Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve

LOS ANGELES COUNTY
EMPLOYEES RETIREMENT ASSOCIATION

ACTUARIAL REVIEW REPORT FOR THE JUNE 30, 2022 ACTUARIAL VALUATION OF RETIREMENT BENEFITS

Prepared by Cavanaugh Macdonald Consulting
February 17, 2023

www.CavMacConsulting.com

February 17, 2023

Mr. Richard Bendall
Chief, Internal Audit
Los Angeles County Employees Retirement Association
300 North Lake Avenue, Suite 820
Pasadena, CA 91101

Dear Mr. Bendall:

Cavanaugh Macdonald Consulting, LLC (CMC) has performed an independent review of the June 30, 2022 actuarial valuation of retirement benefits for the Los Angeles County Employees Retirement Association (LACERA). As an independent reviewing, or auditing actuary, we have been asked to express an opinion regarding the reasonableness and accuracy of the valuation results, including a review of sample lives as well as a full independent replication of the key valuation results.

Our opinion on the valuation results is based on an independent replication of the June 30, 2022 actuarial valuation of LACERA and a review of detailed sample lives. We previously reviewed the 2022 Experience Study, prepared by Milliman. Our report, dated January 6, 2023, includes our opinion that the actuarial assumptions and methods recommended in the study were reasonable for purposes of performing the actuarial funding valuation. With respect to this review report, we would like to thank Milliman, LACERA's retained actuary, for their cooperation and assistance in providing the required information to us in a timely fashion. **We find the June 30, 2022 actuarial valuation results to be reasonable and accurate, based on the assumptions and methods used. The valuation was performed by qualified actuaries and was performed in accordance with the principles and practices prescribed by the Actuarial Standards Board.** This report documents the detailed results of our review.

Additional Information and Disclosures

This report has been prepared for LACERA and its stakeholders by CMC and is intended to assist LACERA as it validates the reasonability of the liabilities, costs, and other calculations for retirement benefits, determined as of June 30, 2022. Additionally, the findings, conclusions, and recommendations presented in this report are specific to LACERA, LACERA's retirement benefits, and the work produced by Milliman. CMC may produce different findings or arrive at different conclusions in other situations or even in cases involving other similar retirement benefit plans. As such, it is important to keep in mind that the use of this information for purposes other than those expressed here may not be appropriate.

In preparing this review, we have relied on the following information provided by LACERA and/or Milliman:

- Milliman's valuation report titled, *Los Angeles County Employees Retirement Association June 30, 2022 Actuarial Valuation of Retirement Benefits* (2022 LACERA Actuarial Valuation);
- Raw retirement plan actuarial valuation census data as of June 30, 2022, provided by Milliman on LACERA's behalf;
- Milliman's processed retirement plan actuarial valuation census data as of June 30, 2022;
- Detailed sample lives prepared by Milliman; and
- Complete tables of actuarial assumptions used in the valuation, provided by Milliman.

We also considered our previous actuarial review report dated March 2, 2020 titled, *Los Angeles County Employees Retirement Association Actuarial Review of the June 30, 2019 Actuarial Valuation of Retirement Benefits*.

While we cannot verify the accuracy of all of this information, the supplied information was reviewed for reasonableness and consistency, and we have no reason to doubt the substantial accuracy or completeness of the information. We believe that it is sufficiently reliable for the purpose of conducting this review. The results and conclusions contained in this report depend on the integrity of this information, and if any of the supplied information or analyses change, our results and conclusions may be different, and this report may need to be revised.

The undersigned are familiar with the funding aspects of public retirement plan valuations and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinions contained in this report. In order to prepare the results in this report, we have utilized appropriate actuarial models that were developed for this purpose. These models use assumptions about future contingent events along with recognized actuarial approaches to develop the needed results. All sections of this report, including any appendices and attachments, are considered an integral part of the actuarial opinions.

CMC does not provide legal, investment, or accounting advice. Thus, the information in this report is not intended to supersede or supplant the advice and interpretations of LACERA or its external consultants.

Sincerely,

Patrice Beckham

Brent A. Banister

Patrice Beckham, FSA, EA, MAAA, FCA
Principal and Consulting Actuary

Brent A. Banister, Ph.D., FSA, EA, MAAA, FCA
Chief Actuary

TABLE OF CONTENTS

Section | **Page**

1. Executive Summary

As an independent reviewing actuary, Cavanaugh Macdonald Consulting, LLC (CMC) has been tasked to provide a general overview and express an opinion of the reasonableness and soundness of the actuarial work performed by the retained actuary, Milliman, for the Los Angeles County Employees Retirement Association (LACERA). The specific work product to be reviewed was the June 30, 2022 Actuarial Valuation of Retirement Benefits. The specific items included in the actuarial review were:

(1) Evaluation of the census data used in the performance of the valuation, including the degree to which the data is sufficient and appropriate for the purpose of an actuarial valuation, as well as the appropriateness of any assumptions used in creating the member data file;

(2) Independent parallel valuation as of June 30, 2022 using the actuarial assumptions, methodologies and funding methods used by the retained actuary in their performance of the June 30, 2022 actuarial valuation;

(3) Comparison of our parallel valuation results to the major valuation results in the June 30, 2022 valuation report prepared by Milliman and a reconciliation of any material discrepancies in the findings, assumptions, methodologies, or other calculations found in the retained actuary's work.

