



California Public Employees' Retirement System

Parallel Valuation and Certification Report

CalPERS Public Agency Valuations (Task #1)

Annual Valuation

Reports as of: June 30, 2020

January 2022



110 West Berry Street
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January 24, 2022

Board of Administration
California Public Employees' Retirement System
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Members of the Board:

As provided in Contract 2021-9096, we have reviewed actuarial valuations produced by the California Public Employees' Retirement System (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, 2020 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.

In regard to the Public Agency valuations we examined, we reviewed the assumptions, methods and procedures used by CalPERS staff and confirmed that they conform to applicable Actuarial Standards of Practice. We further certify that the reports on these valuations prepared by CalPERS staff 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, census data, asset information and benefit provisions that were used by CalPERS staff to prepare their June 30, 2020 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. Please see Section IV and Schedule B in this report for a summary comparison of our results to CalPERS' results.

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

For all 20 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.

Although not required under Contract 2021-9096, 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 may offset each other when results are aggregated at the overall plan level.

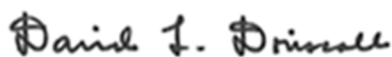
Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions,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

Actuarial Standard of Practice No. 56 (ASOP 56) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. Buck uses third-party software in the performance of annual actuarial valuations and projections. The model is intended to calculate the liabilities associated with the provisions of each plan using data and assumptions as of the measurement date under the funding methods specified in this report. The output from the third-party vendor software is used as input to internally developed models that apply applicable funding methods and policies to the derived liabilities and other inputs, such as plan assets and contributions, to generate many of the exhibits found in this report. Buck has an extensive review process in which the results of the liability calculations are checked using detailed sample life output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other funding outputs and the internal models are similarly reviewed in detail and at a higher level for accuracy, reasonability, and consistency with prior results. Buck also reviews the third-party model when significant changes are made to the software. This review is performed by experts within Buck who are familiar with applicable funding methods, as well as the manner in which the model generates its output. If significant changes are made to the internal models, extra checking and review are completed. Significant changes to the internal models that are applicable to multiple clients are generally developed, checked, and reviewed by multiple experts within Buck who are familiar with the details of the required changes.

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

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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.

In 2021, Buck was contracted to provide parallel valuation and certification services to the Board. This report summarizes our review of sample Public Agency plans' actuarial valuations prepared as of June 30, 2020 under Task #1 of our contract.

Our review of the assumptions and methods used by CalPERS actuarial staff is based on Actuarial Standards of Practice (ASOPs) applicable to the selection of economic assumptions (ASOP 27) and the selection of demographic assumptions (ASOP 35). The results of our review of the assumptions and methods 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 by CalPERS actuarial staff 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 also reviewed the actuarial valuation reports for the sample Public Agency plans based on the requirements of ASOP 4 (the standard of practice for measuring pension obligations and determining pension plan costs or contributions), ASOP 41 (the standard of practice regarding actuarial communications), and ASOP 51 (the standard of practice regarding assessment and disclosure of risks associated with measuring pension obligations and determining pension plan contributions). The results of our review of the actuarial valuation reports are shown in Section V.

We did not audit or review the final valuation data provided to us by CalPERS for this parallel valuation, as review of the data is explicitly excluded from the scope of this assignment.

Section II - Review of Actuarial Assumptions and Methods

We have reviewed the actuarial assumptions and methods used in the 20 sample Public Agency valuations. The key valuation assumptions include the following:

- Expected rate of return on investments, net of investment and administrative expenses: 7.00%
- Payroll growth: 2.75%. This is used for projecting payroll in developing unfunded liability amortization payment schedules.
- Salary scale: Varies by entry age, service, and type of employee.
- Inflation: 2.50%
- Decremental assumptions including mortality, termination and retirement: Based on a 2017 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 20 sample 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 7.00% using our own economic modeling tool and determined that 7.00% is a reasonable assumed long-term expected rate of return for the plans covered by this report. Please refer to our comments in Section V.

Section III – Parallel Actuarial Valuation Methodology

Contract 2021-9096 required Buck to “perform a parallel valuation of the 10 largest public agency plans plus a minimum of 10 other public agency plans chosen by a random sample technique acceptable to CalPERS.” The steps followed in our parallel actuarial valuation are described below.

