Section 2

Actuarial Valuation as of June 30, 2019

for CalPERS

Miscellaneous Risk Pool

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

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Actuarial Certification

To the best of our knowledge, this **Section 2** report is complete and accurate and contains sufficient information to disclose, fully and fairly, the funded condition of the Miscellaneous Risk Pool. This valuation is based on the member and financial data as of June 30, 2019 provided by the various CalPERS databases and the benefits under this Risk Pool with CalPERS as of the date this report was produced. In the opinion of the actuaries whose signatures appear below, the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods are internally consistent and reasonable for this risk pool, as prescribed by the CalPERS Board of Administration according to provisions set forth in the California Public Employees' Retirement Law.

The undersigned are CalPERS staff actuaries, members of both the American Academy of Actuaries and the Society of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

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Highlights and Executive Summary

- **Introduction**
- **Purpose of Section 2**
- **Risk Pool's Required Employer Contribution**
- **Risk Pool's Normal Cost by Benefit Formula**
- **Funded Status of the Risk Pool**
- **Cost**
- **Changes Since the Prior Year's Valuation**
- **Subsequent Events**

Introduction

This Section 2 report presents the results of the June 30, 2019 actuarial valuation of the Miscellaneous Risk Pool of the California Public Employees' Retirement System (CalPERS). This report shows the required employer normal cost contribution rates and the risk pool's payment on amortization bases for fiscal year 2021-22 for plans participating in the risk pool.

The actuarial assumptions and methods used in CalPERS public agency valuations are approved by the Board of Administration upon the recommendation of the Chief Actuary. The assumptions and methods used for the Miscellaneous Risk Pool are provided in Appendix A.

Public Employees' Pension Reform Act of 2013 (PEPRA)

On January 1, 2013, the Public Employees' Pension Reform Act of 2013 (PEPRA) took effect. In addition to creating new retirement formulas for newly hired members, PEPRA also effectively closed all existing active risk pools to new employees. As such, it is no longer appropriate to assume that the payroll of the risk pools for the classic formulas will continue to grow at 2.75 percent annually. Funding the promised pension benefits as a percentage of payroll would lead to the underfunding of the plans. In addition, the current allocation of the existing unfunded liabilities based on payroll would create equity issues for employers within the risk pools. Furthermore, the declining payroll of the classic formula risk pools will lead to unacceptable levels of employer contribution volatility.

In order to address these issues, the CalPERS Board of Administration approved at their May 21, 2014 meeting structural changes to the risk pools. All pooled plans are combined into two active risk pools: one for all miscellaneous groups and one for all safety groups. By combining the risk pools this way, the payroll of the risk pools and the employers within the risk pools can be expected to increase at the assumed 2.75 percent annual growth. This change will allow the continuation of the level percent of payroll amortization method for applicable amortization bases.

Purpose of Section 2

This actuarial valuation for the Miscellaneous Risk Pool of the California Public Employees' Retirement System (CalPERS) was performed by CalPERS' staff actuaries using data as of June 30, 2019 in order to:

- Set forth the assets and accrued liabilities of this risk pool as of June 30, 2019
- Determine the minimum required contribution rate of the pool for the fiscal year July 1, 2021 through June 30, 2022
- Provide actuarial information as of June 30, 2019 to the CalPERS Board of Administration and other interested parties

The pension funding information presented in this report should not be used in financial reports subject to GASB Statement No. 68 for a Cost Sharing Employer Defined Benefit Pension Plan. A separate accounting valuation report for such purposes is available from CalPERS and details for ordering are available on our website.

The measurements shown in this actuarial valuation may not be applicable for other purposes. The employer should contact their 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: experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; changes in actuarial policies; and changes in plan provisions or applicable law.

Risk Pool's Required Employer Contribution

		Fiscal Year 2020-21		Fiscal Year 2021-22
Contribution in Projected Dollars				
a) Risk Pool's Normal Cost	$	458,877,681	$	471,767,122
b) Employee Contribution		184,498,681		193,480,221
c) Risk Pool's Employer Normal Cost [(a) - (b)]	$	274,379,000	$	278,286,901
d) Payment on Risk Pool's Amortization Bases		310,060,000		349,138,593
e) Total Required Employer Contribution* [(c) + (d)]	$	584,439,000	$	627,425,494

* Total may not add up due to rounding

Risk Pool's Normal Cost by Benefit Formula

	Benefit Formula					
Normal Cost Contribution as Percentage of Projected Payroll for Fiscal Year 2021-22	**2% at 62**	**2% at 60**	**2% at 55**	**2.5% at 55**	**2.7% at 55**	**3% at 60**
1) Total Normal Cost Contribution	14.34%	15.57%	17.25%	19.55%	21.31%	22.34%
2) Expected Employee Contribution	6.75%	6.92%	6.91%	7.96%	7.96%	7.80%
3) Total Employer Normal Cost Base Benefit [(1)-(2)]	7.59%	8.65%	10.34%	11.59%	13.35%	14.54%

Class 1 benefits as provided in Appendix C-1 are in addition to these costs.

Funded Status of the Risk Pool

		June 30, 2018		June 30, 2019
1. Present Value of Projected Benefits	$	20,780,297,491	$	21,858,404,639
2. Entry Age Accrued Liability	$	17,461,594,826	$	18,394,114,919
3. Market Value of Assets (MVA)	$	13,162,719,111	$	13,985,117,157
4. Unfunded Accrued Liability [(2) - (3)]		4,298,875,715		4,408,997,762
5. Funded Ratio [(3) / (2)]		75.4%		76.0%

The funded status shown above is the average for all plans in the risk pool. The funded status of an individual plan can be found in its Section 1 report.

This measure of funded status is an assessment of the need for future employer contributions based on the selected actuarial cost method used to fund the plans. The Unfunded Accrued Liability (UAL) is the present value of future employer contributions for service that has already been earned and is in addition to future normal cost contributions for active members. For a measure of funded status that is appropriate for assessing the sufficiency of plan assets to cover estimated termination liabilities, please see "Hypothetical Termination Liability" in the "Risk Analysis" section within the Section 1 report.

Cost

Actuarial Cost Estimates in General

Contributions to fund the pension plan are comprised of two components:

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

The Amortization of UAL component is expressed as a dollar amount and will be invoiced on a monthly basis. There will be an option to prepay this amount during July of each fiscal year.

The Normal Cost component will continue to be 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 (which include mortality rates, retirement rates, employment termination rates, disability rates)
- Economic assumptions (which include future investment earnings, inflation, salary growth rates)

These assumptions reflect CalPERS' best estimate of the future experience of the plan and are long term in nature. We recognize that all the assumptions will not be realized in any given year. For example, the investment earnings at CalPERS have averaged 5.8 percent over the 20 years ending June 30, 2019, yet individual fiscal year returns have ranged from -23.6 percent to +20.7 percent. In addition, CalPERS reviews all the actuarial assumptions on an ongoing basis by conducting in-depth experience studies every four years, with the most recent experience study completed in 2017.

Changes since the Prior Year's Valuation

Actuarial Methods and Assumptions

The CalPERS Board of Administration adopted a new amortization policy effective with this actuarial valuation. The new policy shortens the period over which actuarial gains and losses are amortized from 30 years to 20 years with the payments computed as a level dollar amount. In addition, the new policy does not utilize a 5-year ramp-up and ramp-down on UAL bases attributable to assumption and method changes and non-investment gains/losses. The new policy also does not utilize a 5-year ramp-down on investment gains/losses. These changes will apply only to new UAL bases established on or after June 30, 2019.

For inactive employers, the new amortization policy imposes a maximum amortization period of 15 years for all unfunded accrued liabilities effective June 30, 2017. Furthermore, the plan actuary has the ability to shorten the amortization period on any valuation date based on the life expectancy of plan members and projected cash flow needs of the plan.

Subsequent Events

The contribution requirements determined in this actuarial valuation report are based on demographic and financial information as of June 30, 2019. Changes in the value of assets subsequent to that date are not reflected. Investment returns below the assumed rate of return will increase future required contributions while investment returns above the assumed rate of return will decrease future required contributions.

The projected employer contributions on Page 6 of the Section 1 report are calculated under the assumption that the discount rate remains at 7.0 percent going forward and that the realized rate of return on assets for fiscal year 2019-20 is 7.0 percent.

This actuarial valuation report reflects statutory changes, regulatory changes and CalPERS Board actions through January 2020. Any subsequent changes or actions are not reflected.

Assets

- **Reconciliation of Risk Pool's Market Value of Assets**
- **Asset Allocation**
- **CalPERS History of Investment Returns**

Reconciliation of Risk Pool's Market Value of Assets

1.	Market Value of Assets as of June 30, 2018 including Receivables	$	13,162,719,111
2.	Change in Receivables for Service Buybacks		(1,470,749)
3.	Employer Contributions		599,538,036
4.	Employee Contributions		147,710,796
5.	Benefit Payments to Retirees and Beneficiaries		(769,851,201)
6.	Refunds		(15,515,736)
7.	Service Credit Purchase (SCP) Payments and Interest		6,444,710
8.	Administrative Expenses		(14,910,473)
9.	Transfers and Miscellaneous Adjustments		5,395,171
10.	Investment Return (Net of Investment Expenses)		865,057,493
11.	Market Value of Assets as of June 30, 2019 including Receivables		13,985,117,157

Asset Allocation

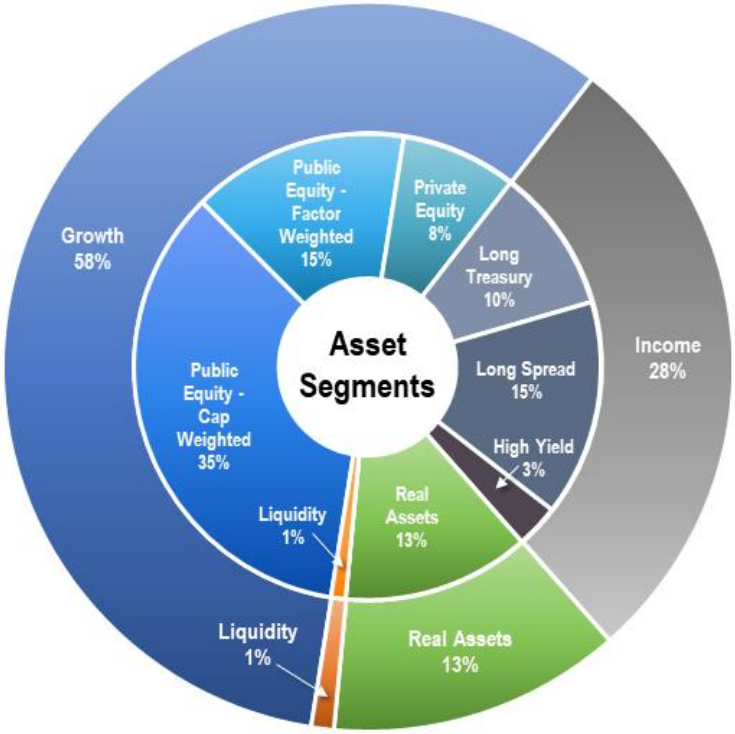
CalPERS adheres to an Asset Allocation Strategy which establishes asset class allocation policy targets and ranges and manages those asset class allocations within their policy ranges. CalPERS Investment Belief No. 6 recognizes that strategic asset allocation is the dominant determinant of portfolio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

The asset allocation shown below reflects the allocation of the Public Employees' Retirement Fund (PERF) in its entirety as of June 30, 2019. The assets for Miscellaneous Risk Pool are part of the PERF and are invested accordingly.