(4) A detailed review of selected sample lives to potentially detect issues that a comparison of total results might miss.

(5) Review of the June 30, 2022 actuarial valuation report for compliance with Actuarial Standards of Practice as well as for completeness, clarity, and calculation accuracy.

Our findings are based on actuarial reports, member census data, and supplemental information provided by both LACERA and Milliman.

We believe it is important to understand that this review process is an independent, yet collaborative effort. We strive to replicate the calculations as independently as possible. Our goal, however, is not to see if we can find errors so much as it is to make sure that Milliman's presentation to LACERA is as accurate and useful as possible. In carrying this out, we provide suggestions, comments, and occasional corrections to Milliman that they often reflect in their report.

In the following discussion, we have summarized the key points from the full report.

Data Analysis

Underlying the results of any actuarial valuation is the census or membership data, including demographic details of each member entitled to a benefit payment in the future. If the data are not accurate, then results drawn from the data may not be accurate, either. We confirmed that the census data provided to the retained actuary by LACERA contains the necessary elements to perform an actuarial valuation, although we did not audit the data itself. The second part of this step was to ensure that Milliman used the data appropriately.

We requested the original member census data provided to Millman for the 2022 valuation by LACERA. We also requested member data, as reconciled for the 2022 valuation by Milliman, along with complete descriptions of assumptions, methods and valuation procedures. Our comparison of the census data used by Milliman for the June 30, 2022 actuarial valuation with the original data produced by LACERA indicated that Milliman's data is substantially consistent with the LACERA data. **We find that the data is consistent, complete, and appropriate for the purpose for which it is being used.**

Parallel Valuation Results

The key findings and recommendations resulting from our review of Milliman's June 30, 2022 actuarial valuation are discussed below. We matched well in aggregate and reasonably well on the various component pieces. It is important to understand that we do not expect to match Milliman's results exactly because we are using independent approaches to valuing the liabilities.

There are three key metrics in the actuarial valuation:

- Present Value of Benefits (PVB),
- Actuarial Accrued Liability (AAL),
- Normal Cost (NC).

The PVB is a measure of all benefits expected to be ultimately paid for all current members of the Plan in the future. The AAL reflects the portion of the PVB attributable to service already performed as of the valuation date. The Normal Cost is the portion of the PVB allocated to the current plan year. Of the three measures, we expect to match the PVB the closest, typically within 1% to 3%, while the AAL is often not quite as close, and the Normal Cost often reflects the greatest difference, with variance of 3% to 6% at times. This wider range is a consequence of the actuarial mathematics involved in which small variants in approach have a larger impact on the results.

In Section 3 of this report, the detailed results of our independent parallel valuation of the LACERA liabilities are compared with the June 30, 2022 valuation results prepared by Milliman. We were able to match all key measurements within a reasonable range. **We find the calculation results in the June 30, 2022 valuation to be reasonable and appropriate for their intended purposes.**

Overall, our parallel valuation results were very close to Milliman's, particularly for the present value of future benefits which is the most important metric from a funding perspective. The following exhibit illustrates the ratio of Cavanaugh Macdonald's results to Milliman's for all three of the key valuation metrics. A ratio near 100% indicates a very close match. For some of the older plans, there are relatively few active members and differences in approach can have a larger impact on the overall numbers so the ratios may be further from 100% for those groups, particularly for the normal cost.

Plan	Ratio of CMC Results to Milliman's Present Value of Benefits	Actuarial Accrued Liability	Normal Cost
General – A	100%	100%	97%
General – B	100%	100%	97%
General – C	100%	100%	100%
General – D	99%	99%	99%
General – E	100%	100%	102%
General – G	98%	97%	97%
Safety – A	100%	100%	N/A
Safety – B	99%	99%	98%
Safety – C	98%	95%	97%
All Plans	99%	99%	99%

Based on our experience performing actuarial reviews and our professional judgment, Cavanaugh Macdonald believes all of the variances shown in the table above are within an acceptable range and the results confirm the reliability of the June 30, 2022 valuation results prepared by Milliman. While we matched closely in our replication work three years ago, additional effort and resources were expended this time to review certain aspects of the valuation in greater depth and to improve our confidence in our replication work. This additional effort, independent of questions asked of Milliman, resulted in an improvement of the match on some of the ancillary benefits.