CalPERS provided a database containing a listing of all CalPERS Public Agency plans and their key results as of June 30, 2020. From this list, and following the direction of the CalPERS Actuarial Office, Buck selected the 10 Public Agency plans with the largest active membership counts.

Then, with approval from the CalPERS Actuarial Office, Buck randomly selected 10 other Public Agency plans using the following methodology:

1. No plans were selected that were covered under Task 1 or 4 of Contract 2015-8123.
2. The remaining non-pooled plans were partitioned into County, City or Town, and Other categories. Three plans were selected at random from each of these three categories.
3. One risk-pool plan was selected at random.

Section III – Parallel Actuarial Valuation Methodology (continued)

The complete list of Public Agency plans selected for review is shown below:

Selected Employer	Type of Public Agency	Type of Plan
10 Largest Plans		
Santa Clara	County	Miscellaneous
San Francisco Bay Area Rapid Transit	Other	Miscellaneous
Long Beach	City or Town	Miscellaneous
Monterey	County	Miscellaneous
Oakland	City or Town	Miscellaneous
Riverside	County	Miscellaneous
Riverside	County	Safety
Sacramento	City or Town	Miscellaneous
Solano	County	Miscellaneous
Public Transportation Services Corporation	Other	Miscellaneous
10 Randomly-Selected Plans		
Clovis	City or Town	Safety
Redwood City	City or Town	Miscellaneous
Rialto	City or Town	Miscellaneous
Cosumnes Community Services District	Other	Safety
Glenn	County	Miscellaneous
Santa Cruz	County	Safety
Yolo	County	Miscellaneous
Metropolitan Transportation Commission	Other	Miscellaneous
Southern California Regional Rail Authority	Other	Miscellaneous
Yorba Linda Water District ¹	Other	Miscellaneous

¹ Plan is valued in a CalPERS risk pool.

Section III – Parallel Actuarial Valuation Methodology (continued)

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, 2020 actuarial valuation report.
 - b) The complete set of decrement tables used by CalPERS actuarial staff 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 CalPERS actuarial valuation reports. We note that, for plans in a risk pool, 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 information provided in 1(d) above and the output data from ProVal[®], we compared the key results on both 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.
5. In the Summary of Findings in Section IV 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 both the 10 largest and the 10 randomly selected Public Agency plans we reviewed, we are pleased to report that all of our calculations for these key results differed by less than 5% from the corresponding results reported by CalPERS.

The table in Schedule B of this report summarizes the results for each of the 20 Public Agency plans whose valuations we reviewed. This schedule indicates that we were able to closely replicate the present value of future benefits, in most cases within 0.5% of CalPERS' results, and in all cases within 1.0% of CalPERS' results. The attribution of the present value of future benefits under the Entry Age Normal actuarial cost method gave rise to a slightly greater variance, particularly in the normal cost. As part of this process, we observed several items that contributed to this variance. These items can be categorized in one of two ways:

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

Differences in valuation system

The following observations relate to evident differences in valuation system. These are not errors; they are simply differences of approach. These items do not have a material effect on overall liabilities but can give rise to significant percentage differences on an individual basis.

- For new entrants, ProVal[®] uses rounded funding ages, so that in the year of hire, the accrued liability is \$0. CalPERS' valuation system imputes a half-year of accrual; i.e., the accrued liability is nonzero, which would result in a difference of 100%. However, the dollar amounts of the resulting differences are immaterial.
- Some of the large individual percentage changes on normal cost come from those past maximum assumed retirement age. ProVal[®] will compute a normal cost of \$0 for these active members, whereas CalPERS's valuation system, always imputes a half-year of accrual, which is to say the normal cost for these participants is non-zero, which would result in a difference of 100%. However, the dollar amounts of the resulting differences are immaterial.
- For active participants, CalPERS' valuation system uses rounded mid-year age to assign age-based decrement probabilities. For retirees, CalPERS's valuation system uses rounded beginning-of-year age to assign the age-based decrement probabilities. This issue has an immaterial impact on the overall liabilities developed in the valuations.

