



**California Public Employees' Retirement System**

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**July 2020**

**Miscellaneous Plan of the Ross Valley Sanitary District  
(CalPERS ID: 6650358204)  
Annual Valuation Report as of June 30, 2019**

Dear Employer,

Attached to this letter, you will find the June 30, 2019 actuarial valuation report of your CalPERS pension plan. **Provided in this report is the determination of the minimum required employer contributions for fiscal year 2021-22.** In addition, the report contains important information regarding the current financial status of the plan as well as projections and risk measures to aid in planning for the future.

Because this plan is in a risk pool, the following valuation report has been separated into two sections:

- Section 1 contains specific information for the plan including the development of the current and projected employer contributions, and
- Section 2 contains the Risk Pool Actuarial Valuation appropriate to the plan as of June 30, 2019.

Section 2 can be found on the CalPERS website ([www.calpers.ca.gov](http://www.calpers.ca.gov)). From the home page, go to "Forms & Publications" and select "View All". In the search box, enter "Risk Pool" and from the results list download the Miscellaneous or Safety Risk Pool Actuarial Valuation Report as appropriate.

Your June 30, 2019 actuarial valuation report contains important actuarial information about your pension plan at CalPERS. Your assigned CalPERS staff actuary, whose signature appears in the Actuarial Certification section on page 1, is available to discuss the report with you after August 1, 2020.

Actuarial valuations are based on assumptions regarding future plan experience including investment return and payroll growth, eligibility for the types of benefits provided, and longevity among retirees. The CalPERS Board of Administration adopts these assumptions after considering the advice of CalPERS actuarial and investment teams and other professionals. Each actuarial valuation reflects all prior differences between actual and assumed experience and adjusts the contribution rates as needed. This valuation is based on an investment return assumption of 7.0% which was adopted by the board in December 2016. Other assumptions used in this report are those recommended in the CalPERS Experience Study and Review of Actuarial Assumptions report from December 2017.

**Required Contribution**

The exhibit below displays the minimum employer contributions, before any cost sharing, for fiscal year 2021-22 along with estimates of the required contributions for fiscal year 2022-23. Member contributions other than cost sharing (whether paid by the employer or the employee) are in addition to the results shown below. **The employer contributions in this report do not reflect any cost sharing arrangements you may have with your employees.**

Fiscal Year	Employer Normal Cost Rate	Employer Amortization of Unfunded Accrued Liability
2021-22	13.35%	\$614,779
<i>Projected Results</i>		
2022-23	13.4%	\$679,000

The actual investment return for fiscal year 2019-20 was not known at the time this report was prepared. The projections above assume the investment return for that year would be 7.00%. ***To the extent the actual investment return for fiscal year 2019-20 differs from 7.00%, the actual contribution requirements for fiscal year 2022-23 will differ from those shown above.*** For additional details regarding the assumptions and methods used for these projections please refer to the "Projected Employer Contributions" in the "Highlights and Executive Summary" section. This section also contains projected required contributions through fiscal year 2026-27.

#### **Changes from Previous Year's Valuation**

The CalPERS Board of Administration has adopted a new amortization policy effective with the June 30, 2019 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 Unfunded Accrued Liability (UAL) bases attributable to assumption and method changes and non-investment gains/losses. The new policy does not utilize a 5-year ramp-down on investment gains/losses. These changes apply only to new UAL bases established on or after June 30, 2019.

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

#### **Questions**

We understand that you might have some questions about these results. While we are very interested in discussing these results with your agency, in the interest of allowing us to give every public agency their results, we ask that you wait until after August 1, 2020 to contact us with actuarial questions. If you have other questions, you may call the Customer Contact Center at (888)-CalPERS or **(888-225-7377)**.

Sincerely,



SCOTT TERANDO  
Chief Actuary



**Actuarial Valuation  
as of June 30, 2019**

**for the  
Miscellaneous Plan  
of the  
Ross Valley Sanitary District  
(CalPERS ID: 6650358204)**

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

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**Section 2 – Risk Pool Actuarial Valuation Information**

# Section 1

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

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## **Plan Specific Information for the Miscellaneous Plan of the Ross Valley Sanitary District**

**(CalPERS ID: 6650358204)  
(Valuation Rate Plan ID: 57)**

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## Actuarial Certification

Section 1 of this report is based on the member and financial data contained in our records as of June 30, 2019 which was provided by your agency and the benefit provisions under your contract with CalPERS. Section 2 of this report is based on the member and financial data as of June 30, 2019 provided by employers participating in the Miscellaneous Risk Pool to which the plan belongs and benefit provisions under the CalPERS contracts for those agencies.