As indicated in our *Actuarial Review of the 2022 Experience Investigation Report*, dated January 6, 2023, we found the actuarial assumptions and methods recommended by Milliman to be reasonable and in accordance with applicable Actuarial Standards of Practice. The assumptions used in this valuation, including a 7.0% investment return assumption, are those that were approved by LACERA's Board of Investments at their December 2022 meeting. We verified that the newly adopted set of actuarial assumptions was used to produce the June 30, 2022 valuation results.

Because of the change to the actuarial assumptions, the employee contribution rates for non-PEPRA Plans, including both Normal Member Contribution Rates and Normal Plus Cost-of-Living Member Contribution Rates, were re-determined in the June 30, 2022 valuation report. Based on the methodology described in the report, we verified that the contribution rates shown are reasonable.

As part of this review, Cavanaugh Macdonald also reviewed our prior actuarial review report, prepared three years ago, including specific recommendations that were made for future valuations. As would be expected in an on-going review process as currently exists for LACERA, the list of recommendations usually becomes shorter because recommendations are implemented, or they are discussed and determined not to be useful.

Review of Selected Individuals

As part of our review, we examined results for 26 individual members, including actives, deferred vested, and in-pay members. By focusing on a limited number of individuals who we selected based on specific criteria, it is often possible to detect differences that are not apparent in the overall replication results. In this case, however, we found that the liability measures reported by Milliman for each of the individual sample lives were consistent with our calculations, further confirming our findings that the valuation results are accurate and reliable.

Review of Valuation Report

As part of our review of the valuation report, we verified the key calculations shown in the exhibits. We also verified the reasonableness of the member contribution rates that are provided in the report. We did not observe any significant issues.

We reviewed the June 30, 2022 Actuarial Valuation Report produced by Milliman in detail. We confirmed that the report contains the basic model disclosures recommended by the California Actuarial Advisory Panel (CAAP). We also reviewed the valuation report for compliance with Actuarial Standards of Practice, including *ASOP 56*, *Modeling*, a new standard with an effective date since the last review of the 2019 valuation report. **We found the valuation report to be well written, comprehensive in content, and in compliance with the ASOPs.** We offer a few comments and suggestions for improvement, but all are minor.

Conclusion

It is our belief that an actuarial review should not focus on finding trivial differences between actuarial processes, procedures, philosophies, or styles utilized by two different actuaries, but rather to verify there are no material errors, and to identify potential improvements to the process and procedures utilized by LACERA's retained actuary. Actuarial work draws heavily on professional judgment, so there is a subjective component that must be considered alongside the objective component of matching numerical results. In performing this review, we attempt to limit discussions concerning stylistic preferences and focus more on the significant philosophical approaches, the accuracy of calculations, the completeness and reliability of reporting, and the compliance with generally acceptable actuarial practices and standards of practice in all of the work reviewed.

Because of the complexity of actuarial work, we would not expect to match Milliman's valuation results exactly, nor would we necessarily expect our professional opinions regarding the results to be the same as Milliman's. While we offer some different viewpoints or ideas, we believe that Milliman's work provides an appropriate assessment of the status of retirement benefits for the purpose of determining contribution rates.

***Finding of the Review*:** **We find the actuarial calculations in the June 30, 2022 actuarial valuation to be reasonable, based on the actuarial assumptions and methods used. The valuation was performed by qualified actuaries and was performed in accordance with the**

principles and practices prescribed by the Actuarial Standards Board. Furthermore, the valuation report complies with applicable Actuarial Standards of Practice and the basic model disclosures recommended by the California Actuarial Advisory Panel.

The remainder of this report provides the basis for our findings for each of the requested tasks, including our recommendations.

2. DATA REVIEW

Milliman supplied CMC with the member data used for the June 30, 2022 actuarial valuation. This included both the raw data prepared by LACERA and the processed data used by Milliman for its actuarial software. We compared the records and are comfortable with the data processing being performed by Milliman.

There is minimal data scrubbing performed by Milliman, so we were generally able to confirm that the processed records used by Milliman were consistent with the data provided by LACERA. We further tested that the manner in which records were selected for inclusion or exclusion in the valuation or assignment of valuation status was appropriate.

We tested the member counts by status and the totals of selected key fields to be sure they were reasonably close. The following tables contain some additional detail summarizing our review. In most cases, the matching is quite close, considering rounding issues. For the General G and Safety C plans, our compensation numbers do not quite match Milliman's, although we do match their input numbers. We have determined that this is due to some adjustments that were made by Milliman for new hires. This has no meaningful impact on the total results since these individuals have virtually no actuarial accrued liability.

