California Public Employees’ Retirement System

Final Actuarial Review Report for the Period September 1, 2021 through October 1, 2023

April 2024

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April 30, 2024

Board of Administration
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Members of the Board:

As provided in Contract 2021-9096, we have reviewed valuations prepared by the CalPERS professional actuarial staff in order to certify that such work satisfies applicable standards of the actuarial profession. In the following pages, we present a summary of findings from the actuarial reviews we've completed as a part of Contract 2021-9096, along with commentary on how issues were resolved and what issues remain outstanding.

The Table of Contents, which immediately follows, outlines the material contained in the report.

This report was prepared for the Board and professional staff of CalPERS for their use in evaluating the preparation of actuarial valuations by the System. Use of this report for any other purpose or by other parties may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for other purposes. Because of the risk of misinterpretation of actuarial results, Buck recommends requesting its advance review of any statement, document, or filing to be based on information contained in this report. Buck will accept no liability for any such statement, document or filing made without its prior review.

The undersigned are Fellows of the Society of Actuaries, Members of the American Academy of Actuaries and Enrolled Actuaries. We each meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about it.

Buck, A Gallagher Company (Buck)

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Section I - Introduction

Under the California Constitution, the Board of Administration has plenary authority and fiduciary responsibility to provide for actuarial services. The CalPERS Chief Actuary advises the Board and directs the activities of the CalPERS professional actuarial staff. The Board also retains the services of an outside actuarial firm to review the work of the CalPERS professional actuarial staff and to certify that such work satisfies actuarial professional standards.

Buck was contracted to provide parallel valuation and certification services to the Board.

This report presents a summary of findings from the actuarial reviews we have completed as a part of Contract 2021-9096, along with commentary on how issues were resolved and what issues remain outstanding.

Our review methodology for each actuarial valuation examined as part of Contract 2021-9096 was as follows:

- We did not audit or review the final valuation data provided to us by CalPERS for any of the actuarial reviews completed, as review of the data was explicitly excluded from the scope of this assignment.
- We reviewed the actuarial assumptions and methods used for each valuation under examination. Our review was based on Actuarial Standards of Practice (ASOP) applicable to the selection of economic assumptions (ASOP 27) and the selection of demographic assumptions (ASOP 35).
- We completed parallel actuarial valuations for each valuation under examination in order to compare our key valuation results with those published in the valuation report prepared for the plan. CalPERS requested that we reconcile any differences of more than 5% between the two sets of valuation results.
- We also reviewed each valuation report under examination for compliance with applicable Actuarial Standards of Practice, including:
    - ASOP 4 – Measuring Pension Obligations and Determining Pension Plan Costs or Contributions
    - ASOP 6 – Measuring Retiree Group Benefits Obligations and Determining Retiree Group Benefits Program Periodic Costs or Actuarially Determined Contributions
    - ASOP 41 – Actuarial Communications
    - ASOP 51 – Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions
    - ASOP 56 - Modeling

Section II of this report summarizes Task 1 of Contract 2021-9096, pertaining to CalPERS's Public Agency valuations. Specifically, it provides a recap of issues identified in that Task, commentary on how issues were resolved, and what issues remain outstanding. Section III provides the same information for Task 2, pertaining to CalPERS's State and Schools valuations. Section IV provides the same information for Task 3, pertaining to CalPERS's Judges, Legislators, and 1959 Survivors valuations. Section V presents our final comments and recommendations following the actuarial reviews we've completed as part of Contract 2021-9096.

Section II – Summary of Task 1 – Public Agencies

For Task 1, we concluded that the assumptions used in the Public Agency valuations were reasonable and the methodology used to select these assumptions was appropriate and consistent with guidance provided in ASOP 27 and 35. We reviewed the assumed annual rate of return assumption of 7.00% for valuations reviewed under Task 1 using our own economic modeling tool and determined it to be reasonable.

For both the 10 largest and 10 randomly selected public agency plans reviewed for Task 1, we replicated total present values of future benefits, actuarial accrued liabilities, normal costs, and total employer contribution rates within 5% of the corresponding results reported by CalPERS.

In Task 1, our observations related to the valuation calculations were organized into two categories:

1. Differences in valuation system. No two valuation systems will produce identical results due to differing approaches to age- and service-rounding, adjustments for mid-year timing, consideration of monthly-vs.-annual payments, etc. These differences generally will not produce materially different results. For purposes of this report, we will not restate items we identified as differences in valuation systems.