As set forth in Section 2 of this report, the pool actuaries have certified that, in their opinion, the valuation of the risk pool containing your Miscellaneous Plan has been performed in accordance with generally accepted actuarial principles consistent with standards of practice prescribed by the Actuarial Standards Board, and that the assumptions and methods are internally consistent and reasonable for the risk pool as of the date of this valuation and as prescribed by the CalPERS Board of Administration according to provisions set forth in the California Public Employees' Retirement Law.

Having relied upon the information set forth in Section 2 of this report and based on the census and benefit provision information for the plan, it is my opinion as the plan actuary that the Unfunded Accrued Liability amortization bases as of June 30, 2019 and employer contribution as of July 1, 2021 have been properly and accurately determined in accordance with the principles and standards stated above.

The undersigned is an actuary for CalPERS, a member of both the American Academy of Actuaries and Society of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.



SHELLY CHU, ASA, MAAA  
Senior Pension Actuary, CalPERS

# Highlights and Executive Summary

- **Introduction**
- **Purpose of Section 1**
- **Required Employer Contributions**
- **Additional Discretionary Employer Contributions**
- **Plan's Funded Status**
- **Projected Employer Contributions**
- **Cost**
- **Changes Since the Prior Year's Valuation**
- **Subsequent Events**

## Introduction

This report presents the results of the June 30, 2019 actuarial valuation of the Miscellaneous Plan of the Ross Valley Sanitary District of the California Public Employees' Retirement System (CalPERS). This actuarial valuation sets the required employer contributions for fiscal year 2021-22.

## Purpose of Section 1

This Section 1 report for the Miscellaneous Plan of the Ross Valley Sanitary District of CalPERS was prepared by the plan actuary in order to:

- Set forth the assets and accrued liabilities of this plan as of June 30, 2019;
- Determine the minimum required employer contribution for this plan for the fiscal year July 1, 2021 through June 30, 2022; and
- 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: plan 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.

### Assessment and Disclosure of Risk

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

- A "Scenario Test," projecting future results under different investment income returns.
- A "Sensitivity Analysis," showing the impact on current valuation results using alternative discount rates of 6.0% and 8.0%.
- A "Sensitivity Analysis," showing the impact on current valuation results assuming rates of mortality are 10% lower or 10% higher than our current mortality assumptions adopted in 2017.
- Plan maturity measures indicating how sensitive a plan may be to the risks noted above.

## Required Employer Contributions

	Fiscal Year
<b>Required Employer Contributions</b>	<b>2021-22</b>
<b>Employer Normal Cost Rate</b>	<b>13.35%</b>
<i>Plus, Either</i>	
<b>1) Monthly Employer Dollar UAL Payment</b>	<b>\$51,231.58</b>
<i>Or</i>	
<b>2) Annual UAL Prepayment Option*</b>	<b>\$594,329</b>
<p><i>The total minimum required employer contribution is the <b>sum</b> of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll) <b>plus</b> the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly in dollars).</i></p> <p><i>* Only the UAL portion of the employer contribution can be prepaid (<b>which must be received in full no later than July 31</b>). Any prepayment totaling over \$5 million requires a 72-hour notice email to <a href="mailto:FCSD_public_agency_wires@calpers.ca.gov">FCSD_public_agency_wires@calpers.ca.gov</a>. Plan Normal Cost contributions will be made as part of the payroll reporting process. If there is contractual cost sharing or other change, this amount will change.</i></p> <p><i>In accordance with Sections 20537 and 20572 of the Public Employees' Retirement Law, if a contracting agency fails to remit the required contributions when due, interest and penalties may apply.</i></p>	

	Fiscal Year 2020-21	Fiscal Year 2021-22
<b>Development of Normal Cost as a Percentage of Payroll<sup>1</sup></b>		
Base Total Normal Cost for Formula	21.471%	21.31%
Surcharge for Class 1 Benefits <sup>2</sup>		
None	0.000%	0.00%
Phase out of Normal Cost Difference <sup>3</sup>	0.000%	0.00%
Plan's Total Normal Cost	21.471%	21.31%
Formula's Expected Employee Contribution Rate	7.956%	7.96%
Employer Normal Cost Rate	13.515%	13.35%
Projected Payroll for the Contribution Fiscal Year	\$2,937,991	\$3,292,777
<b>Estimated Employer Contributions Based on Projected Payroll</b>		
Plan's Estimated Employer Normal Cost	\$397,069	\$439,586
Plan's Payment on Amortization Bases <sup>4</sup>	530,715	614,779
% of Projected Payroll (illustrative only)	18.064%	18.67%
Estimated Total Employer Contribution	\$927,784	\$1,054,365
% of Projected Payroll (illustrative only)	31.579%	32.02%

<sup>1</sup> The results shown for fiscal year 2020-21 reflect the prior year valuation and may not take into account any lump sum payment, side fund payoff, or rate adjustment made after April 30, 2019.