We believe that the data provided by LACERA is sufficient for Milliman to reasonably perform its work. We did not audit the data, but simply determined whether Milliman was using the data appropriately and that it was consistent with the raw data provided by LACERA. ***Overall, we are comfortable that the data Milliman uses to perform its valuation is complete and appropriate for the purposes of an actuarial funding valuation, as well as consistent with the data supplied by LACERA.***

ANALYSIS OF ACTIVE DATA

		Number	Annual Salary	Average Age	Average Monthly Salary	Average Service
General Members						
Plan A	LACERA Data	56	$6,620,400	73.3	$9,852	43.0
	Milliman Data	56	$6,620,400	73.3	$9,852	43.0
	% Difference	0.00%	0.00%	0.00%	0.00%	0.00%
Plan B	LACERA Data	15	$1,834,968	69.1	$10,194	37.5
	Milliman Data	15	$1,834,968	69.2	$10,194	37.5
	% Difference	0.00%	0.00%	0.14%	0.00%	0.00%
Plan C	LACERA Data	17	$1,924,044	70.1	$9,432	42.4
	Milliman Data	17	$1,924,044	70.1	$9,431	42.4
	% Difference	0.00%	0.00%	0.00%	-0.01%	0.00%
Plan D	LACERA Data	35,763	$3,569,510,784	51.9	$8,318	20.5
	Milliman Data	35,760	$3,570,269,076	51.9	$8,320	20.5
	% Difference	-0.01%	0.02%	0.00%	0.02%	0.00%
Plan E	LACERA Data	13,987	$1,204,268,664	56.1	$7,175	24.3
	Milliman Data	13,984	$1,203,660,576	56.0	$7,173	24.3
	% Difference	-0.02%	-0.05%	-0.18%	-0.03%	0.00%
Plan G	LACERA Data	33,863	$2,539,242,383	39.6	$6,249	4.6
	Milliman Data	33,857	$2,550,530,520	39.6	$6,278	4.6
	% Difference	-0.02%	0.44%	0.00%	0.46%	0.00%
Total	LACERA Data	83,701	$7,323,401,243	47.6	$7,291	14.7
	Milliman Data	83,689	$7,334,839,584	47.6	$7,304	14.7
	% Difference	-0.01%	0.16%	0.00%	0.18%	0.00%
Safety Members						
Plan A	LACERA Data	1	$178,488	64.7	$14,874	27.3
	Milliman Data	1	$178,488	65.0	$14,874	27.3
	% Difference	0.00%	0.00%	0.46%	0.00%	0.00%
Plan B	LACERA Data	8,093	$1,139,132,412	46.9	$11,730	20.0
	Milliman Data	8,092	$1,139,012,580	46.9	$11,730	20.1
	% Difference	-0.01%	-0.01%	0.00%	0.00%	0.50%
Plan C	LACERA Data	4,757	$485,878,066	32.6	$8,512	4.4
	Milliman Data	4,757	$487,718,088	32.7	$8,544	4.4
	% Difference	0.00%	0.38%	0.31%	0.38%	0.00%
Total	LACERA Data	12,851	$1,625,188,966	41.6	$10,539	14.2
	Milliman Data	12,850	$1,626,909,156	41.6	$10,551	14.3
	% Difference	-0.01%	0.11%	0.00%	0.11%	0.70%
Total	LACERA Data	96,552	$8,948,590,209	46.8	$7,723	14.6
	Milliman Data	96,539	$8,961,748,740	46.8	$7,736	14.7
	% Difference	-0.01%	0.15%	0.00%	0.17%	0.68%

ANALYSIS OF VESTED FORMER MEMBER DATA

		Number	Average Age
General Members			
Plan A	LACERA Data	47	74.9
	Milliman Data	47	74.9
	% Difference	0.00%	0.00%
Plan B	LACERA Data	8	72.9
	Milliman Data	8	72.9
	% Difference	0.00%	0.00%
Plan C	LACERA Data	13	68.3
	Milliman Data	13	68.3
	% Difference	0.00%	0.00%
Plan D	LACERA Data	7,872	50.0
	Milliman Data	7,944	50.1
	% Difference	0.91%	0.20%
Plan E	LACERA Data	3,076	57.3
	Milliman Data	3,001	57.5
	% Difference	-2.44%	0.35%
Plan G	LACERA Data	6,745	38.2
	Milliman Data	6,745	38.2
	% Difference	0.00%	0.00%
Total	LACERA Data	17,761	46.9
	Milliman Data	17,758	46.9
	% Difference	-0.02%	0.00%
Safety Members			
Plan A	LACERA Data	4	69.8
	Milliman Data	4	70.0
	% Difference	0.00%	0.29%
Plan B	LACERA Data	795	45.5
	Milliman Data	798	45.6
	% Difference	0.38%	0.22%
Plan C	LACERA Data	487	32.3
	Milliman Data	487	32.2
	% Difference	0.00%	-0.31%
Total	LACERA Data	1,286	40.6
	Milliman Data	1,289	40.6
	% Difference	0.23%	0.00%
Total	LACERA Data	19,047	46.5
	Milliman Data	19,047	46.5
	% Difference	0.00%	0.00%

Note: Inactive vested counts from the LACERA data are not adjusted for suspended active records.