Section IV - Summary of Findings (continued)

- The present value of a participant’s future benefits is based on his or her actual credited service amount as of the valuation date. However, in CalPERS’ valuation system the accrued liability and normal cost are determined using a theoretical service amount built by assumption from entry age. Generally, the theoretical service is at least as much as the actual, which tends to produce a lower accrued liability and a higher normal cost than if actual service were used.

Consider the following example: An active member in the City of Long Beach Miscellaneous plan whose birth date was in February 1953, whose “Normal Cost Start Date” was in September 2007, and whose credited service at the valuation date was 2.27 years. The following table compares the resulting liabilities under the two methods—to be clear, the “actual service” approach refers to valuing the Entry Age Normal liabilities by projecting the actual service as of the valuation date back to entry age, rather than building a theoretical service amount:

	Buck Calculation Using the CalPERS Approach	Buck Calculation Using the Actual Service Approach
Present value of future benefits	241,640	241,640
Entry age normal accrued liability	102,349	213,142
Entry age normal cost	37,187	7,608

This issue affects a relatively small portion of the active plan population; thus, the overall impact on liabilities and costs is minor. For example, for the Long Beach plan, we estimate that using the “actual service” approach would increase the active accrued liability and reduce the normal cost by less than 1% each.

- Like the treatment of service noted above, in CalPERS’ valuation system the liability for refund-of-contribution benefits is valued by calculating the present value of a participant’s future benefits based on his or her actual accumulated balance as of the valuation date, but the accrued liability and normal cost are determined using a theoretical accumulated balance built by assumption from entry age. If CalPERS were to apply the attribution method by projecting the current account balance as of the valuation date back to entry age and forward to future decrement ages (as opposed to creating the theoretical balance starting at entry age), we expect that the active accrued liability would increase and the normal cost would decrease, both by immaterial amounts.
- For retirees, ProVal[®] can assume either beginning-of-period or end-of-period payment timing, and best replicates the CalPERS valuation system’s benefit payment modelling using the assumption of monthly payment frequency with end-of-period payment timing.

Section IV - Summary of Findings (continued)

Areas for refinement

Our review of CalPERS's calculations did not identify any refinements of the valuation calculations that we would consider necessary or advisable.

As shown in the chart in Schedule C of this report, in which we compare our calculations of individual participants' present values of benefits to those developed by CalPERS (part of our enhanced reconciliation process), our results matched within the 5% tolerance for the vast majority of participants belonging to the 20 Public Agency plans that were reviewed.

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.

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.

We found that the reports prepared by the CalPERS Actuarial Office on the 20 valuations covered in our parallel valuation and audit process appear to conform well to applicable Actuarial Standards of Practice in effect at the time of their issuance. We note that revised versions of Actuarial Standards of Practice Nos. 27 and 35 have subsequently become effective, and that a revised version of ASOP No. 4 has just been adopted by the Actuarial Standards Board. We encourage the personnel of the CalPERS Actuarial Office to consider the changes that may be needed to future reports on these systems to maintain compliance with these standards of practice in their most recently amended forms.

Schedule A – Comparison of Active Member Data

10 Largest Public Agency Plans

Employer	Plan		Number of Actives	Average Age	Average Service	Average Pay
County of Santa Clara	Miscellaneous	CalPERS	17,805	46.12	9.64	\$100,822
		Buck	17,805	46.12	9.64	\$100,822
San Francisco Bay Area Rapid Transit	Miscellaneous	CalPERS	3,962	47.95	10.61	\$98,978
		Buck	3,962	47.95	10.61	\$98,978
City of Long Beach	Miscellaneous	CalPERS	3,528	44.07	10.09	\$73,306
		Buck	3,528	44.07	10.09	\$73,306
City of Oakland	Miscellaneous	CalPERS	2,797	48.08	10.51	\$90,389
		Buck	2,797	48.08	10.51	\$90,389
City of Sacramento	Miscellaneous	CalPERS	2,650	44.63	10.24	\$74,564
		Buck	2,650	44.63	10.24	\$74,564
Public Transportation Services Corporation	Miscellaneous	CalPERS	2,618	48.05	9.07	\$101,211
		Buck	2,618	48.05	9.07	\$101,211
County of Monterey	Miscellaneous	CalPERS	4,663	44.06	9.70	\$76,307
		Buck	4,663	44.06	9.70	\$76,307
County of Riverside	Miscellaneous	CalPERS	17,467	44.09	9.56	\$67,720
		Buck	17,467	44.09	9.56	\$67,720
County of Riverside	Safety	CalPERS	3,404	40.07	11.52	\$92,892
		Buck	3,404	40.07	11.52	\$92,892
County of Solano	Miscellaneous	CalPERS	2,495	45.57	9.36	\$77,925
		Buck	2,495	45.57	9.36	\$77,925

