



Item No. 4 Town of Atherton

FINANCE COMMITTEE STAFF REPORT

TO: FINANCE COMMITTEE

FROM: ROBERT BARRON III, FINANCE DIRECTOR

DATE: SEPTEMBER 17, 2020

SUBJECT: PRESENTATION AND REVIEW OF THE CALPERS ACTUARIAL REPORTS AS OF JUNE 30, 2019 AND PROVIDE GENERAL UPDATE ON RETIREMENT PLANS; IF APPROPRIATE MAKE RECOMMENDATIONS OF OPTIONS FOR COUNCIL REVIEW AND CONSIDERATION

RECOMMENDATION

Presentation and review of the CalPERS actuarial reports as of June 30, 2019 and provide general update on retirement plans.

BACKGROUND

At its May 2019 Finance Committee meeting we heard a presentation from senior pension actuary Julian Robinson from CalPERS to discuss our June 30, 2018 Actuary reports. Staff felt it was beneficial to help us better understand CalPERS implemented changes over the years that included a rate smoothing policy, changes in actuary assumptions due to demographics, investment risk volatility, and most notably changes in the discount rate to the pension plan and the outlook of future pension costs impact.

During this discussion there was an update on the climate of the CalPERS pension as a result of the COVID-19 pandemic. The immediate impacts of the pandemic during March 31, 2020 saw the CalPERS investment returns reach negative -4 (%) percent. Markets recovered somewhat in April, and the best estimate for FY 2020 CalPERS returns would remain somewhere around zero. *As of year ending June 30, 2020, the CalPERS investment returns for FY 19/20 was 4.7%*, This was an 8 percent swing from March 31 to June 30. It is important to note that the investment returns for FY 2019/20 will be reflected in the June 30, 2020 actuarial valuation reports. Any gains and losses will be reflected in FY 2022/23 valuation reports as the first payment for Public

Agencies. It was communicated that three key priorities for CalPERS included investment risk, employer affordability, and economic climate risk.

Investments	Employers
Healthy Liquidity Position	7% Discount Rate
Diversified Portfolio & Asset Allocation	Shortened Amortization to 20 Years
Total Fund Perspective	Additional payments by State and most public Agencies

It was discussed during the meeting that once the latest actuary reports as of June 30, 2019 were released, we would revisit the Town pension plans and invite our pension actuary back to discuss our pension liabilities.

It was also recommended within the Finance Committee that a recommendation be sent to the City Council that once the Civic Center project was completed, funding towards paying down unfunded pensions liabilities would be implemented. It was conferred that it makes sense once the Civic Center is completed. The Committee supported and recommended that a formal statement be made to the Council for contributions toward pension liabilities via Pension Rate Stabilization Trust (PARS Trust). Staff felt that with the changes in CalPERS assumptions, recent COVID-19 implications, and prior to submitting a formal recommendation to the Council, it would be beneficial to review and discuss our most recent reports with our CalPERS actuary.

FINDINGS

In July 2020, CalPERS held a webinar update regarding fiscal returns, cost impacts, and the path forward. Staff provided this webinar to the Finance committee. Some highlights included increase of assets from \$356 Billion in March 2020 to \$389 Billion in FY 19/20 with an overall funded status of 70.8%. The public equity portion of returns had a recovery of 35.2% from March to June. It was communicated that the CalPERS net rate of return over long term as the following:

CalPERS Returns time period	Net Rate of Return
1-year FY 19/20	4.7%
5-year time period	6.3%
10- year	8.5%
20-year	5.5%
Over 30-years	8.0%

The ten-year mark reflects the time period of the Great Recession.

The Town's Miscellaneous Employees future contribution assumes the investment return of 7.00% in FY 2019/20. The actual investment return for FY 19/20 was not known at the time the valuation reports were prepared. The FY 2021/22 Employer Contribution rate for Miscellaneous Employees is 11.06% a decrease of .139%. The Unfunded Liability Payment (UAL) is \$400,641. ***The current FY 20/21 Employer contribution rate for Miscellaneous employees is 11.199% and the unfunded liability payment (UAL) is \$333,762.***

(page 6 of Miscellaneous Valuation Report)

	Required Contribution	Projected Future Employer Contributions (Assumes 7.00% Return for Fiscal Year 2019-20)				
Fiscal Year	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Normal Cost %	11.06%	11.1%	11.1%	11.1%	11.1%	11.1%
UAL Payment	\$400,641	\$446,000	\$474,000	\$503,000	\$519,000	\$532,000

The UAL payment for FY 2021/22 is \$400,641, this is an increase of \$66,879 over the current year. The Plan's funded status as of June 30, 2019 for Miscellaneous Employees is currently at 72% with an unfunded liability of \$5,385,460.

Below are projected future contribution rates for the Town Public Safety Employees and assumes the investment return of 7.00% in FY 2019/20. The projected employer rate and UAL for Safety is as follows:

(page 6 of Public Safety Valuation Report)

	Required Contribution	Projected Future Employer Contributions (Assumes 7.00% Return for Fiscal Year 2019-20)				
Fiscal Year	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Normal Cost %	25.59%	25.6%	25.6%	25.6%	25.6%	25.6%
UAL Payment	\$1,029,533	\$1,138,000	\$1,207,000	\$1,277,000	\$1,315,000	\$1,350,000

The current FY 2020/21 normal cost employer contribution rate as a percentage of payroll is 25.54% and the UAL \$860,123. Based on the valuation report, the FY 2021/22 contribution rate for Public Safety is 25.59%, an increase of .05%. *The Town's employer payment of the unfunded liability for FY 2021/22 Public Safety is \$1,029,533. This is an increase of \$169K in UAL from the current FY of \$860,123*

Based on the actuarial report, the Public Safety Employees Plan's funded status as of June 30, 2019 is currently at 70% with an unfunded liability of \$13,693,892. For FY 2021/22 the projected combined UAL payment is \$1,430,174 (\$400,641 Miscellaneous & \$1,029,533 Public Safety).

Julian Robinson is a senior actuary familiar with our pension plan and is here to provide a review of our June 30, 2019 reports, analysis tools, and provide a brief general update on retirement plans.

Changes from Previous Valuations

Effective within the June 30, 2019 reports, CalPERS new amortization policy that shortens the gains and losses from 30 years to 20 years with payments factored as a level dollar amount. In addition, the 5-year ramp-up and ramp-down on the UAL is removed. Additional discretionary contributions analysis is provided in the reports. This provides projection for agencies to select additional discretionary payments for consideration in paying down UAL. CalPERS allows employers to make additional discretionary payments (ADP) at any time and in any amount to

reduce the UAL and future required contributions. (Page 5 of the Valuation reports) Alternative Fiscal Year 2021-22 employer contributions for great UAL reductions listed below.

Miscellaneous Valuation

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

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP ¹	Total UAL Contribution	Estimated Total Contribution
20 years	\$174,304	\$400,641	\$101,358	\$501,999	\$676,303
15 years	\$174,304	\$400,641	\$183,267	\$583,908	\$758,212
10 years	\$174,304	\$400,641	\$356,548	\$757,189	\$931,493
5 years	\$174,304	\$400,641	\$896,414	\$1,297,055	\$1,471,359

Public Safety Valuation

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

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP ¹	Total UAL Contribution	Estimated Total Contribution
20 years	\$443,857	\$1,029,533	\$242,489	\$1,272,022	\$1,715,879
15 years	\$443,857	\$1,029,533	\$450,040	\$1,479,573	\$1,923,430
10 years	\$443,857	\$1,029,533	\$889,121	\$1,918,654	\$2,362,511
5 years	\$443,857	\$1,029,533	\$2,257,094	\$3,286,627	\$3,730,484

The Town has contributed its normal cost and UAL payment consistently over the years. Below is a table illustrating the last six (6) fiscal years of CalPERS contributions:

CalPERS Contribution	Employer Required Contribution (NC) FY 2014/15	Employer Required Contribution (NC) FY 2015/16	Employer Required Contribution (NC) FY 2016/17	Employer Required Contribution (NC) FY 2017/18	Employer Required Contribution (NC) FY 2018/19	Employer Required Contribution (NC) FY 2019/20
Miscellaneous Employees	\$195,111	\$157,046	\$164,695	\$172,239	\$186,446	\$200,999
Public Safety Employees	\$709,233	\$487,709	\$460,440	\$458,742	\$434,965	\$441,115
Total NC	\$904,345	\$644,755	\$625,135	\$630,981	\$621,411	\$642,114
CalPERS UAL		UAL FY 2015/16	UAL FY 2016/17	UAL FY 2017/18	UAL FY 2018/19	UAL FY 2019/20
Miscellaneous Employees		\$116,323	\$140,897	\$177,126	\$230,536	\$288,470
Public Safety Employees		\$325,906	\$388,638	\$480,734	\$607,679	\$750,799
Total UAL*		\$442,229	\$529,535	\$657,860	\$838,215	\$1,039,269
TOTAL NC & UAL/OTHER	\$904,345	\$1,086,984	\$1,154,670	\$1,288,841	\$1,459,626	\$1,681,383

Value of Assets (Page 6 of the Valuation Reports)

