



Notice of Special Meeting

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The Board of Retirement of the San Mateo County Employees' Retirement Association will meet on **Monday, October 16, 2017 at 10:00 A.M.**

Please take notice that the Chair of the Board of Retirement, acting pursuant to the authority of Government Code §54956, hereby calls a special meeting to take place on October 16, 2017 at 10:00 a.m. in SamCERA's Board Room, 100 Marine Parkway, Suite 160, Redwood City, CA 94065. The special meeting is for the purpose of discussing and transacting the following business:

PUBLIC SESSION – The Board will meet in Public Session at 10:00 a.m.

1. Call to Order, Roll Call
2. Presentation of the June 30, 2017, Actuarial Valuation Report by Milliman, Inc.
3. Presentation of June 30, 2017, Actuarial Valuation Audit by Segal Company
4. Approval of Resolution Accepting the Fiscal Year 2018-2019 Employer and Member Contribution Rates and Recommendations
5. Annual Review of SamCERA's Actuarial Services Firm, Milliman, Inc.

CLOSED SESSION – The Board will meet in closed session prior to adjournment

- C1 Approval of Proposed Alternative Investment *(to be heard in Closed Session, Confidential Under Gov. Code § 54956.81 and 6254.26)*
6. Adjournment

Pursuant to Government Code §54954.3, members of the public, to the extent required by law, will have the opportunity to directly address the Board concerning the above-mentioned business.

This notice is to be delivered to each member of the Board of Retirement and to each local newspaper of general circulation and radio or television station requesting notice in writing. The notice shall be delivered personally or by other means, and shall be received at least 24 hours before the time of the meeting as specified in this notice.

Dated: October 4, 2017



 Mark Battey, Chair

THE BOARD MEETS AT 100 MARINE PARKWAY, SUITE 160, WHICH IS LOCATED ON THE SE CORNER OF TWIN DOLPHIN & MARINE PARKWAY IN REDWOOD CITY. Detailed directions are available on the "Contact Us" page of the website www.samcera.org. *Free Parking is available in all lots in the vicinity of the building. A copy of the Board of Retirement's open session agenda packet is available for review at the SamCERA offices and on our website unless the writings are privileged or otherwise exempt from disclosure under the provisions of the California Public Records Act. Office hours are Monday through Thursday 7 a.m.– 6 p.m.*

IN COMPLIANCE WITH THE CALIFORNIA GOVERNMENT CODE AND THE AMERICANS WITH DISABILITIES ACT: *SamCERA's* facilities and board and committee meetings are accessible to individuals with disabilities. Contact *SamCERA* at (650) 599-1234 at least three business days prior to the meeting if (1) you need special assistance or a disability-related modification or accommodation, including auxiliary aids or services, in order to participate in this meeting; or (2) you have a disability and wish to receive the agenda, meeting notice, agenda packet or other writings that may be distributed at the meeting in an alternative format. Notification in advance of the meeting will enable *SamCERA* to make reasonable arrangements to ensure full accessibility to this meeting and the materials related to it.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 16, 2017

Agenda Item 2

TO: Board of Retirement



FROM: Scott Hood, Chief Executive Officer

SUBJECT: Presentation of the June 30, 2017, Actuarial Valuation Report by Milliman, Inc.

Recommendation

Milliman, Inc. will discuss the results of its Actuarial Valuation Report. This is for information only.

Background

Nick Collier, of Milliman, Inc., will present the results and recommendations of its Actuarial Valuation Report as of June 30, 2017. This year's actuarial valuation process resulted in:

- An increase in Employer Statutory Contribution rate from 33.76% (effective July 1, 2017) to 35.31% (effective July 1, 2018)
- An increase in the member contribution rates for all plans except Safety and Probation Plan 1 and 2 (effective July 1, 2018)
- An increase in the funded ratio of the system from 83.1% as of June 30, 2016, to 84.3% as of June 30, 2017

Attachment

San Mateo County Employees' Retirement Association June 30th, 2017 Actuarial Valuation



San Mateo County Employees' Retirement Association

June 30, 2017 Actuarial Valuation

Prepared by:

Nick Collier, ASA, EA, MAAA
Consulting Actuary

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

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September 20, 2017

Board of Retirement
San Mateo County Employees' Retirement Association
100 Marine Parkway, Suite 125
Redwood City, CA 94065-5208

Dear Members of the Board:

As requested, we have completed an actuarial valuation for the San Mateo County Employees' Retirement Association (SamCERA). The purpose of the valuation is to recommend the employer and member contribution rates for the fiscal year beginning July 1, 2018.

Actuarial Certification – Per SamCERA Consulting Contract

This actuarial valuation has been completed in accordance with generally accepted actuarial principles and practices, including Actuarial Standards of Practice (ASOPs) Nos. 4, 27, and 35. In particular, it reflects the actuary's responsibility under Section 5.8 ("Actuary's Responsibility") of ASOP No. 4 (1993 Reformatted Edition) for assessing the implications of overall results, in terms of short- and long-range benefit security and expected cost progression. Note that this section no longer exists in the current ASOP No. 4; however, Milliman will continue to assess the results pursuant to the prior section.

To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our best professional judgment, the assumptions and methodologies as adopted by the Board of Retirement, individually and in combination, are reasonably related to the experience of and the expectations for SamCERA, and will not, in and of themselves, expose the retirement system to "unsound financial risk." In this regard, we consider "unsound financial risk" to mean the following:

- A substantial likelihood that future required contribution rates as a percentage of payroll will be dramatically higher than the rates shown in this report, given the uncertainties of actuarial projections and assuming the full payment of all recommended contributions; or
- A substantial likelihood that SamCERA's assets will be insufficient to pay benefit payments when due, given the uncertainties of actuarial projections and assuming the full payment of all recommended contributions.

In preparing this report, we have complied with all quality assurance procedures detailed on page 14 of our November 28, 2005 proposal titled "Response for Request for Actuarial Services."

Actuarial Certification – Milliman

The major findings of the valuation are contained in this report. This report reflects the benefit provisions as of June 30, 2017 and member contribution rates effective July 1, 2018 (including adjustments for specific bargaining units as communicated to us by SamCERA staff). In preparing this report, we relied, without audit, on information (some oral and some in writing) supplied by SamCERA staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We found this information to be reasonably consistent and comparable with information used for other purposes. The valuation results depend on the integrity

This work product was prepared solely for SamCERA for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

of this information. If any data of this information is inaccurate or incomplete, our results may be different and our calculations may need to be revised.

All costs, liabilities, rates of interest, and other factors for SamCERA have been determined on the basis of actuarial assumptions and methods which are individually reasonable (taking into account the experience of SamCERA and reasonable expectations) and which, in combination, offer a reasonable estimate of anticipated experience affecting SamCERA.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the Plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of our assignment, we did not perform an analysis of the potential range of future measurements. The Board of Retirement has the final decision regarding the appropriateness of the assumptions and adopted them as indicated in Appendix A.

Actuarial computations presented in this report are for purposes of determining the recommended funding amounts for SamCERA. The calculations in this report have been made on a basis consistent with our understanding of SamCERA's current funding requirements. Determinations for purposes other than meeting these requirements may be significantly different from the results contained in this report. Accordingly, additional determinations may be needed for other purposes.

Milliman's work is prepared solely for the internal business use of SamCERA. The System may place the final version of this report on its website. Milliman's "work" to create this report, to the extent that Milliman's work is not subject to disclosure under applicable public records laws, may not be provided to third parties without Milliman's prior written consent. Milliman does not intend to benefit or create a legal duty to any third party recipient of its work product. Milliman's consent to release its work product to any third party may be conditioned on the third party signing a Release, subject to the following exceptions:

- (a) The System may provide a copy of Milliman's work, in its entirety, to the System's professional service advisors who are subject to a duty of confidentiality and who agree to not use Milliman's work for any purpose other than to benefit the System.
- (b) The System may provide a copy of Milliman's work, in its entirety, to other governmental entities, as required by law.

No third party recipient of Milliman's work product should rely upon Milliman's work product. Such recipients should engage qualified professionals for advice appropriate to their own specific needs.

The consultants who worked on this assignment are pension actuaries. Milliman's advice is not intended to be a substitute for qualified legal or accounting counsel.

The signing actuaries are independent of the plan sponsors. We are not aware of any relationship that would impair the objectivity of our work.

This work product was prepared solely for SamCERA for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

On the basis of the foregoing, we hereby certify that, to the best of our knowledge and belief, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices. We are members of the American Academy of Actuaries and meet the Qualification Standards to render the actuarial opinion contained herein.

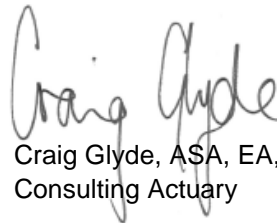
We would like to express our appreciation to Mr. Scott Hood, Chief Executive Officer of SamCERA, and to members of his staff, who gave substantial assistance in supplying the data on which this report is based.

We respectfully submit the following report, and we look forward to discussing it with you.

Sincerely,

A handwritten signature in black ink that reads "Nick Collier".

Nick Collier, ASA, EA, MAAA
Consulting Actuary
NJC/CJG/nlo

A handwritten signature in black ink that reads "Craig Glyde".

Craig Glyde, ASA, EA, MAAA
Consulting Actuary

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Section 1 Summary of the Findings



Overview

2017 Valuation Results

	June 30, 2017	June 30, 2016
Employer Statutory Contribution Rate ⁽¹⁾⁽²⁾	35.31%	33.76%
Funded Ratio	84.3%	83.1%

1. The June 30, 2016 Statutory Contribution Rate shown above reflects changes in member rates negotiated subsequent to the 2016 valuation report. The 2016 Statutory Contribution Rate calculated in the 2016 valuation report was 33.77%.

2. Weighted average Statutory Contribution Rate for only the County as of June 30, 2017 is 35.48% of pay.

This report presents the results of the June 30, 2017 actuarial valuation. Several key points are summarized as follows:

- Funding:** The Funded Ratio increased from 83.1% to 84.3%. This increase was primarily due to employer contributions to amortize the Unfunded Actuarial Accrued Liability (UAAL) and investment earnings in excess of the assumed rate. It was offset somewhat by the increase in the UAAL due to assumptions adopted as a result of the 2017 Investigation of Experience study. On a market value basis, the funded ratio increased from 81.2% to 85.6% due primarily to an investment return of 12.6%. Investment returns are discussed in more detail below.

The assets used in the calculation of the Funded Ratio include the value of the County Supplementary Contribution Account (CSCA) and the District Supplementary Contribution Account (DSCA). Throughout this report we use the term SCA when referring to both of these accounts.

The County contributed \$33.6 million to the CSCA over the year ended June 30, 2017. These contributions resulted in an increase in the funded ratio of 0.8%. In total, the CSCA has an actuarial value of \$118.3 million as of June 30, 2017. The San Mateo County Mosquito and Vector Control District (SMCM&VCD) contributed \$0.25 million to the DSCA over the year ended June 30, 2017. Without the CSCA and DSCA (\$2.0 million), the funded ratio would be 81.7% as of June 30, 2017.

- Employer Contribution Rates:** The Employer Normal Cost rate increased from 10.25% (calculated in the 2016 valuation report) to 10.95% of pay. The increase is primarily because of the changes in actuarial assumptions adopted as a result of the 2017 Investigation of Experience study. Rates will vary slightly from year to year as the average entry age of the membership changes and as a greater proportion of members enter Plan 7.

The primary drivers of the increase in employer contribution rate as a result of the 2017 Investigation of Experience study were lowering the investment return assumption from 7.00% to 6.75%, and adopting generational mortality.

**Overview
(continued)**

The employer contribution rate to finance the UAAL increased from 23.52% to 24.36% of pay. This increase is largely driven by the recently adopted assumptions from the 2017 Investigation of Experience study, as well as salary increases and cost-of-living-adjustments greater than assumed. Recognition of investment gains, strong funding (including the SCA contributions), and the use of newly available data from the new PASS system (in lieu of reliance on certain assumptions) partially offset these UAAL rate increases. The overall result is an increase in the Statutory Contribution Rate from the prior valuation of 1.55% (from 33.76% to 35.31% of payroll).

The CSCA provides an offset of 2.36% of pay (compared to 1.73% of pay in the prior valuation) to the County's Statutory Contribution Rate (SCR), resulting in a County-only SCR of 35.48%. Without the recognition of the CSCA, the County SCR would be 37.84%. The DSCA provides an offset of 10.21% of pay (compared to 8.80% of pay in the prior valuation) for the SMCM&VCD.

- **Investment Returns:** SamCERA's investment return on the market value of assets for the fiscal year 2016-2017 of 12.6% (as provided by SamCERA) was greater than the actuarial assumed rate of 7.00%. Combined with the recognition of investment gains, the net result was a return on Valuation Assets of 7.8%, which is greater than the assumed return. This actuarial gain on Valuation Assets caused a decrease in the Statutory Contribution Rate.

Note that currently a net asset gain of \$21.8 million is being deferred. This is because the asset-smoothing method has not yet recognized a portion of the net asset gain from December 31, 2012 to June 30, 2017. These deferred gains will be reflected in future valuations.

- **Negotiated Member Contribution Rates:** As a result of bargaining by the County since the June 30, 2016 valuation report was issued, new member COLA share contribution rates for Court Interpreters and Court Commissioners of Plans 1, 2, and 4 were effective in October 2016. All of these members now contribute 50% of the cost of COLA benefits in addition to other member rates and cost sharing. See Appendix B for additional information about member contributions.

Due to timing, this change was not reflected in the June 30, 2016 valuation. The net effect of this change is a reduction in the Statutory Contribution Rate of approximately 0.01% for the fiscal year 2017-2018.

- **Economic and Demographic Assumptions:** The assumptions developed as a result of the 2017 Investigation of Experience study were adopted for use in this valuation. These changes include lowering the investment return assumption, a change in the mortality assumption, and the addition of a projection scale that reflects gradual year-to-year improvement in mortality that is expected to occur in the future. The new mortality assumption results in an increase in assumed life expectancy compared to the prior assumption.

The net effect of these assumptions changes was an increase in UAAL of approximately \$133 million and a decrease in the funded ratio of 2.3%. In addition, Normal Cost increased by approximately 0.92% of payroll.

Member contribution rates for all plans (except for Safety and Probation Plans 1 and 2) have also increased due to the new assumptions. See Exhibit 1b for details. A complete list of all member contribution rates is shown in Appendix D.

**Comparison with
Prior Valuation**

Note that for comparison purposes, except where noted, the prior valuation employer Statutory Contribution Rates shown in this report reflects all bargained COLA and cost sharing arrangements negotiated subsequent to the June 30, 2016 actuarial valuation.

**Summary of
Contribution Rates**

The following exhibits summarize our recommendations to the Board.

Exhibit 1a Summary of Recommended Minimum Statutory Contribution Rates

Recommendation #1: Adopt new Statutory Contribution Rates for fiscal year beginning July 1, 2018

	Fiscal Year Beginning		Increase / (Decrease)
	July 1, 2018	July 1, 2017	
Gross Normal Cost	23.35%	22.31%	1.04%
Member Contributions	(12.40)%	(12.07)%	(0.33)%
Employer Normal Cost	10.95%	10.24%	0.71%
UAAL Amortization	24.36%	23.52%	0.84%
Total Employer Rate	35.31%	33.76%	1.55%

Notes:

1. Detailed contribution rates by plan are shown in Section 6.
2. The Total Employer Rate for July 1, 2017 reflects all valuation addendums subsequent to the 2016 valuation. The Total Employer Rate calculated in the 2016 valuation is 33.77% of pay.
3. The Total Employer Rate of 35.31% is the aggregate rate for all employers. For the fiscal year beginning July 1, 2018, employer rates by employer are as follows:
 - a. The County contribution rate is 35.48% of pay.
 - b. The Courts contribution rate is 32.23% of pay.
 - c. The SMCM&VCD contribution rate is 24.69% of pay.

Exhibit 1b Summary of Recommended Member Contribution Rates

Recommendation #2: Adopt new member contribution rates for fiscal year beginning July 1, 2018

	Entry Age	Recommended Rates			Total as a % of Pay	Current	Ratio (New/Curr)
		Basic	50% COLA Sharing	Cost Sharing		Total as a % of Pay	
General Members (not including SMCM&VCD)							
Plan 1	25	6.69%	2.42%	3.00%	12.11%	11.79%	102.7%
	35	8.03%	2.91%	3.00%	13.94%	13.54%	103.0%
	45	9.68%	3.50%	3.00%	16.18%	15.68%	103.2%
Plan 2	25	6.69%	2.27%	3.00%	11.96%	11.72%	102.1%
	35	8.03%	2.72%	3.00%	13.75%	13.45%	102.2%
	45	9.68%	3.28%	3.00%	15.96%	15.57%	102.5%
Plan 4	25	6.47%	1.70%	3.00%	11.17%	10.73%	104.1%
	35	7.76%	2.04%	3.00%	12.80%	12.26%	104.4%
	45	9.31%	2.45%	3.00%	14.76%	14.09%	104.8%
Plan 5	25	5.59%	1.42%	0.00%	7.01%	6.59%	106.4%
	35	6.71%	1.70%	0.00%	8.41%	7.91%	106.3%
	45	8.07%	2.05%	0.00%	10.12%	9.50%	106.6%
Plan 7	All	7.23%	1.48%	0.00%	8.71%	8.14%	107.0%
SMCM&VCD Members							
Plan 1	25	6.69%	0.00%	0.00%	6.69%	6.49%	103.1%
	35	8.03%	0.00%	0.00%	8.03%	7.78%	103.2%
	45	9.68%	0.00%	0.00%	9.68%	9.36%	103.4%
Plan 2	25	6.69%	0.00%	0.00%	6.69%	6.49%	103.1%
	35	8.03%	0.00%	0.00%	8.03%	7.78%	103.2%
	45	9.68%	0.00%	0.00%	9.68%	9.36%	103.4%
Plan 4	25	6.47%	0.00%	0.00%	6.47%	6.26%	103.4%
	35	7.76%	0.00%	0.00%	7.76%	7.50%	103.5%
	45	9.31%	0.00%	0.00%	9.31%	8.98%	103.7%
Plan 7	All	7.34%	1.50%	0.00%	8.84%	8.15%	108.5%

Notes:

1. All General members contribute 50% of the cost of COLA benefits except for all members of SMCM&VCD and members of the Board of Supervisors whose most recent hire date is before August 7, 2011. Plan 7 COLA share represents one-half of the cost of the COLA. See Appendix B of this report for a full description of members COLA share. See Appendix D of this report for a full schedule of rates.

Exhibit 1b Summary of Recommended Member Contribution Rates (Continued)

Recommendation #2: Adopt new member contribution rates for fiscal year beginning July 1, 2018

	Entry Age	Recommended Rates			Total as a % of Pay	Current	Ratio (New/Curr)
		Basic	50% COLA Sharing	Cost Sharing		Total as a % of Pay	
Safety Members							
Plan 1	25	9.27%	4.44%	5.00%	18.71%	19.46%	96.1%
	35	10.94%	5.24%	5.00%	21.18%	22.37%	94.7%
	45	12.83%	6.15%	5.00%	23.98%	25.47%	94.2%
Plan 2	25	9.27%	4.64%	5.00%	18.91%	19.26%	98.2%
	35	10.94%	5.48%	5.00%	21.42%	22.13%	96.8%
	45	12.83%	6.42%	5.00%	24.25%	25.18%	96.3%
Plan 4	25	8.94%	3.37%	5.00%	17.31%	16.50%	104.9%
	35	10.54%	3.97%	5.00%	19.51%	18.82%	103.7%
	45	12.17%	4.59%	5.00%	21.76%	20.99%	103.7%
Plan 5	25	8.94%	3.11%	4.00%	16.05%	15.19%	105.6%
	35	10.54%	3.66%	4.00%	18.20%	17.45%	104.3%
	45	12.17%	4.23%	4.00%	20.40%	19.57%	104.2%
Plan 6	25	8.94%	2.90%	0.00%	11.84%	10.96%	108.0%
	35	10.54%	3.42%	0.00%	13.96%	13.18%	106.0%
	45	12.17%	3.95%	0.00%	16.12%	15.25%	105.7%
Plan 7	All	11.70%	2.81%	0.00%	14.51%	13.90%	104.4%
Probation Members							
Plan 1	25	9.27%	4.93%	3.50%	17.70%	17.78%	99.5%
	35	10.94%	5.82%	3.50%	20.26%	20.66%	98.1%
	45	12.83%	6.83%	3.50%	23.16%	23.71%	97.7%
Plan 2	25	9.27%	4.76%	3.50%	17.53%	17.59%	99.7%
	35	10.94%	5.62%	3.50%	20.06%	20.42%	98.2%
	45	12.83%	6.59%	3.50%	22.92%	23.43%	97.8%
Plan 4	25	8.94%	3.38%	3.50%	15.82%	14.99%	105.5%
	35	10.54%	3.99%	3.50%	18.03%	17.31%	104.2%
	45	12.17%	4.61%	3.50%	20.28%	19.48%	104.1%
Plan 5	25	8.94%	3.10%	3.50%	15.54%	14.67%	106.0%
	35	10.54%	3.65%	3.50%	17.69%	16.92%	104.5%
	45	12.17%	4.22%	3.50%	19.89%	19.03%	104.5%
Plan 6	25	8.94%	2.72%	0.00%	11.66%	10.87%	107.2%
	35	10.54%	3.21%	0.00%	13.75%	13.07%	105.2%
	45	12.17%	3.70%	0.00%	15.87%	15.12%	104.9%
Plan 7	All	11.45%	2.88%	0.00%	14.33%	13.38%	107.1%

Notes:

- All Safety and Probation members contribute 50% of the cost of COLA benefits. Plan 7 COLA share represents one-half of the cost of the COLA. See Appendix B of this report for a full description of members COLA share. See Appendix D of this report for a full schedule of rates.
- Safety member cost sharing is for all members who are not Deputy Sheriffs. Cost sharing varies for Deputy Sheriffs as follows:
 - 3.0% if employee is less than 45 and has less than 5 years of service.
 - 3.5% if employee is less than 45 and has between 5 and 15 years of service.
 - 4.5% if employee is older than 45 or has at least 15 years of service.

Employer Contribution Rate

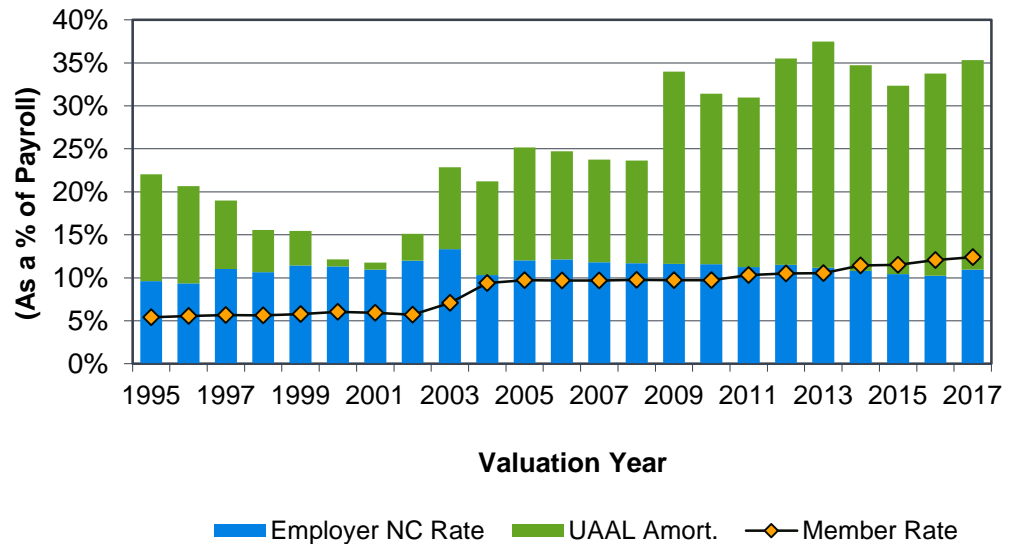
The Statutory Contribution Rate is equal to the payment of the Employer Normal Cost rate plus a 15-year layered amortization of the UAAL (excluding the CSCA and DSCA) for each year beginning with the UAAL as of June 30, 2008. The UAAL rate for the County is reduced to reflect the CSCA, as is the SMCM&VCD to reflect the DSCA. The Statutory Contribution Rate (blended average for all employers) is 35.31% for the fiscal year beginning July 1, 2018, 35.48% for the County, 32.23% for Courts, and 24.69% for SMCM&VCD.

