# California Public Employees' Retirement System

## Parallel Valuation and Certification Report CalPERS Public Agency Valuations

As of June 30, 2014

September 2016

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Board of Administration
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Members of the Board:

As provided in Contract 2015-8123, we have reviewed valuations produced 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 report the results of our review of the June 30, 2014 annual actuarial valuations prepared for 20 sample Public Agency plans. The process by which the 20 plans reviewed in this report were selected is set forth in Section III of this report.

We reviewed the assumptions, methods and procedures used by CalPERS staff to perform the Public Agency valuations we examined, and we confirm that they conform to applicable Actuarial Standards of Practice.

In addition, we completed parallel actuarial valuations for the 20 sample Public Agency plans using the same assumptions and census, asset and benefit provision data that were used by CalPERS staff to prepare their June 30, 2014 valuations of these plans. We compared the key results of our parallel valuations with the results published in the 20 sample Public Agency plan valuation reports.

Each actuarial organization has its own valuation model and applies actuarial assumptions and methods in its preferred way. There is rarely a single “right” answer when it comes to actuarial calculations. For a pension actuarial valuation, we consider one actuary’s calculations to reasonably match another actuary’s calculations when the present values (liabilities), normal cost contributions, and total employer contributions computed by the two actuaries are within 5% of each other.

For 16 Public Agency plans, our key calculations matched those prepared by CalPERS staff within 5%, which was the target tolerance level specified by CalPERS. We view the differences as not material. For four Public Agency Plans, our calculations produced results that differed by more than 5% from the corresponding results produced by CalPERS. We have documented causes of the differences in results.

Although not required by the Request for Proposal (No. 2015-7649), we also compared key valuation results for each individual participant (active members, transferred and terminated members, and retired members and beneficiaries) in the 20 Public Agency plans whose valuations we reviewed. This enhanced reconciliation process provides a deeper review of the calculations and may highlight differences in the handling of individual participants in the valuation process whose effects offset each other when results are aggregated at the level of the entire plan.

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

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions, applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this study.

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. No one may make any representations or warranties based on any statements or conclusions contained in this report without Buck Consultants' prior written consent.

The undersigned are Fellows of the Society of Actuaries, Members of the American Academy of Actuaries and Enrolled Actuaries. They 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.

Respectfully submitted,

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# Table of Contents

## Section



## Schedules

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

This report summarizes our review of sample Public Agency plans' actuarial valuation results as of June 30, 2014.

We first reviewed the actuarial assumptions and methods used for the June 30, 2014 Public Agency valuations. Many of the assumptions and methods were revised for the June 30, 2014 valuations. Our review reflects recent changes in the Actuarial Standards of Practice (ASOP) applicable to the selection of economic assumptions (ASOP 27) and the selection of demographic assumptions (ASOP 35). The results of our review are discussed in Section II.

Next, we completed parallel actuarial valuations for 20 of the Public Agency plans in order to compare our key valuation results with those published in the valuation reports prepared for the 20 plans. CalPERS requested that we reconcile any differences of more than 5% between the two sets of valuation results. Section III contains a summary of our parallel valuation methodology. The results of our analysis are summarized in Section IV.

We have also reviewed the reports for the sample Public Agency plans in light of the relatively new requirements of ASOP 4, the standard of practice for measuring pension obligations and determining pension plan costs or contributions. ASOP 4 was significantly updated in late 2013 for valuations made on or after December 31, 2014. Since the measurement date for the Public Agencies we reviewed was June 30, 2014, our comments in connection with the requirements of ASOP 4 are suggestions to be considered for reflection in future reports.

# Section II - Review of Actuarial Assumptions and Methods

We have reviewed the actuarial assumptions and methods used in the public agency valuations. The key valuation assumptions include the following:

- Expected rate of return on investments, net of expenses: 7.50%
- Payroll growth: 3.00%. This is used for projecting payroll in developing amortization payment schedules
- Salary scale: varies by entry age, service, and type of employee.
- Inflation: 2.75%
- Decremental assumptions including mortality, rates of termination and retirement: based on a 2014 experience study.