As of June 30, 2019, it was illustrated that the Town's unfunded pension liability increased. The market Value of Assets (MVA) for Miscellaneous Employees is \$13,847,354 and an unfunded liability of \$5,385,460. For Public Safety Employees the MVA is \$32,008,145 with an unfunded liability of \$13,693,892. This calculates to a total unfunded liability of \$19,079,352. This is a total increase of \$934,665 from previous year valuation reports. Amortization schedules and alternatives are illustrated in the valuation reports that show the minimum contributions required according to the CalPERS amortization schedule. (pages 13 & 14)

Risk Analysis Tools (page 17 of valuation reports)

Included in the reports are risk analysis tools that used to estimate future Town Contributions toward unfunded liabilities, Employer normal cost rates and projection of paying down liabilities. These tools are based on the assumed annual rate of return and the impact on future UAL contributions. If the investment return was below or over the projection, these amounts will be used to set the rates in Fiscal Year 2022/23 calculations. In the reports there are different investment returns scenarios analysis of the effects on the Town UAL amount if the rate of return ranges between 1% to 12%

Discussion/Recommendation

The City Council has developed a policy to direct ERAF funds toward pension obligations over time along with other budget priorities. It is not the current philosophy to contribute to CalPERS any more funds than our required normal cost and unfunded liability requires. Currently with the construction of the Town Center, it is anticipated that ERAF funds will be used for debt service for the project. The Finance Committee over the years has reviewed opportunities to pay down long-term liabilities. Such opportunities include developing an analysis with respect to changes in the discount rate and a forecast on how to reduce the Town's CalPERS unfunded liability.

As was previously mentioned the Finance Committee anticipates making a recommendation to the City Council that once the Civic Center project is completed, funding towards paying down unfunded pensions liabilities would be implemented. It was conferred that it makes sense once the Civic Center is completed. The Committee supported and recommended that a formal statement be made to the Council for contributions toward pension liabilities via Pension Rate Stabilization Trust (PARS Trust). **Staff recommends that with the recent actuarial valuations update, that a formal statement via adhoc subcommittee be crafted for future committee review.**

FISCAL IMPACT

None

PUBLIC NOTICE

Public notification was achieved by posting the agenda, with this agenda item being listed, at least 72 hours prior to the meeting in print and electronically. Information about the project is also

disseminated via the Town's electronic News Flash and Atherton Online. There are approximately 1,200 subscribers to the Town's electronic News Flash publications. Subscribers include residents as well as stakeholders – to include, but be not limited to, media outlets, school districts, Menlo Park Fire District, service provides (water, power, and sewer), and regional elected officials.

ATTACHMENTS

June 30, 2019 Actuarial Valuation Reports



California Public Employees' Retirement System

Actuarial Office

400 Q Street, Sacramento, CA 95811 | Phone: (916) 795-3000 | Fax: (916) 795-2744

888 CalPERS (or 888-225-7377) | TTY: (877) 249-7442 | www.calpers.ca.gov

July 2020

**Miscellaneous Plan of the Town of Atherton
(CalPERS ID: 1382390535)
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). 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	11.06%	\$400,641
<i>Projected Results</i>		
2022-23	11.1%	\$446,000

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
Town of Atherton
(CalPERS ID: 1382390535)**

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

Table of Contents

Section 1 – Plan Specific Information

Section 2 – Risk Pool Actuarial Valuation Information

Section 1

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Plan Specific Information for the Miscellaneous Plan of the Town of Atherton

**(CalPERS ID: 1382390535)
(Valuation Rate Plan ID: 64)**

Table of Contents

Actuarial Certification	1
Highlights and Executive Summary	
Introduction	3
Purpose of Section 1	3
Required Employer Contributions	4
Additional Discretionary Employer Contributions	5
Plan's Funded Status	6
Projected Employer Contributions	6
Cost	7
Changes Since the Prior Year's Valuation	8
Subsequent Events	8
Assets and Liabilities	
Breakdown of Entry Age Normal Accrued Liability	10
Allocation of Plan's Share of Pool's Experience/Assumption Change	10
Development of Plan's Share of Pool's Market Value of Assets	10
Schedule of Plan's Amortization Bases	11
Amortization Schedule and Alternatives	13
Employer Contribution History	15
Funding History	15
Risk Analysis	
Future Investment Return Scenarios	17
Discount Rate Sensitivity	18
Mortality Rate Sensitivity	18
Maturity Measures	19
Maturity Measures History	20
Hypothetical Termination Liability	21
Participant Data	22
List of Class 1 Benefit Provisions	22
Plan's Major Benefit Options	23

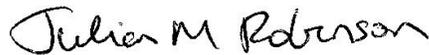
Actuarial Certification

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.



JULIAN ROBINSON, FSA, EA, 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 Town of Atherton 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 Town of Atherton 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
Required Employer Contributions	2021-22
Employer Normal Cost Rate	11.06%
<i>Plus, Either</i>	
1) Monthly Employer Dollar UAL Payment	\$33,386.75
<i>Or</i>	
2) Annual UAL Prepayment Option*	\$387,314
<i>The total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly in dollars).</i>	
<i>* Only the UAL portion of the employer contribution can be prepaid (which must be received in full no later than July 31). Any prepayment totaling over \$5 million requires a 72-hour notice email to FCSD_public_agency_wires@calpers.ca.gov. 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>	
<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>	

	Fiscal Year	Fiscal Year
	2020-21	2021-22
Development of Normal Cost as a Percentage of Payroll¹		
Base Total Normal Cost for Formula	17.392%	17.25%
Surcharge for Class 1 Benefits ²		
a) PRSA	0.715%	0.72%
Phase out of Normal Cost Difference ³	0.000%	0.00%
Plan's Total Normal Cost	18.107%	17.97%
Formula's Expected Employee Contribution Rate	6.908%	6.91%
Employer Normal Cost Rate	11.199%	11.06%
Projected Payroll for the Contribution Fiscal Year	\$1,603,887	\$1,575,983
Estimated Employer Contributions Based on Projected Payroll		
Plan's Estimated Employer Normal Cost	\$179,619	\$174,304
Plan's Payment on Amortization Bases ⁴	338,645	400,641
% of Projected Payroll (illustrative only)	21.114%	25.42%
Estimated Total Employer Contribution	\$518,264	\$574,945
% of Projected Payroll (illustrative only)	32.313%	36.48%

¹ 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.

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

³ 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.

⁴ 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 \$400,641. 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
\$174,304	\$400,641	\$0	\$400,641	\$574,945

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

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP ¹	Total UAL Contribution	Estimated Total Contribution
20 years	\$174,304	\$400,641	\$101,358	\$501,999	\$676,303
15 years	\$174,304	\$400,641	\$183,267	\$583,908	\$758,212
10 years	\$174,304	\$400,641	\$356,548	\$757,189	\$931,493
5 years	\$174,304	\$400,641	\$896,414	\$1,297,055	\$1,471,359

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

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 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)	\$21,673,433	\$21,572,926
2. Entry Age Normal Accrued Liability (AL)	19,118,587	19,232,814
3. Plan's Market Value of Assets (MVA)	14,011,196	13,847,354
4. Unfunded Accrued Liability (UAL) [(2) - (3)]	5,107,391	5,385,460
5. Funded Ratio [(3) / (2)]	73.3%	72.0%

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
Normal Cost %	11.06%	11.1%	11.1%	11.1%	11.1%	11.1%
UAL Payment	\$400,641	\$446,000	\$474,000	\$503,000	\$519,000	\$532,000

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	\$2,930,782
Transferred Members	1,560,912
Terminated Members	1,539,837
Members and Beneficiaries Receiving Payments	<u>13,201,283</u>
Total	\$19,232,814

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	\$19,232,814
2. Projected UAL balance at 6/30/2019	5,243,189
3. Pool's Accrued Liability ¹	18,394,114,919
4. Sum of Pool's Individual Plan UAL Balances at 6/30/2019 ¹	4,268,374,183
5. Pool's 2018/19 Investment (Gain)/Loss ¹	68,711,010
6. Pool's 2018/19 Non-Investment (Gain)/Loss ¹	70,985,020
7. Plan's Share of Pool's Investment (Gain)/Loss: $[(1) - (2)] \div [(3) - (4)] \times (5)$	68,049
8. Plan's Share of Pool's Non-Investment (Gain)/Loss: $(1) \div (3) \times (6)$	74,222
9. Plan's New (Gain)/Loss as of 6/30/2019: $(7) + (8)$	142,271
10. Other Changes in the UAL ²	0

¹ Does not include plans that transferred to Pool on the valuation date.