It should be noted that these rates are a weighted average for all SamCERA plans. The actual percent of payroll to be contributed by each employer varies by plan. See Exhibit 10 for the Statutory Contribution Rates by classification and Exhibits 10a through 10d for the Statutory Contribution Rates by plan.

In our opinion, the contribution rates calculated are adequate to maintain the funding of the retirement system benefits based on the actuarial methods and assumptions shown in Appendix A of this report.

A historical perspective of the total Statutory Contribution Rate is shown in the following graph.

Employer Statutory Contribution Rate



Comparison with Last Year

A detailed analysis of the sources of the changes in both the employer contribution rates and the Funded Ratio was performed. There were several factors that influenced the Funded Ratio and the employer contribution rate, with the overall impact of these additional factors being an increase in the Funded Ratio and a decrease in the employer rates from the last valuation.

The following chart shows how the various factors affected the overall funding of SamCERA, as compared to the last valuation.

Sources of Change	Statutory Contribution Rate	Funded Ratio
Calculated Rate for 2017 (2016 valuation)	33.77%	83.1%
Changes due to new member rates effective 2016	-0.01%	0.0%
Estimated Aggregate Rate for 2017	33.76%	83.1%
Expected Year-to-Year Change	0.00%	2.3%
Assumption Changes	3.38%	-2.3%
Recognized Asset Gain/Loss		
From Current Year	-0.40%	0.4%
From Prior Years	-0.12%	0.2%
Retiree COLAs > Expected	0.13%	-0.1%
Salary Increase > Assumed	0.27%	-0.5%
Contributions > Assumed	-0.13%	0.0%
SCA Contribution Funding	-0.61%	0.7%
Increase in Plan 7 Membership	-0.04%	0.0%
Other Experience Changes ⁽¹⁾	-0.93%	0.5%
Total Change	1.55%	1.2%
Calculated rate for 2018 (2017 valuation)	35.31%	84.3%

1. Other experience changes include the impact of the use of newly available data from the new PASS system (in lieu of reliance on certain assumptions).

Funding Progress

Based on the 2016 valuation, the expected UAAL as of June 30, 2017 was \$627 million. The actual UAAL for the fiscal year ended June 30, 2017 is \$743 million. This difference was primarily caused by the adoption of new assumptions based on the 2017 Investigation of Experience study (\$133 million). Other factors, such as salary increases greater than assumed and Retiree COLAs greater than assumed contributed to an increase in the UAAL of \$35 million. The recognition of asset gains (\$28 million) and other experience changes (\$24 million) caused a decrease in the UAAL. These factors are shown in detail at the end of Section 4.

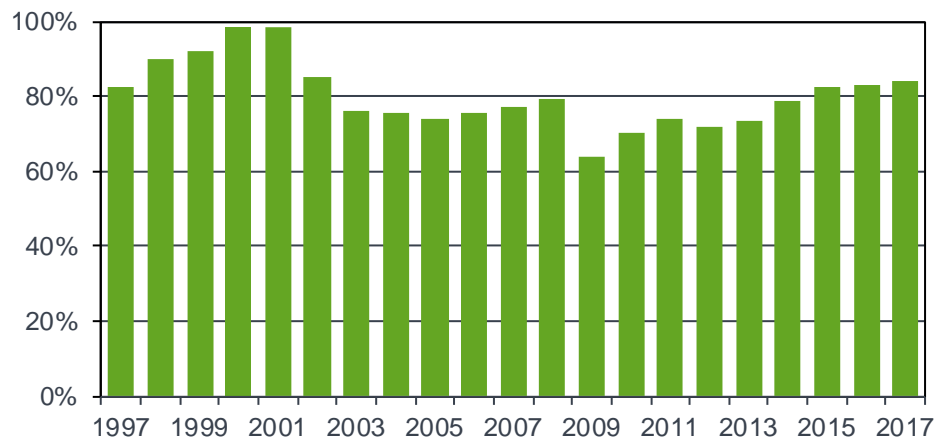
**Funding Progress
 (continued)**

One measure of the funding adequacy of the system is the Funded Ratio, which compares the value of the Actuarial Value of Assets (net of certain non-valuation reserves) to the Actuarial Accrued Liability (AAL) for all SamCERA plans combined. SamCERA's funded ratio increased rapidly in the last half of the 1990s, reaching almost 100% in 2001. However, due primarily to asset losses from that time through 2009, the funded ratio decreased significantly over those years. In recent years, the funded ratio has improved, due primarily to better-than-assumed investment performance and strong funding. Currently, the Funded Ratio is 84.3%; that is, the Valuation Assets of \$3,977 million are about 16% less than the AAL of \$4,720 million. Note that if the market value of assets was used, the Funded Ratio would be 85.6%.

(All dollar amounts in millions)

	Market Value of Total Assets	Actuarial Value		Actuarial Accrued Liability	Funded Ratio
		Valuation	Non-Valuation		
2008	\$2,011	\$2,219	\$0	\$2,806	79.1%
2009	1,591	1,910	0	2,988	63.9
2010	1,816	2,179	0	3,098	70.3
2011	2,318	2,405	0	3,247	74.1
2012	2,360	2,480	0	3,443	72.0
2013	2,728	2,619	0	3,573	73.3
2014	3,292	2,993	30	3,797	78.8
2015	3,454	3,344	34	4,046	82.6
2016	3,541	3,625	36	4,362	83.1
2017	4,039	3,977	40	4,720	84.3

Historical Funded Ratios



Assets

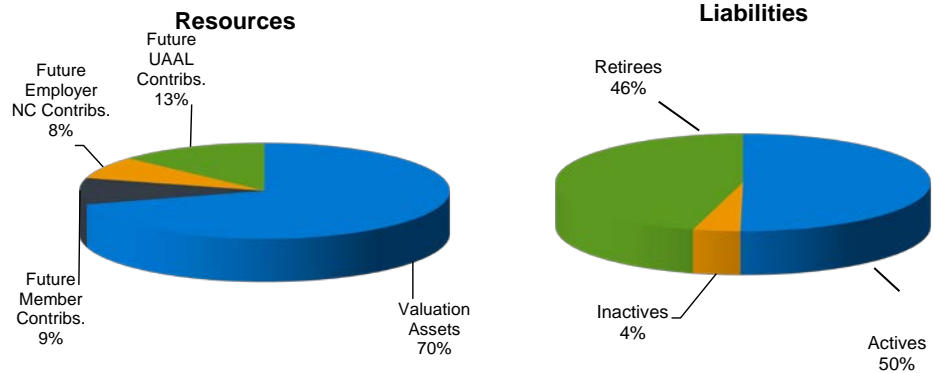
For the fiscal year ended June 30, 2017, SamCERA earned 12.6% net of investment expenses on its market assets. This figure was provided by SamCERA and will be shown in the 2017 CAFR.

SamCERA uses an asset-smoothing method in the calculation of the UAAL contribution. Under this method, the market value returns are smoothed over a five-year period (10 six-month periods). Due to the recognition of current and deferred asset gains, the return on Actuarial Valuation Assets, at 7.8% net of expenses, was greater than the assumed return of 7.00% for the fiscal year 2016-2017.

Actuarial Balance Sheet

The first step in the valuation process is to compare the total Valuation Assets of SamCERA with its total liabilities for all plans. In this analysis, SamCERA's resources equal the actuarial assets plus the expected future contributions by both the employers and members. Liabilities reflect benefits already earned in the past and those expected to be earned in the future by current members. This relationship is shown in the following chart. The AAL is the total of these liabilities less expected future Normal Cost contributions.

Comparing the current and future resources to the current and future liabilities, we then determine the annual contribution amount for the coming fiscal year.

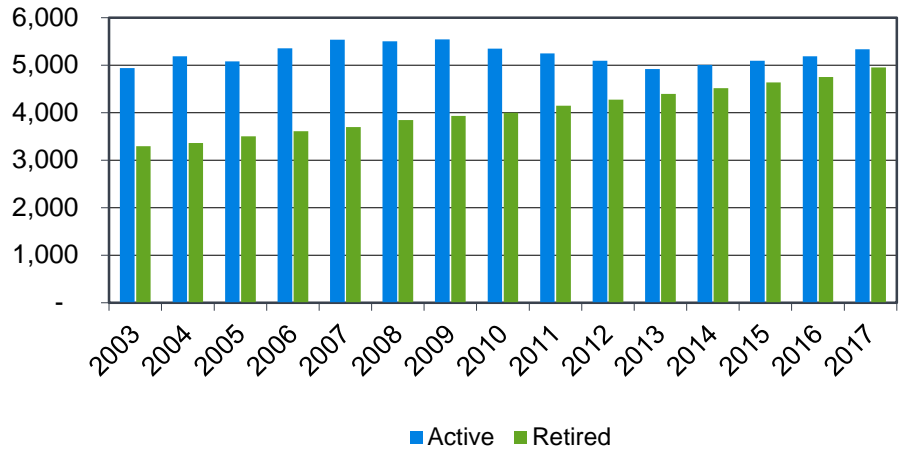


Member Information

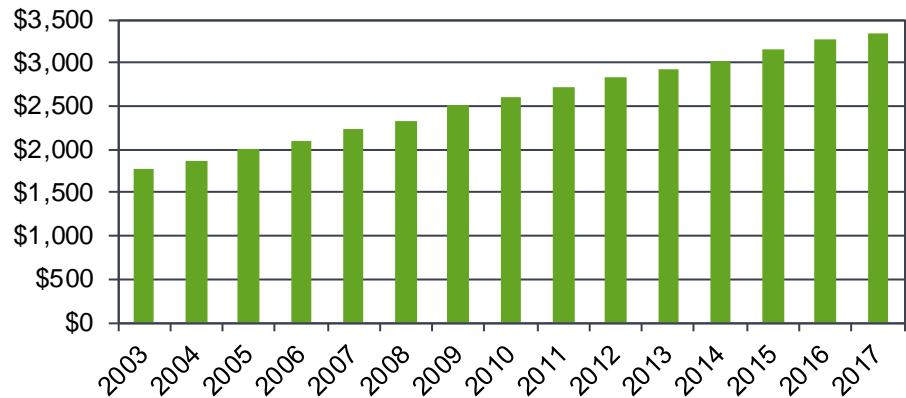
The number of active members included in the valuation increased by 2.9% from 5,187 in 2016 to 5,337 in 2017.

Retired member counts continue to increase steadily. For 2017, there were 4,956 retired members and beneficiaries with an average benefit of \$3,347 per month. This represents a 4.4% increase in count (up from 4,748 in 2016) and a 2.4% increase in the average monthly benefit (up from \$3,268 over the period).

Membership Count



Average Monthly Retirement Benefit



Analysis of Change in Member Population

The following table summarizes the year-to-year change in member population.

	Active Members	Inactive Members	Service Retired Members	Disabled Retired Members	Benefeciaries in Pay	Total
As of June 30, 2016	5,187	1,486	3,749	454	545	11,421
New Members	478	28	1	-	91	598
Status Change:						
to Active	138	(137)	(1)	-	-	-
to Inactive	(230)	230	-	-	-	-
to Service Retirement	(163)	(60)	223	-	-	-
to Disabled Retirement	(8)	(9)	(6)	23	-	-
to Beneficiary	(5)	(1)	(2)	-	8	-
Refunds	(57)	(50)	-	-	-	(107)
Deaths	(3)	-	(95)	(8)	(26)	(132)
As of June 30, 2017	5,337	1,487	3,869	469	618	11,780

Summary Valuation Results

The following Exhibit 2 presents a comparison of the key results from the June 30, 2017 and June 30, 2016 valuations. More detail on each of these elements can be found in the following sections and exhibits of this report.

Exhibit 2 Summary of Significant Valuation Results

	June 30, 2017	June 30, 2016	Relative Change
1. Total Membership			
A. Active Members	5,337	5,187	2.9 %
B. Retired Members & Beneficiaries	4,956	4,748	4.4%
C. Inactive Members	1,487	1,486	0.1%
D. Total	11,780	11,421	3.1 %
2. Pay Rate			
A. Annual Total (\$thousands)	\$ 522,223	\$ 493,790	5.8%
B. Monthly Average	8,154	7,933	2.8%
3. Average Monthly Benefit to Current Retirees and Beneficiaries			
A. Service Retirement	3,527	3,382	4.3%
B. Disability Retirement	3,469	3,420	1.4%
C. Surviving Spouse and Dependents	2,128	2,356	(9.7)%
D. Total Average	3,347	3,268	2.4%
4. Actuarial Accrued Liability (\$thousands)			
A. Active Members	1,908,199	1,726,887	10.5%
B. Retired Members	2,582,107	2,383,274	8.3%
C. Inactive Members	229,544	252,135	(9.0)%
D. Total	4,719,850	4,362,296	8.2%
5. Assets			
A. Market Value of Fund (\$thousands)	4,038,702	3,541,388	14.0%
B. Return on Market Value	12.6%	0.7%	
C. Actuarial Value (\$thousands)	\$ 3,976,717	\$ 3,624,726	9.7%
D. Return on Actuarial Value	7.8%	6.4%	
6. Unfunded Actuarial Accrued Liability or Surplus Funding (\$thousands)	\$ 743,133	\$ 737,570	0.8%
7. Statutory Employer Contribution Rate for all plans combined as a percent of total payroll			
A. Gross Normal Cost	23.35%	22.31%	4.7%
B. Member Contributions	(12.40)%	(12.07)%	2.7%
C. Employer Normal Cost	10.95%	10.24%	6.9%
D. UAAL Amortization	24.36%	23.52%	3.6%
E. Total Employer Rate	35.31%	33.76%	4.6%
8. Funded Ratio (5C / 4D)	84.3%	83.1%	1.4%
9. Results Based on Market Value (No Asset Smoothing) -- For Informational Purposes Only			
A. Total Employer Rate	34.15%	35.40%	(3.5)%
B. Funded Ratio (5A / 4D)	85.6%	81.2%	5.4%

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Section 2 Scope of the Report



This report presents the actuarial valuation of the San Mateo County Employees' Retirement Association as of June 30, 2017. This valuation was requested by the Board. Section 31453 of the County Employees Retirement Law of 1937 (the '37 Act) requires an actuarial valuation to be performed at least every three years for the purposes of setting contribution rates.

In reading our cover letter, please pay particular attention to the guidelines employed in the preparation of this report. We also comment on the sources and reliability of both the data and the actuarial assumptions upon which our findings depend. Those comments are the basis for our certification that this report is complete and accurate to the best of our knowledge and belief.

A summary of the findings resulting from this valuation is presented in the previous section. Section 3 describes the assets and investment experience of SamCERA. The assets and investment income are presented in Exhibits 3-5. Exhibits 6-8 develop the Actuarial Value of Assets as of June 30, 2017.

Section 4 describes the benefit obligations of SamCERA. Exhibits 9a and 9b show the Actuarial Balance Sheet. Additional analysis on the change in UAAL is also provided in this section.

Section 5 discusses the member contribution rates.

Section 6 discusses the employer contributions needed to fund the benefits under the actuarial cost method in use.

Section 7 discloses information to be included in SamCERA's CAFR.

This report includes several appendices:

- Appendix A A summary of the actuarial procedures and assumptions used to estimate liabilities and contributions.
- Appendix B A summary of the current benefit structure, as determined by the provisions of governing law on June 30, 2017.
- Appendix C Schedules of valuation data classified by various categories of members by plan.
- Appendix D Member contribution rates by plan.
- Appendix E A glossary of actuarial terms used in this report.

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Section 3 Assets



In many respects, an actuarial valuation can be thought of as an inventory process. The inventory is taken as of the actuarial valuation date which, for this valuation, is June 30, 2017. On that date, the assets available for the payment of retirement benefits are appraised. These assets are compared with the accrued and future actuarial liabilities, which are generally well in excess of the actuarial assets. The purpose of the valuation is to determine what future contributions by the members and employers are needed to pay all expected future benefits not funded by the current assets.

This section of the report deals with the determination of assets used for funding purposes. In the next section, the actuarial liabilities will be discussed. Sections 5 and 6 deal with the process for determining required contributions based on the relationship between the actuarial assets and the actuarial liabilities.

A historical summary of SamCERA's assets is presented below:

	All dollar amounts in millions		
	Market Value of Total <u>Assets</u>	Actuarial Value	
		Non- Valuation <u>Assets</u>	Valuation <u>Assets</u>
2000	\$ 1,381	\$ 49	\$ 1,271
2001	1,308	51	1,385
2002	1,207	32	1,417
2003	1,233	34	1,354
2004	1,435	31	1,453
2005	1,599	0	1,616
2006	1,790	0	1,769
2007	2,132	0	1,977
2008	2,011	0	2,219
2009	1,591	0	1,910
2010	1,816	0	2,179
2011	2,318	0	2,405
2012	2,360	0	2,480
2013	2,728	0	2,619
2014	3,292	30	2,993
2015	3,454	34	3,344
2016	3,541	36	3,625
2017	4,039	40	3,977

On June 30, 2017, the total market value of the fund was about \$4.04 billion. The actuarial value of the fund was determined to be \$4.02 billion, including the non-valuation reserves.

Financial Exhibits

Exhibit 3 presents a Statement of Plan Net Assets and Exhibit 4 presents a Statement of Changes in Plan Net Assets. Exhibit 5 describes the allocation of SamCERA's assets by the various reserve values determined for accounting purposes.

Exhibits 3-5 are taken from data furnished to us by SamCERA for its annual financial report. We have accepted these tables for use in this report without audit, but we have reviewed them for reasonableness and consistency with previous reports.

Actuarial Asset Method

The actuarial asset method computes the expected market value of assets based on the prior year's market value of assets, the actual cash flow of contributions and benefit payments, and the assumed investment rate of return. For the current valuation, the assumed rate of return on the prior year's assets is 7.00%, net of all expenses. The difference between the actual market value and the computed expected market value is smoothed or recognized over a five-year period.

Beginning with the June 30, 2014 valuation, assets used to calculate the preliminary UAAL contribution rates exclude the value of the CSCA. The CSCA is used to adjust the County's Statutory Contribution Rate. Beginning with the June 30, 2016 valuation, assets used to calculate the preliminary UAAL contribution rates also exclude the value of the DSCA. The DSCA is used to adjust the San Mateo County Mosquito and Vector Control District's Statutory Contribution Rate. To adjust the Statutory Contribution Rates we track CSCA and DSCA assets separately.

Actuarial Value of Assets

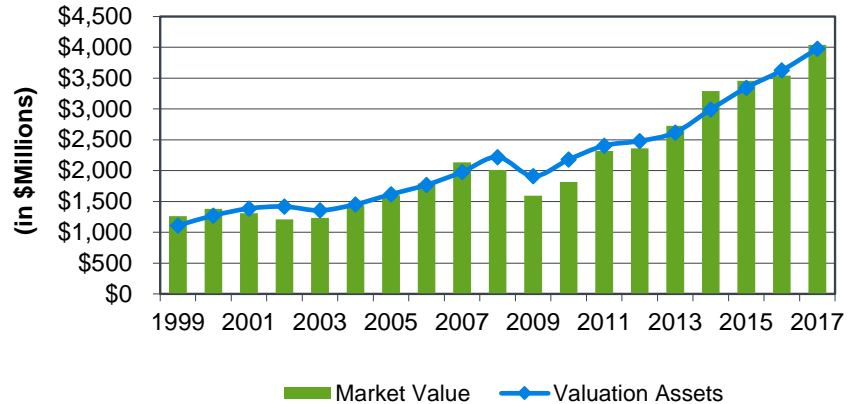
The development of the June 30, 2017 actuarial value of assets is shown in Exhibits 6 and 7. Exhibits 6a and 7a show the development of the total actuarial value of assets. Exhibits 6b and 7b show the development excluding the Supplemental Contribution Account (SCA) assets. Exhibits 6c and 7c show the development of the actuarial value of assets for the CSCA. Exhibits 6d and 7d show the development of the actuarial value of assets for the DSCA.

The County made their contribution for the year ended June 30, 2017 based on the SCR. Since the SCR reflected an offset due to the CSCA, the County effectively used up an amount of the CSCA equivalent to the offset. Therefore, we have shown this in the "Credits Used" column in Exhibit 6c.

Actuarial Value of Assets (continued)

There are still portions of investment gains and losses that have not yet been recognized by the asset smoothing method, including the current year gain. The result is a market value of assets that is slightly higher than the actuarial value. The following graph shows a historical comparison of the total actuarial and market assets used for valuation purposes on a system-wide basis.

Applicable Valuation Assets



Valuation Assets

Valuation Assets are the actuarial value of the fund, less the value of any reserves which have been set aside for current liabilities and special benefits (if any) that are to be funded outside of the actuarially determined contribution rates.

Allocation of Assets

Valuation Assets are allocated by classification (general, safety, and probation) as shown in Exhibit 8. This allocation is necessary because the UAAL contribution rates are determined separately by class and plan.

In the calculation of the Statutory Contribution Rate, the Normal Cost Rate is determined separately for each plan. The UAAL portion of the rate is allocated proportionately to each classification. To determine the UAAL amount by classification, the actual UAAL is allocated in proportion to the expected UAAL after reflecting expected contributions from the prior year to pay down the UAAL. The allocation is done without consideration of the SCAs. Valuation Assets are equal to the AAL minus the UAAL for each classification. These calculations are shown in Exhibit 8.

CSCA assets are allocated to each classification in proportion to the actual UAAL (without consideration of the SCAs). These assets directly reduce the UAAL of each classification.

DSCA assets are allocated entirely to the District general member classification.