ANALYSIS OF IN-PAY MEMBER DATA

		Number	Annual Allowances	Average Age	Average Monthly Benefit
General Members					
Plan A	LACERA Data	18,063	$1,126,181,843	81.0	$5,196
	Milliman Data	18,057	$1,126,123,848	81.0	$5,197
	% Difference	-0.03%	-0.01%	0.00%	0.02%
Plan B	LACERA Data	712	$43,623,686	76.0	$5,106
	Milliman Data	711	$43,557,760	76.0	$5,105
	% Difference	-0.14%	-0.15%	0.00%	-0.02%
Plan C	LACERA Data	485	$25,684,941	75.4	$4,413
	Milliman Data	485	$25,684,941	75.4	$4,413
	% Difference	0.00%	0.00%	0.00%	0.00%
Plan D	LACERA Data	21,776	$1,007,149,623	69.2	$3,854
	Milliman Data	21,775	$1,007,385,686	69.1	$3,855
	% Difference	0.00%	0.02%	-0.14%	0.03%
Plan E	LACERA Data	16,379	$509,647,231	72.8	$2,593
	Milliman Data	16,377	$509,616,133	72.8	$2,593
	% Difference	-0.01%	-0.01%	0.00%	0.00%
Plan G	LACERA Data	201	$3,150,756	64.6	$1,306
	Milliman Data	201	$3,165,769	64.7	$1,313
	% Difference	0.00%	0.48%	0.15%	0.54%
Total	LACERA Data	57,616	$2,715,438,080	74.0	$3,927
	Milliman Data	57,606	$2,715,534,137	74.0	$3,928
	% Difference	-0.02%	0.00%	0.00%	0.03%
Safety Members					
Plan A	LACERA Data	6,154	$628,121,669	78.6	$8,506
	Milliman Data	6,152	$627,902,061	78.6	$8,505
	% Difference	-0.03%	-0.03%	0.00%	-0.01%
Plan B	LACERA Data	7,796	$805,726,794	61.2	$8,613
	Milliman Data	7,792	$805,477,688	61.2	$8,614
	% Difference	-0.05%	-0.03%	0.00%	0.01%
Plan C	LACERA Data	21	$1,101,733	51.2	$4,372
	Milliman Data	21	$1,101,733	51.3	$4,372
	% Difference	0.00%	0.00%	0.20%	0.00%
Total	LACERA Data	13,971	$1,434,950,196	68.9	$8,559
	Milliman Data	13,965	$1,434,481,482	68.9	$8,560
	% Difference	-0.04%	-0.03%	0.00%	0.01%
Total	LACERA Data	71,587	$4,150,388,276	73.0	$4,831
	Milliman Data	71,571	$4,150,015,619	73.0	$4,832
	% Difference	-0.02%	-0.01%	0.00%	0.02%

ANALYSIS OF IN-PAY MEMBER DATA – HEALTHY RETIREES

		Number	Annual Benefits (in thousands)	Average Monthly Benefit
General Members				
Plan A	LACERA Data	12,713	$903,205	$5,920
	Milliman Data	12,712	$903,205	$5,921
	% Difference	-0.01%	0.00%	0.02%
Plan B	LACERA Data	590	$38,747	$5,473
	Milliman Data	590	$38,747	$5,473
	% Difference	0.00%	0.00%	0.00%
Plan C	LACERA Data	371	$22,016	$4,945
	Milliman Data	371	$22,016	$4,945
	% Difference	0.00%	0.00%	0.00%
Plan D	LACERA Data	17,607	$871,671	$4,126
	Milliman Data	17,606	$872,120	$4,128
	% Difference	-0.01%	0.05%	0.05%
Plan E	LACERA Data	14,862	$485,306	$2,721
	Milliman Data	14,860	$485,306	$2,722
	% Difference	-0.01%	0.00%	0.04%
Plan G	LACERA Data	167	$2,357	$1,176
	Milliman Data	167	$2,372	$1,183
	% Difference	0.00%	0.64%	0.60%
Safety Members				
Plan A	LACERA Data	1,931	$228,292	$9,852
	Milliman Data	1,931	$228,295	$9,852
	% Difference	0.00%	0.00%	0.00%
Plan B	LACERA Data	3,226	$354,558	$9,159
	Milliman Data	3,223	$354,562	$9,167
	% Difference	-0.09%	0.00%	0.09%
Plan C	LACERA Data	11	$697	$5,277
	Milliman Data	11	$697	$5,277
	% Difference	0.00%	0.00%	0.00%
Total	LACERA Data	51,478	$2,906,849	$4,706
	Milliman Data	51,471	$2,907,320	$4,707
	% Difference	-0.01%	0.02%	0.02%