² 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: $(2) + (9) + (10)$	\$5,385,460
12. Plan's Share of Pool's MVA: $(1) - (11)$	\$13,847,354

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	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
Share of Pre-2013 Pool UAL	6/30/13	No Ramp		2.75%	16	1,334,948	107,176	1,317,531	108,716	1,297,301	111,705
Non-Investment (Gain)/Loss	6/30/13	100%	Up/Down	2.75%	24	(19,177)	(1,286)	(19,189)	(1,302)	(19,185)	(1,337)
Investment (Gain)/Loss	6/30/13	100%	Up/Down	2.75%	24	1,995,040	133,821	1,996,267	135,421	1,995,925	139,145
Non-Investment (Gain)/Loss	6/30/14	100%	Up/Down	2.75%	25	1,587	84	1,611	107	1,613	109
Investment (Gain)/Loss	6/30/14	100%	Up/Down	2.75%	25	(1,462,906)	(77,654)	(1,484,983)	(98,197)	(1,487,356)	(100,898)
Assumption Change	6/30/14	100%	Up/Down	2.75%	15	883,726	65,726	877,599	83,450	852,710	85,745
Non-Investment (Gain)/Loss	6/30/15	100%	Up/Down	2.75%	26	(71,000)	(2,833)	(73,040)	(3,820)	(74,201)	(4,907)
Investment (Gain)/Loss	6/30/15	100%	Up/Down	2.75%	26	873,768	34,871	898,861	47,014	913,150	60,384
Non-Investment (Gain)/Loss	6/30/16	80%	Up/Down	2.75%	27	(129,421)	(3,496)	(134,864)	(5,300)	(138,822)	(7,261)
Investment (Gain)/Loss	6/30/16	80%	Up/Down	2.75%	27	1,045,399	28,241	1,089,364	42,811	1,121,335	58,650
Assumption Change	6/30/16	80%	Up/Down	2.75%	17	318,154	11,743	328,278	17,873	332,769	24,486
Non-Investment (Gain)/Loss	6/30/17	60%	Up/Down	2.75%	28	(27,424)	(381)	(28,950)	(770)	(30,180)	(1,186)
Investment (Gain)/Loss	6/30/17	60%	Up/Down	2.75%	28	(531,728)	(7,387)	(561,308)	(14,920)	(585,166)	(22,996)
Assumption Change	6/30/17	60%	Up/Down	2.75%	18	360,696	6,813	378,897	13,817	391,127	21,295
AL Significant Increase*	6/30/18	40%	Up/Down	2.75%	29	53,407	0	57,145	780	60,338	1,604
Non-Investment (Gain)/Loss	6/30/18	40%	Up/Down	2.75%	29	77,807	0	83,253	1,137	87,905	2,337
Investment (Gain)/Loss	6/30/18	40%	Up/Down	2.75%	29	(155,558)	0	(166,447)	(2,273)	(175,747)	(4,672)
Assumption Change	6/30/18	40%	Up/Down	2.75%	19	543,710	(10,721)	592,860	11,054	622,926	22,715

Schedule of Plan's Amortization Bases (continued)

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
Method Change	6/30/18	40%	Up/Down	2.75%	19	152,161	(709)	163,546	3,049	171,840	6,266
Non-Investment (Gain)/Loss	6/30/19	No Ramp		0.00%	20	74,222	0	79,418	0	84,977	7,754
Investment (Gain)/Loss	6/30/19	20%	Up Only	0.00%	20	68,049	0	72,812	0	77,909	1,703
Total						5,385,460	284,008	5,468,661	338,647	5,501,168	400,641

*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	5,501,168	400,641	5,501,169	583,908	5,501,169	757,189
6/30/2022	5,471,822	446,117	5,282,252	583,908	5,103,008	757,189
6/30/2023	5,393,383	473,684	5,048,011	583,908	4,676,976	757,189
6/30/2024	5,280,937	503,381	4,797,373	583,908	4,221,122	757,189
6/30/2025	5,129,902	518,524	4,529,190	583,908	3,733,358	757,189
6/30/2026	4,952,630	532,334	4,242,234	583,908	3,211,451	757,190
6/30/2027	4,748,661	546,526	3,935,191	583,907	2,653,009	757,189
6/30/2028	4,515,736	561,111	3,606,656	583,907	2,055,477	757,190
6/30/2029	4,251,418	576,095	3,255,124	583,908	1,416,117	757,189
6/30/2030	3,953,101	591,491	2,878,984	583,908	732,003	757,190
6/30/2031	3,617,976	607,305	2,476,514	583,908		
6/30/2032	3,243,033	600,449	2,045,871	583,908		
6/30/2033	2,848,935	592,764	1,585,083	583,907		
6/30/2034	2,435,200	575,508	1,092,041	583,908		
6/30/2035	2,010,354	546,488	564,485	583,908		
6/30/2036	1,585,787	493,681				
6/30/2037	1,186,125	291,618				
6/30/2038	967,501	255,243				
6/30/2039	771,200	226,636				
6/30/2040	590,748	208,157				
6/30/2041	416,781	149,747				
6/30/2042	291,057	140,775				
6/30/2043	165,814	111,047				
6/30/2044	62,553	55,599				
6/30/2045	9,420	9,744				
6/30/2046						
6/30/2047						
6/30/2048						
6/30/2049						
6/30/2050						
Total		10,014,665		8,758,617		7,571,893
Interest Paid		4,513,497		3,257,447		2,070,724
Estimated Savings				1,256,050		2,442,773

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.

Fiscal Year	Employer Normal Cost	Unfunded Liability Payment (\$)
2016 - 17	9.055%	\$146,085
2017 - 18	9.096%	183,236
2018 - 19	9.635%	237,450
2019 - 20	10.327%	295,438
2020 - 21	11.199%	338,645
2021 - 22	11.06%	400,641

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.

Valuation Date	Accrued Liability (AL)	Share of Pool's Market Value of Assets (MVA)	Plan's Share of Pool's Unfunded Liability	Funded Ratio	Annual Covered Payroll
06/30/2011	\$14,126,030	\$10,943,760	\$3,182,270	77.5%	\$2,098,024
06/30/2012	14,084,104	10,326,106	3,757,998	73.3%	1,062,063
06/30/2013	14,539,412	11,816,121	2,723,291	81.3%	1,369,806
06/30/2014	15,466,674	13,003,838	2,462,836	84.1%	1,395,887
06/30/2015	15,806,251	12,571,337	3,234,914	79.5%	1,452,348
06/30/2016	16,506,054	12,141,574	4,364,480	73.6%	1,399,357
06/30/2017	17,850,764	13,504,290	4,346,474	75.7%	1,562,584
06/30/2018	19,118,587	14,011,196	5,107,391	73.3%	1,478,524
06/30/2019	19,232,814	13,847,354	5,385,460	72.0%	1,452,801

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 5th, 25th, 50th, 75th, and 95th 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
1.0%				
Normal Cost	11.1%	11.1%	11.1%	11.1%
UAL Contribution	\$467,000	\$536,000	\$629,000	\$728,000
4.0%				
Normal Cost	11.1%	11.1%	11.1%	11.1%
UAL Contribution	\$457,000	\$505,000	\$567,000	\$626,000
7.0%				
Normal Cost	11.1%	11.1%	11.1%	11.1%
UAL Contribution	\$446,000	\$474,000	\$503,000	\$519,000
9.0%				
Normal Cost	11.3%	11.5%	11.7%	11.9%
UAL Contribution	\$440,000	\$458,000	\$472,000	\$466,000
12.0%				
Normal Cost	11.3%	11.5%	11.7%	11.9%
UAL Contribution	\$430,000	\$425,000	\$405,000	\$349,000

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
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	22.39%	17.97%	14.58%
b) Accrued Liability	\$21,640,719	\$19,232,814	\$17,245,662
c) Market Value of Assets	\$13,847,354	\$13,847,354	\$13,847,354
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$7,793,365	\$5,385,460	\$3,398,308
e) Funded Status	64.0%	72.0%	80.3%

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	19.16%	17.97%	16.55%
b) Accrued Liability	\$20,317,311	\$19,232,814	\$17,823,077
c) Market Value of Assets	\$13,847,354	\$13,847,354	\$13,847,354
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$6,469,957	\$5,385,460	\$3,975,723
e) Funded Status	68.2%	72.0%	77.7%

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	18.29%	17.97%	17.68%
b) Accrued Liability	\$19,618,461	\$19,232,814	\$18,877,672
c) Market Value of Assets	\$13,847,354	\$13,847,354	\$13,847,354
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$5,771,107	\$5,385,460	\$5,030,318
e) Funded Status	70.6%	72.0%	73.4%

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%.

Ratio of Retiree Accrued Liability to Total Accrued Liability	June 30, 2018	June 30, 2019
1. Retired Accrued Liability	13,834,244	13,201,283
2. Total Accrued Liability	19,118,587	19,232,814
3. Ratio of Retiree AL to Total AL [(1) / (2)]	0.72	0.69

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.

Support Ratio	June 30, 2018	June 30, 2019
1. Number of Actives	13	13
2. Number of Retirees	64	63
3. Support Ratio [(1) / (2)]	0.20	0.21

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	\$14,011,196	\$13,847,354
2. Payroll	1,478,524	1,452,801
3. Asset Volatility Ratio (AVR) [(1) / (2)]	9.5	9.5
4. Accrued Liability	\$19,118,587	\$19,232,814
5. Liability Volatility Ratio (LVR) [(4) / (2)]	12.9	13.2

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	0.68	0.28	8.6	11.4
06/30/2018	0.72	0.20	9.5	12.9
06/30/2019	0.69	0.21	9.5	13.2

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.

Market Value of Assets (MVA)	Hypothetical Termination Liability^{1,2} @ 1.75%	Funded Status	Unfunded Termination Liability @ 1.75%	Hypothetical Termination Liability^{1,2} @ 3.25%	Funded Status	Unfunded Termination Liability @ 3.25%
\$13,847,354	\$37,750,682	36.7%	\$23,903,328	\$30,543,637	45.3%	\$16,696,283

¹ 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.