Asset Class	Actual Allocation	Policy Target Allocation
Public Equity	50.2%	50.0%
Private Equity	7.1%	8.0%
Global Fixed Income	28.7%	28.0%
Real Assets	11.0%	13.0%
Liquidity	1.0%	1.0%
Inflation Sensitive Assets	0.0%	0.0%
Trust Level[1]	2.0%	0.0%
Total Fund	**100.0%**	**100.0%**

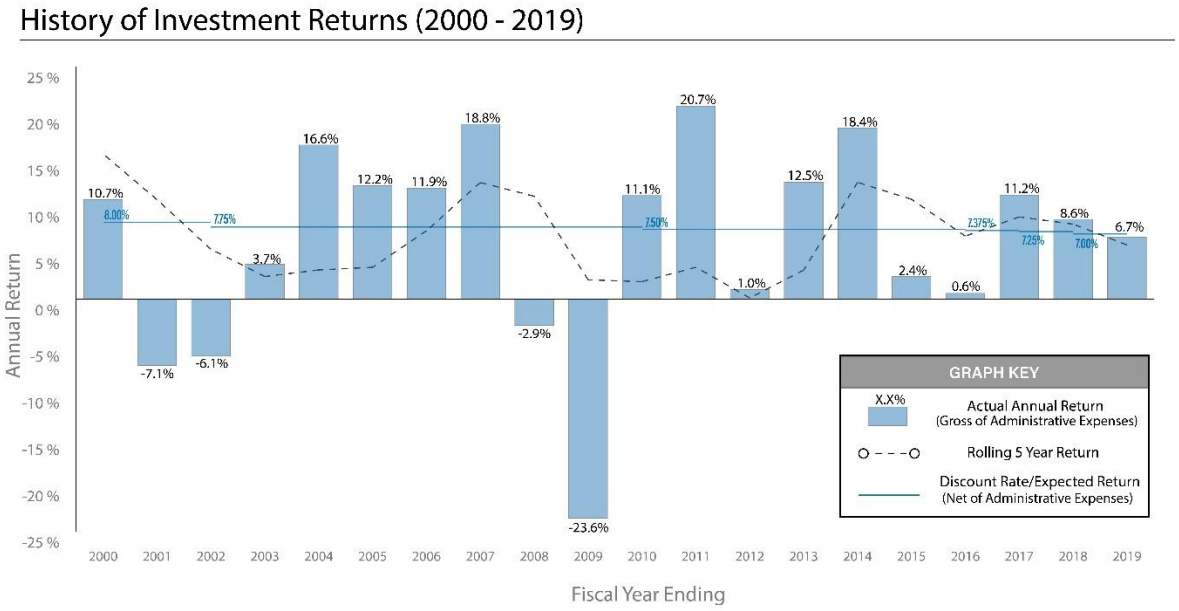
[1] Trust Level includes Multi-Asset Class, Completion Overlay, Risk Mitigation, Absolute Return Strategies, Plan Level Transition and other Total Fund level portfolios.

Strategic Asset Allocation Policy Targets



CalPERS History of Investment Returns

The following is a chart with the 20-year historical annual returns of the Public Employees' Retirement Fund for each fiscal year ending on June 30. Beginning in 2002, the figures are reported as gross of administrative expenses.



The table below shows historical compound annual returns of the Public Employees' Retirement Fund for various time periods ending on June 30, 2019 (figures are reported as gross of fees). The compound annual return is the average rate per year compounded over the indicated number of years. It should be recognized that in any given year the rate of return is volatile. The portfolio has an expected volatility of 11.4 percent per year based on the most recent Asset Liability Modelling study. The volatility is a measure of the risk of the portfolio expressed in the standard deviation of the fund's total return distribution, expressed as a percentage. Consequently, when looking at investment returns, it is more instructive to look at returns over longer time horizons.

History of CalPERS Compound Annual Rates of Return and Volatilities					
	1 year	**5 year**	**10 year**	**20 year**	**30 year**
Compound Annual Return	6.7%	5.8%	9.1%	5.8%	8.1%
Volatility	–	4.4%	6.9%	10.7%	9.8%

Liabilities and Contributions

- **Risk Pool's Accrued and Unfunded Liabilities**
- **(Gain)/Loss Analysis 06/30/18 – 06/30/19**
- **Risk Pool's Annual Required Contributions**
- **Risk Pool's Contribution History**
- **Funding History**

Risk Pool's Accrued and Unfunded Liabilities

			June 30, 2018		June 30, 2019
1.	Present Value of Projected Benefits				
	a) Active Members	$	9,413,557,735	$	9,692,420,115
	b) Transferred Members		1,370,179,613		1,388,113,715
	c) Separated Members		581,877,108		617,954,298
	d) Members and Beneficiaries Receiving Payments		9,414,683,035		10,159,916,511
	e) Total	$	20,780,297,491	$	21,858,404,639
2.	Present Value of Future Employer Normal Costs	$	1,893,245,120	$	1,950,470,588
3.	Present Value of Future Employee Contributions	$	1,425,457,545	$	1,513,819,132
4.	Entry Age Normal Accrued Liability				
	a) Active Members [(1a) - (2) - (3)]	$	6,094,855,070	$	6,228,130,395
	b) Transferred Members (1b)		1,370,179,613		1,388,113,715
	c) Separated Members (1c)		581,877,108		617,954,298
	d) Members and Beneficiaries Receiving Payments (1d)		9,414,683,035		10,159,916,511
	e) Total	$	17,461,594,826	$	18,394,114,919
5.	Market Value of Assets (MVA) Including Receivables	$	13,162,719,111	$	13,985,117,157
6.	Unfunded Accrued Liability [(4e) - (5)]		4,298,875,715		4,408,997,762
7.	Funded Ratio [(5) / (4e)]		75.4%		76.0%

The entry age accrued liability and unfunded accrued liability for the Pool include liabilities of new non-pooled plans that transferred into the Pool during the year. The entry age accrued liability of these new plans to the pool are not used in determining the allocations for plans already part of the pool as shown in a pooled plan's Section 1 Report.

(Gain)/Loss Analysis 06/30/18 – 06/30/19

To calculate the cost requirements of the pool, 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 06/30/18	$	4,298,875,715
b)	Expected Payment on the UAL during FY 2018-19		322,523,815
c)	Interest through 06/30/19 [.07 x (1a) - ((1.07)^{½} - 1) x (1b)]		289,823,887
d)	Expected UAL before all other changes [(1a) - (1b) + (1c)]		4,266,175,787
e)	Change due to plan Amendments		0
f)	Change due to plan Golden Handshakes and Service Purchases		900,289
g)	Transfers out of Risk Pool		1,238,023
h)	Transfers into Risk Pool		129,666
i)	Change due to assumption change		0
j)	Change due to method change		0
k)	Change due to excessive liability		857,967
l)	Expected UAL after all other changes [(1d)+(1e)+(1f)+(1g)+(1h)+(1i)+(1j)+(1k)]		4,269,301,732
m)	Actual UAL as of 06/30/19		4,408,997,762
n)	Total (Gain)/Loss for 2018-19 [(1m) - (1l)]	$	139,696,030
2.	**Asset (Gain)/Loss for the Year**		
a)	Market Value of Assets as of 06/30/18, including Receivables	$	13,162,719,111
b)	Transfers out of Pool		0
c)	Transfers into Pool		0
d)	Adjusted MVA at beginning of year [(2a) + (2b) + (2c)]		13,162,719,111
e)	Receivables PY		(23,258,950)
f)	Receivables CY		21,788,201
g)	Contributions Received		747,248,832
h)	Benefits and Refunds Paid		(785,366,937)
i)	Transfers and Miscellaneous Adjustments		11,839,882
j)	Expected Int. [.07 x ((2d)+(2e)) + ((1.07)^{½} - 1) x ((2g)+(2h)+(2i))]		918,858,029
k)	Expected Assets as of 06/30/19 [(2d)+(2e)+(2f)+(2g)+(2h)+(2i)+(2j)]		14,053,828,167
l)	Market Value of Assets as of 06/30/19, including Receivables		13,985,117,157
m)	Asset (Gain)/Loss [(2k) - (2l)]	$	68,711,010
3.	**Liability (Gain)/Loss for the Year**		
a)	Total (Gain)/Loss (1n)	$	139,696,030
b)	Asset (Gain)/Loss (2m)		68,711,010
c)	Liability (Gain)/Loss [(3a) - (3b)]	$	70,985,020

Items 1i, 1j, 2m, and 3c above were allocated on a proportional basis to each individual risk pooled plan. The allocation of each plan's share of the UAL is developed in Section 1 of the report.