Actuarial Standard of Practice (ASOP) 27 discusses the selection of economic assumptions for the measurement of pension liabilities. Similarly, ASOP 35 discusses the selection of demographic assumptions for the measurement of pension liabilities. In our opinion, the assumptions used in the Public Agency valuations are reasonable and the methodology used to select these assumptions is appropriate and consistent with the guidance provided in ASOP 27 and ASOP 35.

We have reviewed the assumed annual rate of return on plan assets of 7.50%, using our own economic modeling tool, and determined that 7.50% is a reasonable assumed long-term expected rate of return for the plans covered by this report.

# Section III – Parallel Actuarial Valuation Methodology

The steps followed in our parallel actuarial valuation are described below.

CalPERS provided a list of the 10 largest Public Agency plans and asked that these plans be included in the sample. In addition, we were directed to select 10 or more additional Public Agency plans using a random sampling technique.

In order to select an additional 10 Public Agency plans randomly for review, we first identified categories of Public Agency plans for which different methods or assumptions had been implemented and then randomly selected plans from each of those categories.

The selection categories for random sampling were based on the type of Public Agency, specifically 1) City or Town, 2) County, and 3) Other. Within each of these, there exist Miscellaneous and/or Safety rate plans, resulting in six distinct categories to select from:

1. City or Town – Miscellaneous
2. City or Town – Safety
3. County – Miscellaneous
4. County – Safety
5. Other – Miscellaneous
6. Other – Safety

The 10 randomly selected Public Agencies were chosen so that each of these six categories was sampled. The complete list of plans selected for review is shown on the following page:

| Selected Employer | Type of Public Agency | Type of Plan |
|---|---|---|
| **10 Largest Plans** | | |
| Santa Clara | County | Miscellaneous |
| San Francisco Bay Area Rapid Transit | Other | Miscellaneous |
| Los Angeles Office of Education | County | Miscellaneous |
| Long Beach | City | Miscellaneous |
| Monterey | County | Miscellaneous |
| Oakland | City | Miscellaneous |
| Riverside | County | Miscellaneous |
| Riverside | County | Safety |
| Sacramento | City | Miscellaneous |
| Solano | County | Miscellaneous |
| **10 Randomly Selected Plans** | | |
| El Dorado | County | Miscellaneous |
| Placerville* | City | Miscellaneous |
| San Fernando* | City | Safety First Tier |
| Colma* | Town | Miscellaneous |
| Sierra* | County | Miscellaneous |
| Napa* | County | Safety Third Tier |
| San Benito* | County | Safety |
| Pasadena USD Safety Police* | Other | Safety |
| Pleasant Hill* | Other | Miscellaneous |
| Alameda* | Other | Miscellaneous |

* Plan is valued in a CalPERS risk pool.

For each of the 20 plans we completed the following steps:

1. For each valuation report to be validated, we requested:
   a) A copy of the final June 30, 2014 actuarial valuation report
   b) The complete decrement tables used by CalPERS to prepare the valuation
   c) The final participant data used in generating the valuation report
   d) The key actuarial results presented in each valuation report (normal cost, actuarial accrued liability, present value of benefits, present value future salary, etc.) both in the aggregate and *on a per participant basis*.

2. Using the information provided in 1(a), 1(b), and 1(c) above, we produced valuations for each plan using ProVal®, a commercially available valuation system used worldwide by actuaries and investment professionals. We generated the key actuarial results for comparison to results published in the actuarial valuation reports. Note that for plans in a risk pool, their normal cost is based on the average normal cost of all public agencies in that pool. Because replicating the normal cost of the pool is beyond the scope of this engagement, we compared our results to these plans' present values of benefits and accrued liabilities only, which are calculated outside of the risk pool by CalPERS on a stand-alone basis.

3. In the reconciliation process, using the data provided in 1(d) above and the output data from ProVal®, we compared the key results on both on an aggregate basis and an individual basis. Reconciling results for individual participants as well as by rate plans may uncover multiple discrepancies that could offset each other, producing aggregate results that fall within 5% tolerance level. Valuation results that differ by less than 5% in total may camouflage systematic errors with respect to particular types of participants. Comparing results by participant helps us to identify the reasons why aggregate results differ by more than the 5% tolerance and to identify hidden material discrepancies for results that are within the tolerance as well. As part of this enhanced reconciliation process, we provide in Schedule C a frequency distribution of the percentage difference in key actuarial results per person.