2. Areas for which refinement of calculation would be advisable.

   For Task 1, we did not identify any refinements of the valuation calculations that we would consider necessary or advisable.

<u>Final comments and recommendations from Task 1 included:</u>

1. Looking beyond the actuarial valuation calculations, we would like to highlight one area of the CalPERS valuation reports that could be refined to make them more understandable to users. The expected return on assets assumption is currently 7.00%, net of investment expenses and administrative expenses. The CalPERS History of Investment Returns exhibit shown in each report presents annual returns of the Public Employees' Retirement Fund (PERF) that are net of investment expenses and gross of administrative expenses. Accordingly, the actual investment return implied by the Investment (Gain)/Loss amortization bases is inconsistent with the PERF investment return presented elsewhere in the report. We believe these measures would be more useful if they were directly comparable.

   The June 30, 2022, valuation reports contain additional language acknowledging the discrepancy.

Section III – Summary of Task 2 – State and Schools

For Task 2, we concluded that the assumptions used in the State and Schools valuations were reasonable and the methodology used to select these assumptions was appropriate and consistent with guidance provided in ASOP 27 and 35. We reviewed the assumed annual rate of return assumption of 6.80% for valuations reviewed under Task 2 using our own economic modeling tool and determined it to be reasonable.

For Task 2, we replicated total present values of future benefits, actuarial accrued liabilities, normal costs, and total employer contribution rates within 5% of the corresponding results reported by CalPERS.

In Task 2, our observations related to the valuation calculations were organized into two categories:

1. Differences in valuation system. No two valuation systems will produce identical results due to differing approaches to age- and service-rounding, adjustments for mid-year timing, consideration of monthly-vs.-annual payments, etc. These differences generally will not produce materially different results. For purposes of this report, we will not restate items we identified as differences in valuation systems.

2. Areas for which refinement of calculation would be advisable.

   - The valuation reports indicate that when a member is eligible to retire, the probability of termination with a vested benefit is set to zero. It appears that this is not actually done in some of the State valuations, and that this is intentional. We suggest that the description of the decrement that appears in the valuation reports be changed to make it consistent with the actual application of the decrement.

     CalPERS staff indicated at the completion of Task 2 that they agreed this change should be made. More recently, CalPERS staff indicated that the referenced language will be deleted from the June 30, 2023, State valuation report.

   - The application of pay caps should be examined, at least in the case of one sample we reviewed from the Miscellaneous First Tier Plan. The 2021 PEPRA cap (for employees who participate in Social Security) is $128,059. From the sample life results, we can see that the pay cap projected for the valuation year ending June 30, 2022, is $131,004, which is equal to the 2021 PEPRA cap increased by price inflation. Thus, the pay cap is slightly overstated.

     CalPERS staff indicated at the completion of Task 2 that this issue had already been resolved.

<u>Final comments and recommendations from Task 2 included:</u>

1. Improve disclosure of mortality assumption in accordance with ASOP 27 and 35 Sections 4.1.1

   - We suggest that the reports provide a description of the pre-retirement mortality assumption, including the mortality improvement scale, as opposed to or in addition to a table of sample rates.

     The June 30, 2022, Schools Pool valuation report does now include a description of the pre-retirement mortality assumption. CalPERS staff indicated that the State valuation report as of June 30, 2023, will reflect the recommended modification.

- The Non-Industrial Death rates displayed for Miscellaneous Tier 1 and Tier 2 appear to be switched for males and females.

  This appears to have been corrected in the June 30, 2022, valuation report.

- We suggest that the reports provide a description of the post-retirement mortality assumption, as opposed to or in addition to a table of sample rates.

  CalPERS staff indicated that the June 30, 2023, valuation reports will reflect the recommended modifications.

- The statement under the post-retirement mortality sample rate table on Page A-7 of the State valuation report is erroneous. We understand the sample rates to be base rates as of 2017.

  CalPERS staff indicated that the June 30, 2023, valuation reports will reflect the correction.

- Neither the State nor Schools Pool valuation reports reference the mortality improvement assumption used in the valuations, which was 80% of MP-2020 (as shown in the 2021 experience study report).