<sup>2</sup> Section 2 of this report contains a list of Class 1 benefits and corresponding surcharges for each benefit.

<sup>3</sup> The normal cost difference is phased out over a five-year period. The phase out of normal cost difference is 100% for the first year of pooling and is incrementally reduced by 20% of the original normal cost difference for each subsequent year. This is non-zero only for plans that joined a pool within the past 5 years. Most plans joined a pool June 30, 2003, when risk pooling was implemented.

<sup>4</sup> See Schedule of Plan's Amortization Bases.

## Additional Discretionary Employer Contributions

The minimum required employer contribution towards the Unfunded Accrued Liability (UAL) for this rate plan for the 2021-22 fiscal year is \$614,779. CalPERS allows employers to make additional discretionary payments (ADPs) at any time and in any amount. These optional payments serve to reduce the UAL and future required contributions and can result in significant long-term savings. Employers can also use ADPs to stabilize annual contributions as a fixed dollar amount, percent of payroll or percent of revenue.

Provided below are select ADP options for consideration. Making such an ADP during fiscal year 2021-22 does not require an ADP be made in any future year, nor does it change the remaining amortization period of any portion of unfunded liability. For information on permanent changes to amortization periods, see the "Amortization Schedule and Alternatives" section of the report.

If you are considering making an ADP, please contact your actuary for additional information.

### Minimum Required Employer Contribution for Fiscal Year 2021-22

Estimated Normal Cost	Minimum UAL Payment	ADP	Total UAL Contribution	Estimated Total Contribution
\$439,586	\$614,779	\$0	\$614,779	\$1,054,365

### Alternative Fiscal Year 2021-22 Employer Contributions for Greater UAL Reduction

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP <sup>1</sup>	Total UAL Contribution	Estimated Total Contribution
20 years	\$439,586	\$614,779	\$64,782	\$679,561	\$1,119,147
15 years	\$439,586	\$614,779	\$175,663	\$790,442	\$1,230,028
10 years	\$439,586	\$614,779	\$410,236	\$1,025,015	\$1,464,601
5 years	\$439,586	\$614,779	\$1,141,057	\$1,755,836	\$2,195,422

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

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 2021 as determined in the June 30, 2019 actuarial valuation. New unfunded liabilities can emerge in future years due to assumption or method changes, changes in plan provisions and actuarial experience different than assumed. Making an ADP illustrated above for the indicated number of years will not result in a plan that is exactly 100% funded in the indicated number of years. Valuation results will vary from one year to the next and can diverge significantly from projections over a period of several years.

## Plan's Funded Status

	June 30, 2018	June 30, 2019
1. Present Value of Projected Benefits (PVB)	\$28,467,385	\$30,213,010
2. Entry Age Normal Accrued Liability (AL)	23,933,716	25,335,254
3. Plan's Market Value of Assets (MVA)	16,827,703	17,917,769
4. Unfunded Accrued Liability (UAL) [(2) - (3)]	7,106,013	7,417,485
5. Funded Ratio [(3) / (2)]	70.3%	70.7%

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 plan. The 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.

## Projected Employer Contributions

The table below shows the required and projected employer contributions (before cost sharing) for the next six fiscal years. The projection assumes that all actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur during the projection period. As of the preparation date of this report, the year to date return for the 2019-20 fiscal year was well below the 7% assumed return. Actual contribution rates during this projection period could be significantly higher than the projection shown below.

Fiscal Year	Required Contribution	Projected Future Employer Contributions (Assumes 7.00% Return for Fiscal Year 2019-20)				
		2021-22	2022-23	2023-24	2024-25	2025-26
<b>Normal Cost %</b>	13.35%	13.4%	13.4%	13.4%	13.4%	13.4%
<b>UAL Payment</b>	\$614,779	\$679,000	\$723,000	\$768,000	\$674,000	\$692,000

For some sources of UAL, the change in UAL is amortized using a 5-year ramp up. For more information, please see "Amortization of the Unfunded Actuarial Accrued Liability" under "Actuarial Methods" in Appendix A. This method phases in the impact of the change in UAL over a 5-year period in order to reduce employer cost volatility from year to year. As a result of this methodology, dramatic changes in the required employer contributions in any one year are less likely. However, required contributions can change gradually and significantly over the next five years. In years when there is a large increase in UAL, the relatively small amortization payments during the ramp up period could result in a funded ratio that is projected to decrease initially while the contribution impact of the increase in the UAL is phased in.