4. We have communicated preliminary results to CalPERS via email and telephone discussions.

5. In the Summary of Findings in the next section we provide the following:
   - Recap of issues found in each actuarial review
   - Discussion of how issues were resolved
   - Description of any outstanding issues

# Section IV - Summary of Findings

In our parallel valuations and review, we compared total present values of future benefits, actuarial accrued liabilities, normal costs, and total employer contribution rates. For the 10 largest public agency plans we reviewed, we are happy to report that all of our calculations for these key results differed by less than 5% from the corresponding results reported by CalPERS.

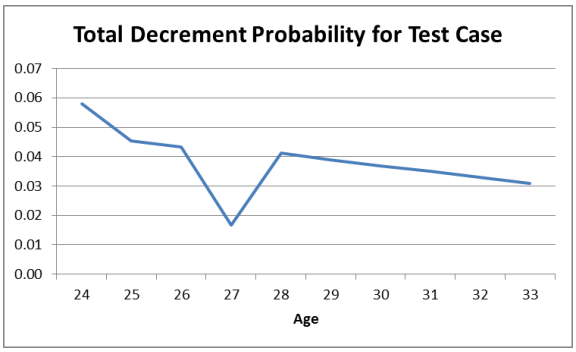
For four of the 10 random public agency plans that we reviewed, there were discrepancies of more than 5% between our calculation and CalPERS' calculation of the present value of benefits and/or the accrued liabilities.

The table in Schedule B summarizes the results for each of the 20 Public Agency plans whose valuations we reviewed.

In an effort to identify the reasons for discrepancies exceeding 5%, we analyzed differences in the development of our results as compared to the development of CalPERS' results. We found that there was a difference in the application of the probabilities of termination for certain participants. In general, the affected participants had fewer than five years of service and were employed part-time or for other reasons had service less than their elapsed time since entry into the plan, although differences in the Buck and CalPERS applications of the termination decrement occurred occasionally for other types of members as well.

As background, CalPERS employs two tables of decrements that are applied to participants who may terminate before retirement. One table consists of probabilities that such participants will terminate and elect to take a refund of their contributions in lieu of leaving their money in the plan. The other table consists of probabilities that they will terminate and leave their money in the plan instead of taking a refund – i.e., that they will choose to receive a retirement income benefit from the plan. These rates are based on vesting service and, together, the two tables indicate the overall probability of termination by a participant at each age. In general, these termination rates are applied consistently for participants who are vested or have been working in a full-time position in which service credited for benefit eligibility purposes is equal to elapsed time in the plan from date of hire. For such participants, after entry into the plan providing their coverage, the valuations posit continually decreasing probabilities of termination as they approach retirement.

Occasionally, we found situations in which rounding, the timing applied in the application of decrements, and the type of service used to select each decrement led to inconsistencies in the manner in which decrements were applied in aggregate. The following chart illustrates one such example. It shows the total decrement probabilities for a sample active participant who is 24 years old and has completed 1.3 years of service on the valuation date. As can readily be seen, there a temporary reduction in decrement probabilities in the year of attainment of age 27 due to the manner in which the termination probability is applied. The participant is projected to attain eligibility for vesting in that year, but not until after the manner in which decrements are applied leads to an unexpected (and perhaps unintended) decrease in the assumed probability of termination.



In developing our parallel valuation results, we used actual accrued time from entry age as the basis for the amount of service used in applying the termination decrement. This eliminated the discontinuity in the decrement rates we observed in some of the results.

Because this issue primarily affects the valuation of liabilities for part-time participants, its impact is immaterial for large plans with many full-time employees. For very small plans with a significant number of short-service and part-time participants, the effect was more pronounced. Note, however, that for a smaller plan that participates in a pool the contribution rate is calculated based on the pool's normal cost percentage. This is calculated on the basis of a census containing a larger number of more diverse participants, mitigating the impact of the discontinuity in the observed decrement rates.