  This was not addressed for the pre-retirement mortality assumption in the June 30, 2022, State valuation report but was addressed for the post-retirement mortality assumption and for both pre- and post-retirement mortality in the June 30, 2022, Schools Pool valuation report. CalPERS staff indicated that the June 30, 2023, State valuation report will reflect the recommended modification.

2. The reports indicate that the demographic assumptions are based on an experience study dated November 17, 2021. However, some of the rates disclosed in the reports do not match the rates published in the 2021 experience study report, the most notable being the non-industrial death rates listed on page 14 of the State report. All of the listed male rates and most of the listed female rates differ. We do note that the rates provided to us for this audit do match the valuation report. We suggest disclosing the source of the rates used for the valuation reports that differ from the experience study.

   This does not appear to have been addressed in the June 30, 2022, valuation report. CalPERS staff noted the following: “the November 17, 2021 Experience Study report inadvertently excluded the non-industrial death rates for safety members. The rates shown in the Experience Study report were the rates for miscellaneous members. The safety non-industrial death rates were developed during the Experience Study and the correct rates (shown on page 14 of the valuation report) were used in the state valuation.”

3. The State valuation report contains an exhibit displaying the “Key Results” (including participant information, funded status information, and employer contribution requirements) of each group within the plan. We recommend that a similar exhibit be provided in the Schools Pool valuation report.

   CalPERS staff indicated that the June 30, 2023, Schools valuation report will reflect the recommended modifications.

4. Within the “Key Results” exhibit in the State valuation report, the display of the Contribution Required information implies that the Total is the sum of the components listed above it, but that is not true. We suggest reorganizing the information to make it clearer which line items sum to equal the Total.

   CalPERS staff indicated that the June 30, 2023, State valuation report will reflect the recommended modifications.

5. Regarding ASOP 51, the Schools Pool report shares all maturity measures from 2017-2021. However, the State report only provides information for the current year (and previous year, in certain cases). ASOP 51 indicates that for some measures, “a table of historical values will be more useful than only showing one or two years of recent values.” It is left to the discretion of the actuary whether including additional historical detail on the plan maturity measures would be useful.

   This does not appear to have been addressed in the June 30, 2022, valuation report. CalPERS staff noted that “it was decided not to collect and disclose these historic measures for the state plans. Such a history of measures will occur over time as more years are added going forward.”

6. Regarding ASOP 56, page A-1 of the State valuation reports includes a description of the valuation model. This description appears to be missing from the Schools Pool valuation report. A section disclosing and describing the actuarial model should be added to the Schools Pool report to satisfy ASOP 56.

   This appears to have been addressed in the June 30, 2022, valuation report.

Section IV – Summary of Task 3 – Judges, Legislators, and 1959 Survivors

For Task 3, we concluded that the assumptions used in the Judges I (JRS I), Judges II (JRS II), Legislators (LRS), and 1959 Survivors valuations were reasonable and the methodology used to select these assumptions was appropriate and consistent with guidance provided in ASOP 27 and 35. We reviewed the assumed annual rate of return assumptions under each of the valuations reviewed using our own economic modeling tool and determined all of them to be reasonable.

For Task 3, we replicated total present values of future benefits, actuarial accrued liabilities, normal costs, and total employer contribution rates within 5% of the corresponding results reported by CalPERS for all of the plans.

In Task 3, our observations related to the valuation calculations were organized into two categories:

1. Differences in valuation system. No two valuation systems will produce identical results due to differing approaches to age- and service-rounding, adjustments for mid-year timing, consideration of monthly-vs.-annual payments, etc. These differences generally will not produce materially different results. For purposes of this report, we will not restate items we identified as differences in valuation systems.

2. Areas for which refinement of calculation would be advisable.

    - The valuation report for JRS II indicates that the Section 75522.5 retirement rate for 1) ages 65-67 and 10-19 years of service is 0.100, and the retirement rate for 2) ages 68-69 and 10-19 years of service is 0.050. However, the valuation programming uses a retirement rate for 1) of 0.200 and for 2) of 0.100. Our matching valuation follows the retirement rates used in the valuation programming.

      Based on our discussions with CalPERS personnel, it is our understanding that the rates shown in future valuation reports for JRS II will match those used in the valuations. CalPERS staff further noted that "recommended modifications made in the June 30, 2023 report. (April 2024 board item.)"