Schedule A – Comparison of Active Member Data (continued)

10 Randomly-Selected Public Agency Plans

Employer	Plan		Number of Actives	Average Age	Average Service	Average Pay
City of Clovis	Safety	CalPERS	156	39.88	10.87	\$ 118,916
		Buck	156	39.88	10.87	\$ 118,916
City of Redwood City	Miscellaneous	CalPERS	385	45.22	10.98	\$ 97,910
		Buck	385	45.22	10.98	\$ 97,910
City of Rialto	Miscellaneous	CalPERS	178	41.41	8.04	\$ 61,755
		Buck	178	41.41	8.04	\$ 61,755
Cosumnes Community Service District	Safety	CalPERS	169	40.15	11.26	\$ 123,624
		Buck	169	40.15	12.37	\$ 123,624
County of Glenn	Miscellaneous	CalPERS	434	43.47	9.55	\$ 59,173
		Buck	434	43.47	9.55	\$ 59,173
County of Santa Cruz	Safety	CalPERS	155	38.00	9.25	\$ 120,848
		Buck	155	38.00	9.25	\$ 120,848
County of Yolo	Miscellaneous	CalPERS	1,329	42.65	8.65	\$ 72,561
		Buck	1,329	42.64	8.65	\$ 72,561
Metropolitan Transportation Commission	Miscellaneous	CalPERS	280	46.45	8.04	\$ 130,142
		Buck	280	46.45	7.79	\$ 130,142
Southern California Regional Rail Authority	Miscellaneous	CalPERS	259	45.26	6.70	\$ 107,125
		Buck	259	45.26	6.70	\$ 107,125
Yorba Linda Water District	Miscellaneous	CalPERS	37	48.20	16.90	\$ 92,957
		Buck	37	48.20	16.90	\$ 92,957

Schedule B – Comparison of Individual Public Agency Plan Key Results

10 Largest Public Agency Plans

Employer	Plan		Present Value of Benefits	Accrued Liability	Total Normal Cost (ER+EE)	Employer Contr. Rate
County of Santa Clara	Miscellaneous	CalPERS	14,895,744,079	12,532,594,912	292,608,544	26.18%
		Buck	14,856,875,388	12,490,172,291	292,548,779	25.71%
		Differ.	-0.26%	-0.34%	-0.02%	-1.81%
San Francisco Bay Area Rapid Transit	Miscellaneous	CalPERS	3,231,448,179	2,759,872,021	59,905,307	24.59%
		Buck	3,210,321,599	2,738,254,372	59,333,450	23.81%
		Differ.	-0.65%	-0.78%	-0.95%	-3.16%
City of Long Beach	Miscellaneous	CalPERS	3,218,572,876	2,849,716,235	43,839,522	30.80%
		Buck	3,216,468,109	2,844,301,779	43,970,068	30.48%
		Differ.	-0.07%	-0.19%	0.30%	-1.03%
City of Oakland	Miscellaneous	CalPERS	3,349,688,743	2,999,679,691	46,593,328	46.67%
		Buck	3,374,691,443	3,014,370,009	47,531,018	47.48%
		Differ.	0.75%	0.49%	2.01%	1.74%
City of Sacramento	Miscellaneous	CalPERS	1,777,480,464	1,513,415,691	30,575,887	25.43%
		Buck	1,778,684,241	1,516,228,569	30,236,275	25.34%
		Differ.	0.07%	0.19%	-1.11%	-0.35%
Public Transportation Services Corporation	Miscellaneous	CalPERS	1,305,826,570	1,008,197,470	38,925,657	14.66%
		Buck	1,309,537,941	1,010,011,387	38,778,462	14.52%
		Differ.	0.28%	0.18%	-0.38%	-0.93%
County of Monterey	Miscellaneous	CalPERS	2,620,501,937	2,164,127,309	52,447,701	19.92%
		Buck	2,600,814,046	2,142,467,836	53,326,566	19.49%
		Differ.	-0.75%	-1.00%	1.68%	-2.14%
County of Riverside	Miscellaneous	CalPERS	10,759,573,772	8,992,723,006	210,323,046	23.05%
		Buck	10,835,329,489	9,036,871,322	213,070,599	23.42%
		Differ.	0.70%	0.49%	1.31%	1.62%
County of Riverside	Safety	CalPERS	4,912,503,829	4,045,933,495	93,770,070	36.40%
		Buck	4,942,152,598	4,058,350,939	96,541,152	37.73%
		Differ.	0.60%	0.31%	2.96%	3.64%
County of Solano	Miscellaneous	CalPERS	2,044,478,518	1,783,023,185	32,830,340	29.86%
		Buck	2,036,510,872	1,776,022,783	32,506,006	29.24%
		Differ.	-0.39%	-0.39%	-0.99%	-2.07%