In the aggregate, as shown in the chart in Schedule C in which we compare our calculations of individual participants' present values of benefits to those developed by CalPERS (in our enhanced reconciliation process), our results matched within the 5% tolerance for the majority of participants belonging to the 20 public agencies.

In considering the cases in which the match between our results and those developed by CalPERS were not within 5% of each other, focusing solely on the 5% threshold as a reasonableness test can be misleading for small plans. For example, for the Town of Colma, due to rounding of fractional service for a new hire, we show an immaterial $170 difference between our results and CalPERS results. The percentage difference, however, is 100%, causing this public agency to fall outside of the 5% threshold.

All differences greater than 5% identified were for small pooled public agencies. Specific comments regarding these differences are noted below:

| Employer | Comments regarding differences |
|---|---|
| Town of Colma | The Buck-calculated present value of benefits (PVB) for this one-participant valuation was 15.99% ($6,386) below the CalPERS-calculated value. The difference is attributable to the difference in the application of termination decrement probabilities described earlier. Using the CalPERS approach to termination decrement selection reduced the 15.99% difference to a 0.33% difference, within the 5% reasonability test. As mentioned above, there was also a $170 immaterial difference in accrued liabilities. Because of the small size of the plan, this small difference in dollar values amounted to a percentage difference greater than 5%. |
| County of Sierra | The Buck-calculated PVB was well within the 5% threshold of the CalPERS-calculated amount. In allocating the PVB between past service (impacting accrued liabilities) and future service (impacting normal cost), rounding differences in the calculation of service and age led Buck to allocate slightly more to accrued liabilities ($2,489) and commensurately less to future normal cost. The $2,489 difference in accrued liabilities exceeded the 5% threshold for this small plan. |
| County of San Benito | Similar to the County of Sierra, the Buck-calculated PVB was well within 5% of the corresponding PVB calculated by CalPERS. A small difference in accrued liabilities ($3,827) resulted in a percentage difference (5.58%) in excess of the 5% threshold. |

| Employer | Comments regarding differences |
|---|---|
| American Canyon Fire Protection District | This case is similar to Town of Colma, for which Buck's PVB was 5.88% ($30,218) less than the CalPERS-calculated PVB due to the termination decrement issue. Also, due to differences in Buck's and CalPERS' rounding of fractional service, Buck attributed more of the PVB to future service and less to service prior to the valuation date, causing a $11,851 difference in the accrued liabilities that exceeded the 5% threshold for this small plan. |

# Section V – Additional Comments and Recommendations

First, we would like to note that our review has indicated that the actuarial process followed by CalPERS is thorough, complete, and complies with applicable Actuarial Standards of Practice. In the prior section, we did note some technical aspects of the calculation of results that may be considered for further refinement. In this section, we will provide some additional comments and recommendations.

**Recommendations**

**1. Add information to the reports to meet new ASOP 4 requirements.**

Actuarial Standard of Practice 4 (ASOP 4), which provides guidance for measuring pension obligations and determining pension plan costs or contributions, was significantly revised in 2013 for measurements made as of dates on or after December 31, 2014. While the valuations we reviewed were made as of June 30, 2014, we have noted the following items that may be considered for inclusion in future reports in order to meet the requirements of the current version of ASOP 4:

**a)** Enhanced description of the contribution allocation procedure, including a more detailed description of what the five-year ramp up and ramp-down in amortizations entails. (4.1(k) of ASOP 4)

**b)** A statement regarding the impact of the funding policy on future contributions. In other words, explain that the impact on funding associated with a current-year gain or loss will be increasing over the next five years before leveling out. This observation is similar to item (a) above but slightly different, as this is specifically addressed to the impact on future contributions. (4.1(m) of ASOP 4)

**c)** Provide some additional comments about the appropriateness of reported measures of the funded status of the plan for various purposes. (4.1(q) of ASOP 4)

**d)** In accordance with 4.1(r) (or 4.1(l) in the version of ASOP 4 that was in effect on June 30, 2014), include a statement about future measurements and the fact that they may differ from current measurements. While some analysis was included in the reports we reviewed regarding the impact of potential variations in future investment returns, a more general statement about the potential effect of experience differing from assumptions may be needed to fully satisfy this requirement of ASOP 4.