<u>Final comments and recommendations from Task 3 (JRS) included:</u>

1. Page A-1 of the report indicates that the "service retirement and mortality assumptions were changed in this valuation based on an experience study review." However, these assumption changes were implemented in the June 30, 2021, valuation. For clarity, we recommend refinement of that language.

   CalPERS staff noted to this point that "the recommended changes were made in the June 30, 2023 report. (April 2024 board item.)"

2. In the development of potential prefunded employer contributions for fiscal year 2023-2024, the projected unfunded accrued liability (UAL) as of June 30, 2023, appears to be determined as follows:

1.	UAL as of 6/30/2022	$	2,752,706,219
2.	Total NC for FY 2022-2023	$	12,221,387
3.	Estimated Employee Contributions FY 2022-2023	$	1,673,303
4.	Estimated Benefit Payments FY 2022-2023	$	200,230,820
5.	Interest [1. * 0.03 + (2. + 3. - 4.) * (1.03^.5 – 1)]	$	79,806,799
6.	UAL as of 6/30/2023 (1. + 2. + 3. – 4. + 5.)	$	2,646,176,888

Based on our understanding of the figures above, estimated employee contributions for FY 2022-2023 are already included in item 2. Accordingly, we believe that this figure is being double-counted in the UAL roll-forward. We would recommend adjusting the calculation to exclude item 3. This, however, would have a negligible effect on the estimated UAL payment for fiscal year 2023-2024. Additionally, we note that the amounts developed in these calculations are hypothetical and do not affect actual funding.

CalPERS staff noted to this point that "the recommended change was made in the June 30, 2023 report. (April 2024 board item.)"

<u>Final comments and recommendations from Task 3 (JRS II) included:</u>

1. Regarding the retirement assumption for Section 75522 service retirement, we recommended that the table be updated for clarity. Specifically, the rates shown in the table do not apply solely to those retiring with over 20 years of service.

   CalPERS staff noted to this point that "recommended modifications made in the June 30, 2023 report. (April 2024 board item.)"

2. Regarding the demographic assumptions excluding mortality and retirement, we recommended that the Plan's actuaries should consider studying these assumptions based on recent Plan experience.

   CalPERS staff noted to this point that "These assumptions will be reviewed during the next CalPERS Experience Study."

3. Regarding the assumed monetary credit balance interest crediting rate, we recommended that the report disclose the basis and rationale for the assumption used.

   CalPERS staff noted to this point that "recommended modifications made in the June 30, 2023 report. (April 2024 board item.)"

4. Regarding the determination of the assumed retirement benefit payable at service retirement, we recommended that the report include additional detail on the methodology used to determine the value of the benefits before they are compared.

   CalPERS staff noted to this point that "recommended modifications made in the June 30, 2023 report. (April 2024 board item.)"

5. Regarding the assumed commencement age for Section 75522.5 retirees, we recommended that the report disclose this assumption, given that Section 75522.5 retirees have the option to defer commencement past full retirement age in lieu of the benefit reduction.

   CalPERS staff noted to this point that "recommended modifications made in the June 30, 2023 report. (April 2024 board item.)"

Final comments and recommendations from Task 3 (LRS) included:

None

Final comments and recommendations from Task 3 (1959 Survivors) included:

1. We recommended that the report explicitly disclose the amortization policy for the State 5th Level Pool. In particular, the June 30, 2021, valuation report indicated that the amortization period used for the State 5th Level Pool was five years. The June 30, 2022, valuation report shows that the period used was 15 years. Page 5 of the June 30, 2022, valuation states that there were no significant changes to the actuarial methods and assumptions for the June 30, 2022, actuarial valuation. We recommend expanding the description of the amortization method to explain that the change in periods from 2021 to 2022 was not a significant change in method. Alternatively, if it there was a change in method, the impact of the change should be disclosed. Also, we suggest that a rationale for the fresh-start approach be included in the report.

   CalPERS staff noted to this point that "The 6/30/2023 report will state that the UAL amortization schedule was fresh started as of 6/30/2022 to 'better achieve the objectives of the Amortization Policy, such as mitigating contribution volatility'. There will not be a fresh start as of 6/30/2023. (April 2024 board item.)"