**Exhibit 3 Statement of Plan Net Assets
 for the Fiscal Years Ended 2017 and 2016**

	2017	2016
Assets		
Cash and Cash Equivalents	\$ 192,194,061	\$ 130,111,362
Cash Management Overlay	25,207,998	26,249,148
Securities Lending Cash Collateral	-	88,363,269
Total Cash and Short-Term Investments	217,402,059	244,723,779
Receivables		
Contributions	8,622,173	7,812,557
Due from broker for investments sold	8,273,972	9,809,813
Investment Income	8,406,749	4,886,171
Securities Lending Income	-	26,788
Other receivables	95,657	100,028
Total Receivables	25,398,551	22,635,357
Prepaid Expense	7,669	7,669
Investments at Fair Value		
Fixed Income	738,544,220	610,607,729
Equity	1,717,793,138	1,723,373,856
Alternatives	480,730,879	404,376,940
Risk Parity	291,757,142	280,336,352
Inflation Hedge	573,336,864	349,680,120
Total Investments at Fair Value	3,802,162,243	3,368,374,997
Capital Assets	8,041,551	5,162,123
Less accumulated depreciation	(412,178)	-
Total Assets	4,052,599,895	3,640,903,925
Liabilities		
Payables		
Investment management fees	1,822,557	1,807,507
Due to broker for investments purchased	9,416,634	7,582,018
Securities Lending Collateral due to borrowers	-	88,363,269
Other	2,658,714	1,762,634
Total Liabilities	13,897,905	99,515,428
Net position restricted for pensions	\$ 4,038,701,990	\$ 3,541,388,497

**Exhibit 4 Statement of Changes in Plan Net Assets
 for the Fiscal Years Ended 2017 and 2016**

	2017	2016
Additions		
Contributions		
Employer	\$ 198,727,135	\$ 191,094,488
Member	62,160,101	56,068,706
Total Contributions	<u>260,887,236</u>	<u>247,163,194</u>
Investment Income/(Loss)		
Interest and dividends	38,445,658	36,703,717
Net appreciation/(depreciation) in Fair Value	431,845,614	22,197,249
	<u>470,291,272</u>	<u>58,900,966</u>
Less investment expense	33,688,058	34,789,209
Net Investment Income/(Loss)	<u>436,603,214</u>	<u>24,111,757</u>
Securities Lending Income		
Earnings	68,090	423,019
Rebates	(10,072)	(78,186)
Fees	(12,747)	(67,054)
Net Securities Lending Income	<u>45,271</u>	<u>277,779</u>
Other Additions	27,221	4,910,228
Total Additions	<u>697,562,942</u>	<u>276,462,958</u>
Deductions		
Member Benefits		
Service retirement allowances	166,975,634	157,513,099
Disability retirement allowances	22,689,813	21,090,529
Survivor, death and other benefits	698,946	893,633
Total Member Benefits	<u>190,364,393</u>	<u>179,497,261</u>
Member refunds	2,875,887	3,366,437
Administrative Expense	5,983,356	5,961,802
Information Technology Expense	995,979	714,347
Other Expense	29,834	10,942
Total Deductions	<u>200,249,449</u>	<u>189,550,789</u>
Net Increase	497,313,493	86,912,169
Net position restricted for pensions		
Beginning of Year	3,541,388,497	3,454,476,328
End of Year	<u>\$ 4,038,701,990</u>	<u>\$ 3,541,388,497</u>
Estimated Return, Net of Investment Expenses	12.6%	0.7%

**Exhibit 5 Allocation of Assets by Accounting Reserve Amounts
 for the Fiscal Years Ended 2017 and 2016**

	2017	2016
Valuation Reserves		
1. Member Reserve	\$ 735,102,254	\$ 679,245,500
2. Employer Advance Reserve	855,356,336	751,265,520
3. Retiree Reserves	1,019,849,399	966,121,612
4. Cost of Living Adjustment Reserve	1,295,487,509	1,213,653,694
5. County Supplemental Contributions Account Reserve	118,435,431	85,235,512
6. District Supplemental Contributions Account Reserve	1,956,796	1,593,122
Total Valuation Reserves	4,026,187,725	3,697,114,960
Non-Valuation Reserves		
1. Contingency Reserve	40,168,859	36,613,393
2. Undistributed Earnings / Losses Reserve	(49,355,495)	(72,299,960)
3. Other Specified Reserves	-	-
Total Non-Valuation Reserves	(9,186,636)	(35,686,567)
Market Stabilization Account	21,700,901	(120,039,896)
Total Reserves (Market Value of Assets)	\$ 4,038,701,990	\$ 3,541,388,497

Note: These amounts were determined by SamCERA for accounting purposes. We have made minor rounding adjustments to these numbers.

Exhibit 6a Five-Year Smoothing of Gains and Losses on Market Value (Total Assets) – History

History of Unexpected Asset Gains and Losses								
Six-Month Period Ended	Market Value at Beginning of Period	Contributions	Benefit Payments	Market Value at End of Period	Assumed Rate of Return	Expected Return	Actual Return	Unexpected Gain / (Loss)
06/30/2017	\$ 3,721,598,964	\$ 154,997,828	\$ 98,037,329	\$ 4,038,701,990	3.500%	\$ 131,806,865	260,142,527	\$ 128,335,662
12/31/2016	3,541,388,497	105,889,408	95,202,951	3,721,598,964	3.500%	125,157,215	169,524,010	44,366,795
06/30/2016	3,361,636,244	141,996,842	93,308,035	3,541,388,497	3.625%	123,696,090	131,063,446	7,367,356
12/31/2015	3,454,476,328	105,166,352	89,555,664	3,361,636,244	3.625%	126,551,502	(108,450,772)	(235,002,274)
06/30/2015	3,298,179,343	128,620,389	87,874,799	3,454,476,328	3.625%	121,532,366	115,551,395	(5,980,971)
12/31/2014	3,291,693,954	100,095,589	83,591,419	3,298,179,343	3.625%	120,689,532	(10,018,781)	(130,708,313)
06/30/2014	3,049,944,702	153,384,050	82,787,545	3,291,693,954	3.750%	116,347,099	171,152,747	54,805,648
12/31/2013	2,727,825,332	96,087,010	79,768,567	3,049,944,702	3.750%	103,671,361	305,800,927	202,129,566
06/30/2013	2,558,508,635	99,631,258	78,520,689	2,727,825,332	3.750%	97,496,612	148,206,128	50,709,516
12/31/2012	2,360,303,654	100,084,854	76,494,734	2,558,508,635	3.750%	89,983,040	174,614,861	84,631,821



This work product was prepared solely for SamCERA for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

Exhibit 6b Five-Year Smoothing of Gains and Losses on Market Value (excluding SCAs) – History

History of Unexpected Asset Gains and Losses								
Six-Month Period Ended	Market Value at Beginning of Period	Contributions and Credits from SCAs	Benefit Payments	Market Value at End of Period	Assumed Rate of Return	Expected Return	Actual Return	Unexpected Gain / (Loss)
06/30/2017	\$ 3,631,731,328	\$ 127,692,026	\$ 98,037,329	\$ 3,918,309,763	3.500%	\$ 128,661,498	\$ 256,923,738	\$ 128,262,240
12/31/2016	3,454,559,863	105,889,408	95,202,951	3,631,731,328	3.500%	122,118,213	166,485,008	44,366,795
06/30/2016	3,292,244,481	127,369,320	93,308,035	3,454,559,863	3.625%	121,003,576	128,254,097	7,250,521
12/31/2015	3,388,995,632	103,655,923	89,555,664	3,292,244,481	3.625%	124,155,013	(110,851,410)	(235,006,423)
06/30/2015	3,245,056,141	118,152,574	87,874,799	3,388,995,632	3.625%	119,348,025	113,661,716	(5,686,309)
12/31/2014	3,240,851,398	99,673,294	83,591,419	3,245,056,141	3.625%	118,831,181	(11,877,132)	(130,708,313)
06/30/2014	3,049,944,702	103,384,050	82,787,545	3,240,851,398	3.750%	115,878,349	170,310,191	54,431,842
12/31/2013	2,727,825,332	96,087,010	79,768,567	3,049,944,702	3.750%	103,671,361	305,800,927	202,129,566
06/30/2013	2,558,508,635	99,631,258	78,520,689	2,727,825,332	3.750%	97,496,612	148,206,128	50,709,516
12/31/2012	2,360,303,654	100,084,854	76,494,734	2,558,508,635	3.750%	89,983,040	174,614,861	84,631,821



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Exhibit 6c Five-Year Smoothing of Gains and Losses on Market Value of CSCA – History

History of Unexpected Asset Gains and Losses								
Six-Month Period Ended	Market Value at Beginning of Period	Contributions	Credits Used	Market Value at End of Period	Assumed Rate of Return	Expected Return	Actual Return	Unexpected Gain / (Loss)
06/30/2017	\$ 88,218,755	\$ 33,600,000	\$ 6,544,198	\$ 118,435,431	3.500%	\$ 3,087,656	\$ 3,160,874	\$ 73,218
12/31/2016	85,235,512	0	0	88,218,755	3.500%	2,983,243	2,983,243	0
06/30/2016	67,854,371	19,538,000	4,910,478	85,235,512	3.625%	2,636,784	2,753,619	116,835
12/31/2015	65,480,696	0	0	67,854,371	3.625%	2,373,675	2,373,675	0
06/30/2015	53,123,202	10,467,815	0	65,480,696	3.625%	2,184,341	1,889,679	(294,662)
12/31/2014	50,842,556	422,295	0	53,123,202	3.625%	1,858,351	1,858,351	0
06/30/2014	0	50,000,000	0	50,842,556	3.750%	468,750	842,556	373,806

Note: The CSCA was opened on May 29, 2014.

Exhibit 6d Five-Year Smoothing of Gains and Losses on Market Value of DCSA – History

History of Unexpected Asset Gains and Losses									
Six-Month Period Ended	Market Value at Beginning of Period	Contributions	Credits Used	Market Value at End of Period	Assumed Rate of Return	Expected Return	Actual Return	Unexpected Gain / (Loss)	
06/30/2017	\$ 1,648,881	\$ 250,000	\$ 0	\$ 1,956,796	3.500%	\$ 57,711	\$ 57,915	\$ 204	
12/31/2016	1,593,122	0	0	1,648,881	3.500%	55,759	55,759	0	
06/30/2016	1,537,392	0	0	1,593,122	3.625%	55,730	55,730	0	
12/31/2015	0	1,510,429	0	1,537,392	3.625%	22,814	26,963	4,149	

Note: The DCSA was opened on October 29, 2015.

Exhibit 7a Five-Year Smoothing – Development of Valuation Assets (Total Assets)

Development of Market Stabilization Reserve

Six-Month Period Ended	Percent Excluded	Phase-Out of Gain / (Loss)		
			Unexpected Gain / (Loss)	Gain / (Loss) Excluded
06/30/2017	90%	x	\$ 128,335,662	= \$ 115,502,096
12/31/2016	80%	x	44,366,795	= 35,493,436
06/30/2016	70%	x	7,367,356	= 5,157,149
12/31/2015	60%	x	(235,002,274)	= (141,001,364)
06/30/2015	50%	x	(5,980,971)	= (2,990,486)
12/31/2014	40%	x	(130,708,313)	= (52,283,325)
06/30/2014	30%	x	54,805,648	= 16,441,694
12/31/2013	20%	x	202,129,566	= 40,425,913
06/30/2013	10%	x	50,709,516	= 5,070,952
12/31/2012	0%	x	84,631,821	= 0
Total Gain / (Loss) Excluded = Market Stabilization Reserve				= \$ 21,816,065

Development of Valuation Assets

1. Market Value of Assets as of June 30, 2017		\$ 4,038,701,990
2. Preliminary Market Stabilization Reserve		21,816,065
3. Preliminary Actuarial Value of Assets (1) - (2)		4,016,885,925
4. Corridor Around Market Value		
a) Minimum = 80% of Market	\$ 3,230,961,592	
b) Maximum = 120% of Market	4,846,442,388	
c) Corridor Adjustment		0
5. Market Stabilization Reserve	21,816,065	
6. Gross Actuarial Valuation of Assets (3) - (4c)		\$ 4,016,885,925
7. Non-Valuation Reserves		
a) Contingency Reserve	40,168,859	
b) Undistributed Earnings / Losses Reserve	0	
c) Other Specified Reserves	0	
d) Total		40,168,859
8. Valuation Assets (6) - (7d)		\$ 3,976,717,066

Exhibit 7b Five-Year Smoothing – Development of Valuation Assets (excluding SCAs)

Development of Market Stabilization Reserve

Six-Month Period Ended	Percent Excluded	Phase-Out of Gain / (Loss)		
			Unexpected Gain / (Loss)	Gain / (Loss) Excluded
06/30/2017	90%	x	\$ 128,262,240	= \$ 115,436,016
12/31/2016	80%	x	44,366,795	= 35,493,436
06/30/2016	70%	x	7,250,521	= 5,075,365
12/31/2015	60%	x	(235,006,423)	= (141,003,854)
06/30/2015	50%	x	(5,686,309)	= (2,843,155)
12/31/2014	40%	x	(130,708,313)	= (52,283,325)
06/30/2014	30%	x	54,431,842	= 16,329,553
12/31/2013	20%	x	202,129,566	= 40,425,913
06/30/2013	10%	x	50,709,516	= 5,070,952
12/31/2012	0%	x	84,631,821	= 0
Total Gain / (Loss) Excluded = Market Stabilization Reserve				= \$ 21,700,901

Development of Valuation Assets

1. Market Value of Assets as of June 30, 2017		\$ 3,918,309,763
2. Preliminary Market Stabilization Reserve		21,700,901
3. Preliminary Actuarial Value of Assets (1) - (2)		3,896,608,862
4. Corridor Around Market Value		
a) Minimum = 80% of Market	\$ 3,134,647,810	
b) Maximum = 120% of Market	4,701,971,716	
c) Corridor Adjustment		0
5. Market Stabilization Reserve	21,700,901	
6. Gross Actuarial Valuation of Assets (3) - (4c)		\$ 3,896,608,862
7. Non-Valuation Reserves		
a) Contingency Reserve	40,168,859	
b) Undistributed Earnings / Losses Reserve	0	
c) Other Specified Reserves	0	
d) Total		40,168,859
8. Valuation Assets (6) - (7d)		\$ 3,856,440,003

Exhibit 7c Five-Year Smoothing – Development of CSCA Assets

Development of Market Stabilization Reserve

Six-Month Period Ended	Percent Excluded	Phase-Out of Gain / (Loss)		Gain / (Loss) Excluded
		x	Unexpected Gain / (Loss) ⁽¹⁾	
06/30/2017	90%	x	\$ 73,218	= \$ 65,896
12/31/2016	80%	x	0	= 0
06/30/2016	70%	x	116,835	= 81,785
12/31/2015	60%	x	0	= 0
06/30/2015	50%	x	(294,662)	= (147,331)
12/31/2014	40%	x	0	= 0
06/30/2014	30%	x	373,806	= 112,142
12/31/2013	20%	x	0	= 0
06/30/2013	10%	x	0	= 0
12/31/2012	0%	x	0	= 0
Total Gain / (Loss) Excluded = Market Stabilization Reserve				= \$ 112,492

Development of Valuation Assets

1. Market Value of Assets as of June 30, 2017	\$ 118,435,431
2. Preliminary Market Stabilization Reserve	<u>112,492</u>
3. Preliminary Actuarial Value of Assets (1) - (2)	118,322,939
4. Corridor Around Market Value	
a) Minimum = 80% of Market	\$ 94,748,345
b) Maximum = 120% of Market	142,122,517
c) Corridor Adjustment	0
5. Market Stabilization Reserve	112,492
6. Gross Actuarial Valuation of Assets (3) - (4c)	\$ 118,322,939
7. Non-Valuation Reserves	
a) Contingency Reserve	0
b) Undistributed Earnings / Losses Reserve	0
c) Other Specified Reserves	<u>0</u>
d) Total	0
8. Valuation Assets (6) - (7d)	\$ 118,322,939

1. Based on the MOU, prepayments earn the assumed rate of return so there is no gain or loss on prepayments. Lump sum payments may cause a gain or loss.

Exhibit 7d Five-Year Smoothing – Development of DCSA Assets

Development of Market Stabilization Reserve

Six-Month Period Ended	Percent Excluded	Phase-Out of Gain / (Loss)		
		Unexpected Gain / (Loss)	=	Gain / (Loss) Excluded
06/30/2017	90%	x \$ 204	=	\$ 184
12/31/2016	80%	x 0	=	0
06/30/2016	70%	x 0	=	0
12/31/2015	60%	x 4,149	=	2,489
06/30/2015	50%	x 0	=	0
12/31/2014	40%	x 0	=	0
06/30/2014	30%	x 0	=	0
12/31/2013	20%	x 0	=	0
06/30/2013	10%	x 0	=	0
12/31/2012	0%	x 0	=	0
Total Gain / (Loss) Excluded = Market Stabilization Reserve =				\$ 2,673

Development of Valuation Assets

1. Market Value of Assets as of June 30, 2017	\$ 1,956,796
2. Preliminary Market Stabilization Reserve	<u>2,673</u>
3. Preliminary Actuarial Value of Assets (1) - (2)	1,954,123
4. Corridor Around Market Value	
a) Minimum = 80% of Market	\$ 1,565,437
b) Maximum = 120% of Market	2,348,155
c) Corridor Adjustment	0
5. Market Stabilization Reserve	2,673
6. Gross Actuarial Valuation of Assets (3) - (4c)	\$ 1,954,123
7. Non-Valuation Reserves	
a) Contingency Reserve	0
b) Undistributed Earnings / Losses Reserve	0
c) Other Specified Reserves	<u>0</u>
d) Total	0
8. Valuation Assets (6) - (7d)	\$ 1,954,123

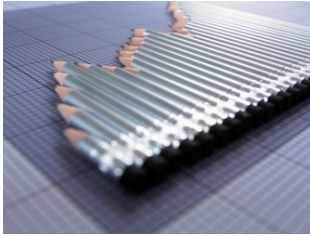
Exhibit 8 Allocation of Valuation Assets

(Dollars in Thousands)

	General	Safety	Probation	Total
1. Prior Year UAAL	\$ 577,836	\$ 190,984	\$ 55,490	\$ 824,310
2. Expected UAAL Contribution for Preceding Year	(79,917)	(28,850)	(6,909)	(115,676)
3. Expected Interest at 7.00%	37,699	12,376	3,647	53,722
4. Expected UAAL Based on Prior Year Assumptions	535,618	174,510	52,228	762,356
5. Percentage of Total Expected UAAL	70.26%	22.89%	6.85%	100.00%
6. Actual UAAL Based on Prior Year Assumptions				724,176
7. Actual AAL Based on Prior Year Assumptions	\$ 3,370,974	\$ 903,945	\$ 305,697	\$ 4,580,616
8. Allocated UAAL Based on Prior Year Assumptions	508,806	165,764	49,606	724,176
9. Valuation Assets (excluding SCA assets)	\$ 2,862,168	\$ 738,181	\$ 256,091	\$ 3,856,440
10. Actual UAAL excluding SCA Valuation Assets	\$ 606,060	\$ 195,027	\$ 62,323	\$ 863,410
11. Allocation of UAAL	70.19%	22.59%	7.22%	100.00%
12. Valuation Assets (CSCA)	\$ 83,051	\$ 26,729	\$ 8,543	\$ 118,323
13. Valuation Assets (DSCA)	\$ 1,954	\$ -	\$ -	\$ 1,954
14. Valuation Assets (Total)	\$ 2,947,173	\$ 764,910	\$ 264,634	\$ 3,976,717

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Section 4 Actuarial Liabilities



In the previous section, an actuarial valuation was compared with an inventory process, and an analysis was given of the inventory of SamCERA's assets as of the valuation date, June 30, 2017. In this section, the discussion will focus on the commitments of SamCERA for retirement benefits, which are referred to as its actuarial liabilities.

In an active system, the combined current and future actuarial liabilities will almost always exceed the actuarial assets. This is usually expected in all but a fully closed down fund, where no further contributions of any sort are anticipated. This deficiency has to be provided by future contributions. An actuarial valuation method sets out a schedule of future contributions that will deal with this deficiency in an orderly fashion. The determination of the level of future contributions needed is discussed in the next section.

Actuarial Balance Sheet – Liabilities

First, we need to determine the amount of the deficiency. We compare the Actuarial Value of the Valuation Assets to the Actuarial Liabilities. The difference is the amount that needs to be funded by the member and employer contributions in the future. Both the current and future assets (contributions) are compared to the actuarial liabilities in the Actuarial Balance Sheet.

Exhibit 9a contains an analysis of the actuarial Present Value of all Future Benefits for retired, inactive and active members and compares these with the total Valuation Assets. Exhibit 9b contains an analysis using the Valuation Assets excluding the SCA assets (sum of the CSCA and DSCA). These analyses are displayed by class of membership and by type of benefit.

The actuarial liabilities include the actuarial present value of all future benefits expected to be paid with respect to each member. For an active member, this value includes measures of both benefits already earned and future benefits to be earned. For all members, active and inactive, the value extends over the rest of their lives and for the lives of any surviving beneficiaries. All liabilities reflect the benefits effective through June 30, 2017.

The actuarial demographic assumptions used to determine the liabilities are based on the results of our Investigation of Experience study for the period ending April 30, 2017. These assumptions were adopted by the Board at their July 2017 meeting and are shown in Appendix A.

Exhibit 9a Actuarial Balance Sheet (Total Assets)
June 30, 2017
 (Dollars in Thousands)

Resources				
	General	Safety	Probation	Total
Valuation Assets (Actuarial)	\$ 2,947,173	\$ 764,910	\$ 264,634	\$ 3,976,717
Present Value of Future Member Contributions	381,077	88,136	32,846	502,059
Present Value of Future Employer Contributions to Fund:				
a) Normal Cost	306,524	84,960	35,406	426,890
b) Unfunded Actuarial Accrued Liability	521,055	168,298	53,780	743,133
Total Resources	\$ 4,155,829	\$ 1,106,304	\$ 386,666	\$ 5,648,799
Liabilities				
	General	Safety	Probation	Total
Present Value of Future Benefits				
1. Present Retired Members	\$ 1,828,974	\$ 608,022	\$ 145,111	2,582,107
2. Current Inactive Members	195,734	20,278	13,532	229,544
3. Current Active Members				
- Service Retirement	1,899,138	424,807	206,164	2,530,109
- Termination Benefits	87,246	11,823	4,532	103,601
- Death Benefits	28,138	8,432	3,106	39,676
- Disability Benefits	116,599	32,942	14,221	163,762
- Total Active	2,131,121	478,004	228,023	2,837,148
Total Actuarial Liabilities	\$ 4,155,829	\$ 1,106,304	\$ 386,666	\$ 5,648,799

Exhibit 9b Actuarial Balance Sheet (excluding SCAs)
June 30, 2017
 (Dollars in Thousands)

Resources				
	General	Safety	Probation	Total
Valuation Assets (Actuarial)	\$ 2,862,168	\$ 738,181	\$ 256,091	\$ 3,856,440
Present Value of Future Member Contributions	381,077	88,136	32,846	502,059
Present Value of Future Employer Contributions to Fund:				
a) Normal Cost	306,524	84,960	35,406	426,890
b) Unfunded Actuarial Accrued Liability	606,060	195,027	62,323	863,410
Total Resources	\$ 4,155,829	\$ 1,106,304	\$ 386,666	\$ 5,648,799

Liabilities				
	General	Safety	Probation	Total
Present Value of Future Benefits				
1. Present Retired Members	\$ 1,828,974	\$ 608,022	\$ 145,111	\$ 2,582,107
2. Current Inactive Members	195,734	20,278	13,532	229,544
3. Current Active Members				
- Service Retirement	1,899,138	424,807	206,164	2,530,109
- Termination Benefits	87,246	11,823	4,532	103,601
- Death Benefits	28,138	8,432	3,106	39,676
- Disability Benefits	116,599	32,942	14,221	163,762
- Total Active	2,131,121	478,004	228,023	2,837,148
Total Actuarial Liabilities	\$ 4,155,829	\$ 1,106,304	\$ 386,666	\$ 5,648,799

Actuarial Balance Sheet – Resources

For the purpose of the Actuarial Balance Sheet, SamCERA's resources are equal to the sum of:

- (a) Assets currently available to pay benefits and considered for funding purposes, the Valuation Assets,
- (b) The present value of future contributions expected to be made by current active members, and
- (c) The present value of future contributions expected to be made by the employer.

Actuarial Cost Method

The Actuarial Balance sheet determines the amount of future contributions that are needed, but the method used to determine the incidence of when those future contributions are yet to be made in future years is called the "actuarial cost method." For this valuation, the entry age actuarial cost method has been used. Under this method – or essentially any actuarial cost method – the contributions required to meet the difference between current assets and current actuarial liabilities are allocated each year between two elements:

- A Normal Cost amount; and
- Whatever amount is left over, which is used to amortize what is called the UAAL.

Normal Cost

The two items described above, the Normal Cost and UAAL, are the keys to understanding the actuarial cost method.