**e)** In accordance with 4.1(s), it may be advisable to provide more detail on the rationale for changes in assumptions than was present in the reports we reviewed.

**2. Consider revising either the termination decrement tables or the process the valuation system uses to draw the probabilities.**

The current use of two termination decrement tables, one for refunds and one for vesting, is a long-time CalPERS practice but is not a universal approach to reflecting multiple possible outcomes of termination before meeting retirement eligibility requirements. The more common approach is to use a single withdrawal table that reflects the total probability of termination at each age. A second forfeiture table can be incorporated to value a refund of contributions instead of a deferred vested benefit. Such a table does not affect the total termination probability at any age and thus does not lead to the inconsistency we have identified in the application of the two termination tables presently used by CalPERS. This issue may be addressed in the next experience study. Until the termination decrement tables are restructured, a short-term fix should be considered within the valuation system to eliminate the occurrence of the problem.

**3. Consider including additional demographic data in pooled public agency valuation reports.**

While not required by actuarial standards, it may be beneficial for completeness and transparency to include additional demographic data such as average age and average service in the pooled public agency valuation reports. This information is incorporated for the entire risk pool by reference in Section 2 of each public agency valuation report, but not separately for each public agency on a stand-alone basis.

# Schedule A – Comparison of Active Member Data

## 10 Largest Public Agency Plans

| Selected Employer | Plan | | Number of Actives | Average Age | Average Service | Average Pay |
|---|---|---|---|---|---|---|
| County of Santa Clara | Miscellaneous | CalPERS | 13,738 | 46.97 | 12.17 | $87,759 |
| | | Buck | 13,738 | 46.97 | 12.16 | $87,759 |
| San Francisco Bay Area Rapid Transit | Miscellaneous | CalPERS | 3,072 | 50.09 | 13.99 | $78,031 |
| | | Buck | 3,072 | 50.09 | 14.00 | $78,031 |
| City of Long Beach | Miscellaneous | CalPERS | 3,210 | 45.76 | 12.25 | $67,515 |
| | | Buck | 3,210 | 45.76 | 12.25 | $67,515 |
| City of Oakland | Miscellaneous | CalPERS | 2,524 | 49.10 | 12.57 | $77,148 |
| | | Buck | 2,524 | 49.10 | 12.56 | $77,148 |
| City of Sacramento | Miscellaneous | CalPERS | 2,450 | 45.75 | 12.61 | $62,393 |
| | | Buck | 2,450 | 45.75 | 12.60 | $62,393 |
| Los Angeles County Office of Education | Miscellaneous | CalPERS | 2,003 | 47.13 | 12.04 | $51,558 |
| | | Buck | 2,003 | 47.13 | 12.03 | $51,558 |
| County of Monterey | Miscellaneous | CalPERS | 3,976 | 45.35 | 10.81 | $68,535 |
| | | Buck | 3,976 | 45.35 | 10.80 | $68,535 |
| County of Riverside | Miscellaneous | CalPERS | 15,934 | 44.08 | 9.75 | $56,327 |
| | | Buck | 15,934 | 44.08 | 9.73 | $56,327 |

# Schedule A – Comparison of Active Member Data (continued)

## 10 Largest Public Agency Plans

| Selected Employer | Plan | | Number of Actives | Average Age | Average Service | Average Pay |
|---|---|---|---|---|---|---|
| County of Riverside | Safety | CalPERS | 3,541 | 39.29 | 10.56 | $83,358 |
| | | Buck | 3,541 | 39.29 | 10.56 | $83,358 |
| County of Solano | Miscellaneous | CalPERS | 2,270 | 47.18 | 10.88 | $68,610 |
| | | Buck | 2,270 | 47.18 | 10.88 | $68,610 |