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

10 Randomly-Selected Public Agency Plans

Employer	Plan		Present Value of Benefits	Accrued Liability	Total Normal Cost (ER+EE)	Employer Contr. Rate
City of Clovis	Safety	CalPERS	300,115,567	247,717,965	5,577,446	56.10%
		Buck	298,770,251	246,702,072	5,550,969	55.56%
		Differ.	-0.45%	-0.41%	-0.47%	-0.96%
City of Redwood City	Miscellaneous	CalPERS	423,676,708	373,699,332	6,212,032	37.32%
		Buck	423,694,223	373,384,981	6,222,071	37.18%
		Differ.	0.00%	-0.08%	0.16%	-0.38%
City of Rialto	Miscellaneous	CalPERS	164,422,274	147,183,308	2,039,024	47.14%
		Buck	164,552,296	147,134,246	2,057,486	47.07%
		Differ.	0.08%	-0.03%	0.91%	-0.15%
Cosumnes Community Services District	Safety	CalPERS	284,027,494	228,177,428	5,534,959	43.27%
		Buck	285,487,125	231,417,743	5,408,748	44.17%
		Differ.	0.51%	1.42%	-2.28%	2.08%
County of Glenn	Miscellaneous	CalPERS	244,335,187	207,703,653	4,106,529	31.01%
		Buck	243,583,301	207,092,359	4,086,371	30.71%
		Differ.	-0.31%	-0.29%	-0.49%	-0.97%
County of Santa Cruz	Safety	CalPERS	284,128,971	230,859,801	5,534,678	52.84%
		Buck	284,643,468	231,195,935	5,630,888	53.57%
		Differ.	0.18%	0.15%	1.74%	1.39%
County of Yolo	Miscellaneous	CalPERS	963,060,370	821,817,657	15,768,230	32.69%
		Buck	958,186,406	817,753,354	15,601,495	32.04%
		Differ.	-0.51%	-0.49%	-1.06%	-2.00%
Metropolitan Transportation Commission	Miscellaneous	CalPERS	249,551,921	197,077,264	6,577,542	15.92%
		Buck	250,730,774	198,013,454	6,553,665	15.99%
		Differ.	0.47%	0.48%	-0.36%	0.41%
Southern California Regional Rail Authority	Miscellaneous	CalPERS	128,303,278	93,587,748	4,106,422	13.75%
		Buck	127,848,158	93,313,393	4,087,331	13.41%
		Differ.	-0.35%	-0.29%	-0.46%	-2.50%
Yorba Linda Water District	Miscellaneous	CalPERS	46,382,055	42,140,886	532,428	N/A
		Buck	46,257,344	42,031,103	533,089	N/A
		Differ.	-0.27%	-0.26%	0.12%	N/A