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% 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:

	June 30, 2018	June 30, 2019
Reported Payroll	\$1,478,524	\$1,452,801
Projected Payroll for Contribution Purposes	\$1,603,887	\$1,575,983
Number of Members		
Active	13	13
Transferred	14	13
Separated	25	27
Retired	64	63

List of Class 1 Benefit Provisions

This plan has the additional Class 1 Benefit Provisions:

- Post-Retirement Survivor Allowance (PRSA)

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
Demographics			
Actives	Yes	No	No
Transfers/Separated	Yes	No	No
Receiving	Yes	Yes	Yes
Benefit Provision			
Benefit Formula	2% @ 55		
Social Security Coverage	No		
Full/Modified	Full		
Employee Contribution Rate	7.00%		
Final Average Compensation Period	Three Year		
Sick Leave Credit	Yes		
Non-Industrial Disability	Standard		
Industrial Disability	No		
Pre-Retirement Death Benefits			
Optional Settlement 2	Yes		
1959 Survivor Benefit Level	Level 3		
Special	No		
Alternate (firefighters)	No		
Post-Retirement Death Benefits			
Lump Sum	\$500	\$500	\$0
Survivor Allowance (PRSA)	Yes	Yes	No
COLA	2%	2%	2%

Section 2

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Risk Pool Actuarial Valuation Information

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



California Public Employees' Retirement System

Actuarial Office

400 Q Street, Sacramento, CA 95811 | Phone: (916) 795-3000 | Fax: (916) 795-2744

888 CalPERS (or 888-225-7377) | TTY: (877) 249-7442 | www.calpers.ca.gov

July 2020

**Safety Plan of the Town of Atherton
(CalPERS ID: 1382390535)
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). 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	25.59%	\$1,029,533
<i>Projected Results</i>		
2022-23	25.6%	\$1,138,000

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,

A handwritten signature in black ink, appearing to read 'Scott Terando', with a long horizontal flourish extending to the right.

SCOTT TERANDO
Chief Actuary



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

**for the
Safety Plan
of the
Town of Atherton
(CalPERS ID: 1382390535)**

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

Table of Contents

Section 1 – Plan Specific Information

Section 2 – Risk Pool Actuarial Valuation Information

Section 1

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Plan Specific Information for the Safety Plan of the Town of Atherton

**(CalPERS ID: 1382390535)
(Valuation Rate Plan ID: 65)**

Table of Contents

Actuarial Certification	1
Highlights and Executive Summary	
Introduction	3
Purpose of Section 1	3
Required Employer Contributions	4
Additional Discretionary Employer Contributions	5
Plan's Funded Status	6
Projected Employer Contributions	6
Cost	7
Changes Since the Prior Year's Valuation	8
Subsequent Events	8
Assets and Liabilities	
Breakdown of Entry Age Normal Accrued Liability	10
Allocation of Plan's Share of Pool's Experience/Assumption Change	10
Development of Plan's Share of Pool's Market Value of Assets	10
Schedule of Plan's Amortization Bases	11
Amortization Schedule and Alternatives	13
Employer Contribution History	15
Funding History	15
Risk Analysis	
Future Investment Return Scenarios	17
Discount Rate Sensitivity	18
Mortality Rate Sensitivity	18
Maturity Measures	19
Maturity Measures History	20
Hypothetical Termination Liability	21
Participant Data	22
List of Class 1 Benefit Provisions	22
Plan's Major Benefit Options	23

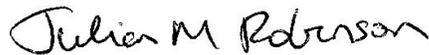
Actuarial Certification

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 Safety 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 Safety 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.



JULIAN ROBINSON, FSA, EA, 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 Safety Plan of the Town of Atherton 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 Safety Plan of the Town of Atherton 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
Required Employer Contributions	2021-22
Employer Normal Cost Rate	25.59%
<i>Plus, Either</i>	
1) Monthly Employer Dollar UAL Payment	\$85,794.42
<i>Or</i>	
2) Annual UAL Prepayment Option*	\$995,287
<i>The total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly in dollars).</i>	
<i>* Only the UAL portion of the employer contribution can be prepaid (which must be received in full no later than July 31). Any prepayment totaling over \$5 million requires a 72-hour notice email to FCSD_public_agency_wires@calpers.ca.gov. 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>	
<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>	

	Fiscal Year	Fiscal Year
	2020-21	2021-22
Development of Normal Cost as a Percentage of Payroll¹		
Base Total Normal Cost for Formula	31.427%	31.47%
Surcharge for Class 1 Benefits ²		
a) FAC 1	1.237%	1.23%
b) PRSA	1.866%	1.88%
Phase out of Normal Cost Difference ³	0.000%	0.00%
Plan's Total Normal Cost	34.530%	34.58%
Formula's Expected Employee Contribution Rate	8.990%	8.99%
Employer Normal Cost Rate	25.540%	25.59%
Projected Payroll for the Contribution Fiscal Year	\$1,788,600	\$1,734,493
Estimated Employer Contributions Based on Projected Payroll		
Plan's Estimated Employer Normal Cost	\$456,808	\$443,857
Plan's Payment on Amortization Bases ⁴	879,200	1,029,533
% of Projected Payroll (illustrative only)	49.156%	59.36%
Estimated Total Employer Contribution	\$1,336,008	\$1,473,390
% of Projected Payroll (illustrative only)	74.696%	84.95%

¹ 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.

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

³ 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.

⁴ 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 \$1,029,533. 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
\$443,857	\$1,029,533	\$0	\$1,029,533	\$1,473,390

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

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP ¹	Total UAL Contribution	Estimated Total Contribution
20 years	\$443,857	\$1,029,533	\$242,489	\$1,272,022	\$1,715,879
15 years	\$443,857	\$1,029,533	\$450,040	\$1,479,573	\$1,923,430
10 years	\$443,857	\$1,029,533	\$889,121	\$1,918,654	\$2,362,511
5 years	\$443,857	\$1,029,533	\$2,257,094	\$3,286,627	\$3,730,484

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

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 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)	\$48,917,285	\$50,360,298
2. Entry Age Normal Accrued Liability (AL)	43,955,355	45,702,037
3. Plan's Market Value of Assets (MVA)	30,918,059	32,008,145
4. Unfunded Accrued Liability (UAL) [(2) - (3)]	13,037,296	13,693,892
5. Funded Ratio [(3) / (2)]	70.3%	70.0%

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
Normal Cost %	25.59%	25.6%	25.6%	25.6%	25.6%	25.6%
UAL Payment	\$1,029,533	\$1,138,000	\$1,207,000	\$1,277,000	\$1,315,000	\$1,350,000

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	\$7,049,697
Transferred Members	3,002,140
Terminated Members	1,482,290
Members and Beneficiaries Receiving Payments	<u>34,167,910</u>
Total	\$45,702,037

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	\$45,702,037
2. Projected UAL balance at 6/30/2019	13,343,595
3. Pool's Accrued Liability ¹	23,981,520,982
4. Sum of Pool's Individual Plan UAL Balances at 6/30/2019 ¹	6,591,388,217
5. Pool's 2018/19 Investment (Gain)/Loss ¹	84,660,352
6. Pool's 2018/19 Non-Investment (Gain)/Loss ¹	101,151,194
7. Plan's Share of Pool's Investment (Gain)/Loss: $[(1) - (2)] \div [(3) - (4)] \times (5)$	157,531
8. Plan's Share of Pool's Non-Investment (Gain)/Loss: $(1) \div (3) \times (6)$	192,766
9. Plan's New (Gain)/Loss as of 6/30/2019: $(7) + (8)$	350,296
10. Other Changes in the UAL ²	0

¹ Does not include plans that transferred to Pool on the valuation date.