(Gains)/losses for the Pool include plan (gains)/losses incurred by new non-pooled plans that transferred into the Pool during the year. The (gains)/losses of these new plans to the pool are not used in determining the allocations for plans already part of the pool as shown in a pooled plan's Section 1 Report

Risk Pool's Annual Required Contributions

		Fiscal Year 2020-21		Fiscal Year 2021-22
1. **Contribution in Projected Dollars**				
a) Total Normal Cost	$	458,877,681	$	471,767,122
b) Employee Contribution	$	184,498,681	$	193,480,221
c) Risk Pool's Employer Normal Cost [(1a) - (1b)]	$	274,379,000	$	278,286,901
d) Payment on Pool's Amortization Bases	$	310,060,000	$	349,138,593
e) Total Required Employer Contributions [(1c) + (1d)]	$	584,439,000	$	627,425,494
2. **Annual Covered Payroll as of Valuation Date**	$	2,359,859,508	$	2,482,824,265
3. **Projected Payroll for Contribution Fiscal Year**	$	2,559,950,926	$	2,693,341,809

Risk Pool's Contribution History

Valuation Date	Contribution Year	Projected Total Employer Normal Cost	Projected Payments on Risk Pool's Amortization Bases	Projected Total Employer Contribution	Actual Additional Discretionary Payment
06/30/2013	2015-16	$196,320,163	$160,711,302	$357,031,465	$29,291,579
06/30/2014	2016-17	$191,941,367	$175,416,476	$367,357,843	$82,440,377
06/30/2015	2017-18	$194,813,943	$201,429,027	$396,242,970	$67,116,678
06/30/2016	2018-19	$209,211,669	$239,409,456	$448,621,125	$76,726,801
06/30/2017	2019-20	$250,677,723	$282,330,885	$533,008,608	$100,570,553
06/30/2018	2020-21	$274,379,000	$310,060,000	$584,439,000	$120,507,790
06/30/2019	2021-22	$278,286,901	$349,138,593	$627,425,494	$141,821,231

Funding History

Valuation Date	Accrued Liabilities (AL)	Market Value of Assets (MVA)	Unfunded Accrued Liabilities (UAL)	Funded Ratio (MVA/AL)	Annual Covered Payroll	UAL as a % of Payroll
06/30/2013	$11,805,627,557	$9,093,458,815	$2,712,168,742	77.0%	$1,909,639,449	142.0%
06/30/2014	$13,137,020,035	$10,686,754,939	$2,450,265,096	81.3%	$1,982,241,289	123.6%
06/30/2015	$13,889,938,645	$10,919,134,771	$2,970,803,874	78.6%	$2,055,683,261	144.5%
06/30/2016	$14,775,287,594	$10,897,707,800	$3,877,579,794	73.8%	$2,153,642,973	180.0%
06/30/2017	$15,944,026,687	$12,162,131,074	$3,781,895,613	76.3%	$2,277,295,097	166.1%
06/30/2018	$17,461,594,826	$13,162,719,111	$4,298,875,715	75.4%	$2,359,859,508	182.2%
06/30/2019	$18,394,114,919	$13,985,117,157	$4,408,997,762	76.0%	$2,482,824,265	177.6%

Risk Analysis

- **Discount Rate Sensitivity**
- **Mortality Rate Sensitivity**
- **Maturity Measures**
- **Maturity Measures History**
- **Hypothetical Termination Liability**

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 4.50 percent and 2.50 percent, 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, 2019 assuming alternate discount rates by changing the two components independently. Results are shown using the current discount rate of 7.0 percent as well as alternate discount rates of 6.0 percent and 8.0 percent. The rates of 6.0 percent and 8.0 percent were selected since they illustrate the impact of a 1.0 percent increase or decrease to the 7.0 percent assumption.

This type of analysis gives the reader a sense of the long-term risk to required contributions. For a measure of funded status that is appropriate for assessing the sufficiency of plan assets to cover estimated termination liabilities, please see "Hypothetical Termination Liability" at the end of this section.

Sensitivity to the Real Rate of Return Assumption

As of June 30, 2019	1% Lower Real Return Rate	Current Assumptions	1% Higher Real Return Rate
Discount Rate	**6.0%**	**7.0%**	**8.0%**
Inflation	2.5%	2.5%	2.5%
Real Rate of Return	**3.5%**	**4.5%**	**5.5%**
a) Total Normal Cost	21.78%	17.50%	14.22%
b) Accrued Liability	$20,869,525,968	$18,394,114,919	$16,351,530,517
c) Market Value of Assets	$13,985,117,157	$13,985,117,157	$13,985,117,157
d) Unfunded Liability/(Surplus) [(b) - (c)]	$6,884,408,811	$4,408,997,762	$2,366,413,360
e) Funded Status	67.0%	76.0%	85.5%

Sensitivity to the Price Inflation Assumption

As of June 30, 2019	1% Lower Inflation Rate	Current Assumptions	1% Higher Inflation Rate
Discount Rate	**6.0%**	**7.0%**	**8.0%**
Inflation	**1.5%**	**2.5%**	**3.5%**
Real Rate of Return	4.5%	4.5%	4.5%
a) Total Normal Cost	18.67%	17.50%	16.09%
b) Accrued Liability	$19,322,105,739	$18,394,114,919	$17,132,699,458
c) Market Value of Assets	$13,985,117,157	$13,985,117,157	$13,985,117,157
d) Unfunded Liability/(Surplus) [(b) - (c)]	$5,336,988,582	$4,408,997,762	$3,147,582,301
e) Funded Status	72.4%	76.0%	81.6%

Mortality Rate Sensitivity

The following table looks at the change in the June 30, 2019 plan costs and funded ratio for the risk pool under two different longevity scenarios, namely assuming rates of post-retirement mortality are 10 percent lower or 10 percent higher than our current mortality assumptions adopted in 2017. This type of analysis highlights the impact on the plan of improving or worsening mortality over the long-term.

As of June 30, 2019	10% Lower Mortality Rates	Current Mortality	10% Higher Mortality Rates
a) Risk Pool's Total Normal Cost	17.81%	17.50%	17.21%
b) Risk Pool's Accrued Liability	$18,769,471,919	$18,394,114,919	$18,048,224,804
c) Risk Pool's Market Value of Assets	$13,985,117,157	$13,985,117,157	$13,985,117,157
d) Risk Pool's Unfunded Liability (Surplus) [(b)-(c)]	$4,784,354,762	$4,408,997,762	$4,063,107,647
e) Risk Pool's Funded Ratio	74.5%	76.0%	77.5%

Maturity Measures

As pension plans mature they become much more sensitive to risks than plans that are less mature. Understanding plan maturity and how it affects the ability of a pension plan to tolerate risk is important in understanding how the 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 starts increasing. A mature plan will often have a ratio above 60-65 percent.

Ratio of Retiree Accrued Liability to Total Accrued Liability	June 30, 2018	June 30, 2019
1. Risk Pool's Retiree Accrued Liability	$ 9,414,683,035	$ 10,159,916,511
2. Risk Pool's Total Accrued Liability	$ 17,461,594,826	$ 18,394,114,919
3. Risk Pool's Ratio of Retiree AL to Total AL [(1) / (2)]	54%	55%

Another way to look at the maturity level of CalPERS and its plans is to look at the ratio of actives to retirees. 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 starts declining. A mature plan will often have a ratio near or below one. The average support ratio for CalPERS public agency plans is 1.25.

Support Ratio	June 30, 2018	June 30, 2019
1. Number of Actives in the Risk Pool	32,961	33,674
2. Number of Retirees in the Risk Pool	34,722	36,392
3. Risk Pool's Support Ratio [(1) / (2)]	0.95	0.93

Maturity Measures (continued)

The actuarial calculations supplied in this communication are based on various assumptions about long-term demographic and economic behavior. Unless these assumptions (terminations, deaths, disabilities, retirements, salary growth, and 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.

Asset Volatility Ratio (AVR)

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

Liability Volatility Ratio (LVR)

Plans that have higher liability-to-payroll ratios experience more volatile employer contributions (as a percentage of payroll) due to changes in liability. For example, a plan with a liability-to-payroll ratio of 8 is expected to have twice the contribution volatility of a plan with a liability-to-payroll ratio of 4. The liability volatility ratio is also included in the table below. It should be noted that this ratio indicates a longer-term potential for contribution volatility. The asset volatility ratio, described above, will tend to move closer to the liability volatility ratio as the plan matures.

Contribution Volatility		June 30, 2018		June 30, 2019
1. Risk Pool's Market Value of Assets without Receivables	$	13,139,460,161	$	13,963,328,957
2. Risk Pool's Payroll		2,359,859,508		2,482,824,265
3. Risk Pool's Asset Volatility Ratio (AVR) [(1) / (2)]		5.6		5.6
4. Risk Pool's Accrued Liability	$	17,461,594,826	$	18,394,114,919
5. Risk Pool's Liability Volatility Ratio (LVR) [(4) / (2)]		7.4		7.4

Maturity Measures History

Valuation Date	Ratio of Retiree Accrued Liability to Total Accrued Liability	Support Ratio	Asset Volatility Ratio	Liability Volatility Ratio
06/30/17	0.53	0.98	5.3	7.0
06/30/18	0.54	0.95	5.6	7.4
06/30/19	0.55	0.93	5.6	7.4

Hypothetical Termination Liability

Contracting agencies with an individual plan(s) in the Miscellaneous Risk Pool have the ability to terminate their contract with CalPERS. Terminating the contract results in a termination of the plan(s). Such terminations occur on an agency by agency basis – the Miscellaneous Risk Pool in total is not subject to termination.

The hypothetical termination liability for a plan in the risk pool is an estimate of the financial position of the plan had the contract with CalPERS been terminated as of June 30, 2019. The plan liability on a termination basis is calculated differently from the plan's ongoing funding liability. For this hypothetical 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.

A more conservative investment policy and asset allocation strategy was adopted by the CalPERS 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 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 hypothetical 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 7 months after.

Risk Pool Market Value of Assets (MVA)	Risk Pool Hypothetical Termination Liability[1,2] @ 1.75%	Risk Pool Funded Status	Risk Pool Unfunded Termination Liability @ 1.75%	Risk Pool Hypothetical Termination Liability[1,2] @ 3.25%	Risk Pool Funded Status	Risk Pool Unfunded Termination Liability @ 3.25%
13,985,117,157	36,551,609,299	38.3%	22,566,492,142	29,292,912,558	47.7%	15,307,795,401

[1] The hypothetical liabilities calculated above include a 5 percent mortality contingency load in accordance with Board policy. Other actuarial assumptions can be found in Appendix A of the Section 2 report.

[2] 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 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 was 2.31 percent on June 30, 2019, and was 1.83 percent on January 31, 2020.

Appendices

- **Appendix A - Actuarial Methods and Assumptions**
- **Appendix B - Principal Plan Provisions**
- **Appendix C - Classification of Optional Benefits**
- **Appendix D - Participant Data**
- **Appendix E - Glossary of Actuarial Terms**

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 when they do occur, they 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 Normal 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.

Amortization of Unfunded Actuarial Accrued Liability

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

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

<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	 2.75% 0%	 2.75% 0%	 2.75% 0%	 2.75% 0%	 2.75% 0%
Ramp Up	5	5	5	0	0
Ramp Down	5	5	5	0	0

The 5-year ramp up means that the payments in the first four years of the amortization period are 20 percent, 40 percent, 60 percent and 80 percent of the "full" payment which begins in year five. The 5-year ramp down means that the reverse is true in the final four years of the amortization period.