The Normal Cost is the theoretical contribution rate that is projected to meet the ongoing costs of a group of average new employees. Suppose that a group of new employees was covered under a separate fund from which all benefits and to which all contributions and associated investment returns were paid. Under the entry age actuarial cost method, the Normal Cost contribution rate maintains the funding of benefits as a level percentage of pay. If experience follows the actuarial assumptions precisely, the fund would be completely liquidated when the last payment to the last survivor of the group was made.

By applying the Normal Cost contribution rate to the present value of salaries expected to be paid in the future, we determine the present value of future Normal Cost contributions. Future contributions are expected to be made by both the members and the employer. The basic member contribution rates are determined based upon requirements established in the '37 Act and the actuarial assumptions. Members may also make additional contributions as part of a cost sharing or COLA cost sharing arrangements. Based on these member contribution rates, we determine the present value of future member contributions. We subtract that value from the total future Normal Cost contributions expected, based on the entry age cost method. The remaining difference is the employer's portion of the future Normal Cost contributions.

Actuarial Accrued Liability

The difference between the present value of all future obligations and the present value of the future Normal Cost contributions is referred to as the "Actuarial Accrued Liability." The AAL is then compared to the value of assets available to fund benefits, and the difference is referred to as the UAAL. The results for SamCERA for all plans (and including all Valuation Assets) are summarized below:

(Dollars in millions)	2017	2016	Percent Change
A. Actuarial present value of all future benefits for contributing members, former contributing members, and their survivors	\$ 5,649	\$ 5,184	9.0%
B. Actuarial present value of total future Normal Costs for current members	<u>929</u>	<u>822</u>	13.0%
C. Actuarial accrued liability [A-B]	\$ 4,720	\$ 4,362	8.2%
D. Valuation Assets	<u>3,977</u>	<u>3,625</u>	9.7%
E. UAAL or Surplus Funding [C-D] *	\$ 743	\$ 738	0.8%
F. Funded Ratio [D/C]	84.3%	83.1%	1.2%

* Note that line E may include a rounding adjustment item.

Unfunded Actuarial Accrued Liability/ Surplus Funding

The portion allocated to service already rendered or accrued is called the Actuarial Accrued Liability. The difference between the Actuarial Accrued Liability and the Valuation Assets is called the Unfunded Actuarial Accrued Liability (UAAL). If a UAAL amount exists, it usually results from prior years' benefit or assumption changes and the net effect of accumulated gains and losses. If the employer had always contributed the current Normal Cost, if there were no prior benefit or assumption changes and if actual experience exactly matched the actuarial assumptions, the present value of all future Normal Cost contributions would be sufficient to fund all benefits and there would be no UAAL.

Exhibits 9a and 9b show how the UAAL was derived for each classification. Exhibit 9a includes all Valuation Assets, and exhibit 9b excludes the SCA. In the Actuarial Balance sheet, the total actuarial accrued liability for all future benefits must be equal to the current and future assets.

Funding Adequacy

A key consideration in determining the adequacy of the funding of SamCERA is how the UAAL is being funded. Under the current funding method, the June 30, 2008 UAAL is amortized over a fixed period ending June 30, 2023. Changes in the UAAL in years following June 30, 2008 are being amortized separately over new 15-year periods from the valuation date at which the difference is calculated, including the change in UAAL as of June 30, 2017.

**Analysis of Change
 in UAAL**

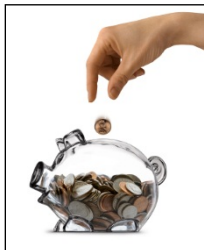
The UAAL, at any date after establishment of a system, is affected by any actuarial gains or losses arising when the actual experience of the system varies from the experience anticipated by the actuarial assumptions used in the valuations. To the extent actual experience, as it develops, differs from that expected according to the assumptions used, so also will the emerging costs differ from the estimated costs.

The 2017 actuarial valuation reflects an increase in the system-wide UAAL of \$5.6 million for the fiscal year just ended.

Unfunded Actuarial Accrued Liability - June 30, 2016	\$ 737.6
Expected Increase / (Decrease) *	(110.4)
Expected UAAL - June 30, 2017	\$ 627.2
Asset (Gains) and Losses	(28.3)
Retiree COLA Greater / (Less) than Expected	7.0
Salary Increases Greater / (Less) than Expected	27.7
Assumption Changes	133.2
Other Liability (Gain) / Loss	<u>(23.7)</u>
Total Changes	<u>115.9</u>
Actual UAAL - June 30, 2017	\$ 743.1

* Based on actual contributions.

Section 5 Member Contributions



Basic Contributions (Plans 1-6)

For SamCERA members in Plans 1-6, contributions are of three types: Basic contributions, Cost Sharing contributions, and COLA Cost Sharing contributions. SamCERA members in Plan 7 pay contributions equal to one-half of the total Normal Cost rate for all members.

Basic contributions for Plans 1-6 are defined in the following sections of the County Employees' Retirement Law:

Plan	Code Section	Contribution Provides Average Annuity of
General Plans 1, 2 & 4	31621.9	1/120 th of FAC at age 55
General Plan 5	31621	1/120 th of FAC at age 60
Probation & Safety	31639.25	1/100 th of FAC at age 50

FAC = Final Average Compensation

There are no member contributions under General Plan 3.

Basic member contributions are determined using the Entry Age Normal Cost Method and the following actuarial assumptions:

1. Expected rate of return on assets
2. Individual salary increase rate (wage growth + merit)
3. Mortality for members based on service retirement
4. No COLAs are assumed

The basic member contribution rates for Plans 1-6 were recalculated as of the June 30, 2017 valuation to reflect the investment return and wage growth assumptions adopted with the 2017 Investigation of Experience study. The rates are shown in Appendix D.

Cost-Sharing Contributions

In addition to the basic rate, all Plan 1, 2, and 4 employees (except SMCM&VCD), as well as Plan 5 Safety and Probation employees, make additional cost-sharing contributions as shown in Appendix B. Plan 5 General employees, and all Plan 6 and 7 employees do not participate in cost-sharing. For valuation purposes, cost-sharing contributions are assumed to be permanent. The cost-sharing contributions are fixed and not impacted by changes in assumptions.

Cost-of-Living Contributions (Plans 1-6)

Depending on which plan and bargaining unit they belong to, members may share in the cost of the COLA by making additional contributions (COLA contributions). The COLA level is described in detail in the Member Contributions section of Appendix B.

COLA member rates are determined by calculating and applying a load factor to the basic member rates. COLA load factors are determined for each class and plan of member separately, as shown in the following table:

Plan	COLA Share	COLA Load
General 1	50%	36.19%
General 2	50%	33.89%
General 4	50%	26.31%
General 5	50%	25.38%
Safety 1	50%	47.93%
Safety 2	50%	50.07%
Safety 4	50%	37.71%
Safety 5	50%	34.76%
Safety 6	50%	32.47%
Probation 1	50%	53.21%
Probation 2	50%	51.34%
Probation 4	50%	37.84%
Probation 5	50%	34.64%
Probation 6	50%	30.44%

Example:

A member who enters General Plan 5 at age 35 has a basic member contribution rate of 6.71% (Exhibit D-1). The General Plan 5 COLA load is 25.38% for a member COLA contribution of 1.70% (6.71% x 25.38%) of pay. The basic plus COLA member contribution rate is 8.41% (6.71% + 1.70%).

The COLA load for each plan is determined as follows: the present value of future normal costs with and without COLA provisions is calculated. The difference is multiplied by the COLA share percentage, and then divided by the present value of future basic only member contributions.

Member Contribution Rates – Pick-up (Plans 1-6)

Effective July 1, 2016 no employer pick-up contributions are valued.

**Member Contribution
Rates
(Plan 7)**

Contributions for Plan 7 are defined in Section 7522.30 of the Government Code.

All employees of the same class who are members of Plan 7 shall contribute the same percentage of payroll. Such percentage will be 50% of the total Normal Cost rate for that class. The rates are recalculated annually. Note that for small groups, the Normal Cost rate, and hence the member rate may change significantly from year-to-year. As the group becomes larger, this volatility should be reduced.

Effective July 1, 2018, Plan 7 member rates are as follows:

- General members: 8.71% (increased from 8.14%)
- SMCM&VCD members: 8.84% (increased from 8.15%)
- Safety members: 14.51% (increased from 13.90%)
- Probation members: 14.33% (increased from 13.38%)

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Section 6 Employer Contributions



Contributions to SamCERA are determined using the Entry Age Normal Cost Method. The portion of the actuarial present value of retirement benefits allocated to a valuation year by the Actuarial Cost Method is called the Normal Cost. These amounts are usually expressed as a percentage of payroll and called the Normal Cost Contribution Rate. Exhibit 11 shows the Normal Cost Rates by type of benefit and for each plan based on this valuation.

It should be noted that when we use the term “Gross Normal Cost rate,” we are referring to the value of benefits earned by active members allocated to the valuation year. The Employer Normal Cost rate is the portion of the annual benefit that the employer is responsible for. This is simply the Gross Normal Cost rate less the contributions expected to be made by the members.

Note that in the following exhibits “SMCM&VCD” refers to the San Mateo County Mosquito and Vector Control District.

Statutory Contribution Rate

A summary of the total Statutory Contribution Rate for each classification, along with a comparison to the prior year's rates, can be found in Exhibit 10, with additional detail for each plan in Exhibits 10a through 10d. These results are expressed as a percentage of payroll. Note that SamCERA's UAAL is determined separately for each class. Thus, the employers fund the UAAL evenly as a percentage of pay over salaries for all members within a class.

The UAAL rate reflects a layered 15-year amortization beginning with the June 30, 2008 valuation. Gains and losses after that date are reflected over new 15-year periods starting with the valuation date. A one-year deferral in the implementation of the new rate is reflected. Therefore, the new employer contribution rate calculated in the 2017 valuation is effective July 1, 2018, and the UAAL is amortized over the remaining 14 years.

The SCA (CSCA for the County UAAL and DSCA for the SMCM&VCD) offset amounts are calculated in a similar manner to the UAAL rate described above.

Exhibits 12a through 12c show detailed information on how the UAAL contribution rate is calculated using the layered method. The UAAL contribution rates are calculated excluding the SCAs. Exhibits 12d and 12e show detailed information on how the SCA offsets are calculated using the same layered approach as used for UAAL amortizations.

Statutory Contribution Rate
(continued)

The total Statutory Contribution Rate was 33.76% for the fiscal year beginning July 1, 2017 after reflecting all bargained COLA and cost sharing arrangements (as compared to 33.77% calculated in the 2016 actuarial valuation). For the fiscal year beginning in 2018, the Statutory Contribution Rate based on this report increased to 35.31%. This is equal to the aggregate Employer Normal Cost contribution rate of 10.95% based on Milliman's 2017 valuation, plus appropriate amounts to amortize the UAAL according to the funding policy, over layered 15-year closed periods.

Statutory Contribution Rate
(all values as a % of Payroll)

Employer Normal Cost	10.95%
Total Amortization of UAAL	<u>24.36%</u>
Total Employer Contribution	35.31%

Changes in the Normal Cost Rate

The change in the calculated gross Normal Cost rates from year-to-year is generally due to two factors. The two factors are:

- 1. Assumption Changes:** Effective July 1, 2017 the economic and demographic assumptions were updated based on the 2017 Investigation of Experience study. These changes increased the Normal Cost rate.
- 2. Experience:** Normal experience from year-to-year, reflecting differences in both the weighting between membership groups and in their characteristics, as well as on what was assumed to occur during the past fiscal year and what actually occurred, particularly with respect to salary increases and turnover experience. Based on current system benefit provisions, the aggregate Normal Cost rate is expected to decrease as a greater number of members are covered by Plan 7, instead of the more expensive older plans. However, the change will be fairly gradual.

**Exhibit 10 Employer Statutory Contribution Rates – All Plans
 For the 2018-2019 Fiscal Year**

	All Plans							Prior Year Total Contribution Rate ⁽²⁾
	Gross Normal Cost	Member Contributions	Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾	Total Contribution Rate	
General Members								
County	20.92%	(11.34)%	7.31%	2.27%	9.58%	20.55%	30.13%	28.72%
Courts	21.63%	(11.98)%	7.65%	2.00%	9.65%	22.58%	32.23%	30.39%
Total	20.95%	(11.37)%	7.33%	2.25%	9.58%	20.64%	30.22%	28.82%
SMCM&VCD Members	20.40%	(8.08)%	8.85%	3.47%	12.32%	12.37%	24.69%	24.52%
Safety Members	34.80%	(17.52)%	13.23%	4.05%	17.28%	45.57%	62.85%	60.56%
Probation Members	34.01%	(16.59)%	13.48%	3.94%	17.42%	32.87%	50.29%	47.66%
All Plans	23.35%	(12.40)%	8.39%	2.56%	10.95%	24.36%	35.31%	33.76%
County Only	23.43%	(12.43)%	8.41%	2.59%	11.00%	24.48%	35.48%	33.91%

1. County UAAL Contribution Rate includes an aggregate offset of 2.36% of County payroll to reflect the County Supplementary Contribution Account. Offsets vary by class of member as follows:

- General member UAAL offset is 2.03% of payroll
- Safety member UAAL offset is 4.08% of payroll
- Probation member UAAL offset is 3.21% of payroll

SMCM&VCD UAAL Contribution Rate includes an offset of 10.21% of District payroll to reflect the District Supplementary Contribution Account.

2. The Prior Year Total Contribution Rate reflects the valuation addendums that were issued subsequent to the valuation report.

**Exhibit 10a Employer Statutory Contribution Rates – General Members
 For the 2018-2019 Fiscal Year**

General Members								
	Gross Normal Cost	Member Contributions	Employer Rates				Total Contribution Rate	Prior Year
			Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾		Total Contribution Rate ⁽²⁾
Plan 1								
County ⁽³⁾	24.12%	(13.38)%	7.60%	3.14%	10.74%	20.55%	31.29%	28.74%
Courts ⁽³⁾	24.12%	(13.38)%	7.60%	3.14%	10.74%	22.58%	33.32%	30.54%
Total	24.12%	(13.38)%	7.60%	3.14%	10.74%	20.55%	31.29%	28.90%
Plan 2								
County ⁽³⁾	22.18%	(12.94)%	6.45%	2.79%	9.24%	20.55%	29.79%	28.76%
Courts ⁽³⁾	22.18%	(12.94)%	5.71%	3.53%	9.24%	22.58%	31.82%	30.58%
Total	22.18%	(12.94)%	6.42%	2.82%	9.24%	20.63%	29.87%	28.84%
Plan 3								
County	8.11%	0.00%	8.11%	0.00%	8.11%	20.55%	28.66%	27.46%
Courts	8.11%	0.00%	8.11%	0.00%	8.11%	22.58%	30.69%	28.95%
Total	8.11%	0.00%	8.11%	0.00%	8.11%	20.55%	28.66%	27.48%
Plan 4								
County (0%) ⁽³⁾	25.38%	(13.22)%	8.19%	3.97%	12.16%	20.55%	32.71%	34.50%
County (50%) ⁽³⁾	22.91%	(12.99)%	7.60%	2.32%	9.92%	20.55%	30.47%	28.87%
Courts ⁽³⁾	22.91%	(12.99)%	7.60%	2.32%	9.92%	22.58%	32.50%	30.55%
Total	22.92%	(12.99)%	7.60%	2.33%	9.93%	20.67%	30.60%	28.93%
Plan 5								
County	20.91%	(9.30)%	9.44%	2.11%	11.61%	20.55%	32.16%	30.26%
Courts	20.91%	(9.30)%	11.60%	2.11%	11.61%	22.58%	34.19%	30.40%
Total	20.91%	(9.30)%	9.50%	2.11%	11.61%	20.60%	32.21%	30.26%
Plan 7								
County	17.42%	(8.71)%	6.71%	2.00%	8.71%	20.55%	29.26%	27.94%
Courts	17.42%	(8.71)%	8.51%	0.20%	8.71%	22.58%	31.29%	29.43%
Total	17.42%	(8.71)%	6.77%	1.94%	8.71%	20.62%	29.33%	27.99%
All Plans								
County	20.92%	(11.34)%	7.31%	2.27%	9.58%	20.55%	30.13%	28.72%
Courts	21.63%	(11.98)%	7.67%	1.98%	9.65%	22.58%	32.23%	30.39%
Total	20.95%	(11.37)%	7.33%	2.25%	9.58%	20.64%	30.22%	28.82%

Notes:

1. UAAL Contribution Rate includes an offset of 2.03% of payroll to reflect the County Supplementary Contribution Account, except for Courts.
2. The Prior Year Total Contribution Rate reflects the valuation addendums that were issued subsequent to the valuation report.
3. All members pay 50% of the cost of COLA, except for members of the Board of Supervisors whose most recent hire date is before August 7, 2011.

**Exhibit 10b Employer Statutory Contribution Rates – SMCM&VCD Members
 For the 2018-2019 Fiscal Year**

SMCM&VCD Members								
	Gross Normal Cost	Member Contributions	Employer Rates				Total Contribution Rate	Prior Year Total Contribution Rate
			Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾		
Plan 1 ⁽²⁾	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plan 2 ⁽²⁾	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plan 4	21.74%	(7.70)%	9.98%	4.06%	14.04%	12.37%	26.41%	25.61%
Plan 7	17.68%	(8.84)%	6.55%	2.29%	8.84%	12.37%	21.21%	20.64%
All Plans	20.40%	(8.08)%	8.85%	3.47%	12.32%	12.37%	24.69%	24.52%

Notes:

1. UAAL Contribution Rate includes an offset of 10.21% of payroll to reflect the District Supplementary Contribution Account.
2. There are currently no active Plan 1 or Plan 2 SMCM&VCD members. Employer rates will be developed in the future if needed.

**Exhibit 10c Employer Statutory Contribution Rates – Safety Members
 For the 2018-2019 Fiscal Year**

Safety Members								
	Employer Rates							Prior Year Total Contribution Rate
	Gross Normal Cost	Member Contributions	Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾	Total Contribution Rate	
Plan 1	39.29%	(5.00)%	24.31%	9.98%	34.29%	45.57%	79.86%	83.63%
Plan 2	36.87%	(18.39)%	13.10%	5.38%	18.48%	45.57%	64.05%	61.03%
Plan 4	35.97%	(18.32)%	13.78%	3.87%	17.65%	45.57%	63.22%	60.49%
Plan 5	36.64%	(18.18)%	14.52%	3.94%	18.46%	45.57%	64.03%	61.65%
Plan 6 ⁽²⁾	N/A	N/A	N/A	N/A	NA	NA	NA	63.81%
Plan 7	29.02%	(14.51)%	11.04%	3.47%	14.51%	45.57%	60.08%	58.15%
All Plans	34.80%	(17.52)%	13.23%	4.05%	17.28%	45.57%	62.85%	60.56%

Notes:

1. UAAL Contribution Rate includes an offset of 4.08% of payroll to reflect the County Supplementary Contribution Account.
2. There are currently no active Safety Plan 6 members. Employer rates will be developed in the future if needed.

**Exhibit 10d Employer Statutory Contribution Rates – Probation Members
 For the 2018-2019 Fiscal Year**

Probation Members								
	Gross Normal Cost	Member Contributions	Employer Rates				Prior Year Total Contribution Rate	
			Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾		Total Contribution Rate
Plan 1	36.14%	(3.50)%	23.86%	8.78%	32.64%	32.87%	65.51%	64.36%
Plan 2	36.69%	(17.39)%	14.11%	5.19%	19.30%	32.87%	52.17%	49.54%
Plan 4	34.30%	(16.84)%	13.72%	3.74%	17.46%	32.87%	50.33%	47.63%
Plan 5	31.52%	(16.36)%	11.72%	3.44%	15.16%	32.87%	48.03%	46.07%
Plan 6	27.61%	(12.44)%	12.09%	3.08%	15.17%	32.87%	48.04%	45.62%
Plan 7	28.65%	(14.33)%	10.99%	3.33%	14.32%	32.87%	47.19%	45.10%
All Plans	34.01%	(16.59)%	13.48%	3.94%	17.42%	32.87%	50.29%	47.66%

Notes:

1. UAAL Contribution Rate includes an offset of 3.21% of payroll to reflect the County Supplementary Contribution Account.