ANALYSIS OF IN-PAY MEMBER DATA – DISABLED RETIREES

		Number	Annual Benefits (in thousands)	Average Monthly Benefit
General Members				
Plan A	LACERA Data	1,213	$54,671	$3,756
	Milliman Data	1,213	$54,671	$3,756
	% Difference	0.00%	0.00%	0.00%
Plan B	LACERA Data	52	$2,026	$3,247
	Milliman Data	52	$2,026	$3,247
	% Difference	0.00%	0.00%	0.00%
Plan C	LACERA Data	49	$1,765	$3,002
	Milliman Data	49	$1,765	$3,002
	% Difference	0.00%	0.00%	0.00%
Plan D	LACERA Data	2,339	$88,470	$3,152
	Milliman Data	2,339	$88,479	$3,152
	% Difference	0.00%	0.01%	0.00%
Plan E	LACERA Data	N/A	N/A	N/A
	Milliman Data	N/A	N/A	N/A
	% Difference	N/A	N/A	N/A
Plan G	LACERA Data	20	$590	$2,458
	Milliman Data	20	$590	$2,458
	% Difference	0.00%	0.00%	0.00%
Safety Members				
Plan A	LACERA Data	2,583	$273,304	$8,817
	Milliman Data	2,583	$273,304	$8,817
	% Difference	0.00%	0.00%	0.00%
Plan B	LACERA Data	4,186	$424,407	$8,449
	Milliman Data	4,185	$424,411	$8,451
	% Difference	-0.02%	0.00%	0.02%
Plan C	LACERA Data	8	$333	$3,473
	Milliman Data	8	$333	$3,473
	% Difference	0.00%	0.00%	0.00%
Total	LACERA Data	10,450	$845,566	$6,743
	Milliman Data	10,449	$845,579	$6,744
	% Difference	-0.01%	0.00%	0.01%

ANALYSIS OF IN-PAY MEMBER DATA – BENEFICIARIES

		Number	Annual Benefits (in thousands)	Average Monthly Benefit
General Members				
Plan A	LACERA Data	4,137	$168,306	$3,390
	Milliman Data	4,132	$168,248	$3,393
	% Difference	-0.12%	-0.03%	0.09%
Plan B	LACERA Data	70	$2,851	$3,394
	Milliman Data	69	$2,785	$3,363
	% Difference	-1.43%	-2.31%	-0.91%
Plan C	LACERA Data	65	$1,903	$2,440
	Milliman Data	65	$1,903	$2,440
	% Difference	0.00%	0.00%	0.00%
Plan D	LACERA Data	1,830	$47,008	$2,141
	Milliman Data	1,830	$46,787	$2,131
	% Difference	0.00%	-0.47%	-0.47%
Plan E	LACERA Data	1,517	$24,341	$1,337
	Milliman Data	1,517	$24,310	$1,335
	% Difference	0.00%	-0.13%	-0.15%
Plan G	LACERA Data	14	$204	$1,212
	Milliman Data	14	$204	$1,214
	% Difference	0.00%	0.00%	0.17%
Safety Members				
Plan A	LACERA Data	1,640	$126,526	$6,429
	Milliman Data	1,638	$126,303	$6,426
	% Difference	-0.12%	-0.18%	-0.05%
Plan B	LACERA Data	384	$26,763	$5,808
	Milliman Data	384	$26,505	$5,752
	% Difference	0.00%	-0.96%	-0.96%
Plan C	LACERA Data	2	$72	$2,990
	Milliman Data	2	$72	$2,990
	% Difference	0.00%	0.00%	0.00%
Total	LACERA Data	9,659	$397,974	$3,434
	Milliman Data	9,651	$397,117	$3,429
	% Difference	-0.08%	-0.22%	-0.15%

3. ACTUARIAL VALUATION RESULTS REVIEW

This section of our review discusses the reasonableness and accuracy of the liabilities and contribution rates developed in Milliman's June 30, 2022 actuarial valuation of LACERA. We independently programmed the various types of benefits provided to members by LACERA using standard actuarial approaches.

The retirement benefits offered by LACERA are generally more complex than many other systems, partly because of the number of groups and benefit tiers covering the members. Different actuaries could reasonably use different approaches to modeling the liabilities of the different Plans. In order to be able to meaningfully compare our results to Milliman's results and to perform a useful sample life review, we selected certain approaches to mimic those used by Milliman. However, we made an effort to minimize direct discussions on methodology and programming in order to maintain our independence. While Milliman was responsive to our questions, they were also careful not to provide any information that would have provided inappropriate insight into their processes. As a result, we believe that the results we obtained are a meaningful test of the reliability of the work performed by Milliman.