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

Amortization payments 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 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 "full" 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 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.

Actuarial Assumptions

In 2017, CalPERS completed its most recent asset liability management study incorporating actuarial assumptions and strategic asset allocation. In December 2017, the CalPERS Board of Administration adopted relatively modest changes to the asset allocation that reduced the expected volatility of returns. The adopted asset allocation was expected to have a long-term blended return that continued to support a discount rate assumption of 7.00 percent. The Board also approved several changes to the demographic assumptions that more closely aligned with actual experience.

On December 21, 2016, the CalPERS Board of Administration lowered the discount rate from 7.50 percent to 7.00 percent using a three-year phase-in beginning with the June 30, 2016 actuarial valuations. The minimum employer contributions for fiscal year 2021-22 determined in this valuation were calculated using a discount rate of 7.00 percent. The decision to reduce the discount rate was primarily based on reduced capital market assumptions provided by external investment consultants and CalPERS investment staff. The specific decision adopted by the Board reflected recommendations from CalPERS staff and additional input from employer and employee stakeholder groups. Based on the investment allocation adopted by the Board and capital market assumptions, the reduced discount rate schedule provides a more realistic assumption for the long-term investment return of the fund.

Notwithstanding the Board's decision to phase into a 7.0 percent discount rate, subsequent analysis of the expected investment return of CalPERS assets or changes to the investment allocation may result in a change to this discount rate schedule.

For more details and additional rationale for the selection of the actuarial assumptions, please refer to the CalPERS Experience Study and Review of Actuarial Assumptions report from December 2017 that can be found on the CalPERS website under: "Forms and Publications". Click on "View All" and search for Experience Study.

All actuarial assumptions (except the discount rates used for the hypothetical termination liability) 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 December 21, 2016 is 7.0 percent compounded annually (net of investment and administrative expenses) as of 6/30/2019.

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 hypothetical termination liabilities 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 7 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 2.31 percent on June 30, 2019, and was 1.83% on January 31, 2020.

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 (2.75% for 2019) 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	0.0850	0.0775	0.0650
1	0.0690	0.0635	0.0525
2	0.0560	0.0510	0.0410
3	0.0470	0.0425	0.0335
4	0.0400	0.0355	0.0270
5	0.0340	0.0295	0.0215
10	0.0160	0.0135	0.0090
15	0.0120	0.0100	0.0060
20	0.0090	0.0075	0.0045
25	0.0080	0.0065	0.0040
30	0.0080	0.0065	0.0040

Public Agency Fire

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1700	0.1700	0.1700
1	0.1100	0.1100	0.1100
2	0.0700	0.0700	0.0700
3	0.0580	0.0580	0.0580
4	0.0473	0.0473	0.0473
5	0.0372	0.0372	0.0372
10	0.0165	0.0165	0.0165
15	0.0144	0.0144	0.0144
20	0.0126	0.0126	0.0126
25	0.0111	0.0111	0.0111
30	0.0097	0.0097	0.0097

Public Agency Police

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1027	0.1027	0.1027
1	0.0803	0.0803	0.0803
2	0.0628	0.0628	0.0628
3	0.0491	0.0491	0.0491
4	0.0384	0.0384	0.0384
5	0.0300	0.0300	0.0300
10	0.0145	0.0145	0.0145
15	0.0150	0.0150	0.0150
20	0.0155	0.0155	0.0155
25	0.0160	0.0160	0.0160
30	0.0165	0.0165	0.0165

Salary Growth (continued)

Public Agency County Peace Officers

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.1320	0.1320	0.1320
1	0.0960	0.0960	0.0960
2	0.0657	0.0657	0.0657
3	0.0525	0.0525	0.0525
4	0.0419	0.0419	0.0419
5	0.0335	0.0335	0.0335
10	0.0170	0.0170	0.0170
15	0.0150	0.0150	0.0150
20	0.0150	0.0150	0.0150
25	0.0175	0.0175	0.0175
30	0.0200	0.0200	0.0200

Schools

Duration of Service	(Entry Age 20)	(Entry Age 30)	(Entry Age 40)
0	0.0428	0.0419	0.0380
1	0.0428	0.0419	0.0380
2	0.0428	0.0419	0.0380
3	0.0354	0.0332	0.0280
4	0.0305	0.0279	0.0224
5	0.0262	0.0234	0.0180
10	0.0171	0.0154	0.0112
15	0.0152	0.0134	0.0098
20	0.0135	0.0117	0.0086
25	0.0120	0.0103	0.0076
30	0.0087	0.0071	0.0048

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

Overall Payroll Growth

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

Inflation

2.50 percent compounded annually.

Non-valued Potential Additional Liabilities

The potential liability loss for a cost-of-living increase exceeding the 2.50 percent inflation assumption, and any potential liability loss from future member service purchases are not reflected in the valuation.

Miscellaneous Loading Factors

Credit for Unused Sick Leave

Total years of service is increased by 1 percent 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 percent contingency load. This load is for unforeseen fluctuations in mortality.

Demographic Assumptions

Pre-Retirement Mortality

Non-industrial death rates vary by age and gender. Industrial death rates vary by age. See sample rates in table below. The non-industrial death rates are used for all plans. The industrial death rates are used for safety plans (except for Local Prosecutor safety members where the corresponding miscellaneous plan does not have the Industrial Death Benefit).

	Non-Industrial Death (Not Job-Related)		**Industrial Death (Job-Related)**
Age	Male	Female	Male and Female
20	0.00022	0.00007	0.00004
25	0.00029	0.00011	0.00006
30	0.00038	0.00015	0.00007
35	0.00049	0.00027	0.00009
40	0.00064	0.00037	0.00010
45	0.00080	0.00054	0.00012
50	0.00116	0.00079	0.00013
55	0.00172	0.00120	0.00015
60	0.00255	0.00166	0.00016
65	0.00363	0.00233	0.00018
70	0.00623	0.00388	0.00019
75	0.01057	0.00623	0.00021
80	0.01659	0.00939	0.00022

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 percent will become the non-industrial death rate and 1 percent 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.

	Healthy Recipients		Non-Industrially Disabled (Not Job-Related)		Industrially Disabled (Job-Related)	
Age	Male	Female	Male	Female	Male	Female
50	0.00372	0.00346	0.01183	0.01083	0.00372	0.00346
55	0.00437	0.00410	0.01613	0.01178	0.00437	0.00410
60	0.00671	0.00476	0.02166	0.01404	0.00671	0.00476
65	0.00928	0.00637	0.02733	0.01757	0.01113	0.00765
70	0.01339	0.00926	0.03358	0.02183	0.01607	0.01111
75	0.02316	0.01635	0.04277	0.02969	0.02779	0.01962
80	0.03977	0.03007	0.06272	0.04641	0.04773	0.03609
85	0.07122	0.05418	0.09793	0.07847	0.08547	0.06501
90	0.13044	0.10089	0.14616	0.13220	0.14348	0.11098
95	0.21658	0.17698	0.21658	0.21015	0.21658	0.17698
100	0.32222	0.28151	0.32222	0.32226	0.32222	0.28151
105	0.46691	0.43491	0.46691	0.43491	0.46691	0.43491
110	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

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

Marital Status

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

Member Category	Percent Married
Miscellaneous Member	70%
Local Police	85%
Local Fire	90%
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.

Terminated Members

It is assumed that terminated members refund immediately if non-vested. Terminated 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
0	0.1742	0.1674	0.1606	0.1537	0.1468	0.1400
1	0.1545	0.1477	0.1409	0.1339	0.1271	0.1203
2	0.1348	0.1280	0.1212	0.1142	0.1074	0.1006
3	0.1151	0.1083	0.1015	0.0945	0.0877	0.0809
4	0.0954	0.0886	0.0818	0.0748	0.0680	0.0612
5	0.0212	0.0193	0.0174	0.0155	0.0136	0.0116
10	0.0138	0.0121	0.0104	0.0088	0.0071	0.0055
15	0.0060	0.0051	0.0042	0.0032	0.0023	0.0014
20	0.0037	0.0029	0.0021	0.0013	0.0005	0.0001
25	0.0017	0.0011	0.0005	0.0001	0.0001	0.0001
30	0.0005	0.0001	0.0001	0.0001	0.0001	0.0001
35	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Public Agency Safety

Duration of Service	Fire	Police	County Peace Officer
0	0.1298	0.1013	0.1188
1	0.0674	0.0636	0.0856
2	0.0320	0.0271	0.0617
3	0.0237	0.0258	0.0445
4	0.0087	0.0245	0.0321
5	0.0052	0.0086	0.0121
10	0.0005	0.0053	0.0053
15	0.0004	0.0027	0.0025
20	0.0003	0.0017	0.0012
25	0.0002	0.0012	0.0005
30	0.0002	0.0009	0.0003
35	0.0001	0.0009	0.0002

The Police termination and refund 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	Entry Age 45
0	0.2107	0.2107	0.1827	0.1546	0.1375	0.1203
1	0.1807	0.1807	0.1526	0.1246	0.1105	0.0963
2	0.1526	0.1526	0.1259	0.0992	0.0878	0.0765
3	0.1266	0.1266	0.1023	0.0780	0.0691	0.0603
4	0.1026	0.1026	0.0815	0.0605	0.0537	0.0469
5	0.0808	0.0808	0.0634	0.0461	0.0409	0.0358
10	0.0202	0.0202	0.0157	0.0112	0.0087	0.0063
15	0.0107	0.0107	0.0077	0.0048	0.0034	0.0021
20	0.0056	0.0056	0.0037	0.0017	0.0016	0.0016
25	0.0026	0.0026	0.0018	0.0009	0.0012	0.0015
30	0.0013	0.0013	0.0011	0.0009	0.0012	0.0015
35	0.0008	0.0008	0.0009	0.0009	0.0012	0.0015

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
5	0.0422	0.0422	0.0393	0.0364	0.0344
10	0.0278	0.0278	0.0271	0.0263	0.0215
15	0.0192	0.0192	0.0174	0.0156	0.0120
20	0.0139	0.0139	0.0109	0.0079	0.0047
25	0.0083	0.0083	0.0048	0.0014	0.0007
30	0.0015	0.0015	0.0007	0.0000	0.0000
35	0.0000	0.0000	0.0000	0.0000	0.0000

Public Agency Safety

Duration of Service	Fire	Police	County Peace Officer
5	0.0094	0.0163	0.0187
10	0.0064	0.0126	0.0134
15	0.0048	0.0082	0.0092
20	0.0038	0.0065	0.0064
25	0.0026	0.0058	0.0042
30	0.0014	0.0056	0.0022
35	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
5	0.0405	0.0405	0.0346	0.0288	0.0264
10	0.0324	0.0324	0.0280	0.0235	0.0211
15	0.0202	0.0202	0.0179	0.0155	0.0126
20	0.0144	0.0144	0.0114	0.0083	0.0042
25	0.0091	0.0091	0.0046	0.0000	0.0000
30	0.0015	0.0015	0.0007	0.0000	0.0000
35	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	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
25	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
30	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0002
35	0.0004	0.0007	0.0001	0.0003	0.0004	0.0005	0.0004
40	0.0010	0.0014	0.0001	0.0004	0.0007	0.0012	0.0008
45	0.0015	0.0019	0.0002	0.0005	0.0013	0.0020	0.0017
50	0.0016	0.0020	0.0005	0.0008	0.0018	0.0026	0.0022
55	0.0016	0.0015	0.0007	0.0013	0.0010	0.0025	0.0018
60	0.0015	0.0011	0.0007	0.0020	0.0006	0.0022	0.0011

- 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.
- Fifty percent of the police industrial disability rates are used for School Police.
- One percent 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 percent will become the non-industrial disability rate and 50 percent will become the industrial disability rate.