Exhibit 11 Calculated Gross Normal Cost Rates

All Plans					
Plan	Normal Cost				Total Gross Normal Cost
	Service Retirement	Disability Retirement	Death Benefits while Active	Termination Benefits	
General Plan 1	17.10%	1.93%	0.56%	4.53%	24.12%
General Plan 2	15.92%	2.06%	0.41%	3.79%	22.18%
General Plan 3	7.46%	0.00%	0.00%	0.65%	8.11%
General Plan 4	16.71%	2.18%	0.40%	3.63%	22.92%
General Plan 5	15.35%	2.35%	0.41%	2.80%	20.91%
General Plan 7	12.78%	2.13%	0.31%	2.20%	17.42%
General Total	15.29%	2.12%	0.37%	3.17%	20.95%
SMCM&VCD Plan 1	N/A	N/A	N/A	N/A	N/A
SMCM&VCD Plan 2	N/A	N/A	N/A	N/A	N/A
SMCM&VCD Plan 4	16.36%	2.10%	0.35%	2.93%	21.74%
SMCM&VCD Plan 7	12.86%	1.85%	0.40%	2.57%	17.68%
SMCM&VCD Total	15.20%	2.02%	0.37%	2.81%	20.40%
Safety Plan 1	30.35%	3.97%	1.59%	3.38%	39.29%
Safety Plan 2	28.48%	3.73%	1.49%	3.17%	36.87%
Safety Plan 4	27.65%	4.19%	1.23%	2.90%	35.97%
Safety Plan 5	27.87%	5.10%	1.17%	2.50%	36.64%
Safety Plan 6	N/A	N/A	N/A	N/A	N/A
Safety Plan 7	21.73%	4.41%	1.07%	1.81%	29.02%
Safety Total	26.63%	4.26%	1.23%	2.68%	34.80%
Probation Plan 1	28.27%	3.59%	1.28%	3.00%	36.14%
Probation Plan 2	28.70%	3.64%	1.30%	3.05%	36.69%
Probation Plan 4	26.73%	3.57%	1.08%	2.92%	34.30%
Probation Plan 5	24.59%	3.72%	0.94%	2.27%	31.52%
Probation Plan 6	20.76%	3.63%	1.16%	2.06%	27.61%
Probation Plan 7	21.78%	3.89%	0.97%	2.01%	28.65%
Probation Total	26.46%	3.62%	1.10%	2.83%	34.01%
All Plans	17.28%	2.46%	0.52%	3.09%	23.35%

Exhibit 12a UAAL Amortization Detail – General Members
 (Dollars in Thousands)

Unfunded Actuarial Liability Amortization Detail							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2008	Initial UAAL	\$ 260,529	\$ 17,586	\$ 50,586	\$ 227,529	5 Years	\$ 49,769
June 30, 2009	(Gain) / Loss	\$ 266,293	\$ 17,975	\$ 45,081	\$ 239,187	6 Years	\$ 44,360
June 30, 2010	(Gain) / Loss	\$ (103,459)	\$ (6,983)	\$ (15,587)	\$ (94,855)	7 Years	\$ (15,340)
June 30, 2011	(Gain) / Loss	\$ (32,179)	\$ (2,172)	\$ (4,383)	\$ (29,968)	8 Years	\$ (4,314)
June 30, 2012	(Gain) / Loss	\$ 102,383	\$ 6,911	\$ 12,762	\$ 96,532	9 Years	\$ 12,563
June 30, 2013	(Gain) / Loss	\$ 19,716	\$ 1,331	\$ 2,272	\$ 18,775	10 Years	\$ 2,237
June 30, 2014	(Gain) / Loss	\$ (42,434)	\$ (2,864)	\$ (4,557)	\$ (40,741)	11 Years	\$ (4,487)
June 30, 2015	(Gain) / Loss	\$ (32,011)	\$ (2,161)	\$ (3,226)	\$ (30,946)	12 Years	\$ (3,176)
June 30, 2016	(Gain) / Loss	\$ 102,478	\$ 6,917	\$ 9,751	\$ 99,644	13 Years	\$ 9,598
June 30, 2017	(Gain) / Loss	\$ 64,743	\$ 4,370	\$ (1,874) ³	\$ 70,988	14 Years	<u>\$ 6,455</u>
Total Amortization Payment July 1, 2018:							\$ 97,665
Projected Payroll July 1, 2018:							<u>\$ 432,583</u>
UAAL as of June 30, 2017:		<u>\$ 606,060</u>		UAAL Contribution Rate (as a % of Payroll) FYB July 1, 2018:			<u>22.58%</u>

Notes:

1. Amortization Payments are based on a fixed schedule that increases by the payroll assumption each year.
2. The calculation of UAAL is as of June 30, 2017; whereas, the contribution rates are effective as of July 1, 2018. The June 30, 2017 UAAL is adjusted to June 30, 2018 based on the July 1, 2017 contribution rates and June 30, 2017 valuation assumptions.
3. (Gain)/Loss includes the following:
 - new assumptions adopted effective June 30, 2011 based on the Investigation of Experience report
 - new economic assumptions effective June 30, 2012
 - new assumptions adopted effective June 30, 2014 based on the Investigation of Experience report
 - new economic assumptions effective June 30, 2016
 - new assumptions adopted effective June 30, 2017 based on the Investigation of Experience report

Exhibit 12b UAAL Amortization Detail – Safety Members
 (Dollars in Thousands)

Unfunded Actuarial Liability Amortization Detail							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2008	Initial UAAL	\$ 95,073	\$ 6,417	\$ 18,458	\$ 83,032	5 Years	\$ 18,162
June 30, 2009	(Gain) / Loss	\$ 97,660	\$ 6,592	\$ 16,533	\$ 87,719	6 Years	\$ 16,269
June 30, 2010	(Gain) / Loss	\$ (38,701)	\$ (2,612)	\$ (5,831)	\$ (35,482)	7 Years	\$ (5,738)
June 30, 2011	(Gain) / Loss	\$ (14,925)	\$ (1,007)	\$ (2,033)	\$ (13,899)	8 Years	\$ (2,001)
June 30, 2012	(Gain) / Loss	\$ 30,440	\$ 2,055	\$ 3,795	\$ 28,700	9 Years	\$ 3,735
June 30, 2013	(Gain) / Loss	\$ 5,765	\$ 389	\$ 664	\$ 5,490	10 Years	\$ 654
June 30, 2014	(Gain) / Loss	\$ (17,074)	\$ (1,153)	\$ (1,834)	\$ (16,393)	11 Years	\$ (1,805)
June 30, 2015	(Gain) / Loss	\$ (8,915)	\$ (602)	\$ (899)	\$ (8,618)	12 Years	\$ (885)
June 30, 2016	(Gain) / Loss	\$ 27,629	\$ 1,865	\$ 2,629	\$ 26,865	13 Years	\$ 2,588
June 30, 2017	(Gain) / Loss	\$ 18,076	\$ 1,220	\$ (398) ³	\$ 19,694	14 Years	\$ 1,791
Total Amortization Payment July 1, 2018:							\$ 32,770
Projected Payroll July 1, 2018:							\$ 66,001
UAAL as of June 30, 2017:		<u>\$ 195,027</u>	UAAL Contribution Rate (as a % of Payroll) FYB July 1, 2018:				<u>49.65%</u>

Notes:

1. Amortization Payments are based on a fixed schedule that increases by the payroll assumption each year.
2. The calculation of UAAL is as of June 30, 2017; whereas, the contribution rates are effective as of July 1, 2018. The June 30, 2017 UAAL is adjusted to June 30, 2018 based on the July 1, 2017 contribution rates and June 30, 2017 valuation assumptions.
3. (Gain)/Loss includes the following:
 - new assumptions adopted effective June 30, 2011 based on the Investigation of Experience report
 - new economic assumptions effective June 30, 2012
 - new assumptions adopted effective June 30, 2014 based on the Investigation of Experience report
 - new economic assumptions effective June 30, 2016
 - new assumptions adopted effective June 30, 2017 based on the Investigation of Experience report

Exhibit 12c UAAL Amortization Detail – Probation Members
 (Dollars in Thousands)

Unfunded Actuarial Liability Amortization Detail							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2008	Initial UAAL	\$ 23,821	\$ 1,608	\$ 4,625	\$ 20,804	5 Years	\$ 4,551
June 30, 2009	(Gain) / Loss	\$ 24,579	\$ 1,659	\$ 4,161	\$ 22,078	6 Years	\$ 4,095
June 30, 2010	(Gain) / Loss	\$ (9,446)	\$ (638)	\$ (1,423)	\$ (8,660)	7 Years	\$ (1,401)
June 30, 2011	(Gain) / Loss	\$ (3,424)	\$ (231)	\$ (466)	\$ (3,189)	8 Years	\$ (459)
June 30, 2012	(Gain) / Loss	\$ 10,265	\$ 693	\$ 1,280	\$ 9,678	9 Years	\$ 1,259
June 30, 2013	(Gain) / Loss	\$ 1,472	\$ 99	\$ 170	\$ 1,401	10 Years	\$ 167
June 30, 2014	(Gain) / Loss	\$ (3,451)	\$ (233)	\$ (371)	\$ (3,314)	11 Years	\$ (365)
June 30, 2015	(Gain) / Loss	\$ (2,404)	\$ (162)	\$ (242)	\$ (2,324)	12 Years	\$ (239)
June 30, 2016	(Gain) / Loss	\$ 11,303	\$ 763	\$ 1,076	\$ 10,991	13 Years	\$ 1,059
June 30, 2017	(Gain) / Loss	\$ 9,609	\$ 649	\$ (13) ³	\$ 10,271	14 Years	\$ 934
Total Amortization Payment July 1, 2018:							\$ 9,601
Projected Payroll July 1, 2018:							\$ 26,613
UAAL as of June 30, 2017:		\$ 62,323	UAAL Contribution Rate (as a % of Payroll) FYB July 1, 2018:				36.08%

Notes:

1. Amortization Payments are based on a fixed schedule that increases by the payroll assumption each year.
2. The calculation of UAAL is as of June 30, 2017; whereas, the contribution rates are effective as of July 1, 2018. The June 30, 2017 UAAL is adjusted to June 30, 2018 based on the July 1, 2017 contribution rates and June 30, 2017 valuation assumptions.
3. (Gain)/Loss includes the following:
 - new assumptions adopted effective June 30, 2011 based on the Investigation of Experience report
 - new economic assumptions effective June 30, 2012
 - new assumptions adopted effective June 30, 2014 based on the Investigation of Experience report
 - new economic assumptions effective June 30, 2016
 - new assumptions adopted effective June 30, 2017 based on the Investigation of Experience report

Exhibit 12d Amortization Detail – County SCA Offsets
 (Dollars in Thousands)

General Members							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2014	Initial CSCA	\$ 36,004	\$ 2,430	\$ 3,868	\$ 34,567	11 Years	\$ 3,807
June 30, 2015	CSCA Addition	\$ 8,237	\$ 556	\$ 830	\$ 7,963	12 Years	\$ 817
June 30, 2016	CSCA Addition	\$ 15,056	\$ 1,016	\$ 1,433	\$ 14,640	13 Years	\$ 1,410
June 30, 2017	CSCA Addition	\$ 23,753	\$ 1,603	\$ -	\$ 25,356	14 Years	\$ 2,306
Total CSCA County Offset Payment July 1, 2018:							\$ 8,340
Projected County Payroll July 1, 2018:							\$ 410,436
CSCA Value as of June 30, 2017:		\$ 83,051		CSCA County Offset (as a % of Payroll) FYB July 1, 2018:			2.03%

Safety Members							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2014	Initial CSCA	\$ 12,201	\$ 824	\$ 1,311	\$ 11,714	11 Years	\$ 1,290
June 30, 2015	CSCA Addition	\$ 2,794	\$ 189	\$ 282	\$ 2,701	12 Years	\$ 277
June 30, 2016	CSCA Addition	\$ 4,567	\$ 308	\$ 435	\$ 4,441	13 Years	\$ 428
June 30, 2017	CSCA Addition	\$ 7,168	\$ 484	\$ -	\$ 7,652	14 Years	\$ 696
Total CSCA County Offset Payment July 1, 2018:							\$ 2,691
Projected County Payroll July 1, 2018:							\$ 66,001
CSCA Value as of June 30, 2017:		\$ 26,729		CSCA County Offset (as a % of Payroll) FYB July 1, 2018:			4.08%

Probation Members							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2014	Initial CSCA	\$ 3,318	\$ 224	\$ 356	\$ 3,186	11 Years	\$ 351
June 30, 2015	CSCA Addition	\$ 796	\$ 54	\$ 80	\$ 769	12 Years	\$ 79
June 30, 2016	CSCA Addition	\$ 1,593	\$ 108	\$ 152	\$ 1,549	13 Years	\$ 149
June 30, 2017	CSCA Addition	\$ 2,836	\$ 191	\$ -	\$ 3,027	14 Years	\$ 275
Total CSCA County Offset Payment July 1, 2018:							\$ 854
Projected County Payroll July 1, 2018:							\$ 26,613
CSCA Value as of June 30, 2017:		\$ 8,543		CSCA County Offset (as a % of Payroll) FYB July 1, 2018:			3.21%

Notes:

1. CSCA Offsets are based on a fixed schedule that increases by the payroll assumption each year.
2. The calculation of CSCA amounts are as of June 30, 2017; whereas, the contribution rates are effective as of July 1, 2018. The June 30, 2017 CSCA is adjusted to June 30, 2018 based on the July 1, 2017 contribution rates and June 30, 2017 valuation assumptions.

Exhibit 12e Amortization Detail – District SCA Offsets
 (Dollars in Thousands)

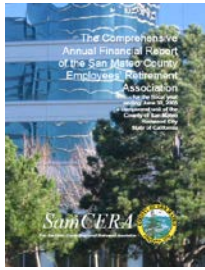
SMCM&VCD Members							
Date Established	Description	Balance as of June 30, 2017	Interest on Balance	Amortization Payment on June 30, 2018	Balance as of June 30, 2018	Remaining Period as of June 30, 2018	July 1, 2018 Amortization Payment
June 30, 2016	Initial CSCA	\$ 1,701	\$ 115	\$ 162	\$ 1,654	13 Years	\$ 159
June 30, 2017	DSCA Addition	\$ 253	\$ 17	\$ -	\$ 270	14 Years	\$ 25
Total DSCA Offset Payment July 1, 2018:							\$ 184
Projected District Payroll July 1, 2018:							\$ 1,801
DSCA Value as of June 30, 2017:		<u>\$ 1,954</u>	DSCA District Offset (as a % of Payroll) FYB July 1, 2018:				<u>10.21%</u>

Notes:

1. DSCA Offsets are based on a fixed schedule that increases by the payroll assumption each year.
2. The calculation of DSCA amounts are as of June 30, 2017; whereas, the contribution rates are effective as of July 1, 2018. The June 30, 2017 DSCA is adjusted to June 30, 2018 based on the July 1, 2017 contribution rates and June 30, 2017 valuation assumptions.

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Section 7 Information for Comprehensive Annual Financial Report (CAFR)



The Governmental Accounting Standards Board (GASB) Statement No. 67 sets standards for defined benefit pension plan reporting and disclosures. The reporting requirements for GASB 67 include certain supplementary information that must be added to the financial statements. GASB Statement No. 68 specifies financial reporting for pension accounting by state and local governmental employers. We will provide information required for GASB 67 and GASB 68 in a separate report.

We are providing several exhibits in this report for consistency with prior reports and as supporting information for inclusion in SamCERA's CAFR.

- Exhibit 13 – Schedule of Funding Progress
- Exhibit 14 – Solvency Test
- Exhibit 15 – History of Employer Contribution Rates
- Exhibit 16 – Actuarial Analysis of Financial Experience
- Exhibit 17 – Asset and Liability Volatility Ratios
- Exhibit 18 – Summary of Significant Actuarial Statistics and Measures
- Exhibit 19 – Summary of SamCERA Membership
For more detailed information on the valuation data, see Appendix C.
- Exhibit 20 – Summary of Active Member Valuation Data
- Exhibit 21 – Summary of Demographic Activity of Retirees and Beneficiaries
- Exhibit 22 – Average Salary and Active Counts by Employer
- Exhibit 23 – Summary of Retired and Inactive Benefits

Please note that all liability calculations shown in this Section 7 are based on an investment return assumption of 6.75%. GASB 67 and 68 calculations as of June 30, 2017 will use an investment return assumption of 6.92%, as the investment return for GASB 67 and 68 is required to be gross of expected administrative expenses.

Additional CAAP Disclosure

The California Actuarial Advisory Panel (CAAP) has adopted a set of model disclosure elements for actuarial valuation reports of public retirement systems in California. Most of these elements are included in other areas of this report. The remaining CAAP-recommended disclosures are as follows:

Disclosure Element	Description	Value
Gross Normal Cost \$	Normal Cost allocated to valuation year, paid at mid-year.	\$ 120,834,571
Statutory Contribution \$	Expected Statutory Contribution paid at mid-year.	\$ 182,726,711
Asset Smoothing Ratio	Actuarial Value of Assets divided by Market Value of Assets	98.5%
Asset Volatility Ratio	Market Value of Assets divided by Payroll	7.8
Liability Volatility Ratio	Actuarial Accrued Liability divided by Payroll	9.1

A history of the Asset and Liability Volatility Ratios is included in Exhibit 17.

Exhibit 13 Schedule of Funding Progress
 (Dollars in Thousands)

<u>Actuarial Valuation Date</u>	<u>(a) Actuarial Value of Valuation Assets</u>	<u>(b) Actuarial Accrued Liabilities</u>	<u>(b-a) Unfunded Actuarial Accrued Liabilities (UAAL)</u>	<u>(a/b) Funded Ratio</u>	<u>(c) Covered Payroll</u>	<u>[(b-a)/c] UAAL as a Percentage of Covered Payroll</u>
June 30, 2008	\$ 2,218,937	\$ 2,806,222	\$ 587,285	79.1%	\$ 411,294	142.79%
June 30, 2009	1,909,679	2,987,712	1,078,033	63.9%	433,668	248.58%
June 30, 2010	2,179,076	3,098,453	919,377	70.3%	434,295	211.69%
June 30, 2011	2,405,140	3,246,727	841,587	74.1%	427,041	197.07%
June 30, 2012	2,480,271	3,442,553	926,282	72.0%	418,916	229.71%
June 30, 2013	2,618,639	3,572,750	954,111	73.3%	404,361	235.96%
June 30, 2014	2,993,187	3,797,042	803,855	78.8%	416,274	193.11%
June 30, 2015	3,343,550	4,045,786	702,236	82.6%	439,018	159.96%
June 30, 2016	3,624,726	4,362,296	737,570	83.1%	472,385	156.14%
June 30, 2017	3,976,717	4,719,850	743,133	84.3%	510,132	145.67%

Note: The Covered Payroll amounts are consistent with the GASB 67/68 Disclosure report.

Exhibit 14 Solvency Test
 (Dollars in Thousands)

Actuarial Valuation Date	Valuation Assets	Actuarial Accrued Liabilities for			Portion of Actuarial Accrued Liabilities Covered by Assets		
		Active Member Contributions (A)	Retirees and Beneficiaries ⁽¹⁾ (B)	Active Members (Employer Financed Portion) (C)	(A)	(B)	(C)
June 30, 2008	\$ 2,218,937	\$ 385,300	\$ 1,550,875	\$ 870,047	100%	100%	32%
June 30, 2009	1,909,679	412,147	1,670,547	905,018	100%	90%	0%
June 30, 2010	2,179,076	449,355	1,745,146	903,952	100%	99%	0%
June 30, 2011	2,405,140	485,126	1,866,219	895,382	100%	100%	6%
June 30, 2012	2,480,271	498,569	2,022,791	921,193	100%	98%	0%
June 30, 2013	2,618,639	534,276	2,157,590	880,884	100%	97%	0%
June 30, 2014	2,993,187	584,080	2,285,328	927,634	100%	100%	13%
June 30, 2015	3,343,550	628,287	2,451,544	965,955	100%	100%	27%
June 30, 2016	3,624,726	679,246	2,635,409	1,047,641	100%	100%	30%
June 30, 2017	3,976,717	735,102	2,811,651	1,173,097	100%	100%	37%

1. Includes inactive members.

Exhibit 15 History of Employer Statutory Contribution Rates

Statutory Contribution Rates									
Valuation Year	General Members (County & Courts)			General Members (Nurses & UAPD)			General Members (SMCM&VCD)		
	Normal	UAAL	Total	Normal	UAAL	Total	Normal	UAAL	Total
2008	10.16%	9.81%	19.97%	Same as County General			8.55%	8.04%	16.59%
2009	10.11%	18.40%	28.51%	Same as County General			8.25%	15.09%	23.34%
2010	10.05%	16.35%	26.40%	Same as County General			11.70%	16.35%	28.05%
2011	9.71%	16.41%	26.12%	8.70%	16.41%	25.11%	11.97%	16.41%	28.38%
2012	9.98%	20.17%	30.15%	8.96%	20.17%	29.13%	11.68%	20.17%	31.85%
2013	9.74%	22.35%	32.09%	8.92%	22.35%	31.27%	11.70%	22.35%	34.05%
2014	10.12%	20.27%	30.39%	9.14%	20.21%	29.35%	11.72%	21.16%	32.88%

Statutory Contribution Rates									
Valuation Year	General Members (County)			General Members (Courts)			General Members (SMCM&VCD)		
	Normal	UAAL	Total	Normal	UAAL	Total	Normal	UAAL	Total
2015	8.67%	18.37%	27.04%	9.04%	19.54%	28.58%	11.75%	19.54%	31.29%
2016	8.91%	19.81%	28.72%	9.09%	21.30%	30.39%	12.02%	12.50%	24.52%
2017	9.58%	20.55%	30.13%	9.65%	22.58%	32.23%	12.32%	12.37%	24.69%

Statutory Contribution Rates									
Valuation Year	Safety Member			Probation Members (excluding Managers)			Probation Members (Managers)		
	Normal	UAAL	Total	Normal	UAAL	Total	Normal	UAAL	Total
2008	19.32%	27.31%	46.63%	20.05%	12.81%	32.86%	Same as Probation (ex Managers)		
2009	19.21%	51.83%	71.04%	19.92%	23.84%	43.76%	Same as Probation (ex Managers)		
2010	19.01%	44.50%	63.51%	19.85%	21.62%	41.47%	Same as Probation (ex Managers)		
2011	18.87%	41.75%	60.62%	19.50%	22.30%	41.80%	Same as Probation (ex Managers)		
2012	19.05%	48.51%	67.56%	19.99%	26.71%	46.70%	Same as Probation (ex Managers)		
2013	18.51%	50.33%	68.84%	18.33%	29.32%	47.65%	17.85%	29.32%	47.17%
2014	18.99%	46.48%	65.47%	18.92%	28.09%	47.01%	18.79%	28.09%	46.88%
2015	15.14%	43.58%	58.72%	15.31%	26.77%	42.08%	17.23%	26.77%	44.00%
2016	16.31%	44.25%	60.56%	15.94%	31.72%	47.66%	Same as Probation (ex Managers)		
2017	17.28%	45.57%	62.85%	17.42%	32.87%	50.29%	Same as Probation (ex Managers)		

Notes:

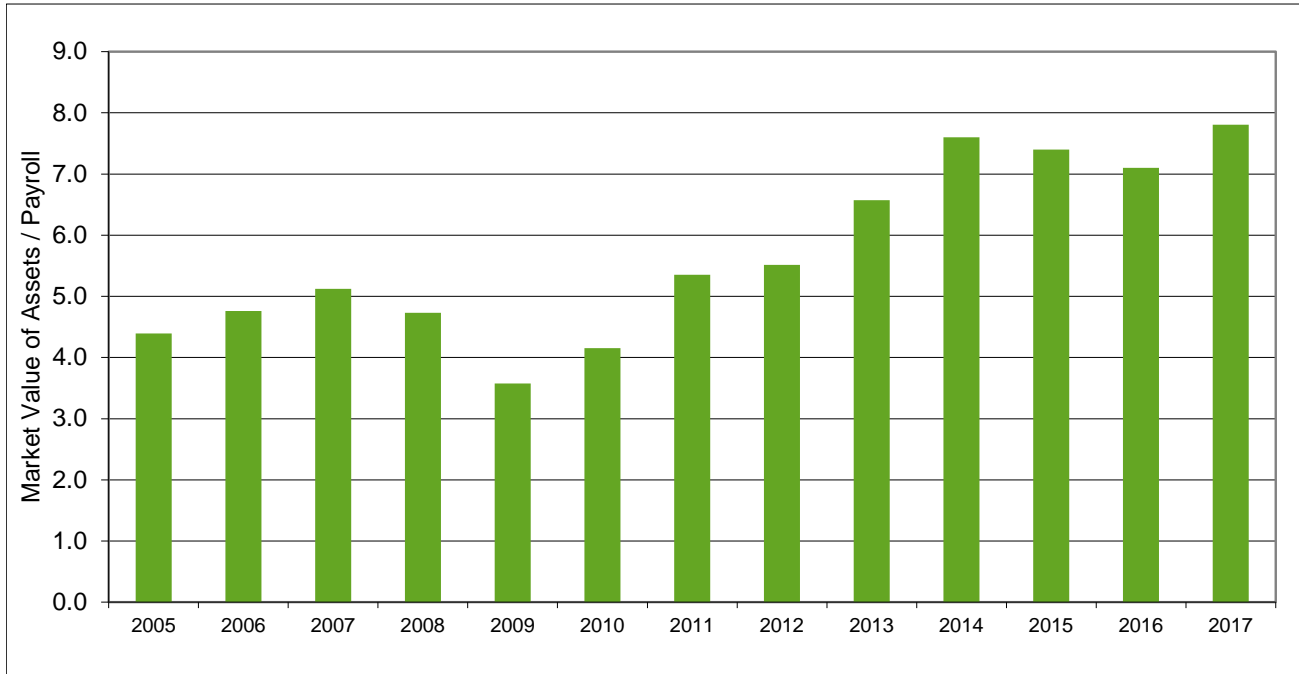
1. Contribution rates shown are those calculated in the corresponding actuarial valuation. In some cases, actual contributions were higher.
2. Beginning with the 2010 actuarial valuation, the Mosquito and Vector Control District adopted the same benefit formula and member contribution rates as Plan 1, 2 and 4 General County members (excluding cost sharing and COLA sharing on member rates).
3. Beginning with the 2011 actuarial valuation, Plan 1, 2, and 4 members of the CNA contribute 25% of the cost of COLA, in addition to current member rates and cost sharing.
4. Beginning with the 2012 actuarial valuation, Plan 1, 2, and 4 Probation members (excluding Managers) contribute 25% of the cost of COLA, in addition to current member rates and cost sharing.
5. Beginning with the 2013 actuarial valuation, Plan 1, 2, and 4 members of the UAPD contribute 25% of the cost of COLA, in addition to current member rates and cost sharing. In 2011 and 2012 these members contributed the same as County General members.
6. Beginning with the 2015 actuarial valuation, Plan 1, 2, and 4 members of the UAPD and the CNA, and Probation members (Managers) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing.
7. Effective with the first pay period after June 30, 2016 all members (except those with benefits negotiated under Court Interpreters and Board of Supervisors bargaining units, and SMCM&VCD members) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing. Additionally, pick-contributions are discontinued for members with benefits negotiated under the PDA bargaining unit.
8. Effective October 2016, all members (except those with benefits negotiated under Board of Supervisors bargaining unit, and SMCM&VCD members) contribute 50% of the cost of COLA, in addition to current member rates and cost sharing. This is reflected in 2016 values.

