	2023	2024
Actuarially Determined Contribution	$ 474,617	$ 1,325,770	$ 1,547,637	$ 0	0
Contributions Made in Relation to the Actuarially Determined Contribution	$ 811,519	$ 2,281,929	$ 3,140,160	$ 3,755,492	TBD
Contribution Deficiency (Excess)	$ (336,902)	$ (956,159)	$ (1,592,523)	$ (3,755,492)	TBD
Covered-Employee Payroll[1]	$ 53,040,458	$ 56,764,403	$ 56,275,269	$ 67,302,724	$ TBD
Contributions as a Percentage of Payroll	1.53%	4.02%	5.58%	5.58%	TBD

Schedule of Investment Returns

The follow exhibit is a 10-year history of Investment Returns.

Year Ending June 30,	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Annual Money-Weighted Rate of Return, Net of Investment Expense	16.5%	0.41%	(0.36%)	13.12%	9.66%	4.66%	3.72%	30.35%	(17.35%)	11.35%

These schedules are presented to illustrate the requirement to show information for 10 years.

[1] Covered-Employee Payroll represents the total compensation over the Measurement Period

Disclosure—Contribution Schedule

Notes to Schedule:

Valuation Date:	Actuarially determined contribution rates are calculated as of June 30, one year prior to the end of the fiscal year in which contributions are reported.

Methods and assumptions used to determine contribution rates:

Actuarial Cost Method	Projected Unit Credit with amortization of 7/1/2017 unfunded liability over a period ending 6/30/2037 and amortization of subsequent unanticipated changes in liability over 15-year periods and any asset gain/loss over 5-year periods.
Asset Valuation Method	Smoothed market value
Salary Increases	2.80% per annum
Investment Rate of Return	6.00%, net of Pension plan investment expense, including inflation.
Retirement Age	See assumption section
Mortality	Pub-2010 amount-weighted tables for General employees of all income levels, projected using improvement scale MP2021 from 2010

Participant Information

The below exhibits summarize participant demographic information as of June 30, 2023.

Number of Participants:	
Actives	2,331
Full-time Actives (not accruing benefits)[1]	5,708
Deferred Vested	3,051
Retirees	548
Total	11,638
Participant Compensation – Active Participants Currently Accruing Benefits	
Compensation (prior year)	$40,675,747
Number of Active Participants below assumed retirement age	2,302
Average Compensation	$17,450
Actives	
Average Age	39.46
Average Benefit Service (years)	2.37
Full-time Actives	
Average Age	43.05
Average Accrued Annual Benefit	$593
Deferred Vested	
Average Age	47.38
Average Accrued Annual Benefit	$1,646
Retired	
Average Age	73.15
Average Annual Benefit	$3,302

Reconciliation of Participants from Prior Valuation

	Actives	Full-time Actives	Terminated Vesteds	Retirees and Beneficiaries	Totals
As of July 1, 2022	2,282	5,810	3,367	495	11,954
Classification Change	(255)	255	n/a	n/a	0
New Entrants	1,158	544	94	0	1,796
Vested Terminations	(244)	(392)	636	0	0
Rehires	31	27	(58)	0	0
Retired	(5)	(7)	(55)	67	0
Deaths	0	0	0	(14)	(14)
Lump Sum Cashouts	(794)	(371)	(933)	0	(2,098)
Data Correction	158	(158)	0	0	0
Net Change	49	(102)	(316)	53	(316)
As of July 1, 2023	**2,331**	**5,708**	**3,051**	**548**	**11,638**

[1] Participants who become full-time employees and transfer to CalPERS are no longer accruing a benefit under the plan.