2. Consider including a more detailed breakdown of the participant counts by status, such as average age and service for current active participants in the Public Agency Indexed Level Pool, average age and benefit for those currently receiving benefits, and average age and service for those included in the normal cost determination (at least in the most recent year) for those in Public Agency 1st, 2nd, 3rd and 4th, and State and Schools 5th Level Pool.

   CalPERS staff noted to this point that "The 6/30/2023 report will include some but not all of these suggested additions. We will review the remainder of the items for the 6/30/2024 report. (April 2024 board item.)"

3. ASOP 6 Compliance

   Actuarial Standard of Practice 6 (ASOP 6) provides guidance for measuring retiree group benefits obligations and determining retiree group benefits plan costs or contributions. We have noted the following items that may be considered for inclusion in future reports to more completely fulfill the requirements of the current versions of these ASOPs:

   a) A statement regarding the impact of the funding policy on future contributions and funded status; i.e., an explanation that the impact on funding associated with a current-year gain or loss will be increasing over the next five years before leveling out. (4.1(p) of ASOP 6)

   b) Some additional comments about the appropriateness of reported measures of the funded status of the plan for various purposes. (4.1(t) of ASOP 6)

   c) In accordance with 4.1(w), a statement about future measurements and the fact that they may differ from current measurements. While some analysis was included in the report regarding the impact of potential variations in discount rate, mortality assumptions, and future investment returns on contributions in near-term future years, a more general statement about the potential effect of experience differing from assumptions may be needed in light of this requirement of ASOP 6.

   CalPERS staff noted to this point that "We disagree that ASOP 6 applies to this plan. However, the 6/30/2023 report will include modified language to address the above recommendations. (April 2024 board item.)" In subsequent discussions, CalPERS staff noted that they believe ASOP 4 is

more appropriate than ASOP 6 because the plan does not provide death benefits during retirement—rather, those benefits are provided in case of death prior to retirement.
Buck generally agrees that this is a reasonable reading of the Actuarial Standards of Practice. The disclosure requirements noted above are generally applicable under ASOP 4 as they are under ASOP 6. Buck would recommend that the future reports include commentary addressing the following:

a. **Whether the funded status measure is appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations;**

b. **Whether the funded status measure is appropriate for assessing the need for or the amount of future contributions. To this point, a statement was added in the 6/30/2023 report regarding the funded status on a low-default-risk basis, but not the other funded status measures.**

4. Regarding the discount rate assumption, we recommended that the actuary examine the determination that the assumption is prescribed (based on definitions provided in ASOP 27) and, if applicable, disclose the information and analysis used to support the actuary's determination that the assumption does not significantly conflict with what, in the actuary's professional judgment, is reasonable for the purpose of the measurement.

   CalPERS staff noted to this point that "We believe the discount rate is a prescribed assumption and the 6/30/2023 report will include the suggested language. (April 2024 board item.)"

5. Regarding the mortality assumption, we recommended that the basis for the non-industrial rates for Safety plans be explicitly documented since the 2021 experience study did not include the Safety rates.

   CalPERS staff noted to this point that "the November 17, 2021 Experience Study report inadvertently excluded the non-industrial death rates for safety members. The rates shown in the Experience Study report were the rates for miscellaneous members. The safety non-industrial death rates were developed during the Experience Study and the correct rates (shown on page 14 of the valuation report) were used in the state valuation."

6. Regarding the decrement assumptions (excluding mortality), assumed weights for historical data to calculate expected claims, and assumed eligible survivor status for the Indexed Level claims assumption, we recommended that the report include disclosure of the basis and rationale for the assumptions.

   CalPERS staff noted to this point that "a description will be provided in the June 30, 2023 report for the assumed weights for historical data. The assumption for "eligible survivor status" will be studied during the next experience study. (April 2024 board item.)"

7. Regarding ASOP 56, we noted that a description of the valuation model does not appear to be included in the report.

   CalPERS staff noted to this point that "a description will be provided in the June 30, 2023 report. (April 2024 board item.)"

Section V – Final Comments and Recommendations

The results of our reviews completed as part of Contract 2021-9096 confirm that the actuarial process followed by CalPERS is thorough, complete, and complies with applicable Actuarial Standards of Practice. We have been able to closely replicate key valuation results, and differences generally were due to reasonable differences in valuation systems.

The CalPERS Actuarial Office has addressed each of the outstanding issues noted in this report, and have indicated their intention to resolve them in a reasonable period of time.