Exhibit 16 Actuarial Analysis of Financial Experience

Summary of (Gains) / Losses	Change In Liability				
	2017	2016	2015	2014	2013
Unfunded Liability as of July 1	\$ 737,570,000	\$ 702,236,000	\$ 803,855,000	\$ 954,111,000	\$ 962,282,000
Expected Change in UAAL	(110,404,000)	(96,454,000)	(76,018,000)	(88,525,000)	(34,535,000)
Salary (Gain) / Loss	27,685,000	24,707,000	39,129,000	(15,884,000)	(59,411,000)
Fewer Withdrawals than expected	0	0	0	0	0
Retiree COLA more / (less) than expected	7,050,000	(6,275,000)	3,648,000	(15,603,000)	(8,606,000)
Asset (Gain) / Loss	(28,286,000)	27,821,000	(74,068,000)	(88,035,000)	93,999,000
Change due to Assumption Changes	133,221,000	89,364,000	0	59,345,000	0
Miscellaneous Experience	(23,703,000)	(3,829,000)	5,690,000	(1,554,000)	382,000
Change Due to New Formula					
Unfunded Liability as of June 30	\$ 743,133,000	\$ 737,570,000	\$ 702,236,000	\$ 803,855,000	\$ 954,111,000

Exhibit 17 Asset and Liability Volatility Ratios

Asset Volatility Ratios



Liability Volatility Ratios

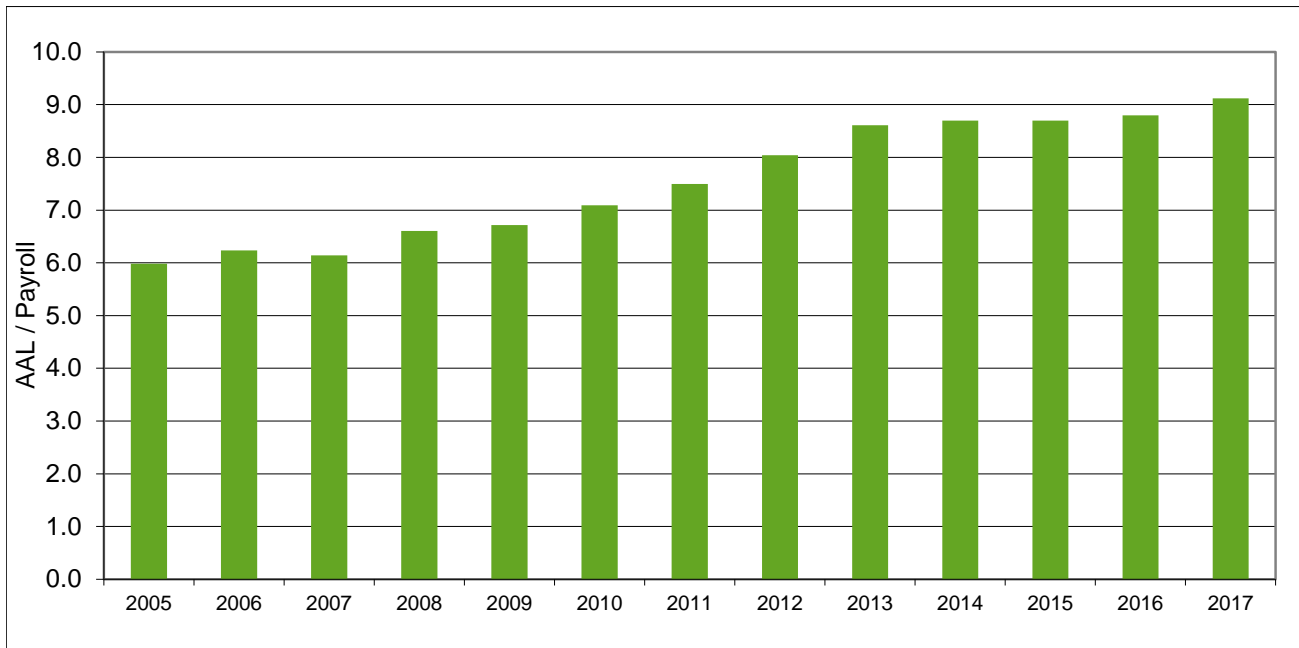


Exhibit 18 Summary of Significant Actuarial Statistics and Measures

	June 30th of		Relative
	2017	2016	Change
1. Active Members			
Number of Members	5,337	5,187	2.9 %
Average Age	44.2	45.4	(2.6)%
Average Credited Service	10.5	10.8	(2.8)%
Covered Payroll (\$thousands)	\$ 510,132	\$ 472,385	8.0 %
Average Monthly Salary	\$ 8,154	\$ 7,933	2.8 %
2. Retired Members			
Number of Members			
Service Retirement	3,869	3,749	3.2 %
Disability Retirement	469	454	3.3 %
Beneficiaries	618	545	13.4 %
Average Age	71.2	71.0	0.3 %
Actual Retiree Benefits Paid (\$thousands)	\$ 190,364	\$ 179,497	6.1 %
Average Monthly Pension	\$ 3,347	\$ 3,268	2.4 %
3. Number of Inactive Members	1,487	1,486	0.1 %
4. Assets			
Market Value of Fund (\$thousands)	\$ 4,038,702	\$ 3,541,388	14.0 %
Return on Market Value	12.6%	0.7%	
Valuation Assets (\$thousands)	\$ 3,976,717	\$ 3,624,726	9.7 %
Return on Valuation Assets	7.8%	6.4%	
5. Liability Values (\$thousands)			
Actuarial Accrued Liability	\$ 4,719,850	\$ 4,362,296	8.2 %
Unfunded Actuarial Accrued Liability	\$ 743,133	\$ 737,570	0.8%
Deferred Asset (Gains) / Losses	\$ (21,816)	\$ 119,951	
6. Funded Ratio (based on valuation assets)	84.3%	83.1%	1.4 %

Exhibit 19 Summary of SamCERA Membership

Plan	One	Two	Three	Four	Five	Six	Seven	Total
Retirees and beneficiaries currently receiving benefits:								
General	1,603	1,913	130	675	1	-	-	4,322
Safety	276	194	-	59	-	-	-	529
Probation	28	54	-	23	-	-	-	105
Subtotal	<u>1,907</u>	<u>2,161</u>	<u>130</u>	<u>757</u>	<u>1</u>	<u>-</u>	<u>-</u>	<u>4,956</u>
Inactive employees entitled to but not currently receiving benefits (Deferred):								
General	10	324	89	725	50	-	152	1,350
Safety	1	22	-	45	5	-	4	77
Probation	-	19	-	38	1	-	2	60
Subtotal	<u>11</u>	<u>365</u>	<u>89</u>	<u>808</u>	<u>56</u>	<u>-</u>	<u>158</u>	<u>1,487</u>
Current employees:								
Vested:								
General	11	658	70	2,076	88	-	13	2,916
Safety	1	64	-	249	12	-	1	327
Probation	1	38	-	189	2	-	-	230
Non-Vested:								
General	-	-	6	33	191	-	1,414	1,644
Safety	-	-	-	1	47	-	128	176
Probation	-	-	-	-	5	1	38	44
Subtotal	<u>13</u>	<u>760</u>	<u>76</u>	<u>2,548</u>	<u>345</u>	<u>1</u>	<u>1,594</u>	<u>5,337</u>
Total SamCERA Membership	1,931	3,286	295	4,113	402	1	1,752	11,780

Exhibit 20 Summary of Active Member Valuation Data

Valuation Date		Members	Annual Salary	Average Annual Salary	% Change Average Salary
2008	General	4,743	\$353,518,525	\$74,535	2.6%
	Safety	432	46,326,906	107,238	4.7%
	Probation	325	24,741,003	76,126	2.8%
	Total	5,500	424,586,434	77,198	2.8%
2009	General	4,777	370,760,830	77,614	4.1%
	Safety	436	48,120,081	110,367	2.9%
	Probation	330	26,270,802	79,608	4.6%
	Total	5,543	445,151,713	80,309	4.0%
2010	General	4,609	363,305,740	78,825	1.6%
	Safety	425	48,576,912	114,299	3.6%
	Probation	313	25,247,595	80,663	1.3%
	Total	5,347	437,130,248	81,752	1.8%
2011	General	4,494	355,876,715	79,189	0.5%
	Safety	446	52,073,940	116,758	2.2%
	Probation	305	24,591,392	80,628	0.0%
	Total	5,245	432,542,046	82,468	0.9%
2012	General	4,361	351,965,689	80,708	1.9%
	Safety	435	51,129,267	117,539	0.7%
	Probation	299	24,554,583	82,122	1.9%
	Total	5,095	427,649,539	83,935	1.8%
2013	General	4,173	338,595,633	81,140	2.5%
	Safety	452	52,233,510	115,561	-1.0%
	Probation	292	23,722,165	81,240	0.8%
	Total	4,917	414,551,308	84,310	2.2%
2014	General	4,272	352,918,558	82,612	1.8%
	Safety	452	52,974,475	117,200	1.4%
	Probation	280	23,514,343	83,980	3.4%
	Total	5,004	429,407,375	85,813	1.8%
2015	General	4,334	382,303,295	88,210	6.8%
	Safety	479	55,917,864	116,739	-0.4%
	Probation	282	24,418,977	86,592	3.1%
	Total	5,095	462,640,136	90,803	5.8%
2016	General	4,421	408,191,518	92,330	4.7%
	Safety	495	61,564,028	124,372	6.5%
	Probation	271	24,034,819	88,689	2.4%
	Total	5,187	493,790,365	95,198	4.8%
2017	General	4,560	430,613,886	94,433	2.3%
	Safety	503	65,105,116	129,434	4.1%
	Probation	274	26,503,623	96,729	9.1%
	Total	5,337	522,222,625	97,849	2.8%

Exhibit 21 Summary of Demographic Activity of Retirees and Beneficiaries

Year Ended	Added to Rolls ⁽¹⁾		Removed from Rolls		Rolls end of year		% Increase in Payroll	Average Monthly Allowances
	No.	Annual Allowances in Thousands	No.	Annual Allowances in Thousands	No.	Total Retiree Payroll in Thousands		
June 30, 2008	218	N/A	70	N/A	3,842	\$ 109,616	11.0	\$ 2,378
June 30, 2009	159	\$ 12,717	66	\$ 3,281	3,935	119,052	8.6	2,521
June 30, 2010	163	9,076	96	3,240	4,002	124,888	4.9	2,601
June 30, 2011 ⁽²⁾	209	12,703	64	2,916	4,147	134,675	7.8	2,706
June 30, 2012	218	14,379	90	4,209	4,275	144,845	7.6	2,823
June 30, 2013	186	13,024	63	3,095	4,398	154,774	6.9	2,933
June 30, 2014	203	12,474	83	3,479	4,518	163,769	5.8	3,021
June 30, 2015	213	16,290	93	4,179	4,638	175,880	7.4	3,160
June 30, 2016	233	15,347	123	5,030	4,748	186,197	5.9	3,268
June 30, 2017	310	16,738	102	3,867	4,956	199,068	6.9	3,347

1. Amount added to rolls includes COLAs granted in year to continuing retirees and beneficiaries.

2. Revised from June 30, 2011 valuation for corrections.

Exhibit 22 Average Salary and Active Counts by Employer

	2017	2016	2015	2014	2013
General Plan 1	\$11,305	\$9,945	\$9,235	\$8,617	\$8,104
General Plan 2	8,994	8,636	8,186	7,584	7,355
General Plan 3	7,484	7,173	6,747	6,300	6,254
General Plan 4	8,134	7,807	7,386	6,873	6,662
General Plan 5	8,980	8,485	7,735	6,912	6,418
General Plan 7	6,737	6,714	6,315	5,721	5,433
General Plan Total	7,869	7,694	7,351	6,884	6,762
Safety Plan 1	14,434	15,810	14,712	14,091	13,185
Safety Plan 2	13,528	12,505	11,545	11,191	10,935
Safety Plan 4	11,381	10,729	9,919	9,581	9,402
Safety Plan 5	10,544	9,940	9,145	8,958	8,699
Safety Plan 6	0	16,793	16,010	14,381	12,374
Safety Plan 7	8,356	7,538	6,701	7,011	6,695
Safety Plan Total	10,786	10,364	9,728	9,767	9,630
Probation Plan 1	7,722	7,261	7,038	6,874	6,618
Probation Plan 2	9,069	8,349	8,012	7,699	7,445
Probation Plan 4	8,270	7,454	7,267	6,922	6,622
Probation Plan 5	7,612	6,429	6,106	5,916	5,242
Probation Plan 6	7,347	6,259	5,739	5,216	4,808
Probation Plan 7	6,121	5,962	5,684	5,807	7,742
Probation Plan Total	8,061	7,391	7,216	6,998	6,770
Grand Total	8,154	7,933	7,567	7,151	7,026

Participating Employers and Active Members

	2017	2016	2015	2014	2013
<i>County of San Mateo</i>					
General Members	4,303	4,170	4,092	4,014	3,906
Safety Members	503	495	479	452	452
Probation Members	274	271	282	280	292
Total	5,080	4,936	4,853	4,746	4,650
<i>San Mateo County Mosquito and Vector Control District</i>					
General Members Total	20	20	20	19	18
<i>Courts</i>					
General Members Total	237	231	222	239	249
Total Active Membership	5,337	5,187	5,095	5,004	4,917

Exhibit 23 Summary of Retired and Inactive Benefits

Retired Members	2017	2016	2015	2014	2013
Service Retirement					
Number	3,869	3,749	3,628	3,525	3,446
Annual Allowance					
Basic Only	\$ 122,893,000	\$ 119,212,000	\$ 112,557,000	\$ 105,556,000	\$ 100,411,000
COLA	33,352,000	32,949,000	30,835,000	28,027,000	26,594,000
Total	156,245,000	152,161,000	143,392,000	133,583,000	127,005,000
Average Monthly Payment	3,527	3,382	3,294	3,158	3,071
Disability Retirement					
Number	469	454	442	428	393
Annual Allowance					
Basic Only	\$ 14,634,000	\$ 14,040,000	\$ 13,303,000	\$ 12,508,000	\$ 10,733,000
COLA	4,657,000	4,590,000	4,208,000	3,800,000	3,564,000
Total	19,291,000	18,630,000	17,511,000	16,308,000	14,297,000
Average Monthly Payment	3,469	3,420	3,301	3,175	3,032
Beneficiaries					
Number	618	545	568	565	559
Annual Allowance					
Basic Only	\$ 8,669,000	\$ 8,944,000	\$ 8,610,000	\$ 7,986,000	\$ 7,668,000
COLA	6,245,000	6,462,000	6,367,000	5,892,000	5,804,000
Total	14,914,000	15,406,000	14,977,000	13,878,000	13,472,000
Average Monthly Payment	2,128	2,356	2,197	2,047	2,008
Total Retired Members					
Number	4,956	4,748	4,638	4,518	4,398
Annual Allowance					
Basic Only	\$ 146,196,000	\$ 142,196,000	\$ 134,470,000	\$ 126,050,000	\$ 118,812,000
COLA	44,254,000	44,001,000	41,410,000	37,719,000	35,962,000
Total	190,450,000	186,197,000	175,880,000	163,769,000	154,774,000
Average Monthly Payment	3,347	3,268	3,160	3,021	2,933
Inactive Members	1,487	1,486	1,384	1,304	1,306

Note: Beginning in 2017, the Annual Allowance amounts shown on this exhibit are provided by SamCERA and reflect actual benefit payments made during the year. The Number of Retired Members and Average Monthly Payment amounts are calculated by Milliman as of the valuation date.

Appendix A Actuarial Procedures and Assumptions



The actuarial procedures and assumptions to be used in the valuation are described in this section. The assumptions were reviewed and changed effective June 30, 2017 as a result of the 2017 Investigation of Experience Study. New assumptions were adopted for use in the 2017 valuation.

The actuarial assumptions used in the valuations are intended to estimate the future experience of the members of SamCERA and of SamCERA itself in areas that affect the projected benefit flow and anticipated investment earnings. Any variations in future experience from that expected from these assumptions will result in corresponding changes in the estimated costs of SamCERA's benefits.

Table A-1 summarizes the assumptions. The mortality rates are taken from the sources listed.

Tables A-2 and A-3 show how members are expected to leave retired status due to death.

Table A-4 presents the probability of refund of contributions upon termination of employment while vested.

Table A-5 presents the expected annual percentage increase in salaries.

Tables A-6 to A-11 present the probabilities a member will leave the system for various reasons.

NOTE: Assumptions for Probation members are assumed to be the same as Safety members unless otherwise noted.

Actuarial Cost Method

The actuarial valuation is prepared using the entry age actuarial cost method (CERL 31453.5). Under the principles of this method, the actuarial present value of the projected benefits of each individual included in the valuation is allocated as a level percentage of the individual's projected compensation between entry age and assumed exit (until maximum retirement age).

The portion of this actuarial present value allocated to a valuation year is called the normal cost. The portion of this actuarial present value not provided for at a valuation date by the sum of: (a) the actuarial value of the assets and (b) the actuarial present value of future normal costs is called the Unfunded Actuarial Accrued Liability (UAAL). The UAAL as of June 30, 2008 is amortized as a level percentage of the projected salaries of present and future members of SamCERA over the remaining period from the valuation date to June 30, 2023. This is commonly referred to as a "closed amortization method". Actuarial gains and losses after the June 30, 2008 valuation are amortized over new closed 15-year periods from their respective valuation dates.

Beginning with the June 30, 2010 actuarial valuation, the San Mateo County Mosquito and Vector Control District adopted the same "enhanced" benefit formula that applies to Plan 1, 2, and 4 County General members and the same member rates currently being paid by County General members from those plans. However, because the Mosquito and Vector Control District does not participate in cost sharing on the member rates, it will have a separate normal cost rate and expected member contribution rate from the County General group.

The normal cost rate is calculated separately for County General and for the Mosquito and Vector Control District. These normal cost rates will differ from each other for two reasons:

- 1) The demographics within the two groups will vary (specifically, the groups will have different average entry ages), and
- 2) The expected refund of contributions, which is a component of the normal cost, will differ between the County and the Mosquito and Vector Control District, since the District does not participate in cost sharing on the member rates.

Records and Data

The data used in this valuation consist of financial information and the age, service, and income records for active and inactive members and their survivors. All of the data were supplied by SamCERA and are accepted for valuation purposes without audit.

Replacement of Terminated Members

The ages and relative salaries at entry of future members are assumed to follow a new entrant distribution based on the pattern of current members. Under this assumption, the normal cost rates for active members will remain fairly stable in future years unless there are changes in the governing law, the actuarial assumptions, or the pattern of the new entrants.

Growth in Membership	For benefit determination purposes, no growth in the membership of SamCERA is assumed. For funding purposes, if amortization is required, the total payroll of covered members is assumed to grow due to the combined effects of future wage increases of current active members and the replacement of the current active members by new employees. No growth in the total number of active members is assumed.
Internal Revenue Code Section 415 Limit	The Internal Revenue Code Section 415 maximum benefit limitations are not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement, except for Plan 7 members which cannot receive benefits in excess of the 415 limit. For Plan 7 members, the benefit levels, combined with the limited compensation are low enough that it is unlikely the 415 limit would apply.
Internal Revenue Code Section 401(a)(17)	The Internal Revenue Code Section 401(a)(17) maximum compensation limitation is not reflected in the valuation for funding purposes. Any limitation is reflected in a member's benefit after retirement.
Government Code Section 7522.10	The maximum compensation limit under Government Code 7522.10 is reflected in the valuation for funding purposes. Future annual increases to the limit are assumed to occur based on the CPI inflation assumption.
Employer Contributions	The statutory employer contribution rate is set by the Retirement Board based on actuarial valuations.
Member Contributions	<p>The member contribution rates vary by entry age (except for Plan 7) and are described in the law. Code references are shown in Appendix B of the valuation report. The methods and assumptions used are detailed later in this section.</p> <p>The individual member rates by entry age, plan, and class are illustrated in Appendix D of the valuation report.</p>
Valuation of Assets	The assets are valued using a modified five-year smoothed method based on the difference between the expected market value and the actual market value of the assets as of the end of each six-month period (12/31 and 6/30). The expected market value is the prior period's market value increased with the net increase in the cash flow of funds, all increased with interest during the period at the expected investment return rate assumption.
Investment Earnings and Expenses	The future investment earnings of the assets of SamCERA are assumed to accrue at an annual rate of 6.75% compounded annually, net of both investment and administrative expenses. This rate was adopted effective June 30, 2017.

Postretirement Benefit Increases

Postretirement increases are described in Appendix B. Assumed increases for valuation purposes are:

	General	Safety	Probation
Plan 1	2.50%	2.50%	2.50%
Plan 2	2.40%	2.40%	2.40%
Plan 3	0.00%	N/A	N/A
Plans 4, 5, and 7	1.90%	1.90%	1.90%
Plan 6	N/A	1.90%	1.90%

Assumed Plan 1 General and Safety COLAs are set at the inflation (CPI) assumption of 2.50% per year. Since Plan 2 does not have a COLA bank, it is expected that increases will be limited in some years. This reduces the overall expected rate and is reflected in a lower assumed increase.

Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 6.75% compounded semi-annually (3.375% per six-month period) for an annualized rate of 6.86%. This rate was adopted effective June 30, 2017 for valuation purposes, although the change in the member crediting rate is not effective until July 1, 2018.

Future Salaries

The rates of annual salary increase assumed for the purpose of the valuation are illustrated in Table A-5. In addition to increases in salary due to promotions and longevity, this scale includes an assumed 3.00% per annum rate of increase in the general wage level of the membership.

Increases are assumed to occur mid-year. The mid-year timing reflects that salary increases occur throughout the year, or on average mid-year.

SamCERA supplied two types of compensation data:

- 1) pensionable pay from the most recent bi-weekly pay period; and
- 2) pensionable pay from the prior year. We annualized bi-weekly pay (by multiplying by 26) and then used the greater of the two amounts.

Social Security Wage Base

Plan 3 members have their benefits offset by an assumed Social Security Benefit. For valuation funding purposes, we need to project the Social Security Benefit. We assume the current Social Security provisions will continue and the annual Wage Base will increase at the rate of 2.50% per year. Note, statutory provisions describe how to compute a member's offset amount at time of termination or retirement.

Retirement

The retirement rates vary by age and are shown by plan in Tables A-6 through A-11.

All General members who attain or who have attained age 75 and all Safety members who have attained age 65 are assumed to retire immediately. Additionally, if a member's benefit is equal to or greater than the 100% of compensation limit, the member is assumed to retire immediately. For purposes of the valuation, immediate retirement is assumed at:

- Age 62 with 38 years of service (General, except Plan 3, Plan 5, and Plan 7)
- Age 65 with 41 years of service (General Plan 5)
- Age 67 with 40 years of service (General Plan 7)
- Any age with 33 years of service (Safety & Probation, except Plans 5, 6, and 7)
- Age 55 with 33 years of service (Safety & Probation Plan 5)
- Age 55 with 38 years of service (Safety & Probation Plan 6)
- Age 57 with 38 years of service (Safety & Probation Plan 7)

Inactive members are assumed to retire at the later of current age and:

- Age 58 (General Members, except Plan 3 and Plan 7)
- Age 65 (General Plan 3 Members)
- Age 62 (General Plan 7 Members)
- Age 50 (Probation and Safety members)

The retirement rates were adopted effective June 30, 2017.