Active Age Distribution as of July 1, 2023

Age	Number of Participants
15-19	37
20-24	309
25-29	459
30-34	371
35-39	253
40-44	180
45-49	155
50-54	134
55-59	117
60-64	127
65-69	97
70-74	63
75 +	29
Total	2,331

Active Career Earnings Distribution as of July 1, 2023

Career Earnings	Number of Participants
Under $5,000	839
$5,000 - $10,000	425
$10,000 - $25,000	384
$25,000 - $50,000	181
$50,000 - $100,000	173
Over $100,000	329
Total	2,331

Development of GASB 68 Amortization Period for Changes in Liability

	July 1, 2022		July 1, 2023	
Status	**Count**	**Average Future Working Life**	**Count**	**Average Future Working Life**
1. Actives	2,282	0.84	2,331	0.90
2. Actives not accruing benefits	5,810	16.26	5,708	16.15
3. Deferred Vested Terminated	3,367	0.00	3,051	0.00
4. Retirees	495	0.00	548	0.00
5. Total/Weighted Average	11,954	8.06	11,638	8.10

Summary of Principal Plan Provisions

1. Membership Requirements

All employees of the County not covered by another retirement plan as provided by Code Section 3121(b)(7)(F).

2. Career Compensation

Total amount of compensation, limited annually by the Social Security Wage Base.

3. Normal or Late Retirement Benefit

Eligibility: Age 65

Benefit: 2% times Career Compensation, payable as a single life annuity.

4. Pre-Retirement Death Benefit

Refund of contributions accumulated with interest at 5% per annum.

5. Death after Retirement

None. Benefits are payable for the life of the employee only.

6. Termination Benefit

Normal retirement benefit accrued to date of termination.

A lump sum distribution is paid if the actuarial equivalent benefit is less than $5,000. Actuarial Equivalence for this purpose is based on the greater of the factor produced under the UP1984 unisex mortality table at 6% or the applicable mortality table and interest rate under 417(e).

7. Vesting

Benefits are 100% vested immediately.

8. Member Contributions

3.75% of compensation per pay period.

Actuarial Assumptions and Methods

1. Actuarial Cost Method

Actuarially Determined Contributions – Projected Unit Credit

GASB 68 – Entry Age Normal

2. Funding Contribution Methodology

Funding contributions are based on the sum of:

<u>Ongoing accruals</u>

a) Normal Cost with interest and administrative expense, less
b) Expected Employee Contributions

<u>Plus, Amortization of unfunded liabilities</u>

c) Amortization of July 1, 2017 Unfunded Actuarial Accrued Liability (UAAL) over the period ending June 30, 2037, plus
d) Amortization of subsequent unanticipated changes in liability (i.e., actuarial gains / losses and changes in assumptions) over 15-year periods and unanticipated changes in assets over 5-year periods.

3. Interest Rates

Funding Interest Rate – 6.00%
Used as the asset return assumption and based on the long term expected return on plan assets.

GASB 68 Discount Rate – 6.00%
The discount rate is based on a single equivalent rate that reflects a blend of:

- Expected return on assets during the period such that assets are projected to be sufficient to pay benefits of current participants (6.00%); and
- Municipal bond index for periods beyond the depletion of assets (3.65%).

Based on the current funding policy, projected cash flows, and the assumed asset return, the plan assets are not projected to be depleted, and the discount rate can be based on the 6.00% asset return.

4. Salary Increases

2.80% per year

5. Payroll Growth (used for amortization of unfunded liability)

2.80% per year (same as CalPERS assumption)

6. Mortality

Pub-2010 amount-weighted tables for General employees of all income levels, projected using improvement scale MP-2021 from 2010.

Sample rates for the 2010 base year are as follows:

Age	Male	Female
30	0.04%	0.02%
40	0.07%	0.04%
50	0.30%	0.02%
60	0.61%	0.38%
70	0.70%	0.49%
80	1.73%	1.33%
90	14.67%	11.49%

7. Termination Rates

Actives (accruing benefits)

	Years of Service	
Attained Age	**0-2**	**2+**
20-24	65%	65%
25-29	65%	55%
30-34	65%	50%
35-39	65%	50%
40-44	65%	40%
45-49	65%	40%
50-54	55%	40%
55-59	50%	35%
60-64	50%	30%

Full-time Actives (no longer accruing benefits)

Turnover rates for male and female active participants developed in the 2021 CalPERS Experience Study for Miscellaneous were used in the valuation.