For projected contributions under alternate investment return scenarios, please see the "Future Investment Return Scenarios" in the "Risk Analysis" section.

## Cost

### Actuarial Determination of Pension Plan Cost

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

For fiscal years prior to FY 2016-17, the Amortization of UAL component was expressed as a percentage of total active payroll. Starting with FY 2016-17, the Amortization of UAL component was expressed as a dollar amount and invoiced on a monthly basis. There continues to 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 (e.g., mortality rates, retirement rates, employment termination rates, disability rates)
- Economic assumptions (e.g., future investment earnings, inflation, salary growth rates)

These assumptions reflect CalPERS' best estimate of future experience of the plan and are long term in nature. We recognize that all assumptions will not be realized in any given year. For example, the investment earnings at CalPERS have averaged 5.8% over the 20 years ending June 30, 2019, yet individual fiscal year returns have ranged from -23.6% to +20.7%. In addition, CalPERS reviews all actuarial assumptions 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

### Benefits

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

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

### 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 to 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 are calculated under the assumption that the discount rate remains at 7.0% going forward and that the realized rate of return on assets for fiscal year 2019-20 is 7.0%.

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 and Liabilities**

- **Breakdown of Entry Age Normal Accrued Liability**
- **Allocation of Plan's Share of Pool's Experience/Assumption Change**
- **Development of Plan's Share of Pool's Market Value of Assets**
- **Schedule of Plan's Amortization Bases**
- **Amortization Schedule and Alternatives**
- **Employer Contribution History**
- **Funding History**

## Breakdown of Entry Age Normal Accrued Liability

Active Members	\$9,711,026
Transferred Members	1,285,529
Terminated Members	1,514,212
Members and Beneficiaries Receiving Payments	12,824,487
Total	\$25,335,254

## Allocation of Plan's Share of Pool's Experience/Assumption Change

It is the policy of CalPERS to ensure equity within the risk pools by allocating the pool's experience gains/losses and assumption changes in a manner that treats each employer equitably and maintains benefit security for the members of the System while minimizing substantial variations in employer contributions. The Pool's experience gains/losses and impact of assumption/method changes is allocated to the plan as follows:

1. Plan's Accrued Liability	\$25,335,254
2. Projected UAL balance at 6/30/2019	7,231,653
3. Pool's Accrued Liability <sup>1</sup>	18,394,114,919
4. Sum of Pool's Individual Plan UAL Balances at 6/30/2019 <sup>1</sup>	4,268,374,183
5. Pool's 2018/19 Investment (Gain)/Loss <sup>1</sup>	68,711,010
6. Pool's 2018/19 Non-Investment (Gain)/Loss <sup>1</sup>	70,985,020
7. Plan's Share of Pool's Investment (Gain)/Loss: $[(1) - (2)] \div [(3) - (4)] \times (5)$	88,060
8. Plan's Share of Pool's Non-Investment (Gain)/Loss: $(1) \div (3) \times (6)$	97,772
9. Plan's New (Gain)/Loss as of 6/30/2019: $(7) + (8)$	185,832
10. Other Changes in the UAL <sup>2</sup>	0

<sup>1</sup> Does not include plans that transferred to Pool on the valuation date.

<sup>2</sup> May include Golden Handshakes, Service Purchases, etc. See Schedule of Plan's Amortization Bases for details.

## Development of the Plan's Share of Pool's Market Value of Assets

11. Plan's UAL: $(2) + (9) + (10)$	\$7,417,485
12. Plan's Share of Pool's MVA: $(1) - (11)$	\$17,917,769

## Schedule of Plan's Amortization Bases

Note that there is a two-year lag between the valuation date and the start of the contribution fiscal year.

- The assets, liabilities, and funded status of the plan are measured as of the valuation date: June 30, 2019.
- The required employer contributions determined by the valuation are for the fiscal year beginning two years after the valuation date: fiscal year 2021-22.