Disability

The rates of disability used in the valuation are illustrated in Tables A-6 through A-11.

The disability rates were adopted effective June 30, 2017.

Mortality – Active Members

The rates of mortality used in the valuation are described in Table A-1 and illustrated in Tables A-6 through A-11.

These mortality rates were adopted effective June 30, 2017.

Other Employment Terminations

Tables A-6 to A-11 show, for all ages, the rates assumed in this valuation for future termination from active service other than for death, disability or retirement. These rates do not apply to members eligible for service retirement.

Terminating employees may withdraw their contributions immediately upon termination of employment and forfeit the right to further benefits, or they may leave their contributions with SamCERA. Former contributing members whose contributions are on deposit may later elect to receive a refund, may return to work or may remain inactive until becoming eligible to receive a retirement benefit under either SamCERA or a reciprocal retirement system. All terminating members who are not eligible for vested benefits are assumed to withdraw their contributions immediately.

The rates of termination were adopted effective June 30, 2017.

Probability of Refund	<p>Table A-4 gives the assumed probabilities that vested members will withdraw their contributions and elect a refund immediately upon termination and the probability the remaining members will elect a deferred retirement benefit. For Plan 3, 100% of members are assumed to elect a vested benefit. All non-vested members are assumed to elect a refund and withdraw their contributions.</p> <p>The probability of refund assumptions were adopted effective June 30, 2017.</p>
Mortality – Disabled Members	<p>The rates of mortality used in the valuation are described in Table A-1 and illustrated in Table A-3.</p> <p>These mortality rates were adopted effective June 30, 2017.</p>
Mortality – Other than Disabled Members, and Beneficiaries	<p>The rates of mortality for service retired members and members after termination that are used in the valuation are described in Table A-1 and illustrated in Table A-2.</p> <p>Beneficiaries of retired and disabled members are assumed to be of the opposite sex and have the same mortality as service retired General members.</p> <p>These mortality rates were adopted effective June 30, 2017.</p>
Probability of Eligible Survivor	<p>For members not currently in pay status, 75% of all males and 55% of all females are assumed to have eligible survivors (spouses or qualified domestic partners). Survivors are assumed to be three years younger than male members and two years older than female members. Survivors are assumed to be of the opposite sex as the member. There is no explicit assumption for children's benefits. We believe the survivor benefits based on this assumption are sufficient to cover children's benefits as they occur.</p>
Valuation of Current Inactive Members	<p>Current non-vested members who have terminated active employment are assumed to take a refund of their contributions at the valuation date.</p> <p>Current vested members who have terminated active employment are assumed to keep their accounts with SamCERA and retire as specified in this section. An adjustment for these individuals such that the greater of the Final Average Compensation and annualized bi-weekly pay limited to two times the Final Average Compensation is used.</p>
Reciprocal Benefits	<p>Thirty percent of future deferred vested General members and 40% of future deferred vested Safety members are assumed to immediately join a reciprocal agency. For future reciprocal members, salaries are assumed to increase at the same rate as if they had remained in active employment with SamCERA. For current deferred vested members, eligibility is based on the data supplied by SamCERA and future salaries are assumed to increase at 3.52% annually for General members and 3.77% annually for Safety members.</p> <p>This assumption was adopted effective June 30, 2017</p>
Part-Time Employees	<p>For valuation purposes, part-time employees are assumed to continue working the same number of hours in the future.</p>

**Adjustment to Plan 3
Normal Cost Rate**

Plan 3 members are eligible to transfer to Plan 2 or Plan 4 (depending on entry date) after five years of service. We have adjusted the Plan 3 Normal Cost to account for this. The adjustment is equal to 50% of the difference between the unadjusted Plan 3 Normal Cost rate and the Plan 4 Normal Cost rate.

**Member Contribution
Rate Assumptions**

The following assumptions summarize the procedures used to compute member contribution rates based on entry age:

In general, the member rate is determined by the present value of the future benefit (PVFB) payable at retirement age, divided by the present value of all future salaries payable between age at entry and retirement age. For these purposes, per the CERL:

- A. The annuity factor used for General members is based on a 33% / 67% blend of the male and female annuity factors using current valuation assumptions and no COLA. For Safety members it is based on a 75% / 25% blend of the male and female annuity factors using current valuation assumptions. The valuation mortality tables use a static projection to 2039.
- B. The annuity factor used in determining the present value of future benefits (PVFB) at entry age is equal to the life only annuity factor at 6.75%.
- C. The Final Compensation is based on the salary paid in the year prior to attaining the retirement age.

Example: For a Plan 4 Member who enters at age 54 or earlier, the Final Compensation at retirement (age 55) will be the monthly average of the annual salary for age 54.
- D. For purposes of calculating the value of the member's future contribution, interest is assumed to be credited at 6.75% semiannually (3.375% for each six-month period) for a 6.86% annual rate.
- E. Member Rates are assumed to increase with entry age, except in Plan 7. There are a few exceptions at the higher entry ages where the calculated rate is less than the previous entry age. In these cases the member contribution rate is adjusted so that it is no less than the value for the previous entry age.

**Member Contribution
Rate Assumptions
(continued)**

F. Member rates for all Plans 1, 2, 4, 5, and 6 members are loaded to account for a 50% COLA share. The only exception is for Plans 1, 2, and 4 members of the Board of Supervisors bargaining unit with a most recent hire date before August 7, 2011. The COLA loads are applied to the otherwise applicable basic member rates prior to the addition of any cost-sharing rates. The loads were determined based on 2017 information and applied as follows:

General Plan 1:	36.19%
General Plan 2:	33.89%
General Plan 4:	26.31%
General Plan 5:	25.38%

Safety Plan 1:	47.93%
Safety Plan 2:	50.07%
Safety Plan 4:	37.71%
Safety Plan 5:	34.76%
Safety Plan 6:	32.47%

Probation Plan 1:	53.21%
Probation Plan 2:	51.34%
Probation Plan 4:	37.84%
Probation Plan 5:	34.64%
Probation Plan 6:	30.44%

Table A-1 Summary of Valuation Assumptions as of June 30, 2017

I.	Economic assumptions	
A.	General wage increases	3.00%
B.	Investment earnings	6.75%
C.	Growth in active membership	0.00%
D.	CPI inflation assumption	2.50%
II.	Demographic assumptions	
A.	Salary increases due to service	Table A-5
B.	Retirement	Tables A-6 to A-11
C.	Disability	Tables A-6 to A-11
D.	Mortality for active members prior to termination	Tables A-6 to A-11

Basis – RP-2014 Employee Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

<u>Class of Members</u>	<u>Adjustment Factor</u>
General – Males	100%
General – Females	100%
Safety – Males	100%
Safety – Females	100%

E.	Mortality for active members after termination and service retired members	Table A-2
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Basis – RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

<u>Class of Members</u>	<u>Adjustment Factor</u>
General – Males	95%
General – Females	95%
Safety – Males	95%
Safety – Females	95%

**Table A-1 Summary of Valuation Assumptions as of June 30, 2017
 (continued)**

F. Mortality among disabled members

Table A-3

Basis – Average of RP-2014 Healthy Annuitant and Disabled Mortality Tables for respective genders, with MP-2014 Ultimate Projection Scale:

<u>Class of Members</u>	<u>Adjustment Factor</u>	<u>Minimum Blended Rate</u>
General – Males	95% for Healthy and 105% for Disabled	1.00%
General – Females	95% for Healthy and 105% for Disabled	0.50%

Basis – RP-2014 Healthy Annuitant Mortality Table for respective genders with MP-2014 Ultimate Projection Scale:

<u>Class of Members</u>	<u>Adjustment Factor</u>	<u>Minimum Blended Rate</u>
Safety – Males	105%	1.00%
Safety – Females	105%	0.50%

G. Mortality for beneficiaries

Table A-2

Basis – Beneficiaries are assumed to be of the opposite sex and have the same mortality as General members.

H. Other terminations of employment

Tables A-6 to A-11

I. Refund of contributions on vested termination

Table A-4

Table A-2 Mortality for Members Retired for Service⁽¹⁾

Age	General Male	General Female	Safety Male	Safety Female
20	0.093%	0.039%	0.093%	0.039%
25	0.111%	0.041%	0.111%	0.041%
30	0.103%	0.052%	0.103%	0.052%
35	0.120%	0.068%	0.120%	0.068%
40	0.144%	0.094%	0.144%	0.094%
45	0.223%	0.157%	0.223%	0.157%
50	0.386%	0.263%	0.386%	0.263%
55	0.545%	0.344%	0.545%	0.344%
60	0.738%	0.493%	0.738%	0.493%
65	1.046%	0.765%	1.046%	0.765%
70	1.593%	1.223%	1.593%	1.223%
75	2.548%	1.989%	2.548%	1.989%
80	4.249%	3.310%	4.249%	3.310%
85	7.362%	5.748%	7.362%	5.748%
90	12.911%	10.177%	12.911%	10.177%

Annual Projected Mortality Improvement

Age	All Groups
65 & Less	1.000%
70	1.000%
75	1.000%
80	1.000%
85	1.000%
90	0.930%
95	0.850%
100	0.640%
105	0.430%
110	0.210%
115	0.000%

1. Mortality rates are those applicable for the fiscal year beginning in 2014. Annual projected improvements are assumed in the following years under the schedule shown. For example, the annual mortality rate for an 85-year old General male in fiscal year beginning in 2017 is 7.143% calculated as follows:

$$\begin{aligned}
 \text{Age 85 rate in 2017} &= \text{Age 85 rate in 2014 with 3 years improvement} \\
 &= 7.362\% \times (100.0\% - 1.0\%) \times (100.0\% - 1.0\%) \times (100.0\% - 1.0\%) \\
 &= 7.143\%
 \end{aligned}$$

Table A-3 Mortality for Members Retired for Disability

Age	General Male	General Female	Safety Male	Safety Female
20	1.000%	0.500%	1.000%	0.500%
25	1.000%	0.500%	1.000%	0.500%
30	1.000%	0.500%	1.000%	0.500%
35	1.000%	0.500%	1.000%	0.500%
40	1.000%	0.500%	1.000%	0.500%
45	1.006%	0.554%	1.000%	0.500%
50	1.264%	0.757%	1.000%	0.500%
55	1.499%	0.932%	1.000%	0.500%
60	1.766%	1.139%	1.000%	0.545%
65	2.187%	1.477%	1.156%	0.845%
70	2.915%	2.092%	1.761%	1.351%
75	4.124%	3.149%	2.817%	2.198%
80	6.147%	4.860%	4.696%	3.659%
85	9.629%	7.621%	8.137%	6.353%
90	15.538%	12.053%	14.270%	11.248%

**Table A-4 Immediate Refund of Contributions upon Termination of Employment
 (Excludes Plan 3)**

Years of Service	General	Safety
0	100%	100%
1	100%	100%
2	100%	100%
3	100%	100%
4	100%	100%
5	35%	35%
6	35%	35%
7	35%	35%
8	34%	33%
9	34%	31%
10	33%	29%
11	33%	27%
12	32%	25%
13	31%	22%
14	30%	19%
15	30%	16%
16	29%	13%
17	28%	10%
18	25%	8%
19	23%	6%
20	20%	0%
21	18%	0%
22	15%	0%
23	12%	0%
24	9%	0%
25	6%	0%
26	3%	0%
27	0%	0%
28	0%	0%
29	0%	0%
30 & Up	0%	0%

Table A-5 Annual Increase in Salary

Years of Service	Due to Promotion and Longevity		Total Annual Increase ⁽¹⁾	
	General	Safety	General	Safety
<1	6.50%	6.00%	9.70%	9.18%
1	4.75%	4.00%	7.89%	7.12%
2	3.50%	3.00%	6.61%	6.09%
3	2.75%	2.50%	5.83%	5.58%
4	2.00%	2.00%	5.06%	5.06%
5	1.75%	1.75%	4.80%	4.80%
6	1.50%	1.50%	4.55%	4.55%
7	1.25%	1.25%	4.29%	4.29%
8	1.05%	1.05%	4.08%	4.08%
9	0.90%	0.90%	3.93%	3.93%
10	0.80%	0.80%	3.82%	3.82%
11	0.70%	0.75%	3.72%	3.77%
12	0.60%	0.75%	3.62%	3.77%
13	0.50%	0.75%	3.52%	3.77%
14	0.50%	0.75%	3.52%	3.77%
15	0.50%	0.75%	3.52%	3.77%
16	0.50%	0.75%	3.52%	3.77%
17	0.50%	0.75%	3.52%	3.77%
18	0.50%	0.75%	3.52%	3.77%
19	0.50%	0.75%	3.52%	3.77%
20 or More	0.50%	0.75%	3.52%	3.77%

1. The total expected increase in salary is the increase due to promotion and longevity, adjusted for assumed 3.00% per annum increases in the general wage. The total result is compounded rather than additive.

**Appendix A Rates of Separation from Active Service
Tables A-6 to A-11**

A schedule of the probabilities of termination of employment due to the following causes can be found on the following pages:

Service Retirement:	Member retires after meeting age and service requirements for reasons other than disability.
Withdrawal:	Member terminates and elects a refund of member contributions, or a deferred retirement benefit.
Service Disability:	Member receives disability retirement; disability is service related.
Ordinary Disability:	Member receives disability retirement; disability is not service related.
Service Death:	Member dies before retirement; death is service related.
Ordinary Death:	Member dies before retirement; death is not service related.

Each rate represents the probability that a member will separate from service at each age due to the particular cause. For example, a rate of 0.0300 for a member's service retirement at age 50 means we assume that 30 out of 1,000 members who are age 50 will retire at that age.

Each table represents the detailed rates needed for each SamCERA plan by sex:

Table A-6: General Plan 1, 2, 4, 5 & 7 Males	A-10: Safety and Probation Plans 1, 2, 4, 5, 6 & 7 Males
A-7: General Plan 1, 2, 4, 5 & 7 Females	
A-8: General Plan 3 Males	A-11: Safety and Probation Plans 1, 2, 4, 5, 6 & 7 Females
A-9: General Plan 3 Females	

**Table A-6 Rate of Separation from Active Service
 General Plans 1, 2, 4, 5 and 7 – Male**

Age	Plans 1, 2, 4 Service Retirement ⁽¹⁾	Plans 5 & 7 Service Retirement ⁽¹⁾	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.0000	0.0000	0.0004	0.0002	N/A	0.0003	0	0.1300
19	0.0000	0.0000	0.0004	0.0002	N/A	0.0004	1	0.1100
20	0.0000	0.0000	0.0004	0.0002	N/A	0.0004	2	0.0900
21	0.0000	0.0000	0.0004	0.0002	N/A	0.0004	3	0.0800
22	0.0000	0.0000	0.0004	0.0002	N/A	0.0005	4	0.0700
23	0.0000	0.0000	0.0004	0.0002	N/A	0.0005	5	0.0633
24	0.0000	0.0000	0.0004	0.0002	N/A	0.0005	6	0.0567
25	0.0000	0.0000	0.0004	0.0002	N/A	0.0005	7	0.0500
26	0.0000	0.0000	0.0004	0.0002	N/A	0.0005	8	0.0470
27	0.0000	0.0000	0.0004	0.0002	N/A	0.0004	9	0.0440
28	0.0000	0.0000	0.0005	0.0002	N/A	0.0004	10	0.0410
29	0.0000	0.0000	0.0005	0.0003	N/A	0.0004	11	0.0380
30	0.0000	0.0000	0.0006	0.0003	N/A	0.0005	12	0.0350
31	0.0000	0.0000	0.0006	0.0003	N/A	0.0005	13	0.0330
32	0.0000	0.0000	0.0006	0.0003	N/A	0.0005	14	0.0310
33	0.0000	0.0000	0.0007	0.0004	N/A	0.0005	15	0.0290
34	0.0000	0.0000	0.0008	0.0004	N/A	0.0005	16	0.0270
35	0.0000	0.0000	0.0008	0.0004	N/A	0.0005	17	0.0250
36	0.0000	0.0000	0.0008	0.0005	N/A	0.0005	18	0.0230
37	0.0000	0.0000	0.0009	0.0005	N/A	0.0006	19	0.0210
38	0.0000	0.0000	0.0010	0.0006	N/A	0.0006	20	0.0190
39	0.0000	0.0000	0.0011	0.0006	N/A	0.0006	21	0.0170
40	0.0000	0.0000	0.0012	0.0007	N/A	0.0006	22	0.0150
41	0.0000	0.0000	0.0013	0.0007	N/A	0.0007	23	0.0140
42	0.0000	0.0000	0.0014	0.0008	N/A	0.0007	24	0.0130
43	0.0000	0.0000	0.0015	0.0008	N/A	0.0008	25	0.0120
44	0.0000	0.0000	0.0016	0.0008	N/A	0.0009	26	0.0110
45	0.0000	0.0000	0.0017	0.0009	N/A	0.0010	27	0.0100
46	0.0000	0.0000	0.0018	0.0009	N/A	0.0011	28	0.0100
47	0.0000	0.0000	0.0019	0.0010	N/A	0.0012	29	0.0100
48	0.0000	0.0000	0.0020	0.0011	N/A	0.0014	30 & Above ⁽²⁾	0.0100
49	0.0000	0.0000	0.0020	0.0011	N/A	0.0015		
50	0.0300	0.0270	0.0021	0.0011	N/A	0.0017		
51	0.0300	0.0270	0.0021	0.0012	N/A	0.0019		
52	0.0300	0.0270	0.0022	0.0012	N/A	0.0021		
53	0.0300	0.0270	0.0023	0.0012	N/A	0.0023		
54	0.0500	0.0450	0.0023	0.0013	N/A	0.0025		
55	0.0600	0.0540	0.0023	0.0013	N/A	0.0028		
56	0.0600	0.0540	0.0024	0.0013	N/A	0.0031		
57	0.0750	0.0675	0.0025	0.0013	N/A	0.0034		
58	0.1200	0.1080	0.0027	0.0014	N/A	0.0038		
59	0.1200	0.1080	0.0028	0.0015	N/A	0.0042		
60	0.1500	0.1350	0.0029	0.0016	N/A	0.0047		
61	0.1750	0.1575	0.0031	0.0017	N/A	0.0052		
62	0.2500	0.2250	0.0033	0.0018	N/A	0.0059		
63	0.2000	0.1800	0.0033	0.0018	N/A	0.0066		
64	0.2200	0.1980	0.0033	0.0018	N/A	0.0074		
65	0.3500	0.3150	0.0033	0.0018	N/A	0.0083		
66	0.3500	0.3150	0.0033	0.0018	N/A	0.0092		
67	0.3500	0.4200	0.0033	0.0018	N/A	0.0102		
68	0.3000	0.3000	0.0033	0.0018	N/A	0.0113		
69	0.3000	0.3000	0.0033	0.0018	N/A	0.0125		
70	0.4000	0.4000	0.0033	0.0018	N/A	0.0139		
71	0.4000	0.4000	0.0033	0.0018	N/A	0.0154		
72	0.4000	0.4000	0.0033	0.0018	N/A	0.0170		
73	0.4000	0.4000	0.0033	0.0018	N/A	0.0189		
74	0.4000	0.4000	0.0033	0.0018	N/A	0.0209		
75	1.0000	1.0000	0.0000	0.0000	N/A	0.0232		

1. 100% probability of retirement is assumed at ages 62 and above with 38 or more years of service (65/41 for Plan 5; 67/40 for Plan 7). Rates of retirement are 0.00% prior to age 52 for Plan 7.

2. 0.00% probability of termination with 30 years of service and above for Plans 1, 2, 4, & 5.

**Table A-7 Rate of Separation from Active Service
 General Plans 1, 2, 4, 5 and 7 – Female**

Age	Plans 1, 2, 4 Service Retirement ⁽¹⁾	Plans 5 & 7 Service Retirement ⁽¹⁾	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	0	0.1300
19	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	1	0.1100
20	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	2	0.0950
21	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	3	0.0800
22	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	4	0.0750
23	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	5	0.0700
24	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	6	0.0650
25	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	7	0.0600
26	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	8	0.0550
27	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	9	0.0500
28	0.0000	0.0000	0.0005	0.0003	N/A	0.0002	10	0.0450
29	0.0000	0.0000	0.0006	0.0003	N/A	0.0002	11	0.0400
30	0.0000	0.0000	0.0006	0.0003	N/A	0.0002	12	0.0350
31	0.0000	0.0000	0.0007	0.0004	N/A	0.0002	13	0.0340
32	0.0000	0.0000	0.0007	0.0004	N/A	0.0002	14	0.0330
33	0.0000	0.0000	0.0007	0.0004	N/A	0.0003	15	0.0320
34	0.0000	0.0000	0.0008	0.0004	N/A	0.0003	16	0.0310
35	0.0000	0.0000	0.0008	0.0005	N/A	0.0003	17	0.0300
36	0.0000	0.0000	0.0009	0.0005	N/A	0.0003	18	0.0270
37	0.0000	0.0000	0.0010	0.0005	N/A	0.0003	19	0.0240
38	0.0000	0.0000	0.0011	0.0006	N/A	0.0003	20	0.0210
39	0.0000	0.0000	0.0012	0.0007	N/A	0.0004	21	0.0180
40	0.0000	0.0000	0.0014	0.0007	N/A	0.0004	22	0.0150
41	0.0000	0.0000	0.0015	0.0008	N/A	0.0004	23	0.0140
42	0.0000	0.0000	0.0016	0.0009	N/A	0.0005	24	0.0130
43	0.0000	0.0000	0.0018	0.0010	N/A	0.0005	25	0.0120
44	0.0000	0.0000	0.0020	0.0011	N/A	0.0006	26	0.0110
45	0.0000	0.0000	0.0022	0.0012	N/A	0.0007	27	0.0100
46	0.0000	0.0000	0.0024	0.0013	N/A	0.0007	28	0.0100
47	0.0000	0.0000	0.0026	0.0014	N/A	0.0008	29	0.0100
48	0.0000	0.0000	0.0027	0.0015	N/A	0.0009	30 & Above ⁽²⁾	0.0100
49	0.0000	0.0000	0.0029	0.0015	N/A	0.0010		
50	0.0300	0.0270	0.0030	0.0016	N/A	0.0011		
51	0.0300	0.0270	0.0031	0.0017	N/A	0.0012		
52	0.0300	0.0270	0.0033	0.0018	N/A	0.0013		
53	0.0300	0.0270	0.0034	0.0019	N/A	0.0014		
54	0.0500	0.0450	0.0036	0.0020	N/A	0.0015		
55	0.0600	0.0540	0.0038	0.0021	N/A	0.0017		
56	0.0600	0.0540	0.0040	0.0022	N/A	0.0018		
57	0.0750	0.0675	0.0042	0.0023	N/A	0.0019		
58	0.1200	0.1080	0.0044	0.0024	N/A	0.0021		
59	0.1200	0.1080	0.0046	0.0025	N/A	0.0023		
60	0.1500	0.1350	0.0048	0.0026	N/A	0.0024		
61	0.1750	0.1575	0.0050	0.0027	N/A	0.0026		
62	0.2500	0.2250	0.0052	0.0028	N/A	0.0029		
63	0.2000	0.1800	0.0052	0.0028	N/A	0.0031		
64	0.2200	0.1980	0.0052	0.0028	N/A	0.0034		
65	0.3500	0.3150	0.0052	0.0028	N/A	0.0037		
66	0.3500	0.3150	0.0052	0.0028	N/A	0.0041		
67	0.3500	0.4200	0.0052	0.0028	N/A	0.0046		
68	0.3000	0.3000	0.0052	0.0028	N/A	0.0051		
69	0.3000	0.3000	0.0052	0.0028	N/A	0.0057		
70	0.4000	0.4000	0.0052	0.0028	N/A	0.0063		
71	0.4000	0.4000	0.0052	0.0028	N/A	0.0070		
72	0.4000	0.4000	0.0052	0.0028	N/A	0.0078		
73	0.4000	0.4000	0.0052	0.0028	N/A	0.0087		
74	0.4000	0.4000	0.0052	0.0028	N/A	0.0097		
75	1.0000	1.0000	0.0000	0.0000	N/A	0.0108		

1. 100% probability of retirement is assumed at ages 62 and above with 38 or more years of service (65/41 for Plan 5; 67/40 for Plan 7). Rates of retirement are 0.00% prior to age 52 for Plan 7.
 2. 0.00% probability of termination with 30 years of service and above for Plans 1, 2, 4, & 5.