The following sample rates for male actives are based on age and service:

Attained	Years of Service						
Age	**0 – 1**	**5**	**10**	**15**	**20**	**25**	**30**
30	16.31%	8.04%	3.77%	1.80%	0.00%	0.00%	0.00%
35	14.93%	7.15%	3.66%	1.80%	1.41%	0.00%	0.00%
40	14.90%	6.27%	3.37%	1.80%	1.41%	0.84%	0.00%
45	14.87%	5.62%	3.09%	1.66%	1.41%	0.84%	0.47%
50	15.09%	4.97%	2.45%	1.52%	1.10%	0.84%	0.47%
55	15.30%	4.61%	1.81%	1.19%	0.79%	0.64%	0.47%

The following sample rates for female actives are based on age and service:

Attained Age	Years of Service 0 – 1	5	10	15	20	25	30
30	18.24%	10.41%	5.02%	2.52%	0.00%	0.00%	0.00%
35	17.49%	9.25%	4.91%	2.52%	1.75%	0.00%	0.00%
40	17.31%	8.09%	4.46%	2.52%	1.75%	1.08%	0.00%
45	17.13%	7.30%	4.01%	2.13%	1.75%	1.08%	0.56%
50	17.41%	6.50%	3.08%	1.74%	1.31%	1.08%	0.56%
55	17.69%	5.80%	2.15%	1.32%	0.87%	0.76%	0.56%

8. Retirement Rates

Actives (accruing benefits)

Attained Age	Probability of Retirement
65-66	60%
67-74	50%
75+	100%

Full-time Actives (no longer accruing benefits)

Retirement rates developed in the 2021 CalPERS Experience Study for Miscellaneous were used in the valuation. Applicable retirement rate table is based on employee date of hire, as summarized below:

- Hire date prior to August 24, 2012: Miscellaneous 3% @ 60 rates
- Hire date August 24, 2012 to December 31, 2012: Miscellaneous 2% @ 60 rates
- Hire date post December 31, 2012: Miscellaneous 2% @ 62 rates

Sample rates from the ‘Miscellaneous 3% @ 60 table’ are as follows:

Attained Age	Years of Service 5	10	15	20	25	30	35
<65	N/A	N/A	N/A	N/A	N/A	N/A	N/A
65	15.20%	20.10%	26.20%	29.90%	32.30%	32.30%	32.30%
70	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%	24.50%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Sample rates from the ‘Miscellaneous 2% @ 60 table’ are as follows:

Attained Age	Years of Service 5	10	15	20	25	30	35
<65	N/A	N/A	N/A	N/A	N/A	N/A	N/A
65	13.80%	16.00%	21.40%	21.60%	23.70%	28.30%	31.30%
70	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%	20.00%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Sample rates from the ‘Miscellaneous 2% @ 62 table’ are as follows:

Attained Age	Years of Service 5	10	15	20	25	30	35
<65	N/A	N/A	N/A	N/A	N/A	N/A	N/A
65	10.80%	14.10%	17.30%	20.60%	23.90%	30.00%	34.80%
70	12.00%	15.60%	19.30%	22.90%	26.50%	33.30%	38.70%
75	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

9. Value of Assets

Funding – Effective June 30, 2014, smoothed asset value, with differences between actual and expected earnings recognized over a 5-year period (with the first year of recognition being the period in which the Gain/(Loss) occurred), subject to an 80%-120% corridor around market value.

GASB 68 – Market value

10. Form of Benefit Paid

Lump sums paid immediately at termination for benefits with a present value less than $5,000. Single life annuities deferred to normal retirement age paid for benefits with a present value greater than $5,000.

11. Lump Sum Conversion Assumptions

Mortality – Current IRC section 417(e) table

Lump Sum Interest Rate – 4.00%
Used to estimate lump sum benefit amounts and based on the long term expected effective rate used for determining lump sums under plan provisions. Generally, this is based on high quality corporate bonds.