Service Retirement

Retirement rates vary by age, service, and formula, except for the safety ½ @ 55 and 2% @ 55 formulas, where retirement rates vary by age only.

Service Retirement

Public Agency Miscellaneous 1.5% @ 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% @ 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.020	0.020	0.020	0.020	0.020	0.150
51	0.006	0.019	0.027	0.031	0.035	0.038
52	0.011	0.024	0.031	0.034	0.037	0.040
53	0.010	0.015	0.021	0.027	0.033	0.040
54	0.025	0.025	0.029	0.035	0.041	0.048
55	0.019	0.026	0.033	0.092	0.136	0.146
56	0.030	0.034	0.038	0.060	0.093	0.127
57	0.030	0.046	0.061	0.076	0.090	0.104
58	0.040	0.044	0.059	0.080	0.101	0.122
59	0.024	0.044	0.063	0.083	0.103	0.122
60	0.070	0.074	0.089	0.113	0.137	0.161
61	0.080	0.086	0.093	0.118	0.156	0.195
62	0.100	0.117	0.133	0.190	0.273	0.357
63	0.140	0.157	0.173	0.208	0.255	0.301
64	0.140	0.153	0.165	0.196	0.239	0.283
65	0.140	0.178	0.215	0.264	0.321	0.377
66	0.140	0.178	0.215	0.264	0.321	0.377
67	0.140	0.178	0.215	0.264	0.321	0.377
68	0.112	0.142	0.172	0.211	0.257	0.302
69	0.112	0.142	0.172	0.211	0.257	0.302
70	0.140	0.178	0.215	0.264	0.321	0.377

Service Retirement

Public Agency Miscellaneous 2% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.008	0.013	0.018	0.021	0.022	0.033
51	0.009	0.016	0.020	0.023	0.026	0.036
52	0.015	0.018	0.020	0.021	0.025	0.030
53	0.016	0.020	0.024	0.028	0.031	0.035
54	0.018	0.022	0.026	0.030	0.034	0.038
55	0.040	0.040	0.056	0.093	0.109	0.154
56	0.034	0.050	0.066	0.092	0.107	0.138
57	0.042	0.048	0.058	0.082	0.096	0.127
58	0.046	0.054	0.062	0.090	0.106	0.131
59	0.045	0.055	0.066	0.097	0.115	0.144
60	0.058	0.075	0.093	0.126	0.143	0.169
61	0.065	0.088	0.111	0.146	0.163	0.189
62	0.136	0.118	0.148	0.190	0.213	0.247
63	0.130	0.133	0.174	0.212	0.249	0.285
64	0.113	0.129	0.165	0.196	0.223	0.249
65	0.145	0.173	0.201	0.233	0.266	0.289
66	0.170	0.199	0.229	0.258	0.284	0.306
67	0.250	0.204	0.233	0.250	0.257	0.287
68	0.227	0.175	0.193	0.215	0.240	0.262
69	0.200	0.180	0.180	0.198	0.228	0.246
70	0.150	0.171	0.192	0.239	0.304	0.330

Public Agency Miscellaneous 2.5% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.008	0.014	0.020	0.026	0.033	0.050
51	0.008	0.015	0.023	0.030	0.037	0.059
52	0.009	0.016	0.023	0.030	0.037	0.061
53	0.014	0.021	0.028	0.035	0.042	0.063
54	0.014	0.022	0.030	0.039	0.047	0.068
55	0.020	0.038	0.055	0.073	0.122	0.192
56	0.025	0.047	0.069	0.091	0.136	0.196
57	0.030	0.048	0.065	0.083	0.123	0.178
58	0.035	0.054	0.073	0.093	0.112	0.153
59	0.035	0.054	0.073	0.092	0.131	0.183
60	0.044	0.072	0.101	0.130	0.158	0.197
61	0.050	0.078	0.105	0.133	0.161	0.223
62	0.055	0.093	0.130	0.168	0.205	0.268
63	0.090	0.124	0.158	0.192	0.226	0.279
64	0.080	0.112	0.144	0.175	0.207	0.268
65	0.120	0.156	0.193	0.229	0.265	0.333
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 Miscellaneous 2.7% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.003	0.010	0.016	0.034	0.033	0.045
51	0.009	0.016	0.023	0.042	0.038	0.047
52	0.015	0.019	0.024	0.040	0.036	0.046
53	0.012	0.020	0.028	0.047	0.046	0.060
54	0.020	0.027	0.035	0.054	0.056	0.073
55	0.033	0.055	0.078	0.113	0.156	0.234
56	0.039	0.067	0.095	0.135	0.169	0.227
57	0.050	0.067	0.084	0.113	0.142	0.198
58	0.043	0.066	0.089	0.124	0.151	0.201
59	0.050	0.070	0.090	0.122	0.158	0.224
60	0.060	0.086	0.112	0.150	0.182	0.238
61	0.071	0.094	0.117	0.153	0.184	0.241
62	0.091	0.122	0.152	0.194	0.226	0.279
63	0.143	0.161	0.179	0.209	0.222	0.250
64	0.116	0.147	0.178	0.221	0.254	0.308
65	0.140	0.174	0.208	0.254	0.306	0.389
66	0.170	0.209	0.247	0.298	0.310	0.324
67	0.170	0.199	0.228	0.269	0.296	0.342
68	0.150	0.181	0.212	0.255	0.287	0.339
69	0.150	0.181	0.212	0.255	0.287	0.339
70	0.150	0.181	0.212	0.243	0.291	0.350

Public Agency Miscellaneous 3% @ 60

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.013	0.019	0.026	0.042	0.038	0.064
51	0.035	0.037	0.039	0.052	0.047	0.062
52	0.023	0.030	0.038	0.055	0.051	0.056
53	0.025	0.032	0.040	0.057	0.056	0.066
54	0.035	0.042	0.050	0.067	0.066	0.076
55	0.040	0.052	0.064	0.085	0.095	0.120
56	0.043	0.056	0.070	0.094	0.102	0.150
57	0.045	0.060	0.074	0.099	0.109	0.131
58	0.053	0.056	0.059	0.099	0.126	0.185
59	0.050	0.068	0.085	0.113	0.144	0.202
60	0.089	0.106	0.123	0.180	0.226	0.316
61	0.100	0.117	0.133	0.212	0.230	0.298
62	0.130	0.155	0.180	0.248	0.282	0.335
63	0.120	0.163	0.206	0.270	0.268	0.352
64	0.150	0.150	0.150	0.215	0.277	0.300
65	0.200	0.242	0.283	0.330	0.300	0.342
66	0.220	0.264	0.308	0.352	0.379	0.394
67	0.250	0.279	0.309	0.338	0.371	0.406
68	0.170	0.196	0.223	0.249	0.290	0.340
69	0.220	0.261	0.302	0.344	0.378	0.408
70	0.220	0.255	0.291	0.326	0.358	0.388

Service Retirement

Public Agency Miscellaneous 2% @ 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 ½ @ 55 and 2% @ 55

Age	Rate	Age	Rate
50	0.0159	56	0.1108
51	0.0000	57	0.0000
52	0.0344	58	0.0950
53	0.0199	59	0.0441
54	0.0413	60	1.00000
55	0.0751		

Public Agency Police ½ @ 55 and 2% @ 55

Age	Rate	Age	Rate
50	0.0255	56	0.0692
51	0.0000	57	0.0511
52	0.0164	58	0.0724
53	0.0272	59	0.0704
54	0.0095	60	0.3000
55	0.1667		

Service Retirement

Public Agency Police 2% @ 50

	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	0.040	0.040	0.040	0.040	0.061	0.087
53	0.040	0.040	0.040	0.040	0.082	0.123
54	0.040	0.040	0.040	0.046	0.098	0.158
55	0.072	0.072	0.072	0.096	0.141	0.255
56	0.066	0.066	0.066	0.088	0.129	0.228
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% @ 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.009	0.009	0.009	0.009	0.013	0.020
51	0.013	0.013	0.013	0.013	0.020	0.029
52	0.018	0.018	0.018	0.018	0.028	0.042
53	0.052	0.052	0.052	0.052	0.079	0.119
54	0.067	0.067	0.067	0.067	0.103	0.154
55	0.089	0.089	0.089	0.089	0.136	0.204
56	0.083	0.083	0.083	0.083	0.127	0.190
57	0.082	0.082	0.082	0.082	0.126	0.189
58	0.088	0.088	0.088	0.088	0.136	0.204
59	0.074	0.074	0.074	0.074	0.113	0.170
60	0.100	0.100	0.100	0.100	0.154	0.230
61	0.072	0.072	0.072	0.072	0.110	0.165
62	0.099	0.099	0.099	0.099	0.152	0.228
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