Schedule C – Comparison of Individual Participant Key Results

Present Value of Future Benefit (PVFB) Differences

All Members for all 20 Public Agency Plans Combined

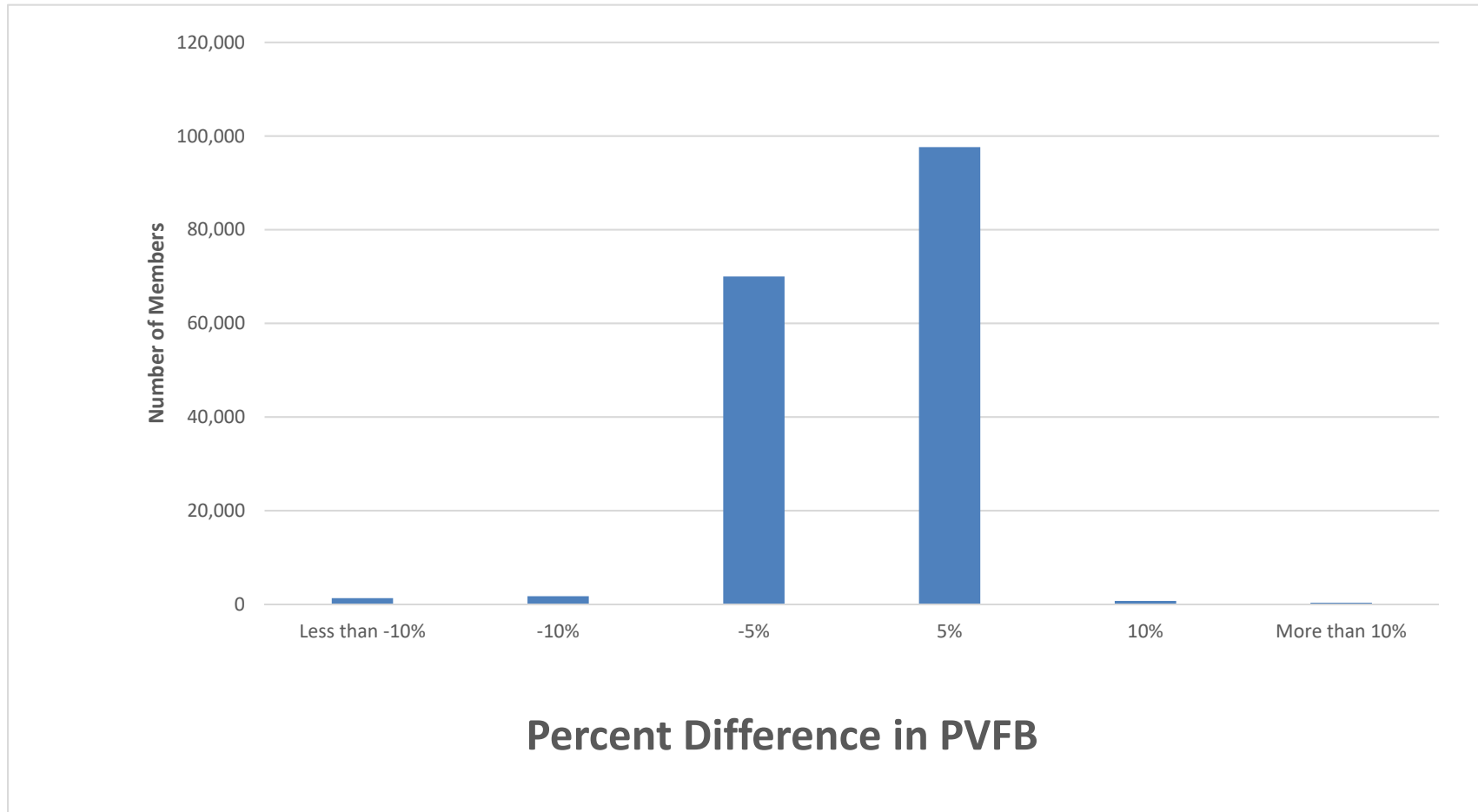


Chart Tabulation Method and Notation: The chart above reflects percent differences between Buck and CalPERS PVFB results by individual, rounded to the nearest hundredth of a percent, where -5% reflects Buck results that were within the range from 0.00% to -4.99% compared to CalPERS results, where -10%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