12. Administrative Expenses

Assumed $300,000 per year

13. Participants Valued

Only current active, full time active, terminated vested, retirees and beneficiaries of the plan as of June 30, 2023 are included in the valuation.

Changes in Assumptions and Methods Since the Prior Valuation

There are no assumptions or method changes since the prior valuation..

Appendix A – Estimated Annual Expense for FYE 2025

Development of Annual Expense FYE 2025 under GASB 68 (Estimate)

The estimated expense amount shown below has been prepared for GASB 68 for the fiscal year ending June 30, 2025.

The Actuarial Accrued Liability as of July 1, 2023 has been prepared using the Entry Age Normal cost method, as required by GASB 68. The following estimated expense amounts have been prepared based on a Valuation Date of July 1, 2023, Measurement Date of July 1, 2024 and interest rate of 6.00%.

The expense shown below will be updated in next year's report to reflect actual administrative costs, employee contributions, and any gains or losses with respect to assets and liabilities.

Unfunded Actuarial Accrued Liability, as of July 1, 2023		
Actuarial Accrued Liability as of 7/1/2023	$	67,876,484
Value of Plan Assets as of 7/1/2023		59,186,816
Unfunded Actuarial Accrued Liability (UAAL)	$	(8,689,668)
Estimated Annual Expense, FYE June 30, 2025[1]		
1. Service Cost	$	2,004,000
2. Interest Cost		4,070,000
3. Expected Return on Assets		(3,610,000)
4. Employee Contributions[2]		(2,594,000)
5. Administrative Expense		300,000
6. Plan Changes		-
7. Amortization of Unrecognized		
(a) Liability (Gain)/Loss		1,622,000
(b) Asset (Gain)/Loss		258,000
(c) Assumption Changes		232,000
(d) Total		2,112,000
8. Annual Expense	$	2,282,000

[1] Final FYE 2025 expense information will be provided in the actuarial valuation based on a June 30, 2024 measurement date reflecting updated census, assumptions, plan provisions and actual asset values, in addition to any asset, liability, or assumption gains/losses initially recognized over the period June 30, 2023 to June 30, 2024

[2] Employee contribution was estimated based on total compensation during FY2023, assuming a constant active population

Appendix B – Low-Default-Risk Obligation Measure (“LDROM”)

A key purpose of this report is to communicate an Actuarially Determined Contribution and Funded Percentage for the Part-time and Temporary Employees’ Retirement Plan. For both of these calculations, we use an Actuarial Accrued Liability that represents the present value of the portion of expected future benefit payments accrued under the plan’s actuarial cost method, discounted back to the valuation date using an asset return expectation of 6.00%. The asset return expectation is based on the plan’s diversified asset portfolio and long-term capital market return assumptions for the various asset classes represented in the portfolio. The objective of the portfolio is to maximize investment returns with a reasonable amount of risk.

For all funding valuations with measurement dates on or after February 15, 2023, and for which an actuarial report is issued on or after February 15, 2023, ASOP 4 now requires the calculation and disclosure of an additional measure of the plan’s liability using a discount rate or discount rates derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future.

This additional liability measure is referred to as the Low-Default-Risk Obligation Measure (LDROM). The LDROM shown in this report is based upon the Bond Buyer GO-20 index as of the measurement date, 3.65%, although other discount rates may also be appropriate for this purpose.

The LDROM can be thought of as a measure of what the plan’s funding liability would be if the plan were to use an ultra-low-risk investment policy. Since plan assets are not invested in an all-bond portfolio, the LDROM may not be appropriate for assessing funding status progress on an Actuarial Accrued Liability basis, necessary plan contributions, or the security of participant benefits.

All assumptions and methods other than the asset return assumption are the same for the calculation of Actuarial Accrued Liability and LDROM.

	Measurement Date July 1, 2023
LDROM	$ 100,503,734
Interest Rate	3.65%
Actuarial Cost Method	Entry Age Normal