Public Agency Police 3% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.035	0.035	0.035	0.035	0.070	0.090
51	0.028	0.028	0.028	0.029	0.065	0.101
52	0.032	0.032	0.032	0.039	0.066	0.109
53	0.028	0.028	0.028	0.043	0.075	0.132
54	0.038	0.038	0.038	0.074	0.118	0.333
55	0.070	0.070	0.070	0.120	0.175	0.340
56	0.060	0.060	0.060	0.110	0.165	0.330
57	0.060	0.060	0.060	0.110	0.165	0.320
58	0.080	0.080	0.080	0.100	0.185	0.350
59	0.090	0.090	0.095	0.130	0.185	0.350
60	0.150	0.150	0.150	0.150	0.185	0.350
61	0.120	0.120	0.120	0.120	0.160	0.350
62	0.150	0.150	0.150	0.150	0.200	0.350
63	0.150	0.150	0.150	0.150	0.200	0.400
64	0.150	0.150	0.150	0.150	0.175	0.350
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% @ 55

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.001	0.001	0.001	0.006	0.016	0.069
51	0.002	0.002	0.002	0.006	0.018	0.071
52	0.012	0.012	0.012	0.021	0.040	0.098
53	0.032	0.032	0.032	0.049	0.085	0.149
54	0.057	0.057	0.057	0.087	0.144	0.217
55	0.073	0.073	0.073	0.109	0.179	0.259
56	0.064	0.064	0.064	0.097	0.161	0.238
57	0.063	0.063	0.063	0.095	0.157	0.233
58	0.065	0.065	0.065	0.099	0.163	0.241
59	0.088	0.088	0.088	0.131	0.213	0.299
60	0.105	0.105	0.105	0.155	0.251	0.344
61	0.118	0.118	0.118	0.175	0.282	0.380
62	0.087	0.087	0.087	0.128	0.210	0.295
63	0.067	0.067	0.067	0.100	0.165	0.243
64	0.067	0.067	0.067	0.100	0.165	0.243
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 3% @ 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.050	0.050	0.050	0.100	0.155	0.400
51	0.040	0.040	0.040	0.090	0.140	0.380
52	0.040	0.040	0.040	0.070	0.115	0.350
53	0.040	0.040	0.040	0.080	0.135	0.350
54	0.040	0.040	0.040	0.090	0.145	0.350
55	0.070	0.070	0.070	0.120	0.175	0.340
56	0.060	0.060	0.060	0.110	0.165	0.330
57	0.060	0.060	0.060	0.110	0.165	0.320
58	0.080	0.080	0.080	0.100	0.185	0.350
59	0.090	0.090	0.095	0.130	0.185	0.350
60	0.150	0.150	0.150	0.150	0.185	0.350
61	0.120	0.120	0.120	0.120	0.160	0.350
62	0.150	0.150	0.150	0.150	0.200	0.350
63	0.150	0.150	0.150	0.150	0.200	0.400
64	0.150	0.150	0.150	0.150	0.175	0.350
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% @ 50

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.020	0.020	0.020	0.040	0.130	0.192
51	0.008	0.008	0.008	0.023	0.107	0.164
52	0.023	0.023	0.023	0.043	0.136	0.198
53	0.023	0.023	0.023	0.043	0.135	0.198
54	0.027	0.027	0.027	0.048	0.143	0.207
55	0.043	0.043	0.043	0.070	0.174	0.244
56	0.053	0.053	0.053	0.085	0.196	0.269
57	0.054	0.054	0.054	0.086	0.197	0.271
58	0.052	0.052	0.052	0.084	0.193	0.268
59	0.075	0.075	0.075	0.116	0.239	0.321
60	0.065	0.065	0.065	0.102	0.219	0.298
61	0.076	0.076	0.076	0.117	0.241	0.324
62	0.068	0.068	0.068	0.106	0.224	0.304
63	0.027	0.027	0.027	0.049	0.143	0.208
64	0.094	0.094	0.094	0.143	0.277	0.366
65	1.000	1.000	1.000	1.000	1.000	1.000

Service Retirement

Public Agency Police 2% @ 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% @ 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% @ 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% @ 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% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.0500	0.0500	0.0500	0.0500	0.0500	0.1000
51	0.0400	0.0400	0.0400	0.0400	0.0575	0.0942
52	0.0380	0.0380	0.0380	0.0380	0.0580	0.0825
53	0.0380	0.0380	0.0380	0.0380	0.0774	0.1169
54	0.0380	0.0380	0.0380	0.0437	0.0931	0.1497
55	0.0684	0.0684	0.0684	0.0912	0.1340	0.2423
56	0.0627	0.0627	0.0627	0.0836	0.1228	0.2168
57	0.0600	0.0600	0.0600	0.0800	0.1175	0.2125
58	0.0800	0.0800	0.0800	0.0880	0.1375	0.2275
59	0.0800	0.0800	0.0800	0.0920	0.1400	0.2275
60	0.1500	0.1500	0.1500	0.1500	0.1500	0.2275
61	0.1440	0.1440	0.1440	0.1440	0.1440	0.1700
62	0.1500	0.1500	0.1500	0.1500	0.1500	0.2125
63	0.1500	0.1500	0.1500	0.1500	0.1500	0.2125
64	0.1500	0.1500	0.1500	0.1500	0.1500	0.3188
65	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

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

Service Retirement

Public Agency Fire 2.7% @ 57

	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.0065	0.0065	0.0065	0.0065	0.0101	0.0151
51	0.0081	0.0081	0.0081	0.0081	0.0125	0.0187
52	0.0164	0.0164	0.0164	0.0164	0.0254	0.0380
53	0.0442	0.0442	0.0442	0.0442	0.0680	0.1018
54	0.0606	0.0606	0.0606	0.0606	0.0934	0.1397
55	0.0825	0.0825	0.0825	0.0825	0.1269	0.1900
56	0.0740	0.0740	0.0740	0.0740	0.1140	0.1706
57	0.0901	0.0901	0.0901	0.0901	0.1387	0.2077
58	0.0790	0.0790	0.0790	0.0790	0.1217	0.1821
59	0.0729	0.0729	0.0729	0.0729	0.1123	0.1681
60	0.1135	0.1135	0.1135	0.1135	0.1747	0.2615
61	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
62	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
63	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
64	0.1136	0.1136	0.1136	0.1136	0.1749	0.2618
65	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Service Retirement

Schools 2% @ 55						
	Duration of Service					
Age	5 Years	10 Years	15 Years	20 Years	25 Years	30 Years
50	0.004	0.007	0.011	0.012	0.013	0.015
51	0.004	0.008	0.011	0.014	0.016	0.017
52	0.005	0.010	0.014	0.016	0.018	0.021
53	0.006	0.012	0.016	0.020	0.022	0.025
54	0.008	0.017	0.023	0.027	0.031	0.034
55	0.021	0.042	0.058	0.069	0.077	0.086
56	0.019	0.037	0.053	0.062	0.069	0.078
57	0.019	0.038	0.054	0.064	0.071	0.079
58	0.022	0.045	0.062	0.074	0.082	0.092
59	0.025	0.049	0.069	0.082	0.090	0.101
60	0.033	0.066	0.092	0.109	0.121	0.135
61	0.037	0.072	0.101	0.119	0.133	0.149
62	0.066	0.131	0.184	0.218	0.242	0.271
63	0.064	0.126	0.178	0.209	0.233	0.261
64	0.059	0.117	0.163	0.193	0.215	0.240
65	0.080	0.158	0.221	0.261	0.291	0.326
66	0.081	0.160	0.224	0.265	0.296	0.330
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 dollar limit for the 2019 calendar year is $225,000.

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 2019 calendar year is $280,000.

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. 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 percent at 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 your 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	½ 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 percent 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 $124,180 for 2019 and for those employees that do not participate in Social Security the cap for 2019 is $149,016. Adjustments to the caps are permitted annually based on changes to the CPI for all urban consumers.

- Employees must be covered by Social Security with the 1.5% at 65 formula. Social Security is optional for all other 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 percent 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% @ 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 percent of final compensation, multiplied by *service*, which is determined as follows:

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

- *Service* is CalPERS credited service plus the additional number of years that the member would have worked until age 60, for members with at least 10 years but not more than 18.518 years of service. The maximum benefit in this case is 33 1/3 percent 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 percent of final compensation for the first 5 years of service, plus 1 percent for each additional year of service to a maximum of 50 percent 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

All safety members have this benefit. For 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 percent of final compensation.

Increased Benefit (75 percent of Final Compensation)

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

Improved Benefit (50 percent to 90 percent 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 percent or greater, with a maximum of 90 percent) 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.

Improved Lump Sum Payment

Employers have the option of providing an improved lump sum death benefit of $600, $2,000, $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 the modified formula, 25 percent 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 the full or supplemental formula, 50 percent 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 percent or 50 percent 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 percent or 50 percent 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 percent 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 safety PEPRA members and age 52 for miscellaneous PEPRA 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 2W Death Benefit

This is a standard benefit for members in a risk pool.

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 safety PEPRA members and age 52 for miscellaneous PEPRA 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 percent 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. An employer may elect to provide this benefit for miscellaneous members.

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 percent 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 percent of final compensation
- if 2 eligible children: 20.0 percent of final compensation
- if 3 or more eligible children: 25.0 percent 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 percent. Annual adjustments are calculated by first determining the lesser of 1) 2 percent compounded from the end of the year of retirement or 2) actual rate of inflation. The resulting increase is divided by the total increase provided in prior years. For any given year, the COLA adjustment may be less than 2 percent (when the rate of inflation is low), may be greater than the rate of inflation (when the rate of inflation is low after several years of high inflation) or may even be greater than 2 percent (when inflation is high after several years of low inflation).

Improved Benefit

Employers have the option of providing a COLA of 3 percent, 4 percent, or 5 percent, determined in the same manner as described above for the standard 2 percent 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 inflation by PPPA. PPPA benefits are cost-of-living adjustments that are intended to maintain an individual's allowance at 80 percent of the initial allowance at retirement adjusted for inflation since retirement. The PPPA benefit will be coordinated with other cost-of-living adjustments provided under the plan.

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 percent.
- 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, 1/2 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 percent 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 percent.

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 percent 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 at www.calpers.ca.gov.

Appendix C

Classification of Optional Benefits

Classification of Optional Benefits

Below is the list of the available optional benefit provisions and their initial classification upon establishment of risk pools. When new benefits become available as a result of legislation, the Chief Actuary will determine their classification in accordance with the criteria established in the Board policy.

Class 0

Class 0 benefit surcharge is the increase in normal cost for a given benefit formula above the baseline PEPRA 2% at 62 benefit formula.

Class 1

Class 1 benefits have been identified as additional benefits which have a significant, ongoing effect on the total plan cost. In some cases, a Class 1 benefit may be an alternate benefit formula. These benefits vary by employer across the risk pool. Agencies contracting for a Class 1 benefit will be responsible for the past service liability associated with such benefit and will be required to pay a surcharge established by the actuary to cover the ongoing cost (normal cost) of the Class 1 benefit.