# Schedule A – Comparison of Active Member Data (continued)

## 10 Randomly Selected Public Agency Plans

| Selected Employer | Plan | | Number of Actives | Average Age | Average Service | Average Pay |
|---|---|---|---|---|---|---|
| County of El Dorado | Miscellaneous | CalPERS | 1,437 | 48.19 | 9.73 | $57,067 |
| | | Buck | 1,437 | 48.19 | 9.71 | $57,067 |
| City of Placerville | Miscellaneous | CalPERS | 9 | Not published* | Not published* | $41,624 |
| | | Buck | 9 | 39.98 | 1.89 | $41,624 |
| City of San Fernando | Safety First Tier | CalPERS | 5 | Not published* | Not published* | $126,884 |
| | | Buck | 5 | 50.19 | 27.03 | $126,884 |
| Town of Colma | PEPRA Misc. | CalPERS | 1 | Not published* | Not published* | $25,748 |
| | | Buck | 1 | 30.89 | 0 | $25,748 |
| County of Sierra | PEPRA Misc. | CalPERS | 11 | Not published* | Not published* | $35,506 |
| | | Buck | 11 | 38.64 | 0.77 | $35,506 |
| County of Napa | Safety Third Tier | CalPERS | 14 | Not published* | Not published* | $99,371 |
| | | Buck | 14 | 39.76 | 1.29 | $99,371 |

* Information not published in the public agency valuation report. See Recommendation 3 in Section V.

# Schedule A – Comparison of Active Member Data (continued)

## 10 Randomly Selected Public Agency Plans

| Selected Employer | Plan | | Number of Actives | Average Age | Average Service | Average Pay |
|---|---|---|---|---|---|---|
| County of San Benito | PEPRA Safety | CalPERS | 12 | Not published* | Not published* | $44,285 |
| | | Buck | 12 | 27.89 | 0.75 | $44,285 |
| Pasadena USD Safety Police | Safety | CalPERS | 0 | N/A | N/A | N/A |
| | | Buck | 0 | N/A | N/A | N/A |
| American Canyon Fire Protection District | PEPRA Safety | CalPERS | 2 | Not published* | Not published* | $61,780 |
| | | Buck | 2 | 34.47 | 0.47 | $61,780 |
| Alameda County WMA | Miscellaneous | CalPERS | 37 | Not published* | Not published* | $108,254 |
| | | Buck | 37 | 46.27 | 11.05 | $108,254 |

* Information not published in the public agency valuation report. See Recommendation 3 in Section V.

# Schedule B – Comparison of Individual Public Agency Plan Key Results

## 10 Largest Public Agency Plans

| Selected Employer | Plan | | Present Value of Benefits | Accrued Liability | Total Normal Cost (ER+EE) | Employer Contr. Rate |
|---|---|---|---|---|---|---|
| County of Santa Clara | Miscellaneous | CalPERS | 10,028,061,375 | 8,541,118,608 | 200,069,493 | 18.978% |
| | | Buck | 10,042,459,968 | 8,527,270,779 | 198,418,147 | 19.028% |
| | | Differ. | 0.14% | -0.16% | -0.83% | 0.26% |
| San Francisco Bay Area Rapid Transit | Miscellaneous | CalPERS | 2,223,944,235 | 1,973,973,607 | 36,023,116 | 16.383% |
| | | Buck | 2,210,344,348 | 1,955,159,042 | 36,415,006 | 16.650% |
| | | Differ. | -0.61% | -0.95% | 1.09% | 1.63% |
| City of Long Beach | Miscellaneous | CalPERS | 2,590,462,435 | 2,317,460,837 | 37,562,330 | 20.586% |
| | | Buck | 2,575,283,899 | 2,308,904,103 | 35,956,840 | 20.008% |
| | | Differ. | -0.59% | -0.37% | -4.27% | -2.81% |
| City of Oakland | Miscellaneous | CalPERS | 2,592,643,829 | 2,341,202,493 | 37,154,361 | 34.234% |
| | | Buck | 2,596,048,924 | 2,351,084,063 | 35,522,498 | 33.667% |
| | | Differ. | 0.13% | 0.42% | -4.39% | 1.65% |
| City of Sacramento | Miscellaneous | CalPERS | 1,177,474,929 | 1,004,412,173 | 22,527,540 | 16.476% |
| | | Buck | 1,165,800,668 | 993,460,936 | 21,998,068 | 16.446% |
| | | Differ. | -0.99% | -1.09% | -2.35% | -0.18% |
| Los Angeles County Office of Education | Miscellaneous | CalPERS | 978,579,991 | 847,807,871 | 17,923,313 | 17.915% |
| | | Buck | 975,763,217 | 847,379,454 | 17,292,463 | 17.538% |
| | | Differ. | -0.29% | -0.05% | -3.52% | -2.10% |