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

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

Reason for Base	Date Est.	Ramp Level 2021-22	Ramp Shape	Escalation Rate	Amort. Period	Balance 6/30/19	Expected Payment 2019-20	Balance 6/30/20	Expected Payment 2020-21	Balance 6/30/21	Minimum Required Payment 2021-22
Share of Pre-2013 Pool UAL	6/30/13	No Ramp		2.75%	15	2,014,425	168,134	1,981,516	170,620	1,943,731	175,312
Non-Investment (Gain)/Loss	6/30/13	100%	Up/Down	2.75%	24	7,508	504	7,512	510	7,510	524
Investment (Gain)/Loss	6/30/13	100%	Up/Down	2.75%	24	1,885,471	126,472	1,886,630	127,983	1,886,307	131,503
Non-Investment (Gain)/Loss	6/30/14	100%	Up/Down	2.75%	25	1,813	96	1,841	122	1,844	125
Investment (Gain)/Loss	6/30/14	100%	Up/Down	2.75%	25	(1,542,794)	(81,895)	(1,566,077)	(103,560)	(1,568,579)	(106,408)
Side Fund	2013 or Prior	No Ramp		2.75%	4	523,621	100,299	456,524	102,253	382,709	105,065
Assumption Change	6/30/14	100%	Up/Down	2.75%	15	1,025,168	76,246	1,018,060	96,807	989,186	99,469
Non-Investment (Gain)/Loss	6/30/15	100%	Up/Down	2.75%	26	(85,712)	(3,421)	(88,173)	(4,612)	(89,574)	(5,923)
Investment (Gain)/Loss	6/30/15	100%	Up/Down	2.75%	26	997,321	39,802	1,025,962	53,662	1,042,271	68,922
Non-Investment (Gain)/Loss	6/30/16	80%	Up/Down	2.75%	27	(158,766)	(4,289)	(165,443)	(6,502)	(170,298)	(8,907)
Investment (Gain)/Loss	6/30/16	80%	Up/Down	2.75%	27	1,226,528	33,134	1,278,111	50,228	1,315,623	68,812
Assumption Change	6/30/16	80%	Up/Down	2.75%	17	399,998	14,764	412,726	22,471	418,373	30,785
Non-Investment (Gain)/Loss	6/30/17	60%	Up/Down	2.75%	28	(33,004)	(459)	(34,839)	(926)	(36,320)	(1,427)
Investment (Gain)/Loss	6/30/17	60%	Up/Down	2.75%	28	(612,130)	(8,504)	(646,182)	(17,177)	(673,647)	(26,473)
Assumption Change	6/30/17	60%	Up/Down	2.75%	18	448,523	8,472	471,156	17,181	486,365	26,480
AL Significant Increase*	6/30/18	40%	Up/Down	2.75%	29	348,484	0	372,878	5,093	393,711	10,465
Non-Investment (Gain)/Loss	6/30/18	40%	Up/Down	2.75%	29	97,403	0	104,221	1,423	110,045	2,925
Investment (Gain)/Loss	6/30/18	40%	Up/Down	2.75%	29	(190,007)	0	(203,307)	(2,777)	(214,666)	(5,706)
Assumption Change	6/30/18	40%	Up/Down	2.75%	19	686,905	(19,638)	755,302	14,082	793,607	28,939

## Schedule of Plan's Amortization Bases (continued)

Reason for Base	Date Est.	Ramp Level 2021-22	Ramp Shape	Escala-tion Rate	Amort. Period	Balance 6/30/19	Expected Payment 2019-20	Balance 6/30/20	Expected Payment 2020-21	Balance 6/30/21	Minimum Required Payment 2021-22
Method Change	6/30/18	40%	Up/Down	2.75%	19	190,898	(1,299)	205,605	3,833	216,032	7,878
Non-Investment (Gain)/Loss	6/30/19	No Ramp		0.00%	20	97,772	0	104,616	0	111,939	10,215
Investment (Gain)/Loss	6/30/19	20%	Up Only	0.00%	20	88,060	0	94,224	0	100,820	2,204
<b>Total</b>						<b>7,417,485</b>	<b>448,418</b>	<b>7,472,863</b>	<b>530,714</b>	<b>7,446,989</b>	<b>614,779</b>

\*Government Code Section 20791 requires that a significant increase in actuarial liability to a contracting agency due to increased compensation by a subsequent employer to a non-represented employee is borne by the agency that created the increase in liability.

The (gain)/loss bases are the plan's allocated share of the risk pool's (gain)/loss for the fiscal year as disclosed in "Allocation of Plan's Share of Pool's Experience/Assumption Change" earlier in this section. These (gain)/loss bases will be amortized in accordance with the CalPERS amortization policy in effect at the time the base was established.