The table below shows the list of Class 0 and Class 1 benefits and their applicable surcharge for each benefit formula in the Miscellaneous Risk Pool.

Optional Benefit	**2% at 62**	**1.5% at 65**	**2% at 60**	**2% at 55**	**2.5% at 55**	**2.7% at 55**	**3% at 60**
Class 0 Benefit	0.00%	(0.49%)	1.06%	2.75%	4.00%	5.76%	6.95%
One Year Final Compensation	N/A	0.29%	0.48%	0.54%	0.61%	0.67%	0.71%
EPMC by contract, 7%	N/A	N/A	0.93%	1.03%	1.17%	1.28%	1.34%
EPMC by contract, 8%	N/A	N/A	0.00%	0.00%	1.34%	1.46%	1.53%
25% PRSA	0.64%	0.42%	0.65%	0.72%	0.79%	0.85%	0.90%
50% PRSA	0.64%	0.42%	0.65%	0.72%	0.79%	0.85%	0.90%
3% Annual COLA	0.61%	0.40%	0.69%	0.78%	0.90%	1.00%	1.05%
4% Annual COLA	0.61%	0.40%	0.69%	0.78%	0.90%	1.00%	1.05%
5% Annual COLA	0.61%	0.40%	0.69%	0.78%	0.90%	1.00%	1.05%
IDR For Local Miscellaneous Members	0.31%	0.33%	0.32%	0.31%	0.31%	0.31%	0.31%
Increased IDR Allowance to 75% of Compensation	0.54%	0.56%	0.55%	0.54%	0.53%	0.54%	0.54%
Employee Cost Sharing*	varies	varies	varies	varies	varies	varies	varies
Employee Contribution Rate for CSUC Auxiliary Organizations Reduced to State Member Level - Covered by Social Security	N/A	N/A	2.00%	2.00%	2.00%	2.00%	2.00%
Employee Contribution Rate for CSUC Auxiliary Organizations Reduced to State Member Level - Not Covered by Social Security	N/A	N/A	1.00%	1.00%	1.00%	1.00%	1.00%

For employers contracting for more than one Class 1 benefit, the surcharges listed in this table will be added together.

* Employee cost sharing had been eliminated as a surcharge from some of the June 30, 2010 valuations and from all of the June 30, 2011 and later valuations. It is now shown on myCalPERS as a rate adjustment.

Class 2

Class 2 benefits have been identified to be the ancillary benefits providing one-time increases in benefits. These benefits vary by employer across the risk pool. Agencies contracting for a Class 2 benefit will be responsible for the past service liability associated with such benefit.

The following benefits shall be classified as Class 2:

- One-time 1% to 6% Ad Hoc COLA Increases for members who retired or died prior to January 1, 1998 (Section 21328)
- "Golden Handshakes" – Section 20903 Two Years Additional Service Credit
- Credit for Prior Service Paid for by the Employer
- Military Service Credit (Section 20996)
- Credit for Local Retirement System Service for Employees of Agencies Contracted on a Prospective basis (Section 20530.1)
- Prior Service Credit for Employees of an Assumed Agency Function (Section 20936)
- Limit Prior Service to Members Employed on Contract Date (Section 20938)
- Public Service Credit for Limited Prior Service (Section 21031)
- Public Service Credit for Employees of an Assumed Agency or Function (Section 21025)

Class 3

Class 3 benefits have been identified to be additional benefits which have a minimal effect on the total plan cost. Class 3 benefits may vary by rate plan within each risk pool. However, the employer contribution rate will not vary within the risk pool due to the Class 3 benefits.

The following benefits shall be classified as Class 3:

- Full formula plus social security
- Post Retirement Lump Sum Death Benefit
- $600 lump sum retired death benefit (Section 21622)
- $2,000 lump sum retired death benefit (Section 21623.5)
- $3,000 lump sum retired death benefit (Section 21623.5)
- $4,000 lump sum retired death benefit (Section 21623.5)
- $5,000 lump sum retired death benefit (Section 21623.5)
- Improved non-industrial disability allowance (Section 21427)
- Special death benefit for local safety members (Section 21540.5)
- Service Credit Purchased by Member
- Partial Service Retirement (Section 21118)
- Optional Membership for Part Time Employees (Section 20325)
- Extension of Reciprocity Rights for Elective Officers (Section 20356)
- Removal of Contract Exclusions Prospectively Only (Section 20503)
- Alternate Death Benefit for Local Fire Members credited with 20 or more years of service (Section 21547.7)

Appendix D

Participant Data

- **Source of the Participant Data**
- **Data Validation Tests and Adjustments**
- **Summary of Valuation Data**
- **Active Members**
- **Transferred and Terminated Members**
- **Retired Members and Beneficiaries**
- **Distribution of Plan Costs by Benefit Formula**

Source of the Participant Data

The data was extracted from various databases within CalPERS and placed in the valuation system database by a series of extract programs. Included in this data are:

- Individual member and beneficiary information,
- Employment and payroll information,
- Accumulated contributions with interest,
- Service information,
- Benefit payment information,
- Information about the various organizations which contract with CalPERS, and
- Detailed information about the plan provisions applicable to each group of members.

Data Validation Tests and Adjustments

Once the information is extracted from the various computer systems into the database, update queries are then run against this data to correct for flaws found in the data. This part of the process is intended to validate the participant data for all CalPERS plans. The data is then checked for reasonableness and consistency with data from the prior valuation.

Checks on the data include:

- A reconciliation of the membership of the plans,
- Comparisons of various member statistics (average attained age, average entry age, average salary, etc.) for each plan with those from the prior year valuation,
- Comparisons of pension amounts for each retiree and beneficiary receiving payments with those from the prior year valuation,
- Checks for invalid ages and dates, and
- Reasonableness checks on various key data elements such as years of service and salary

As a result of the tests on the data, a number of adjustments were determined to be necessary. These included:

Dates of hire and dates of entry were adjusted where necessary to be consistent with the service fields, the date of birth and each other.

Summary of Valuation Data

			June 30, 2018		June 30, 2019
1.	**Number of Plans in the Risk Pool**		2,389		2,394
2.	**Active Members**				
	a) Counts		32,961		33,674
	b) Average Attained Age		45.15		44.88
	c) Average Entry Age on Rate Plan		36.60		36.41
	d) Average Years of Credited Service		8.45		8.25
	e) Average Annual Covered Pay	$	71,596	$	73,731
	f) Annual Covered Payroll	$	2,359,859,508	$	2,482,824,265
	g) Projected Annual Payroll for Contribution Year	$	2,559,950,926	$	2,693,341,809
	h) Present Value of Future Payroll	$	19,912,498,076	$	21,208,519,966
3.	**Transferred Members**		15,565		15,845
4.	**Terminated Members**		21,606		22,847
5.	**Retired Members and Beneficiaries**				
	a) Counts*		36,184		37,855
	b) Average Annual Benefits*	$	20,346	$	21,126
6.	**Active to Retired Ratio** [(2a) / (5a)]		0.91		0.89

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.

* Values may not match those on pages D-5 and D-6 due to inclusion of community property settlements.

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	1,100	6	0	0	0	0	1,106
25-29	2,782	269	4	0	0	0	3,055
30-34	2,928	824	318	10	0	0	4,080
35-39	2,509	961	877	219	16	0	4,582
40-44	1,901	801	876	567	147	10	4,302
45-49	1,583	698	890	593	313	123	4,200
50-54	1,426	678	878	640	397	401	4,420
55-59	1,129	641	790	646	398	515	4,119
60-64	645	413	549	446	234	338	2,625
65 and Over	316	212	236	199	88	134	1,185
All Ages	**16,319**	**5,503**	**5,418**	**3,320**	**1,593**	**1,521**	**33,674**

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	$39,002	$52,525	$0	$0	$0	$0	$39,075
25-29	49,291	55,637	68,733	0	0	0	49,875
30-34	58,222	64,415	69,437	80,523	0	0	60,402
35-39	65,369	75,164	77,411	77,389	86,429	0	70,377
40-44	72,504	80,926	81,467	82,878	88,135	128,413	77,929
45-49	75,747	84,100	83,732	88,513	89,332	95,692	82,226
50-54	80,871	89,949	86,993	89,406	94,636	97,316	87,444
55-59	78,131	88,646	84,928	89,685	89,576	95,126	86,114
60-64	70,382	80,928	80,681	84,726	87,092	90,483	80,710
65 and Over	56,634	71,514	70,313	78,314	83,385	90,258	71,450
Average	**$63,673**	**$78,231**	**$81,302**	**$86,073**	**$89,917**	**$94,507**	**$73,731**

Transferred and Terminated Members

Distribution of Participants Transferred to Other CalPERS Plans by Age and Service

	Years of Service at Valuation Date							
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**	**Average Salary**
15-24	146	0	0	0	0	0	146	$54,914
25-29	783	24	0	0	0	0	807	60,622
30-34	1,318	174	19	0	0	0	1,511	66,150
35-39	1,583	356	125	15	1	0	2,080	76,896
40-44	1,666	413	172	38	8	0	2,297	84,338
45-49	1,713	475	193	74	23	3	2,481	94,585
50-54	1,698	556	225	101	29	9	2,618	99,173
55-59	1,457	474	194	86	30	11	2,252	95,170
60-64	803	275	99	45	14	3	1,239	86,133
65 and Over	268	94	36	6	6	4	414	83,898
All Ages	**11,435**	**2,841**	**1,063**	**365**	**111**	**30**	**15,845**	**$85,872**

Distribution of Terminated Participants with Funds on Deposit by Age and Service

	Years of Service at Valuation Date							
Attained Age	**0-4**	**5-9**	**10-14**	**15-19**	**20-24**	**25+**	**Total**	**Average Salary**
15-24	365	0	0	0	0	0	365	$32,566
25-29	1,350	14	0	0	0	0	1,364	37,806
30-34	2,285	207	20	1	0	0	2,513	41,202
35-39	2,793	402	112	15	0	0	3,322	44,977
40-44	2,636	429	117	39	5	0	3,226	48,364
45-49	2,465	494	171	79	22	3	3,234	53,046
50-54	2,222	540	178	60	28	3	3,031	53,787
55-59	2,032	448	120	32	19	6	2,657	49,249
60-64	1,482	249	96	30	8	4	1,869	47,439
65 and Over	1,083	124	34	19	4	2	1,266	41,553
All Ages	**18,713**	**2,907**	**848**	**275**	**86**	**18**	**22,847**	**$47,233**