² 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: $(2) + (9) + (10)$	\$13,693,892
12. Plan's Share of Pool's MVA: $(1) - (11)$	\$32,008,145

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	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
Share of Pre-2013 Pool UAL	6/30/13	No Ramp		2.75%	16	3,895,447	312,745	3,844,622	317,238	3,785,592	325,962
Non-Investment (Gain)/Loss	6/30/13	100%	Up/Down	2.75%	24	(52,918)	(3,550)	(52,950)	(3,592)	(52,941)	(3,691)
Investment (Gain)/Loss	6/30/13	100%	Up/Down	2.75%	24	4,661,473	312,677	4,664,341	316,415	4,663,543	325,116
Non-Investment (Gain)/Loss	6/30/14	100%	Up/Down	2.75%	25	41,123	2,183	41,743	2,760	41,810	2,836
Investment (Gain)/Loss	6/30/14	100%	Up/Down	2.75%	25	(3,294,509)	(174,880)	(3,344,227)	(221,143)	(3,349,571)	(227,225)
Assumption Change	6/30/14	100%	Up/Down	2.75%	15	2,172,381	161,569	2,157,319	205,138	2,096,135	210,779
Non-Investment (Gain)/Loss	6/30/15	100%	Up/Down	2.75%	26	(7,288)	(291)	(7,497)	(392)	(7,616)	(504)
Investment (Gain)/Loss	6/30/15	100%	Up/Down	2.75%	26	1,968,264	78,550	2,024,790	105,905	2,056,976	136,021
Non-Investment (Gain)/Loss	6/30/16	80%	Up/Down	2.75%	27	(396,257)	(10,705)	(412,922)	(16,227)	(425,041)	(22,231)
Investment (Gain)/Loss	6/30/16	80%	Up/Down	2.75%	27	2,377,283	64,222	2,477,261	97,353	2,549,967	133,374
Assumption Change	6/30/16	80%	Up/Down	2.75%	17	749,190	27,653	773,029	42,087	783,606	57,660
Non-Investment (Gain)/Loss	6/30/17	60%	Up/Down	2.75%	28	29,938	416	31,603	840	32,946	1,295
Investment (Gain)/Loss	6/30/17	60%	Up/Down	2.75%	28	(1,166,548)	(16,207)	(1,231,442)	(32,734)	(1,283,783)	(50,451)
Assumption Change	6/30/17	60%	Up/Down	2.75%	18	924,833	17,469	971,501	35,426	1,002,861	54,601
Non-Investment (Gain)/Loss	6/30/18	40%	Up/Down	2.75%	29	165,275	0	176,844	2,415	186,725	4,963
Investment (Gain)/Loss	6/30/18	40%	Up/Down	2.75%	29	(340,942)	0	(364,808)	(4,982)	(385,191)	(10,239)
Method Change	6/30/18	40%	Up/Down	2.75%	19	303,960	(512)	325,767	6,074	342,288	12,482

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
Assumption Change	6/30/18	40%	Up/Down	2.75%	19	1,312,890	(22,177)	1,427,732	26,620	1,500,137	54,703
Non-Investment (Gain)/Loss	6/30/19	No Ramp		0.00%	20	192,766	0	206,260	0	220,698	20,139
Investment (Gain)/Loss	6/30/19	20%	Up Only	0.00%	20	157,531	0	168,558	0	180,357	3,943
Total						13,693,892	749,162	13,877,524	879,201	13,939,498	1,029,533

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	13,939,498	1,029,533	13,939,498	1,479,573	13,939,498	1,918,654
6/30/2022	13,850,305	1,138,160	13,384,781	1,479,573	12,930,592	1,918,654
6/30/2023	13,642,504	1,207,224	12,791,233	1,479,573	11,851,062	1,918,654
6/30/2024	13,348,719	1,277,072	12,156,137	1,479,573	10,695,965	1,918,654
6/30/2025	12,962,116	1,315,143	11,476,584	1,479,573	9,460,011	1,918,653
6/30/2026	12,509,069	1,350,215	10,749,463	1,479,573	8,137,542	1,918,654
6/30/2027	11,988,032	1,386,250	9,971,443	1,479,572	6,722,499	1,918,654
6/30/2028	11,393,245	1,423,276	9,138,963	1,479,572	5,208,403	1,918,654
6/30/2029	10,718,524	1,461,321	8,248,209	1,479,573	3,588,320	1,918,653
6/30/2030	9,957,220	1,500,414	7,295,101	1,479,572	1,854,832	1,918,653
6/30/2031	9,102,184	1,540,573	6,275,277	1,479,572		
6/30/2032	8,145,755	1,525,032	5,184,065	1,479,573		
6/30/2033	7,138,454	1,507,498	4,016,467	1,479,572		
6/30/2034	6,078,779	1,467,364	2,767,139	1,479,573		
6/30/2035	4,986,441	1,397,307	1,430,357	1,479,573		
6/30/2036	3,890,107	1,271,855				
6/30/2037	2,846,798	700,416				
6/30/2038	2,321,558	613,577				
6/30/2039	1,849,378	544,955				
6/30/2040	1,415,130	502,602				
6/30/2041	994,293	364,873				
6/30/2042	686,466	340,600				
6/30/2043	382,199	265,484				
6/30/2044	134,334	134,128				
6/30/2045	4,994	5,166				
6/30/2046						
6/30/2047						
6/30/2048						
6/30/2049						
6/30/2050						
Total		25,270,038		22,193,590		19,186,537
Interest Paid		11,330,540		8,254,092		5,247,039
Estimated Savings				3,076,448		6,083,501

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.

Fiscal Year	Employer Normal Cost	Unfunded Liability Payment (\$)
2016 - 17	21.230%	\$402,865
2017 - 18	21.418%	496,462
2018 - 19	22.346%	627,361
2019 - 20	23.654%	771,853
2020 - 21	25.540%	879,200
2021 - 22	25.59%	1,029,533

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.

Valuation Date	Accrued Liability (AL)	Share of Pool's Market Value of Assets (MVA)	Plan's Share of Pool's Unfunded Liability	Funded Ratio	Annual Covered Payroll
06/30/2011	\$28,919,573	\$21,722,502	\$7,197,071	75.1%	\$1,942,071
06/30/2012	30,999,471	22,860,016	8,139,455	73.7%	1,824,609
06/30/2013	32,050,359	24,846,630	7,203,729	77.5%	1,971,765
06/30/2014	35,213,417	28,436,146	6,777,271	80.8%	1,840,375
06/30/2015	36,891,116	28,263,430	8,627,686	76.6%	2,046,383
06/30/2016	38,454,832	27,292,457	11,162,375	71.0%	2,010,099
06/30/2017	41,333,503	29,968,235	11,365,268	72.5%	1,342,110
06/30/2018	43,955,355	30,918,059	13,037,296	70.3%	1,648,799
06/30/2019	45,702,037	32,008,145	13,693,892	70.0%	1,598,921

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 5th, 25th, 50th, 75th, and 95th 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
1.0%				
Normal Cost	25.6%	25.6%	25.6%	25.6%
UAL Contribution	\$1,186,000	\$1,351,000	\$1,565,000	\$1,794,000
4.0%				
Normal Cost	25.6%	25.6%	25.6%	25.6%
UAL Contribution	\$1,162,000	\$1,280,000	\$1,424,000	\$1,562,000
7.0%				
Normal Cost	25.6%	25.6%	25.6%	25.6%
UAL Contribution	\$1,138,000	\$1,207,000	\$1,277,000	\$1,315,000
9.0%				
Normal Cost	26.0%	26.5%	26.9%	27.4%
UAL Contribution	\$1,125,000	\$1,171,000	\$1,207,000	\$1,198,000
12.0%				
Normal Cost	26.0%	26.5%	26.9%	27.4%
UAL Contribution	\$1,101,000	\$1,097,000	\$1,052,000	\$930,000

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
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	43.60%	34.58%	27.72%
b) Accrued Liability	\$51,941,997	\$45,702,037	\$40,604,699
c) Market Value of Assets	\$32,008,145	\$32,008,145	\$32,008,145
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$19,933,852	\$13,693,892	\$8,596,554
e) Funded Status	61.6%	70.0%	78.8%

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	37.00%	34.58%	31.88%
b) Accrued Liability	\$48,444,694	\$45,702,037	\$42,466,712
c) Market Value of Assets	\$32,008,145	\$32,008,145	\$32,008,145
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$16,436,549	\$13,693,892	\$10,458,567
e) Funded Status	66.1%	70.0%	75.4%

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	35.04%	34.58%	34.15%
b) Accrued Liability	\$46,405,614	\$45,702,037	\$45,049,992
c) Market Value of Assets	\$32,008,145	\$32,008,145	\$32,008,145
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$14,397,469	\$13,693,892	\$13,041,847
e) Funded Status	69.0%	70.0%	71.1%

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%.

Ratio of Retiree Accrued Liability to Total Accrued Liability	June 30, 2018	June 30, 2019
1. Retired Accrued Liability	32,398,969	34,167,910
2. Total Accrued Liability	43,955,355	45,702,037
3. Ratio of Retiree AL to Total AL [(1) / (2)]	0.74	0.75

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.

Support Ratio	June 30, 2018	June 30, 2019
1. Number of Actives	12	11
2. Number of Retirees	58	59
3. Support Ratio [(1) / (2)]	0.21	0.19

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	\$30,918,059	\$32,008,145
2. Payroll	1,648,799	1,598,921
3. Asset Volatility Ratio (AVR) [(1) / (2)]	18.8	20.0
4. Accrued Liability	\$43,955,355	\$45,702,037
5. Liability Volatility Ratio (LVR) [(4) / (2)]	26.7	28.6

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	0.76	0.17	22.3	30.8
06/30/2018	0.74	0.21	18.8	26.7
06/30/2019	0.75	0.19	20.0	28.6

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.

Market Value of Assets (MVA)	Hypothetical Termination Liability^{1,2} @ 1.75%	Funded Status	Unfunded Termination Liability @ 1.75%	Hypothetical Termination Liability^{1,2} @ 3.25%	Funded Status	Unfunded Termination Liability @ 3.25%
\$32,008,145	\$97,117,432	33.0%	\$65,109,287	\$77,142,647	41.5%	\$45,134,502

¹ 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.