As the following summary shows, our independent valuation results matched those of Milliman well overall and by the various Plans. As with any replication analysis, we do not expect to match results exactly because we know we are using independent approaches to modeling the liabilities. In particular, ancillary benefits such as active death and disability benefits are generally harder to match without coordinated effort, which loses a degree of the independence that is desired in an actuarial review. These ancillary benefits, however, are typically of less significance from a liability and cost perspective.

Results in the following tables are shown for the Present Value of Benefits (PVB), the Actuarial Accrued Liability (AAL), and the Normal Cost. The PVB is a measure of the value of all benefits expected to be ultimately paid for all current members of the system. The AAL reflects the portion of the PVB attributable to service already performed, and is the measure typically used for funding and accounting purposes. The Normal Cost is the portion of the PVB allocated to the current plan year. Of the three measures, we typically expect to match the PVB the closest, typically within 1% to 3%, while the AAL is often not quite as close, and the Normal Cost often varies by 3% to 6%. **Based on the results shown in the following tables, we are satisfied that the June 30, 2022 results presented in Milliman's valuation report provide a fair representation of LACERA's current funded status and the contribution rates needed to fund the Plan.**

	General											
	Plan A		Plan B		Plan C		Plan D		Plan E		Plan G	
	Milliman	CMC	Milliman	CMC	Milliman	CMC	Milliman	CMC	Milliman	CMC	Milliman	CMC
Present Value of Future Benefits (PVB):												
Actives	$69	$67	$18	$18	$21	$20	$24,514	$24,184	$6,593	$6,579	$8,599	$8,408
Inactive Vesteds	4	4	1	1	0	0	737	728	462	455	109	108
Retirees	10,327	10,286	466	464	291	291	12,592	12,646	5,314	5,315	42	42
Total	$10,400	$10,357	$485	$483	$312	$311	$37,843	$37,558	$12,369	$12,349	$8,750	$8,558
Actuarial Accrued Liability	$10,398	$10,355	$484	$482	$312	$311	$32,137	$31,811	$11,375	$11,320	$2,427	$2,356
Normal Cost Rate	21.75%	21.12%	21.01%	20.41%	15.02%	15.04%	17.64%	17.46%	11.02%	11.19%	18.48%	17.99%
Ratio (CMC/Milliman)												
PVB:												
Actives		97%		100%		95%		99%		100%		98%
Inactive Vesteds		100%		100%		N/A		99%		98%		99%
Retirees		100%		100%		100%		100%		100%		100%
Total		100%		100%		100%		99%		100%		98%
Actuarial Accrued Liability		100%		100%		100%		99%		100%		97%
Normal Cost Rate		97%		97%		100%		99%		102%		97%

Note: Dollars in millions.

	Safety						Total	
	Plan A		Plan B		Plan C		Total	
	Milliman	CMC	Milliman	CMC	Milliman	CMC	Milliman	CMC
Present Value of Future Benefits (PVB):								
Actives	$2	$2	$12,122	$11,940	$2,968	$2,911	$54,906	$54,129
Inactive Vesteds	0	0	152	149	11	11	1,476	1,456
Retirees	6,722	6,720	12,390	12,378	17	17	48,161	48,159
Total	$6,724	$6,722	$24,664	$24,467	$2,996	$2,939	$104,543	$103,744
Actuarial Accrued Liability	$6,724	$6,722	$21,848	$21,648	$615	$584	$86,320	$85,589
Normal Cost Rate	38.50%	N/A	30.14%	29.56%	29.52%	28.78%	19.33%	19.07%
Ratio (CMC/Milliman)								
PVB:								
Actives		100%		98%		98%		99%
Inactive Vesteds		N/A		98%		100%		99%
Retirees		100%		100%		100%		100%
Total		100%		99%		98%		99%
Actuarial Accrued Liability		100%		99%		95%		99%
Normal Cost Rate		N/A		98%		97%		99%

Note: Dollars in millions.

Milliman's normal cost rate for Safety Plan A is based on the prior year's results for the 1 remaining active member in the group, so we were unable to replicate this rate, although we find it reasonable.

4. Sample Life Review

In addition to the replication of results discussed in Section 3, we were also asked by LACERA to perform a review of sample lives. These samples included 15 active (or suspended active) members, 4 deferred (or contingent deferred) vested members, and 7 in-pay members (including healthy retirees, disabled retirees, and beneficiaries). These records were selected to provide a reliable sampling of plans, payment options, age, sex, and service levels of the Plans. Certain records were specifically selected to allow an in-depth review of unusual provisions. We were provided with detail of the present value of benefits for all of the sample lives, as well as the actuarial accrued liability, normal cost, and present value of future salary for the active members. Furthermore, for active members, the aggregate amounts were further broken down by decrement (termination, death, disability, and retirement) to allow for more detailed analysis.

In our review of these individual records, we did not observe any issues of concern. For the majority of individuals, we matched the present value of future benefits within 2%, which is exceptionally close. A few individuals varied by more, but this is to be expected given the complexities of actuarial valuation software.