## Amortization Schedule and Alternatives

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

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

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

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

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

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

## Amortization Schedule and Alternatives

Date	<u>Current Amortization Schedule</u>		<u>Alternate Schedules</u>			
	Balance	Payment	15 Year Amortization		10 Year Amortization	
			Balance	Payment	Balance	Payment
6/30/2021	7,446,989	614,779	7,446,989	790,442	7,446,989	1,025,015
6/30/2022	7,332,349	679,220	7,150,639	790,442	6,907,994	1,025,015
6/30/2023	7,143,022	722,693	6,833,544	790,442	6,331,270	1,025,015
6/30/2024	6,895,475	768,445	6,494,253	790,442	5,714,175	1,025,015
6/30/2025	6,583,271	674,151	6,131,211	790,442	5,053,883	1,025,015
6/30/2026	6,346,753	692,106	5,742,756	790,442	4,347,371	1,025,015
6/30/2027	6,075,105	710,555	5,327,109	790,442	3,591,403	1,025,014
6/30/2028	5,765,360	729,508	4,882,367	790,442	2,782,518	1,025,014
6/30/2029	5,414,326	748,990	4,406,493	790,441	1,917,012	1,025,015
6/30/2030	5,018,566	769,001	3,897,309	790,442	990,919	1,025,015
6/30/2031	4,574,405	789,567	3,352,481	790,441		
6/30/2032	4,077,879	783,880	2,769,516	790,441		
6/30/2033	3,552,479	777,305	2,145,744	790,442		
6/30/2034	2,997,102	758,845	1,478,307	790,442		
6/30/2035	2,421,944	725,884	764,149	790,442		
6/30/2036	1,840,620	399,550				
6/30/2037	1,556,166	356,038				
6/30/2038	1,296,809	309,846				
6/30/2039	1,067,079	273,401				
6/30/2040	858,966	249,513				
6/30/2041	660,997	189,125				
6/30/2042	511,633	185,223				
6/30/2043	355,851	158,079				
6/30/2044	217,242	101,353				
6/30/2045	127,609	59,223				
6/30/2046	75,280	59,149				
6/30/2047	19,366	16,000				
6/30/2048	4,170	4,313				
6/30/2049						
6/30/2050						
<b>Total</b>		<b>13,305,742</b>		<b>11,856,627</b>		<b>10,250,148</b>
<b>Interest Paid</b>		<b>5,858,753</b>		<b>4,409,638</b>		<b>2,803,159</b>
<b>Estimated Savings</b>				<b>1,449,115</b>		<b>3,055,594</b>

## Employer Contribution History

The table below provides a recent history of the required employer contributions for the plan, as determined by the annual actuarial valuation. It does not account for prepayments or benefit changes made during a fiscal year.

<b>Fiscal Year</b>	<b>Employer Normal Cost</b>	<b>Unfunded Liability Payment (\$)</b>
2016 - 17	11.008%	\$294,723
2017 - 18	11.049%	338,157
2018 - 19	11.569%	401,042
2019 - 20	12.514%	469,355
2020 - 21	13.515%	530,715
2021 - 22	13.35%	614,779

## Funding History

The funding history below shows the plan's actuarial accrued liability, share of the pool's market value of assets, share of the pool's unfunded liability, funded ratio, and annual covered payroll.

<b>Valuation Date</b>	<b>Accrued Liability (AL)</b>	<b>Share of Pool's Market Value of Assets (MVA)</b>	<b>Plan's Share of Pool's Unfunded Liability</b>	<b>Funded Ratio</b>	<b>Annual Covered Payroll</b>
06/30/2011	\$14,064,812	\$10,169,681	\$3,895,131	72.3%	\$2,726,704
06/30/2012	14,847,814	10,175,532	4,672,282	68.5%	2,963,363
06/30/2013	15,939,891	11,625,527	4,314,364	72.9%	2,996,008
06/30/2014	17,654,175	13,654,846	3,999,329	77.4%	2,981,696
06/30/2015	19,081,184	14,352,649	4,728,535	75.2%	3,086,410
06/30/2016	20,248,591	14,237,531	6,011,060	70.3%	2,667,803
06/30/2017	21,483,102	15,532,231	5,950,871	72.3%	2,771,814
06/30/2018	23,933,716	16,827,703	7,106,013	70.3%	2,708,351
06/30/2019	25,335,254	17,917,769	7,417,485	70.7%	3,035,406

## **Risk Analysis**

- **Future Investment Return Scenarios**
- **Discount Rate Sensitivity**
- **Mortality Rate Sensitivity**
- **Maturity Measures**
- **Maturity Measures History**
- **Hypothetical Termination Liability**

## Future Investment Return Scenarios

Analysis was performed to determine the effects of various future investment returns on required employer contributions. The projections below provide a range of results based on five investment return scenarios assumed to occur during the next four fiscal years (2019-20, 2020-21, 2021-22 and 2022-23). The projections also assume that all other actuarial assumptions will be realized and that no further changes to assumptions, contributions, benefits, or funding will occur.

For fiscal years 2019-20, 2020-21, 2021-22, and 2022-23, each scenario assumes an alternate fixed annual return. The fixed return assumptions for the five scenarios are 1.0%, 4.0%, 7.0%, 9.0% and 12.0%.