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% 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:

	June 30, 2018	June 30, 2019
Reported Payroll	\$1,648,799	\$1,598,921
Projected Payroll for Contribution Purposes	\$1,788,600	\$1,734,493
Number of Members		
Active	12	11
Transferred	21	19
Separated	7	9
Retired	58	59

List of Class 1 Benefit Provisions

This plan has the additional Class 1 Benefit Provisions:

- One Year Final Compensation (FAC 1)
- Post-Retirement Survivor Allowance (PRSA)

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		
	Police	Police	Police
Demographics			
Actives	Yes	No	No
Transfers/Separated	Yes	No	No
Receiving	Yes	Yes	Yes
Benefit Provision			
Benefit Formula	3% @ 50		
Social Security Coverage	No		
Full/Modified	Full		
Employee Contribution Rate	9.00%		
Final Average Compensation Period	One Year		
Sick Leave Credit	Yes		
Non-Industrial Disability	Standard		
Industrial Disability	Standard		
Pre-Retirement Death Benefits			
Optional Settlement 2	Yes		
1959 Survivor Benefit Level	Level 3		
Special	Yes		
Alternate (firefighters)	No		
Post-Retirement Death Benefits			
Lump Sum	\$500	\$500	\$500
Survivor Allowance (PRSA)	Yes	Yes	Yes
COLA	2%	2%	2%

Section 2

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Risk Pool Actuarial Valuation Information

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



California Public Employees' Retirement System

Actuarial Office

400 Q Street, Sacramento, CA 95811 | Phone: (916) 795-3000 | Fax: (916) 795-2744

888 CalPERS (or 888-225-7377) | TTY: (877) 249-7442 | www.calpers.ca.gov

July 2020

PEPRA Miscellaneous Plan of the Town of Atherton

(CalPERS ID: 1382390535)

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). 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	PEPRA Employee Rate
2021-22	7.73%	\$6,682	7.25%
<i>Projected Results</i>			
2022-23	7.7%	\$6,700	TBD

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
PEPRA Miscellaneous Plan
of the
Town of Atherton
(CalPERS ID: 1382390535)**

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

Table of Contents

Section 1 – Plan Specific Information

Section 2 – Risk Pool Actuarial Valuation Information

Section 1

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Plan Specific Information for the PEPRA Miscellaneous Plan of the Town of Atherton

**(CalPERS ID: 1382390535)
(Valuation Rate Plan ID: 26036)**

Table of Contents

Actuarial Certification	1
Highlights and Executive Summary	
Introduction	3
Purpose of Section 1	3
Required Employer Contributions	4
Additional Discretionary Employer Contributions	5
Plan's Funded Status	6
Projected Employer Contributions	6
Cost	7
Changes Since the Prior Year's Valuation	8
Subsequent Events	8
Assets and Liabilities	
Breakdown of Entry Age Normal Accrued Liability	10
Allocation of Plan's Share of Pool's Experience/Assumption Change	10
Development of Plan's Share of Pool's Market Value of Assets	10
Schedule of Plan's Amortization Bases	11
Amortization Schedule and Alternatives	12
Employer Contribution History	14
Funding History	14
Risk Analysis	
Future Investment Return Scenarios	16
Discount Rate Sensitivity	17
Mortality Rate Sensitivity	17
Maturity Measures	18
Maturity Measures History	19
Hypothetical Termination Liability	20
Participant Data	21
List of Class 1 Benefit Provisions	21
Plan's Major Benefit Options	22
PEPRA Member Contribution Rates	23

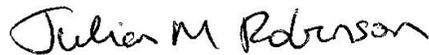
Actuarial Certification

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 PEPRA 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.



JULIAN ROBINSON, FSA, EA, 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 PEPRA Miscellaneous Plan of the Town of Atherton 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 PEPRA Miscellaneous Plan of the Town of Atherton 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
Required Employer Contributions	2021-22
Employer Normal Cost Rate	7.73%
<i>Plus, Either</i>	
1) Monthly Employer Dollar UAL Payment	\$556.83
<i>Or</i>	
2) Annual UAL Prepayment Option*	\$6,460
<i>The total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly in dollars).</i>	
<i>* Only the UAL portion of the employer contribution can be prepaid (which must be received in full no later than July 31). Any prepayment totaling over \$5 million requires a 72-hour notice email to FCSD_public_agency_wires@calpers.ca.gov. 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>	
<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>	

	Fiscal Year	Fiscal Year
	2020-21	2021-22
Development of Normal Cost as a Percentage of Payroll¹		
Base Total Normal Cost for Formula	14.482%	14.34%
Surcharge for Class 1 Benefits ²		
a) PRSA	0.642%	0.64%
Phase out of Normal Cost Difference ³	0.000%	0.00%
Plan's Total Normal Cost	15.124%	14.98%
Plan's Employee Contribution Rate ⁴	7.250%	7.25%
Employer Normal Cost Rate	7.874%	7.73%
Projected Payroll for the Contribution Fiscal Year	\$579,575	\$645,571
Estimated Employer Contributions Based on Projected Payroll		
Plan's Estimated Employer Normal Cost	\$45,636	\$49,903
Plan's Payment on Amortization Bases ⁵	6,600	6,682
% of Projected Payroll (illustrative only)	1.139%	1.04%
Estimated Total Employer Contribution	\$52,236	\$56,585
% of Projected Payroll (illustrative only)	9.013%	8.77%

¹ 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.

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

³ 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.

⁴ For detail regarding the determination of the required PEPRA employee contribution rate see Section on PEPRA Member Contribution Rates.

⁵ 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 \$6,682. 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
\$49,903	\$6,682	\$0	\$6,682	\$56,585

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

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP ¹	Total UAL Contribution	Estimated Total Contribution
5 years	N/A	N/A	N/A	N/A	N/A

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

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 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)	\$1,133,381	\$1,354,926
2. Entry Age Normal Accrued Liability (AL)	266,039	379,195
3. Plan's Market Value of Assets (MVA)	246,793	349,276
4. Unfunded Accrued Liability (UAL) [(2) - (3)]	19,246	29,919
5. Funded Ratio [(3) / (2)]	92.8%	92.1%

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
Normal Cost %	7.73%	7.7%	7.7%	7.7%	7.7%	7.7%
UAL Payment	\$6,682	\$6,700	\$6,700	\$6,700	\$6,700	\$0

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	\$367,120
Transferred Members	10,444
Terminated Members	1,631
Members and Beneficiaries Receiving Payments	0
Total	\$379,195

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	\$379,195
2. Projected UAL balance at 6/30/2019	26,742
3. Pool's Accrued Liability ¹	18,394,114,919
4. Sum of Pool's Individual Plan UAL Balances at 6/30/2019 ¹	4,268,374,183
5. Pool's 2018/19 Investment (Gain)/Loss ¹	68,711,010
6. Pool's 2018/19 Non-Investment (Gain)/Loss ¹	70,985,020
7. Plan's Share of Pool's Investment (Gain)/Loss: $[(1) - (2)] \div [(3) - (4)] \times (5)$	1,714
8. Plan's Share of Pool's Non-Investment (Gain)/Loss: $(1) \div (3) \times (6)$	1,463
9. Plan's New (Gain)/Loss as of 6/30/2019: $(7) + (8)$	3,178
10. Other Changes in the UAL ²	0

¹ Does not include plans that transferred to Pool on the valuation date.

² 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: $(2) + (9) + (10)$	\$29,919
12. Plan's Share of Pool's MVA: $(1) - (11)$	\$349,276

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	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
Fresh Start	6/30/19	No Ramp		0.00%	5	29,919	(824)	32,866	6,600	28,339	6,682
Total						29,919	(824)	32,866	6,600	28,339	6,682

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	0 Year Amortization		0 Year Amortization	
			Balance	Payment	Balance	Payment
6/30/2021	28,340	6,682	N/A	N/A	N/A	N/A
6/30/2022	23,412	6,682				
6/30/2023	18,139	6,682				
6/30/2024	12,497	6,682				
6/30/2025	6,460	6,682				
6/30/2026						
6/30/2027						
6/30/2028						
6/30/2029						
6/30/2030						
6/30/2031						
6/30/2032						
6/30/2033						
6/30/2034						
6/30/2035						
6/30/2036						
6/30/2037						
6/30/2038						
6/30/2039						
6/30/2040						
6/30/2041						
6/30/2042						
6/30/2043						
6/30/2044						
6/30/2045						
6/30/2046						
6/30/2047						
6/30/2048						
6/30/2049						
6/30/2050						
Total		33,410		N/A		N/A
Interest Paid		5,070		N/A		N/A
Estimated Savings				N/A		N/A

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.

Fiscal Year	Employer Normal Cost	Unfunded Liability Payment (\$)
2016 - 17	6.930%	\$0
2017 - 18	6.908%	412
2018 - 19	7.266%	1,435
2019 - 20	7.072%	3,306
2020 - 21	7.874%	6,600
2021 - 22	7.73%	6,682

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.