Overall, we observed:

- PVB – We matched Milliman in total within 1.2%.
- Actuarial Liability – We matched Milliman in total within 1.3%.
- Normal cost – We matched Milliman in total within 1.5%.
- Present value of future salary – We matched Milliman in total within 1.8%.

This consistency among a small number of records helps support the pattern observed in the aggregate and further demonstrates that Milliman's calculation of LACERA's liabilities is reasonable.

	Present Value of Future Benefits		
	Milliman	CMC	Ratio
Active 1	260,226	271,971	105%
Active 2	703,014	693,356	99%
Active 3	2,122,944	2,084,400	98%
Active 4	183,075	183,476	100%
Active 5	649,151	639,472	99%
Active 6	322,276	307,990	96%
Active 7	161,891	162,031	100%
Active 8	328,820	316,950	96%
Active 9	859,907	850,119	99%
Active 10	2,318,043	2,280,219	98%
Active 11	662,538	650,499	98%
Active 12	48,122	48,120	100%
Active 13	247,672	246,890	100%
Active 14	79,759	94,458	118%
Active 15	257,045	246,730	96%
Deferred Vested 1	195,145	193,299	99%
Deferred Vested 2	68,186	67,182	99%
Deferred Vested 3	163,804	162,145	99%
Deferred Vested 4	24,969	24,616	99%
In-Pay 1	2,514,151	2,514,953	100%
In-Pay 2	344,868	345,014	100%
In-Pay 3	887,628	889,907	100%
In-Pay 4	654,955	655,491	100%
In-Pay 5	2,390,062	2,301,422	96%
In-Pay 6	696,914	697,764	100%
In-Pay 7	1,463,370	1,464,026	100%

CONTENT OF THE ACTUARIAL REPORTS

The Actuarial Standard Board has issued a number of Actuarial Standards of Practice (ASOP) which provide guidance on measuring retirement benefit obligations and communicating the results (ASOP Nos. 1, 4, 23, 27, 35, 41, 44, 51, and 56). The guidance in those standards includes specific elements to be included in actuarial communications regarding retirement benefits, either directly or by reference to other documents. Some elements would not be pertinent in all communications, but since an actuarial valuation report is the most complete picture of the actuarial status of the plan, all of the elements listed in the ASOPs should be covered in the report, even if only briefly.

We reviewed the June 30, 2022 actuarial valuation report to confirm that it provides sufficient information for another actuary to understand the valuation process and to assess the reasonableness of the results, as required under Actuarial Standards of Practice. We also reviewed the report for compliance with Actuarial Standards of Practice, including *ASOP 56, Modeling,* a new standard with an effective date since the last review of the 2019 valuation report.

We also compared the contents of the valuation report to over 30 specific items identified for pension actuarial work in the various ASOPs listed above. ***In our review of the June 30 2022 valuation report, we found it to be in compliance with the applicable ASOPs***.

The California Actuarial Advisory Panel (CAAP) has published a document entitled *"Model Disclosure Elements for Actuarial Valuation Reports on Public Retirement Systems in California*". The disclosure elements are organized as basic disclosures generally suitable for the regular actuarial valuation report and enhanced disclosures that may be appropriate for inclusion in either the regular actuarial valuation report or in other reports specific to a certain purpose. We reviewed the June 30, 2022 Actuarial Valuation Report produced by Milliman and confirmed that the report contains all of the basic model disclosures recommended by the California Actuarial Advisory Panel. It also includes many of the enhanced disclosure items set out in the CAAP document.

The valuation report is generally well written and organized. We have just a few suggestions for Milliman's consideration. These points are raised for discussion purposes only. Final decisions should be based on LACERA's needs after discussion with their retained actuary. We note that Milliman has made changes in response to our suggestions, either in our prior 2019 Review or in informal discussion during the preparation of their 2022 valuation report.

- Include an exhibit that shows the projection of the unfunded actuarial accrued liability to June 30, 2023. Milliman describes the process and provides the projected amount in a footnote, but we would suggest considering a short exhibit that would provide the detailed calculation. We generally include such an exhibit in our reports and have found it to be helpful to let the readers understand the concept as well as to demonstrate the accuracy of the calculation.

- Although not required by Actuarial Standards of Practice or the California Actuarial Advisory Panel, we would suggest projections of funded status and employer contribution rates under one or two alternate future investment return scenarios be included. We have found projections of scenarios such as one year of a negative return or a five-year period of below-average returns can be useful in helping interested parties better understand the potential funding risks related to actual versus expected investment returns. While Milliman's Risk Assessment report provides some of this information, we believe that the inclusion in the valuation report with the most current information might communicate the message to more readers.

None of these suggestions are critical in nature and certain suggestions may not be deemed to be an improvement by LACERA. To the extent the recommended changes are determined to be appropriate and beneficial, they could be implemented in the next valuation report.