These alternate investment returns were chosen based on stochastic analysis of possible future investment returns over the four-year period ending June 30, 2023. Using the expected returns and volatility of the asset classes in which the funds are invested, we produced five thousand stochastic outcomes for this period based on the most recently completed Asset Liability Management process. We then selected annual returns that approximate the 5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup>, and 95<sup>th</sup> percentiles for these outcomes. For example, of all the 4-year outcomes generated in the stochastic analysis, approximately 25% had an average annual return of 4.0% or less.

Required contributions outside of this range are also possible. In particular, whereas it is unlikely that investment returns will average less than 1.0% or greater than 12.0% over this four-year period, the likelihood of a single investment return less than 1.0% or greater than 12.0% in any given year is much greater.

Assumed Annual Return From 2019-20 through 2022-23	Projected Employer Contributions			
	2022-23	2023-24	2024-25	2025-26
<b>1.0%</b>				
Normal Cost	13.4%	13.4%	13.4%	13.4%
UAL Contribution	\$706,000	\$804,000	\$931,000	\$945,000
<b>4.0%</b>				
Normal Cost	13.4%	13.4%	13.4%	13.4%
UAL Contribution	\$693,000	\$764,000	\$851,000	\$814,000
<b>7.0%</b>				
Normal Cost	13.4%	13.4%	13.4%	13.4%
UAL Contribution	\$679,000	\$723,000	\$768,000	\$674,000
<b>9.0%</b>				
Normal Cost	13.6%	13.9%	14.2%	14.4%
UAL Contribution	\$672,000	\$702,000	\$727,000	\$606,000
<b>12.0%</b>				
Normal Cost	13.6%	13.9%	14.2%	14.4%
UAL Contribution	\$658,000	\$660,000	\$640,000	\$454,000

These projections reflect the impact of the CalPERS risk mitigation policy, which reduces the discount rate when investment returns exceed specified trigger points.

## 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% and 2.50%, 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% as well as alternate discount rates of 6.0% and 8.0%. The rates of 6.0% and 8.0% were selected since they illustrate the impact of a 1.0% increase or decrease to the 7.0% assumption.

### 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
<b>Discount Rate</b>	<b>6.0%</b>	<b>7.0%</b>	<b>8.0%</b>
Inflation	2.5%	2.5%	2.5%
<b>Real Rate of Return</b>	<b>3.5%</b>	<b>4.5%</b>	<b>5.5%</b>
a) Total Normal Cost	26.64%	21.31%	17.24%
b) Accrued Liability	\$28,799,248	\$25,335,254	\$22,467,668
c) Market Value of Assets	\$17,917,769	\$17,917,769	\$17,917,769
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$10,881,479	\$7,417,485	\$4,549,899
e) Funded Status	62.2%	70.7%	79.7%

### Sensitivity to the Price Inflation Assumption

As of June 30, 2019	1% Lower Inflation Rate	Current Assumptions	1% Higher Inflation Rate
<b>Discount Rate</b>	<b>6.0%</b>	<b>7.0%</b>	<b>8.0%</b>
<b>Inflation</b>	<b>1.5%</b>	<b>2.5%</b>	<b>3.5%</b>
Real Rate of Return	4.5%	4.5%	4.5%
a) Total Normal Cost	22.69%	21.31%	19.63%
b) Accrued Liability	\$26,814,583	\$25,335,254	\$23,421,686
c) Market Value of Assets	\$17,917,769	\$17,917,769	\$17,917,769
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$8,896,814	\$7,417,485	\$5,503,917
e) Funded Status	66.8%	70.7%	76.5%

## Mortality Rate Sensitivity

The following table looks at the change in the June 30, 2019 plan costs and funded ratio under two different longevity scenarios, namely assuming post-retirement rates of mortality are 10% lower or 10% 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 Assumptions	10% Higher Mortality Rates
a) Total Normal Cost	21.67%	21.31%	20.98%
b) Accrued Liability	\$25,863,547	\$25,335,254	\$24,847,919
c) Market Value of Assets	\$17,917,769	\$17,917,769	\$17,917,769
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$7,945,778	\$7,417,485	\$6,930,150
e) Funded Status	69.3%	70.7%	72.1%

## Maturity Measures

As pension plans mature they become more sensitive to risks. Understanding plan maturity and how it affects the ability of a pension plan 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%.

<b>Ratio of Retiree Accrued Liability to Total Accrued Liability</b>	<b>June 30, 2018</b>	<b>June 30, 2019</b>
1. Retired Accrued Liability	12,828,233	12,824,487
2. Total Accrued Liability	23,933,716	25,335,254
3. Ratio of Retiree AL to Total AL [(1) / (2)]	0.54	0.51

Another measure of maturity level of CalPERS and its plans is to look at the ratio of actives to retirees, also called the Support Ratio. A pension plan in its infancy will have a very high ratio of active to retired members. As the plan matures, and members retire, the ratio 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.