Valuation Date	Accrued Liability (AL)	Share of Pool's Market Value of Assets (MVA)	Plan's Share of Pool's Unfunded Liability	Funded Ratio	Annual Covered Payroll
06/30/2013	\$377	\$506	(\$129)	134.2%	\$60,372
06/30/2014	12,473	13,179	(706)	105.7%	64,827
06/30/2015	34,451	33,187	1,264	96.3%	233,018
06/30/2016	83,679	75,884	7,795	90.7%	309,096
06/30/2017	162,209	155,277	6,932	95.7%	438,152
06/30/2018	266,039	246,793	19,246	92.8%	534,274
06/30/2019	379,195	349,276	29,919	92.1%	595,112

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 5th, 25th, 50th, 75th, and 95th 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
1.0%				
Normal Cost	7.7%	7.7%	7.7%	7.7%
UAL Contribution	\$7,200	\$8,300	\$9,800	\$12,000
4.0%				
Normal Cost	7.7%	7.7%	7.7%	7.7%
UAL Contribution	\$6,900	\$7,500	\$8,300	\$9,400
7.0%				
Normal Cost	7.7%	7.7%	7.7%	7.7%
UAL Contribution	\$6,700	\$6,700	\$6,700	\$6,700
9.0%				
Normal Cost	7.9%	7.6%	7.8%	8.0%
UAL Contribution	\$6,600	\$6,400	\$0	\$0
12.0%				
Normal Cost	7.9%	7.6%	7.8%	8.0%
UAL Contribution	\$6,300	\$0	\$0	\$0

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
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	18.57%	14.98%	12.23%
b) Accrued Liability	\$476,209	\$379,195	\$304,506
c) Market Value of Assets	\$349,276	\$349,276	\$349,276
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$126,933	\$29,919	(\$44,770)
e) Funded Status	73.3%	92.1%	114.7%

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	16.01%	14.98%	13.75%
b) Accrued Liability	\$406,969	\$379,195	\$346,292
c) Market Value of Assets	\$349,276	\$349,276	\$349,276
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$57,693	\$29,919	(\$2,984)
e) Funded Status	85.8%	92.1%	100.9%

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	15.27%	14.98%	14.72%
b) Accrued Liability	\$385,977	\$379,195	\$372,984
c) Market Value of Assets	\$349,276	\$349,276	\$349,276
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$36,701	\$29,919	\$23,708
e) Funded Status	90.5%	92.1%	93.6%

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%.

Ratio of Retiree Accrued Liability to Total Accrued Liability	June 30, 2018	June 30, 2019
1. Retired Accrued Liability	0	0
2. Total Accrued Liability	266,039	379,195
3. Ratio of Retiree AL to Total AL [(1) / (2)]	0.00	0.00

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.

Support Ratio	June 30, 2018	June 30, 2019
1. Number of Actives	7	7
2. Number of Retirees	0	0
3. Support Ratio [(1) / (2)]	N/A	N/A

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	\$246,793	\$349,276
2. Payroll	534,274	595,112
3. Asset Volatility Ratio (AVR) [(1) / (2)]	0.5	0.6
4. Accrued Liability	\$266,039	\$379,195
5. Liability Volatility Ratio (LVR) [(4) / (2)]	0.5	0.6

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	0.00	N/A	0.4	0.4
06/30/2018	0.00	N/A	0.5	0.5
06/30/2019	0.00	N/A	0.6	0.6

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.

Market Value of Assets (MVA)	Hypothetical Termination Liability^{1,2} @ 1.75%	Funded Status	Unfunded Termination Liability @ 1.75%	Hypothetical Termination Liability^{1,2} @ 3.25%	Funded Status	Unfunded Termination Liability @ 3.25%
\$349,276	\$803,643	43.5%	\$454,367	\$522,651	66.8%	\$173,375

¹ 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.

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% 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:

	June 30, 2018	June 30, 2019
Reported Payroll	\$534,274	\$595,112
Projected Payroll for Contribution Purposes	\$579,575	\$645,571
Number of Members		
Active	7	7
Transferred	0	3
Separated	2	1
Retired	0	0

List of Class 1 Benefit Provisions

This plan has the additional Class 1 Benefit Provisions:

- Post-Retirement Survivor Allowance (PRSA)

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.

	Benefit Group	
Member Category	Misc	
Demographics		
Actives	Yes	
Transfers/Separated	Yes	
Receiving	No	
Benefit Provision		
Benefit Formula	2% @ 62	
Social Security Coverage	No	
Full/Modified	Full	
Employee Contribution Rate	7.25%	
Final Average Compensation Period	Three Year	
Sick Leave Credit	Yes	
Non-Industrial Disability	Standard	
Industrial Disability	No	
Pre-Retirement Death Benefits		
Optional Settlement 2	Yes	
1959 Survivor Benefit Level	Level 3	
Special	No	
Alternate (firefighters)	No	
Post-Retirement Death Benefits		
Lump Sum	\$500	
Survivor Allowance (PRSA)	Yes	
COLA	2%	

PEPRA Member Contribution Rates

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

The table below shows the determination of the PEPRA member contribution rates effective July 1, 2021, based on 50% of the total normal cost rate as of the June 30, 2019 valuation.

Rate Plan Identifier	Benefit Group Name	Basis for Current Rate		Rates Effective July 1, 2021			
		Total Normal Cost	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
26036	Miscellaneous PEPRA Level	14.322%	7.25%	14.98%	0.658%	No	7.25%

Section 2

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Risk Pool Actuarial Valuation Information

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



California Public Employees' Retirement System

Actuarial Office

400 Q Street, Sacramento, CA 95811 | Phone: (916) 795-3000 | Fax: (916) 795-2744

888 CalPERS (or 888-225-7377) | TTY: (877) 249-7442 | www.calpers.ca.gov

July 2020

**PEPRA Safety Police Plan of the Town of Atherton
(CalPERS ID: 1382390535)
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). 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	PEPRA Employee Rate
2021-22	13.98%	\$12,163	13.75%
<i>Projected Results</i>			
2022-23	14.0%	\$12,000	TBD

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
PEPRA Safety Police Plan
of the
Town of Atherton
(CalPERS ID: 1382390535)**

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

Table of Contents

Section 1 – Plan Specific Information

Section 2 – Risk Pool Actuarial Valuation Information

Section 1

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Plan Specific Information for the PEPRA Safety Police Plan of the Town of Atherton

**(CalPERS ID: 1382390535)
(Valuation Rate Plan ID: 25053)**

Table of Contents

Actuarial Certification	1
Highlights and Executive Summary	
Introduction	3
Purpose of Section 1	3
Required Employer Contributions	4
Additional Discretionary Employer Contributions	5
Plan's Funded Status	6
Projected Employer Contributions	6
Cost	7
Changes Since the Prior Year's Valuation	8
Subsequent Events	8
Assets and Liabilities	
Breakdown of Entry Age Normal Accrued Liability	10
Allocation of Plan's Share of Pool's Experience/Assumption Change	10
Development of Plan's Share of Pool's Market Value of Assets	10
Schedule of Plan's Amortization Bases	11
Amortization Schedule and Alternatives	12
Employer Contribution History	14
Funding History	14
Risk Analysis	
Future Investment Return Scenarios	16
Discount Rate Sensitivity	17
Mortality Rate Sensitivity	17
Maturity Measures	18
Maturity Measures History	19
Hypothetical Termination Liability	20
Participant Data	21
List of Class 1 Benefit Provisions	21
Plan's Major Benefit Options	22
PEPRA Member Contribution Rates	23

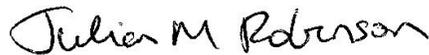
Actuarial Certification

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 Safety 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 PEPRA Safety Police 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.



JULIAN ROBINSON, FSA, EA, 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 PEPRA Safety Police Plan of the Town of Atherton 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 PEPRA Safety Police Plan of the Town of Atherton 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
Required Employer Contributions	2021-22
Employer Normal Cost Rate	13.98%
<i>Plus, Either</i>	
1) Monthly Employer Dollar UAL Payment	\$1,013.58
<i>Or</i>	
2) Annual UAL Prepayment Option*	\$11,758
<i>The total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (billed monthly in dollars).</i>	
<i>* Only the UAL portion of the employer contribution can be prepaid (which must be received in full no later than July 31). Any prepayment totaling over \$5 million requires a 72-hour notice email to FCSD_public_agency_wires@calpers.ca.gov. 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>	
<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>	

	Fiscal Year	Fiscal Year
	2020-21	2021-22
Development of Normal Cost as a Percentage of Payroll¹		
Base Total Normal Cost for Formula	26.044%	26.13%
Surcharge for Class 1 Benefits ²		
a) PRSA	1.590%	1.60%
Phase out of Normal Cost Difference ³	0.000%	0.00%
Plan's Total Normal Cost	27.634%	27.73%
Plan's Employee Contribution Rate ⁴	13.750%	13.75%
Employer Normal Cost Rate	13.884%	13.98%
Projected Payroll for the Contribution Fiscal Year	\$940,385	\$1,001,079
Estimated Employer Contributions Based on Projected Payroll		
Plan's Estimated Employer Normal Cost	\$130,563	\$139,951
Plan's Payment on Amortization Bases ⁵	10,518	12,163
% of Projected Payroll (illustrative only)	1.118%	1.21%
Estimated Total Employer Contribution	\$141,081	\$152,114
% of Projected Payroll (illustrative only)	15.002%	15.20%

¹ 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.

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

³ 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.

⁴ For detail regarding the determination of the required PEPRA employee contribution rate see Section on PEPRA Member Contribution Rates.