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	34	35
30-34	0	1	2	0	1	28	32
35-39	0	13	14	0	1	24	52
40-44	0	34	21	0	0	19	74
45-49	0	55	32	4	1	31	123
50-54	666	109	75	16	0	71	937
55-59	3,417	204	84	36	1	147	3,889
60-64	6,210	228	100	46	1	246	6,831
65-69	7,718	263	72	54	1	369	8,477
70-74	6,464	192	61	31	1	486	7,235
75-79	3,450	128	34	25	1	550	4,188
80-84	1,771	75	9	18	0	452	2,325
85 and Over	1,440	41	3	11	0	699	2,194
All Ages	**31,136**	**1,343**	**507**	**242**	**8**	**3,156**	**36,392**

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	$20,363	$0	$8,071	$8,422
30-34	0	5,245	536	0	293	5,252	4,802
35-39	0	9,065	868	0	98	6,145	5,338
40-44	0	11,538	5,333	0	0	10,728	9,569
45-49	0	12,826	557	23,764	194	14,616	10,338
50-54	17,067	13,233	2,681	17,885	0	13,609	15,221
55-59	22,949	14,129	4,720	19,893	1,370	15,402	21,774
60-64	25,268	14,616	5,375	19,378	2,270	17,026	24,282
65-69	25,107	12,991	5,528	11,901	198	21,088	24,303
70-74	23,711	12,749	7,334	21,179	16	18,223	22,900
75-79	20,507	12,580	7,248	15,805	74	17,815	19,770
80-84	19,164	12,388	10,740	11,197	0	17,638	18,555
85 and Over	16,477	10,057	19,840	7,291	0	14,741	15,763
All Ages	**$23,194**	**$13,175**	**$4,982**	**$16,468**	**$564**	**$16,907**	**$21,975**

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	9,954	184	101	68	1	1,159	11,467
5-9	8,781	220	81	69	0	758	9,909
10-14	6,060	166	105	52	3	542	6,928
15-19	3,269	288	72	28	0	352	4,009
20-24	1,730	255	71	11	2	186	2,255
25-29	822	123	43	9	0	94	1,091
30 and Over	520	107	34	5	2	65	733
All Years	**31,136**	**1,343**	**507**	**242**	**8**	**3,156**	**36,392**

Distribution of Average Annual Disbursement 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	$25,013	$14,854	$5,595	$21,297	$293	$18,765	$24,023
5-9	25,280	14,633	3,877	16,948	0	17,778	24,237
10-14	23,472	14,919	3,138	14,707	103	16,415	22,331
15-19	19,397	13,918	6,103	14,487	0	13,971	18,254
20-24	16,449	11,559	6,556	8,182	1,820	14,773	15,393
25-29	14,567	10,888	6,478	7,720	0	11,020	13,471
30 and Over	9,843	9,065	3,939	7,539	136	8,216	9,269
All Years	**$23,194**	**$13,175**	**$4,982**	**$16,468**	**$564**	**$16,907**	**$21,975**

Retired Members and Beneficiaries (continued)

Distribution of Total Annual Aggregate Disbursements to Retirees and Beneficiaries by Attained Age and Retirement Type (Includes PPPA Payments)

Attained Age	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 30	$0	$0	$0	$20,363	$0	$274,404	$294,767
30-34	0	5,245	1,072	0	293	147,046	153,656
35-39	0	117,840	12,156	0	98	147,469	277,562
40-44	0	392,293	111,995	0	0	203,837	708,125
45-49	0	705,412	17,821	95,054	194	453,084	1,271,566
50-54	11,366,378	1,442,450	201,043	286,163	0	966,236	14,262,269
55-59	78,417,086	2,882,382	396,474	716,136	1,370	2,264,074	84,677,521
60-64	156,915,177	3,332,439	537,495	891,381	2,270	4,188,294	165,867,055
65-69	193,779,568	3,416,555	398,021	642,675	198	7,781,369	206,018,386
70-74	153,271,013	2,447,781	447,375	656,544	16	8,856,613	165,679,342
75-79	70,748,604	1,610,289	246,446	395,120	74	9,798,174	82,798,707
80-84	33,939,795	929,100	96,661	201,554	0	7,972,438	43,139,548
85 and Over	23,727,555	412,354	59,521	80,203	0	10,303,937	34,583,569
Total	**$722,165,176**	**$17,694,139**	**$2,526,078**	**$3,985,194**	**$4,513**	**$53,356,974**	**$799,732,073**

Distribution of Total Annual Aggregate Disbursements to Retirees and Beneficiaries by Years Retired and Retirement Type (Includes PPPA Payments)

Years Retired	Service Retirement	Non-Industrial Disability	Industrial Disability	Non-Industrial Death	Industrial Death	Death After Retirement	Total
Under 5 Yrs	$248,977,822	$2,733,076	$565,119	$1,448,217	$293	$21,748,848	$275,473,376
5-9	221,986,000	3,219,355	314,055	1,169,432	0	13,475,662	240,164,504
10-14	142,242,038	2,476,481	329,507	764,742	308	8,896,816	154,709,892
15-19	63,410,199	4,008,434	439,391	405,629	0	4,917,944	73,181,597
20-24	28,456,902	2,947,563	465,508	89,999	3,640	2,747,832	34,711,443
25-29	11,973,681	1,339,263	278,569	69,478	0	1,035,849	14,696,840
30 and Over	5,118,532	969,967	133,929	37,697	272	534,024	6,794,421
Total	**$722,165,176**	**$17,694,139**	**$2,526,078**	**$3,985,194**	**$4,513**	**$53,356,974**	**$799,732,073**

Distribution of Plan Costs by Benefit Formula

Benefit Formula		Accrued Liability	% of Pool		6/30/2019 Payroll	% of Pool
2.0% @ 62	$	473,571,292	2.6%	$	917,421,086	37.0%
2.0% @ 60		1,379,720,147	7.5%		231,935,329	9.3%
2.0% @ 55		6,697,018,015	36.4%		635,355,787	25.6%
2.5% @ 55		3,500,603,267	19.0%		250,439,674	10.1%
2.7% @ 55		4,317,427,787	23.5%		323,304,970	13.0%
3.0% @ 60		1,799,492,781	9.8%		124,367,419	5.0%
Inactive		226,281,630	1.2%		0	0.0%
Total	**$**	**18,394,114,919**		**$**	**2,482,824,265**	

Appendix E

Glossary of Actuarial Terms

Glossary of Actuarial Terms

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

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

Actuarial Methods
Procedures employed by actuaries to achieve certain funding goals of a pension plan. Actuarial methods include funding method, setting the length of time to fund the Accrued Liability, and determining the Value of Assets.

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

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

Generally, in an actuarial valuation, the separate bases consist of changes in unfunded liability due to contract amendments, actuarial assumption changes, actuarial methodology changes, and/or gains and losses. Payment periods are determined by Board policy and vary based on the cause of the change.

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

Class 0 Benefit Surcharge
Class 0 benefit surcharge is the increase in normal cost for a given benefit formula above the baseline PEPRA 2% at 62 benefit formula.

Class 1 Benefits
Class 1 benefits have been identified as additional benefits which have a significant, ongoing effect on the total plan cost. In some cases, a Class 1 benefit may be an alternate benefit formula. These benefits vary by employer across the risk pool. Agencies contracting for a Class 1 benefit will be responsible for the past service liability associated with such benefit and will be required to pay a surcharge established by the actuary to cover the ongoing cost (normal cost) of the Class 1 benefit.

Class 2 Benefits
Class 2 benefits have been identified to be the ancillary benefits providing one-time increases in benefits. These benefits vary by employer across the risk pool. Agencies contracting for a Class 2 benefit will be responsible for the past service liability associated with such benefit.

Class 3 Benefits
Class 3 benefits have been identified to be additional benefits which have a minimal effect on the total plan cost. Class 3 benefits may vary by rate plan within each risk pool. However, the employer contribution rate will not vary within the risk pool due to the Class 3 benefits.

Classic member (under PEPRA)

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

Discount Rate Assumption

The actuarial assumption that was called "investment return" in earlier CalPERS reports or "actuarial interest rate" in Section 20014 of the California Public Employees' Retirement Law (PERL).

Entry Age

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

(The assumed retirement age minus the entry age is the amount of time required to fund a member's total benefit. Generally, the older a member is at hire, the greater the Normal Cost. This is mainly because there is less time to earn investment income to fund the future benefits.)

Entry Age Normal Cost Method

An actuarial cost method designed to fund a member's total plan benefit over the course of his or her career. This method is designed to yield a rate expressed as a level percentage of payroll.
(The assumed retirement age less the entry age is the amount of time required to fund a member's total benefit. Generally, the older a member on the date of hire, the greater the entry age normal cost. This is mainly because there is less time to earn investment income to fund the future benefits.)

Fresh Start

A Fresh Start is when multiple amortization bases are collapsed to one base and amortized together over a new funding period.

Funded Status

A measure of how well funded, or how "on track" a plan or risk pool is with respect to assets versus accrued liabilities. A ratio greater than 100 percent means the plan or risk pool has more assets than liabilities and a ratio less than 100 percent means liabilities are greater than assets.

GASB 68

Statement No. 68 of the Governmental Accounting Standards Board. The accounting standard governing a state or local governmental employer's accounting and financial reporting for pensions. GASB 68 replaces GASB 27 effective the first fiscal year beginning after June 15, 2014.

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 (also called Total Normal Cost)

The annual cost of service accrual for the upcoming fiscal year for active employees. The normal cost should be viewed as the long-term contribution rate.

Pension Actuary

A business professional that is authorized by the Society of Actuaries, and the American Academy of Actuaries to perform the calculations necessary to properly fund a pension plan.

PEPRA

The California Public Employees' Pension Reform Act of 2013

Prepayment Contribution

A payment made by the employer to reduce or eliminate the year's required employer contribution.

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.

Risk Pool

Utilizing the law of large numbers, a risk pool is a collection of employer plans for the purpose of sharing risk. If a pooled plan has active members at the time of valuation, it belongs to the risk pool composed of all other pooled plans with the same benefit formula.

Unfunded Accrued Liability (UAL)

When a plan or pool's value of assets is less than its Accrued Liability, the difference is the plan or pool's Unfunded Accrued Liability (or unfunded liability). If the unfunded liability is positive, the plan or pool will have to pay contributions exceeding the Normal Cost.