<b>Support Ratio</b>	<b>June 30, 2018</b>	<b>June 30, 2019</b>
1. Number of Actives	24	25
2. Number of Retirees	23	23
3. Support Ratio [(1) / (2)]	1.04	1.09

## 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 (e.g., 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)

Shown in the table below is the asset volatility ratio (AVR), which is the ratio of market value of assets to payroll. Plans that have higher AVR 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. 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)

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

Contribution Volatility	June 30, 2018	June 30, 2019
1. Market Value of Assets	\$16,827,703	\$17,917,769
2. Payroll	2,708,351	3,035,406
3. Asset Volatility Ratio (AVR) [(1) / (2)]	6.2	5.9
4. Accrued Liability	\$23,933,716	\$25,335,254
5. Liability Volatility Ratio (LVR) [(4) / (2)]	8.8	8.3

## Maturity Measures History

Valuation Date	Ratio of Retiree Accrued Liability to Total Accrued Liability	Support Ratio	Asset Volatility Ratio	Liability Volatility Ratio
06/30/2017	0.55	1.24	5.6	7.8
06/30/2018	0.54	1.04	6.2	8.8
06/30/2019	0.51	1.09	5.9	8.3

## Hypothetical Termination Liability

The hypothetical termination liability 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 compared to the plan's ongoing funding liability. For the 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 is assumed. 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.

<b>Market Value of Assets (MVA)</b>	<b>Hypothetical Termination Liability<sup>1,2</sup> @ 1.75%</b>	<b>Funded Status</b>	<b>Unfunded Termination Liability @ 1.75%</b>	<b>Hypothetical Termination Liability<sup>1,2</sup> @ 3.25%</b>	<b>Funded Status</b>	<b>Unfunded Termination Liability @ 3.25%</b>
\$17,917,769	\$49,692,402	36.1%	\$31,774,633	\$39,568,850	45.3%	\$21,651,081

<sup>1</sup> The hypothetical liabilities calculated above include a 5% mortality contingency load in accordance with Board policy. Other actuarial assumptions can be found in Appendix A of the Section 2 report.

<sup>2</sup> 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% on June 30, 2019, and was 1.83% on January 31, 2020.

In order to terminate the plan, you must first contact our Retirement Services Contract Unit to initiate a Resolution of Intent to Terminate. The completed Resolution will allow the plan actuary to give you a preliminary termination valuation with a more up-to-date estimate of the plan liabilities. CalPERS advises you to consult with the plan actuary before beginning this process.

## Participant Data

The table below shows a summary of your plan's member data upon which this valuation is based:

	<b>June 30, 2018</b>	<b>June 30, 2019</b>
Reported Payroll	\$2,708,351	\$3,035,406
Projected Payroll for Contribution Purposes	\$2,937,991	\$3,292,777
Number of Members		
Active	24	25
Transferred	9	9
Separated	13	12
Retired	23	23

## List of Class 1 Benefit Provisions

This plan has the additional Class 1 Benefit Provisions:

- None

## Plan's Major Benefit Options

Shown below is a summary of the major optional benefits for which your agency has contracted. A description of principal standard and optional plan provisions is in Section 2.

Member Category	Benefit Group			
	Misc	Misc	Misc	Misc
<b>Demographics</b>				
Actives	No	Yes	No	No
Transfers/Separated	Yes	Yes	No	No
Receiving	Yes	Yes	Yes	Yes
<b>Benefit Provision</b>				
Benefit Formula	2% @ 55	2.7% @ 55		
Social Security Coverage	Yes	Yes		
Full/Modified	Full	Full		
Employee Contribution Rate		8.00%		
Final Average Compensation Period	Three Year	Three Year		
Sick Leave Credit	Yes	Yes		
Non-Industrial Disability	Standard	Standard		
Industrial Disability	No	No		
Pre-Retirement Death Benefits				
Optional Settlement 2	Yes	Yes		
1959 Survivor Benefit Level	No	No		
Special	No	No		
Alternate (firefighters)	No	No		
Post-Retirement Death Benefits				
Lump Sum	\$500	\$500	\$500	\$0
Survivor Allowance (PRSA)	No	No	No	No
COLA	2%	2%	2%	2%

## Section 2

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

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### **Risk Pool Actuarial Valuation Information**

**Section 2 may be found on the CalPERS website  
([www.calpers.ca.gov](http://www.calpers.ca.gov)) in the Forms and  
Publications section**