⁵ 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 \$12,163. 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
\$139,951	\$12,163	\$0	\$12,163	\$152,114

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

Funding Target	Estimated Normal Cost	Minimum UAL Payment	ADP ¹	Total UAL Contribution	Estimated Total Contribution
5 years	\$139,951	\$12,163	\$8,672	\$20,835	\$160,786

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

Note that the calculations above are based on the projected Unfunded Accrued Liability as of June 30, 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)	\$3,305,851	\$3,978,986
2. Entry Age Normal Accrued Liability (AL)	528,785	805,567
3. Plan's Market Value of Assets (MVA)	479,753	724,919
4. Unfunded Accrued Liability (UAL) [(2) - (3)]	49,032	80,648
5. Funded Ratio [(3) / (2)]	90.7%	90.0%

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
Normal Cost %	13.98%	14.0%	14.0%	14.0%	14.0%	14.0%
UAL Payment	\$12,163	\$12,000	\$12,000	\$12,000	\$12,000	\$12,000

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	\$425,807
Transferred Members	107,137
Terminated Members	0
Members and Beneficiaries Receiving Payments	272,623
Total	\$805,567

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	\$805,567
2. Projected UAL balance at 6/30/2019	73,687
3. Pool's Accrued Liability ¹	23,981,520,982
4. Sum of Pool's Individual Plan UAL Balances at 6/30/2019 ¹	6,591,388,217
5. Pool's 2018/19 Investment (Gain)/Loss ¹	84,660,352
6. Pool's 2018/19 Non-Investment (Gain)/Loss ¹	101,151,194
7. Plan's Share of Pool's Investment (Gain)/Loss: $[(1) - (2)] \div [(3) - (4)] \times (5)$	3,563
8. Plan's Share of Pool's Non-Investment (Gain)/Loss: $(1) \div (3) \times (6)$	3,398
9. Plan's New (Gain)/Loss as of 6/30/2019: $(7) + (8)$	6,961
10. Other Changes in the UAL ²	0

¹ Does not include plans that transferred to Pool on the valuation date.

² 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: $(2) + (9) + (10)$	\$80,648
12. Plan's Share of Pool's MVA: $(1) - (11)$	\$724,919

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	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
Fresh Start	6/30/19	No Ramp		0.00%	10	80,648	(6,244)	92,752	10,518	88,365	12,163
Total						80,648	(6,244)	92,752	10,518	88,365	12,163

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	5 Year Amortization		0 Year Amortization	
	Balance	Payment	Balance	Payment	Balance	Payment
6/30/2021	88,365	12,163	88,365	20,835	N/A	N/A
6/30/2022	81,969	12,163	72,999	20,834		
6/30/2023	75,125	12,163	56,558	20,835		
6/30/2024	67,802	12,162	38,965	20,834		
6/30/2025	59,968	12,163	20,142	20,835		
6/30/2026	51,584	12,162				
6/30/2027	42,614	12,162				
6/30/2028	33,017	12,163				
6/30/2029	22,747	12,163				
6/30/2030	11,758	12,163				
6/30/2031						
6/30/2032						
6/30/2033						
6/30/2034						
6/30/2035						
6/30/2036						
6/30/2037						
6/30/2038						
6/30/2039						
6/30/2040						
6/30/2041						
6/30/2042						
6/30/2043						
6/30/2044						
6/30/2045						
6/30/2046						
6/30/2047						
6/30/2048						
6/30/2049						
6/30/2050						
Total		121,627		104,173		N/A
Interest Paid		33,262		15,808		N/A
Estimated Savings				17,454		N/A

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.

Fiscal Year	Employer Normal Cost	Unfunded Liability Payment (\$)
2016 - 17	12.821%	\$84
2017 - 18	12.729%	1,974
2018 - 19	12.965%	2,327
2019 - 20	13.786%	5,685
2020 - 21	13.884%	10,518
2021 - 22	13.98%	12,163

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.

Valuation Date	Accrued Liability (AL)	Share of Pool's Market Value of Assets (MVA)	Plan's Share of Pool's Unfunded Liability	Funded Ratio	Annual Covered Payroll
06/30/2014	\$1,842	\$1,920	(\$78)	104.2%	\$201,037
06/30/2015	71,655	66,027	5,628	92.1%	443,135
06/30/2016	134,082	116,603	17,479	87.0%	436,385
06/30/2017	230,501	210,826	19,675	91.5%	788,055
06/30/2018	528,785	479,753	49,032	90.7%	866,882
06/30/2019	805,567	724,919	80,648	90.0%	922,832

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 5th, 25th, 50th, 75th, and 95th 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
1.0%				
Normal Cost	14.0%	14.0%	14.0%	14.0%
UAL Contribution	\$13,000	\$15,000	\$19,000	\$23,000
4.0%				
Normal Cost	14.0%	14.0%	14.0%	14.0%
UAL Contribution	\$13,000	\$14,000	\$15,000	\$18,000
7.0%				
Normal Cost	14.0%	14.0%	14.0%	14.0%
UAL Contribution	\$12,000	\$12,000	\$12,000	\$12,000
9.0%				
Normal Cost	14.3%	14.7%	14.3%	14.6%
UAL Contribution	\$12,000	\$12,000	\$11,000	\$9,900
12.0%				
Normal Cost	14.3%	14.7%	14.3%	14.6%
UAL Contribution	\$11,000	\$9,800	\$0	\$0

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
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	34.60%	27.73%	22.49%
b) Accrued Liability	\$974,668	\$805,567	\$674,789
c) Market Value of Assets	\$724,919	\$724,919	\$724,919
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$249,749	\$80,648	(\$50,130)
e) Funded Status	74.4%	90.0%	107.4%

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	29.82%	27.73%	25.40%
b) Accrued Liability	\$864,244	\$805,567	\$739,386
c) Market Value of Assets	\$724,919	\$724,919	\$724,919
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$139,325	\$80,648	\$14,467
e) Funded Status	83.9%	90.0%	98.0%

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	28.12%	27.73%	27.37%
b) Accrued Liability	\$816,211	\$805,567	\$795,714
c) Market Value of Assets	\$724,919	\$724,919	\$724,919
d) Unfunded Liability/(Surplus) [(b) - (c)]	\$91,292	\$80,648	\$70,795
e) Funded Status	88.8%	90.0%	91.1%

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%.

Ratio of Retiree Accrued Liability to Total Accrued Liability	June 30, 2018	June 30, 2019
1. Retired Accrued Liability	0	272,623
2. Total Accrued Liability	528,785	805,567
3. Ratio of Retiree AL to Total AL [(1) / (2)]	0.00	0.34

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.

Support Ratio	June 30, 2018	June 30, 2019
1. Number of Actives	8	8
2. Number of Retirees	0	1
3. Support Ratio [(1) / (2)]	N/A	8.00

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	\$479,753	\$724,919
2. Payroll	866,882	922,832
3. Asset Volatility Ratio (AVR) [(1) / (2)]	0.6	0.8
4. Accrued Liability	\$528,785	\$805,567
5. Liability Volatility Ratio (LVR) [(4) / (2)]	0.6	0.9

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	0.00	N/A	0.3	0.3
06/30/2018	0.00	N/A	0.6	0.6
06/30/2019	0.34	8.00	0.8	0.9

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.

Market Value of Assets (MVA)	Hypothetical Termination Liability^{1,2} @ 1.75%	Funded Status	Unfunded Termination Liability @ 1.75%	Hypothetical Termination Liability^{1,2} @ 3.25%	Funded Status	Unfunded Termination Liability @ 3.25%
\$724,919	\$2,005,221	36.2%	\$1,280,302	\$1,385,657	52.3%	\$660,738

¹ 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.

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% 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:

	June 30, 2018	June 30, 2019
Reported Payroll	\$866,882	\$922,832
Projected Payroll for Contribution Purposes	\$940,385	\$1,001,079
Number of Members		
Active	8	8
Transferred	0	1
Separated	0	0
Retired	0	1

List of Class 1 Benefit Provisions

This plan has the additional Class 1 Benefit Provisions:

- Post-Retirement Survivor Allowance (PRSA)

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.

	Benefit Group	
Member Category	Police	
Demographics		
Actives	Yes	
Transfers/Separated	Yes	
Receiving	Yes	
Benefit Provision		
Benefit Formula	2.7% @ 57	
Social Security Coverage	No	
Full/Modified	Full	
Employee Contribution Rate	13.75%	
Final Average Compensation Period	Three Year	
Sick Leave Credit	Yes	
Non-Industrial Disability	Standard	
Industrial Disability	Standard	
Pre-Retirement Death Benefits		
Optional Settlement 2	Yes	
1959 Survivor Benefit Level	Level 3	
Special	Yes	
Alternate (firefighters)	No	
Post-Retirement Death Benefits		
Lump Sum	\$500	
Survivor Allowance (PRSA)	Yes	
COLA	2%	

PEPRA Member Contribution Rates

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

The table below shows the determination of the PEPRA member contribution rates effective July 1, 2021, based on 50% of the total normal cost rate as of the June 30, 2019 valuation.

Rate Plan Identifier	Benefit Group Name	Basis for Current Rate		Rates Effective July 1, 2021			
		Total Normal Cost	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
25053	Safety Police PEPRA Level	27.634%	13.75%	27.73%	0.096%	No	13.75%

Section 2

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

Risk Pool Actuarial Valuation Information

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