# Schedule B – Comparison of Individual Public Agency Plan Key Results (continued)

## 10 Largest Public Agency Plans

| Selected Employer | Plan | | Present Value of Benefits | Accrued Liability | Total Normal Cost (ER+EE) | Employer Contr. Rate |
|---|---|---|---|---|---|---|
| County of Monterey | Miscellaneous | CalPERS | 1,760,005,273 | 1,449,315,448 | 40,047,382 | 13.257% |
| | | Buck | 1,753,250,115 | 1,448,649,694 | 38,306,045 | 12.747% |
| | | Differ. | -0.38% | -0.05% | -4.35% | -3.85% |
| County of Riverside | Miscellaneous | CalPERS | 6,911,347,405 | 5,656,121,103 | 164,534,558 | 16.476% |
| | | Buck | 6,916,571,547 | 5,671,058,579 | 159,389,219 | 16.117% |
| | | Differ. | 0.08% | 0.26% | -3.13% | -2.18% |
| County of Riverside | Safety | CalPERS | 3,363,956,870 | 2,615,686,777 | 82,670,548 | 26.570% |
| | | Buck | 3,353,474,720 | 2,598,757,698 | 80,686,663 | 26.347% |
| | | Differ. | -0.31% | -0.65% | -2.40% | -0.84% |
| County of Solano | Miscellaneous | CalPERS | 1,498,193,597 | 1,297,925,354 | 27,572,543 | 20.004% |
| | | Buck | 1,492,105,912 | 1,286,315,856 | 28,520,508 | 20.596% |
| | | Differ. | -0.41% | -0.89% | 3.44% | 2.96% |

# Schedule B – Comparison of Individual Public Agency Plan Key Results (continued)

## 10 Randomly Selected Public Agency Plans

| Selected Employer | Plan | | Present Value of Benefits | Accrued Liability | Total Normal Cost (ER+EE) | Employer Contr. Rate |
|---|---|---|---|---|---|---|
| County of El Dorado | Miscellaneous | CalPERS | 687,275,267 | 593,575,470 | 12,860,386 | 18.780% |
| | | Buck | 687,559,280 | 594,186,776 | 12,514,333 | 18.632% |
| | | Differ. | 0.04% | 0.10% | -2.69% | -0.79% |
| City of Placerville | Miscellaneous | CalPERS | 612,748 | 123,235 | Pooled* | Pooled* |
| | | Buck | 612,838 | 128,958 | | |
| | | Differ. | 0.01% | 4.64% | | |
| City of San Fernando | Safety First Tier | CalPERS | 42,576,972 | 42,029,476 | Pooled* | Pooled* |
| | | Buck | 42,519,221 | 41,973,529 | | |
| | | Differ. | -0.14% | -0.13% | | |
| Town of Colma | PEPRA Misc. | CalPERS | 39,941 | 170 | Pooled* | Pooled* |
| | | Buck | 33,555 | 0 | | |
| | | Differ. | -15.99% | -100.00% | | |
| County of Sierra | PEPRA Misc. | CalPERS | 501,666 | 26,175 | Pooled* | Pooled* |
| | | Buck | 511,775 | 28,664 | | |
| | | Differ. | 2.02% | 9.51% | | |

* Replication of the pooled normal cost and related employer contribution rate requires a valuation of the entire risk pool and is beyond the scope of this engagement.

# Schedule B – Comparison of Individual Public Agency Plan Key Results (continued)

## 10 Randomly Selected Public Agency Plans

| Selected Employer | Plan | | Present Value of Benefits | Accrued Liability | Total Normal Cost (ER+EE) | Employer Contr. Rate |
|---|---|---|---|---|---|---|
| County of Napa | Safety Third Tier | CalPERS | 5,183,819 | 586,405 | Pooled* | Pooled* |
| | | Buck | 5,120,151 | 604,625 | | |
| | | Differ. | -1.23% | 3.11% | | |
| County of San Benito | PEPRA Safety | CalPERS | 1,888,824 | 68,583 | Pooled* | Pooled* |
| | | Buck | 1,866,412 | 64,756 | | |
| | | Differ. | -1.19% | -5.58% | | |
| Pasadena USD Safety Police | Safety | CalPERS | 1,523,537 | 1,523,537 | Pooled* | Pooled* |
| | | Buck | 1,494,099 | 1,494,099 | | |
| | | Differ. | -1.93% | -1.93% | | |
| American Canyon Fire Protection District | PEPRA Safety | CalPERS | 513,821 | 11,851 | Pooled* | Pooled* |
| | | Buck | 483,603 | 0 | | |
| | | Differ. | -5.88% | -100.00% | | |
| Alameda County WMA | Miscellaneous | CalPERS | 26,285,132 | 20,894,800 | Pooled* | Pooled* |
| | | Buck | 26,139,784 | 20,959,232 | | |
| | | Differ. | -0.55% | 0.31% | | |

* Replication of the pooled normal cost and related employer contribution rate requires a valuation of the entire risk pool and is beyond the scope of this engagement.

# Schedule C – Comparison of Individual Participant Key Results

## Present Value of Future Benefit Differences
### All Members for all 20 Public Agency Plans Combined

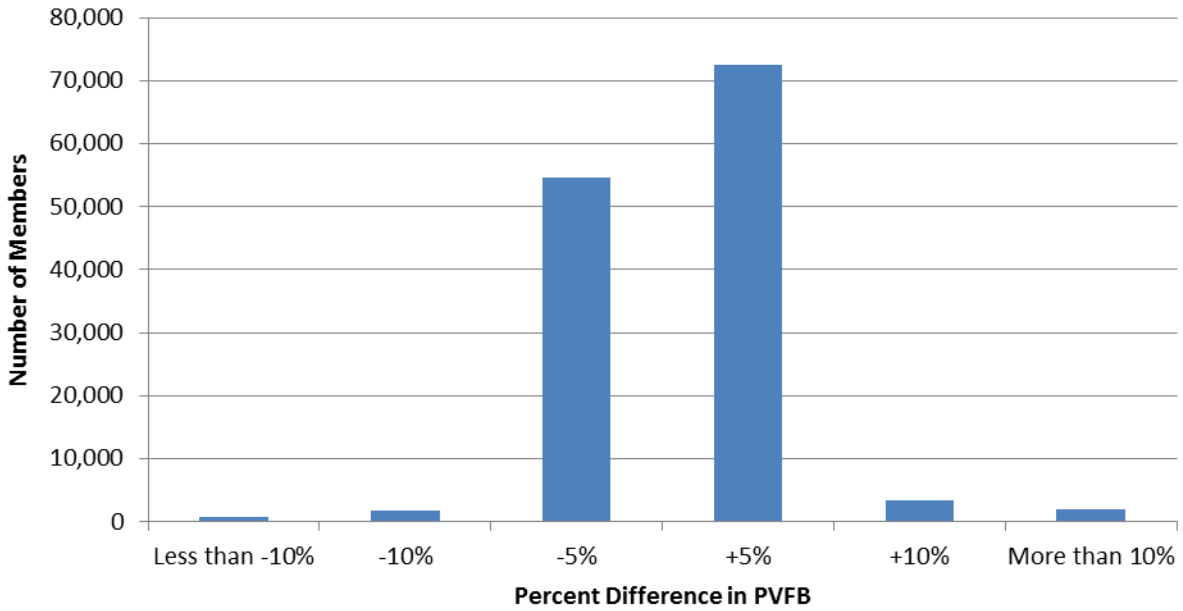



Chart Tabulation Method and Notation: The chart above reflects percent differences between Buck and CalPERS results, rounded to the nearest hundredth of a percent, where -5% reflects Buck results that were within the range from 0.00% to -4.99% compared to CalPERS results, where -10% reflects Buck results within -5.00% to -9.99% of CalPERS results, etc.