**Table A-8 Rate of Separation from Active Service
 General Plan 3 – Male**

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.0000	N/A	N/A	N/A	0.0003	0	0.1300
19	0.0000	N/A	N/A	N/A	0.0004	1	0.1100
20	0.0000	N/A	N/A	N/A	0.0004	2	0.0900
21	0.0000	N/A	N/A	N/A	0.0004	3	0.0800
22	0.0000	N/A	N/A	N/A	0.0005	4	0.0700
23	0.0000	N/A	N/A	N/A	0.0005	5	0.0633
24	0.0000	N/A	N/A	N/A	0.0005	6	0.0567
25	0.0000	N/A	N/A	N/A	0.0005	7	0.0500
26	0.0000	N/A	N/A	N/A	0.0005	8	0.0470
27	0.0000	N/A	N/A	N/A	0.0004	9	0.0440
28	0.0000	N/A	N/A	N/A	0.0004	10	0.0410
29	0.0000	N/A	N/A	N/A	0.0004	11	0.0380
30	0.0000	N/A	N/A	N/A	0.0005	12	0.0350
31	0.0000	N/A	N/A	N/A	0.0005	13	0.0330
32	0.0000	N/A	N/A	N/A	0.0005	14	0.0310
33	0.0000	N/A	N/A	N/A	0.0005	15	0.0290
34	0.0000	N/A	N/A	N/A	0.0005	16	0.0270
35	0.0000	N/A	N/A	N/A	0.0005	17	0.0250
36	0.0000	N/A	N/A	N/A	0.0005	18	0.0230
37	0.0000	N/A	N/A	N/A	0.0006	19	0.0210
38	0.0000	N/A	N/A	N/A	0.0006	20	0.0190
39	0.0000	N/A	N/A	N/A	0.0006	21	0.0170
40	0.0000	N/A	N/A	N/A	0.0006	22	0.0150
41	0.0000	N/A	N/A	N/A	0.0007	23	0.0140
42	0.0000	N/A	N/A	N/A	0.0007	24	0.0130
43	0.0000	N/A	N/A	N/A	0.0008	25	0.0120
44	0.0000	N/A	N/A	N/A	0.0009	26	0.0110
45	0.0000	N/A	N/A	N/A	0.0010	27	0.0100
46	0.0000	N/A	N/A	N/A	0.0011	28	0.0100
47	0.0000	N/A	N/A	N/A	0.0012	29	0.0100
48	0.0000	N/A	N/A	N/A	0.0014	30 & Above	0.0100
49	0.0000	N/A	N/A	N/A	0.0015		
50	0.0000	N/A	N/A	N/A	0.0017		
51	0.0000	N/A	N/A	N/A	0.0019		
52	0.0000	N/A	N/A	N/A	0.0021		
53	0.0000	N/A	N/A	N/A	0.0023		
54	0.0000	N/A	N/A	N/A	0.0025		
55	0.0300	N/A	N/A	N/A	0.0028		
56	0.0300	N/A	N/A	N/A	0.0031		
57	0.0300	N/A	N/A	N/A	0.0034		
58	0.0300	N/A	N/A	N/A	0.0038		
59	0.0300	N/A	N/A	N/A	0.0042		
60	0.0300	N/A	N/A	N/A	0.0047		
61	0.0600	N/A	N/A	N/A	0.0052		
62	0.1500	N/A	N/A	N/A	0.0059		
63	0.1000	N/A	N/A	N/A	0.0066		
64	0.1500	N/A	N/A	N/A	0.0074		
65	0.3000	N/A	N/A	N/A	0.0083		
66	0.3000	N/A	N/A	N/A	0.0092		
67	0.3000	N/A	N/A	N/A	0.0102		
68	0.3000	N/A	N/A	N/A	0.0113		
69	0.3000	N/A	N/A	N/A	0.0125		
70	0.4000	N/A	N/A	N/A	0.0139		
71	0.4000	N/A	N/A	N/A	0.0154		
72	0.4000	N/A	N/A	N/A	0.0170		
73	0.4000	N/A	N/A	N/A	0.0189		
74	0.4000	N/A	N/A	N/A	0.0209		
75	1.0000	N/A	N/A	N/A	0.0232		

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**Table A-9 Rate of Separation from Active Service
 General Plan 3 – Female**

Age	Service Retirement	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.0000	N/A	N/A	N/A	0.0002	0	0.1300
19	0.0000	N/A	N/A	N/A	0.0002	1	0.1100
20	0.0000	N/A	N/A	N/A	0.0002	2	0.0950
21	0.0000	N/A	N/A	N/A	0.0002	3	0.0800
22	0.0000	N/A	N/A	N/A	0.0002	4	0.0750
23	0.0000	N/A	N/A	N/A	0.0002	5	0.0700
24	0.0000	N/A	N/A	N/A	0.0002	6	0.0650
25	0.0000	N/A	N/A	N/A	0.0002	7	0.0600
26	0.0000	N/A	N/A	N/A	0.0002	8	0.0550
27	0.0000	N/A	N/A	N/A	0.0002	9	0.0500
28	0.0000	N/A	N/A	N/A	0.0002	10	0.0450
29	0.0000	N/A	N/A	N/A	0.0002	11	0.0400
30	0.0000	N/A	N/A	N/A	0.0002	12	0.0350
31	0.0000	N/A	N/A	N/A	0.0002	13	0.0340
32	0.0000	N/A	N/A	N/A	0.0002	14	0.0330
33	0.0000	N/A	N/A	N/A	0.0003	15	0.0320
34	0.0000	N/A	N/A	N/A	0.0003	16	0.0310
35	0.0000	N/A	N/A	N/A	0.0003	17	0.0300
36	0.0000	N/A	N/A	N/A	0.0003	18	0.0270
37	0.0000	N/A	N/A	N/A	0.0003	19	0.0240
38	0.0000	N/A	N/A	N/A	0.0003	20	0.0210
39	0.0000	N/A	N/A	N/A	0.0004	21	0.0180
40	0.0000	N/A	N/A	N/A	0.0004	22	0.0150
41	0.0000	N/A	N/A	N/A	0.0004	23	0.0140
42	0.0000	N/A	N/A	N/A	0.0005	24	0.0130
43	0.0000	N/A	N/A	N/A	0.0005	25	0.0120
44	0.0000	N/A	N/A	N/A	0.0006	26	0.0110
45	0.0000	N/A	N/A	N/A	0.0007	27	0.0100
46	0.0000	N/A	N/A	N/A	0.0007	28	0.0100
47	0.0000	N/A	N/A	N/A	0.0008	29	0.0100
48	0.0000	N/A	N/A	N/A	0.0009	30 & Above	0.0100
49	0.0000	N/A	N/A	N/A	0.0010		
50	0.0000	N/A	N/A	N/A	0.0011		
51	0.0000	N/A	N/A	N/A	0.0012		
52	0.0000	N/A	N/A	N/A	0.0013		
53	0.0000	N/A	N/A	N/A	0.0014		
54	0.0000	N/A	N/A	N/A	0.0015		
55	0.0400	N/A	N/A	N/A	0.0017		
56	0.0400	N/A	N/A	N/A	0.0018		
57	0.0400	N/A	N/A	N/A	0.0019		
58	0.0400	N/A	N/A	N/A	0.0021		
59	0.0400	N/A	N/A	N/A	0.0023		
60	0.0400	N/A	N/A	N/A	0.0024		
61	0.0600	N/A	N/A	N/A	0.0026		
62	0.1500	N/A	N/A	N/A	0.0029		
63	0.1000	N/A	N/A	N/A	0.0031		
64	0.1500	N/A	N/A	N/A	0.0034		
65	0.3000	N/A	N/A	N/A	0.0037		
66	0.3000	N/A	N/A	N/A	0.0041		
67	0.3000	N/A	N/A	N/A	0.0046		
68	0.3000	N/A	N/A	N/A	0.0051		
69	0.3000	N/A	N/A	N/A	0.0057		
70	0.4000	N/A	N/A	N/A	0.0063		
71	0.4000	N/A	N/A	N/A	0.0070		
72	0.4000	N/A	N/A	N/A	0.0078		
73	0.4000	N/A	N/A	N/A	0.0087		
74	0.4000	N/A	N/A	N/A	0.0097		
75	1.0000	N/A	N/A	N/A	0.0108		

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**Table A-10 Rate of Separation from Active Service
 Safety & Probation Plans – Male**

Age	Plans 1, 2, 4 Service Retirement ⁽¹⁾	Plans 5, 6, 7 Service Retirement ⁽²⁾	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.0000	0.0000	0.0015	0.0000	0.0010	0.0003	0	0.0700
19	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004	1	0.0550
20	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004	2	0.0450
21	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004	3	0.0300
22	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005	4	0.0250
23	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005	5	0.0240
24	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005	6	0.0230
25	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005	7	0.0220
26	0.0000	0.0000	0.0015	0.0000	0.0010	0.0005	8	0.0201
27	0.0000	0.0000	0.0015	0.0000	0.0010	0.0004	9	0.0182
28	0.0000	0.0000	0.0016	0.0000	0.0010	0.0004	10	0.0163
29	0.0000	0.0000	0.0017	0.0000	0.0010	0.0004	11	0.0144
30	0.0000	0.0000	0.0018	0.0000	0.0010	0.0005	12	0.0125
31	0.0000	0.0000	0.0019	0.0000	0.0010	0.0005	13	0.0120
32	0.0000	0.0000	0.0020	0.0000	0.0010	0.0005	14	0.0115
33	0.0000	0.0000	0.0021	0.0000	0.0010	0.0005	15	0.0110
34	0.0000	0.0000	0.0022	0.0000	0.0010	0.0005	16	0.0105
35	0.0000	0.0000	0.0023	0.0000	0.0010	0.0005	17	0.0100
36	0.0000	0.0000	0.0024	0.0000	0.0010	0.0005	18	0.0080
37	0.0000	0.0000	0.0025	0.0000	0.0010	0.0006	19	0.0060
38	0.0000	0.0000	0.0026	0.0000	0.0010	0.0006	20 ⁽³⁾	0.0040
39	0.0000	0.0000	0.0027	0.0000	0.0010	0.0006	21 ⁽³⁾	0.0020
40	0.0000	0.0000	0.0028	0.0000	0.0010	0.0006	22 & Above ⁽³⁾	0.0000
41	0.0000	0.0000	0.0029	0.0000	0.0010	0.0007		
42	0.0000	0.0000	0.0030	0.0000	0.0010	0.0007		
43	0.0000	0.0000	0.0032	0.0000	0.0010	0.0008		
44	0.0000	0.0000	0.0035	0.0000	0.0010	0.0009		
45	0.0300	0.0000	0.0037	0.0000	0.0010	0.0010		
46	0.0300	0.0000	0.0040	0.0000	0.0010	0.0011		
47	0.0300	0.0000	0.0042	0.0000	0.0010	0.0012		
48	0.0500	0.0000	0.0048	0.0000	0.0010	0.0014		
49	0.0500	0.0000	0.0054	0.0000	0.0010	0.0015		
50	0.1500	0.0500	0.0077	0.0000	0.0010	0.0017		
51	0.1500	0.0500	0.0088	0.0000	0.0010	0.0019		
52	0.1500	0.0500	0.0100	0.0000	0.0010	0.0021		
53	0.2000	0.0500	0.0111	0.0000	0.0010	0.0023		
54	0.1300	0.1000	0.0122	0.0000	0.0010	0.0025		
55	0.2250	0.2750	0.0134	0.0000	0.0010	0.0028		
56	0.2250	0.2750	0.0145	0.0000	0.0010	0.0031		
57	0.1700	0.2750	0.0156	0.0000	0.0010	0.0034		
58	0.1700	0.2750	0.0139	0.0000	0.0010	0.0038		
59	0.2500	0.2750	0.0122	0.0000	0.0010	0.0042		
60	0.4000	0.4000	0.0106	0.0000	0.0010	0.0047		
61	0.4000	0.4000	0.0089	0.0000	0.0010	0.0052		
62	0.4000	0.4000	0.0072	0.0000	0.0010	0.0059		
63	0.4000	0.4000	0.0055	0.0000	0.0010	0.0066		
64	0.4000	0.4000	0.0038	0.0000	0.0010	0.0074		
65	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000		

- 100% probability of retirement is assumed at ages 50 and above with 33 or more years of service for Safety and Probation Plans 1, 2, and 4.
- 100% probability of retirement is assumed at ages 55 and above with 33 or more years of service for Safety and Probation Plan 5, ages 55 and above with 38 or more years of service for Safety and Probation Plan 6, and ages 57 and above with 38 or more years of service for Safety and Probation Plan 7.
- 0.00% probability of termination with 20 years of service and above for all Safety/Probation plans except Plan 7.

**Table A-11 Rate of Separation from Active Service
 Safety & Probation Plans – Female**

Age	Plans 1, 2, 4 Service Retirement ⁽¹⁾	Plans 5, 6, 7 Service Retirement ⁽²⁾	Service Disability	Ordinary Disability	Service Death	Ordinary Death	Years of Service	Other Terminations
18	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	0	0.0700
19	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	1	0.0550
20	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	2	0.0450
21	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	3	0.0300
22	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	4	0.0250
23	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	5	0.0240
24	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	6	0.0230
25	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	7	0.0220
26	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	8	0.0201
27	0.0000	0.0000	0.0015	0.0000	0.0010	0.0002	9	0.0182
28	0.0000	0.0000	0.0016	0.0000	0.0010	0.0002	10	0.0163
29	0.0000	0.0000	0.0017	0.0000	0.0010	0.0002	11	0.0144
30	0.0000	0.0000	0.0018	0.0000	0.0010	0.0002	12	0.0125
31	0.0000	0.0000	0.0019	0.0000	0.0010	0.0002	13	0.0120
32	0.0000	0.0000	0.0020	0.0000	0.0010	0.0002	14	0.0115
33	0.0000	0.0000	0.0021	0.0000	0.0010	0.0003	15	0.0110
34	0.0000	0.0000	0.0022	0.0000	0.0010	0.0003	16	0.0105
35	0.0000	0.0000	0.0023	0.0000	0.0010	0.0003	17	0.0100
36	0.0000	0.0000	0.0024	0.0000	0.0010	0.0003	18	0.0080
37	0.0000	0.0000	0.0025	0.0000	0.0010	0.0003	19	0.0060
38	0.0000	0.0000	0.0026	0.0000	0.0010	0.0003	20 ⁽³⁾	0.0040
39	0.0000	0.0000	0.0027	0.0000	0.0010	0.0004	21 ⁽³⁾	0.0020
40	0.0000	0.0000	0.0028	0.0000	0.0010	0.0004	22 & Above ⁽³⁾	0.0000
41	0.0000	0.0000	0.0029	0.0000	0.0010	0.0004		
42	0.0000	0.0000	0.0030	0.0000	0.0010	0.0005		
43	0.0000	0.0000	0.0032	0.0000	0.0010	0.0005		
44	0.0000	0.0000	0.0035	0.0000	0.0010	0.0006		
45	0.0300	0.0000	0.0037	0.0000	0.0010	0.0007		
46	0.0300	0.0000	0.0040	0.0000	0.0010	0.0007		
47	0.0300	0.0000	0.0042	0.0000	0.0010	0.0008		
48	0.0500	0.0000	0.0048	0.0000	0.0010	0.0009		
49	0.0500	0.0000	0.0054	0.0000	0.0010	0.0010		
50	0.1500	0.0500	0.0077	0.0000	0.0010	0.0011		
51	0.1500	0.0500	0.0088	0.0000	0.0010	0.0012		
52	0.1500	0.0500	0.0100	0.0000	0.0010	0.0013		
53	0.2000	0.0500	0.0111	0.0000	0.0010	0.0014		
54	0.1300	0.1000	0.0122	0.0000	0.0010	0.0015		
55	0.2250	0.2750	0.0134	0.0000	0.0010	0.0017		
56	0.2250	0.2750	0.0145	0.0000	0.0010	0.0018		
57	0.1700	0.2750	0.0156	0.0000	0.0010	0.0019		
58	0.1700	0.2750	0.0139	0.0000	0.0010	0.0021		
59	0.2500	0.2750	0.0122	0.0000	0.0010	0.0023		
60	0.4000	0.4000	0.0106	0.0000	0.0010	0.0024		
61	0.4000	0.4000	0.0089	0.0000	0.0010	0.0026		
62	0.4000	0.4000	0.0072	0.0000	0.0010	0.0029		
63	0.4000	0.4000	0.0055	0.0000	0.0010	0.0031		
64	0.4000	0.4000	0.0038	0.0000	0.0010	0.0034		
65	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000		

1. 100% probability of retirement is assumed at ages 50 and above with 33 or more years of service for Safety and Probation Plans 1, 2, and 4.
2. 100% probability of retirement is assumed at ages 55 and above with 33 or more years of service for Safety and Probation Plan 5, ages 55 and above with 38 or more years of service for Safety and Probation Plan 6, and ages 57 and above with 38 or more years of service for Safety and Probation Plan 7.
3. 0.00% probability of termination with 20 years of service and above for all Safety/Probation plans except Plan 7.

Appendix B Summary of Benefit Provisions



All actuarial calculations are based on our understanding of the statutes governing the SamCERA as contained in the County Employees Retirement Law (CERL) of 1937, with provisions adopted by the SamCERA Board, effective through June 30, 2017. The benefit and contribution provisions of this law are summarized briefly below, along with corresponding references to the Code Section. This summary does not attempt to cover all the detailed provisions of the law.

MEMBERSHIP IN RETIREMENT PLANS

The County has established 12 defined benefit plans based on a member's date of entry into SamCERA. Plans 1, 2, 4, 5, 6, and 7 are open to all members depending on their date of entry. Only General members are eligible for Plan 3.

**Government
Code Section**

Employees of the Mosquito and Vector Control District are eligible for participation in all General retirement plans, except for Plan 3.

- Plan 1:** Employees hired on or before July 5, 1980.
- Plan 2:** Employees hired after July 5, 1980 but on or before July 12, 1997.
- Plan 3:** General members hired on or before December 22, 2012 may have elected to participate in Plan 3. After five years of service, Plan 3 members can elect membership under the open eligible contributory plan. Members currently working in a contributory plan with Plan 3 service may purchase an upgrade of their Plan 3 service. (31496)
- Plan 4:** Employees hired after July 12, 1997 and before August 7, 2011 (General members, except Plan 5 transfers; see below); before July 10, 2011 (Probation members); and before January 8, 2012 (Safety members).
- Plan 5:** General members hired on or after August 7, 2011, and Deputy Sheriffs hired on or after January 8, 2012. Probation members hired on or after July 10, 2011 and Safety members (except Deputy Sheriffs) hired on or after January 8, 2012 may elect this Plan. Members must be first hired before January 1, 2013 to be eligible to elect this Plan.

After 10 years of service, General Plan 5 members can elect to transfer to Plan 4 and must pay the total actuarial equivalent cost of the increase in past service benefits at the date of transfer.
- Plan 6:** Probation members hired on or after July 10, 2011 and Safety members (except Deputy Sheriffs) hired on or after January 8, 2012 may elect this Plan. Members must be first hired before January 1, 2013 to be eligible to elect this Plan.
- Plan 7:** Employees first hired on or after January 1, 2013.

MEMBER CONTRIBUTIONS

Basic:

Plans 1, 2, 4, 5, and 6: Contributions are based on the entry age and class of each member and are required of all members. See section 5 for details on this calculation. Current member rates are shown in Appendix D.

Contributions cease when general members are credited with 30 years of service in a contributory plan provided they were members of SamCERA or a reciprocal system on March 7, 1973, and continuously thereafter. All safety members are eligible for the 30-year cessation of contributions. This provision does not apply to cost-sharing contributions. (31625.2, 31664.1)

Plan 7: Members contribute 50% of the aggregate Normal Cost rate for their Plan.

Plan 3: No member contributions are required under Plan 3.

Cost-of-Living:

Plans 1, 2, and 4: Effective with the first pay period in July 2016, all members of Plans 1, 2 and 4 contribute 50% of the cost of COLA benefits in addition to other current member rates and cost sharing, except as described in the following paragraph.

Members with retirement benefits negotiated under Board of Supervisors, and whose most recent hire date is before August 7, 2011, do not contribute towards the COLA benefit. Members of SMCM&VCD do not contribute towards the COLA benefit.

Plans 5 and 6: All members of Plans 5 and 6 contribute 50% of the cost of the COLA.

Plan 7: Members contribute 50% of the aggregate Normal Cost rate for their Plan.

Cost Sharing:

General Members: All members of Plans 1, 2, and 4 (except SMCM&VCD) contribute an additional 3.0% for cost sharing. (31678.2)

All other General members do not participate in cost sharing.

MEMBER CONTRIBUTIONS (Continued)

Safety Members: Deputy Sheriffs in Plans 1, 2, 4, and 5 contribute the following additional cost sharing rates based on age and service:

If age 45 or older	4.5%
If age is less than 45	
▪ Service is less than 5 years:	3.0%
▪ Service between 5 and 15 years:	3.5%
▪ Service is more than 15 years	4.5%

Safety members (except Deputy Sheriffs) in Plans 1, 2, and 4 contribute an additional 5.0% cost sharing.

Safety members (except Deputy Sheriffs) in Plan 5 contribute an additional 4.0% cost sharing.

Safety members in Plan 6 and 7 do not participate in cost sharing.

Probation Members: Members of Plans 1, 2, 4, and 5 contribute an additional 3.5% for cost sharing.

Members of Plans 6 and 7 do not participate in cost sharing.

Interest Crediting: Interest is credited to contributions semiannually on June 30 and December 31 at an interest rate set by the Board of Retirement on amounts that have been on deposit for at least six months. (31591, 31700)

Employer Pick-Up: Effective with the first pay period in July 2016, no employer provides for employer pick-up contributions.

EMPLOYER CONTRIBUTIONS

The employer (County, Courts, or District) contributes to the retirement fund a percent of the total compensation provided for all members based on an actuarial investigation, valuation and recommendation of the actuary. (31453, 31453.5, 31453.6, 31454 31581)

SERVICE RETIREMENT ALLOWANCE

Eligibility:

General Members: All members of Plans 1, 2, 4, and 5 are eligible to retire after meeting one of the following age and service requirements: (31672)

- Age 50 with 10 years of service*;
- Any age with 30 years of service; or
- Age 70 regardless of service.

Plan 3 members are eligible to retire at age 65 with 10 years of service. A reduced benefit is also payable at age 55 with 10 years of service. (31496)

Plan 7 members are eligible to retire at age 52 with 5 years of service.

SERVICE RETIREMENT ALLOWANCE (Continued)

Safety and Probation Members: Members of all plans except Plan 7 are eligible to retire after meeting one of the following age and service requirements: (31663.25)

- Age 50 with 10 years of service;
- Any age with 20 years of service.

Plan 7 members are eligible to retire at age 50 with 5 years of service. (31672.1)

** For part-time employees, age 50 is replaced with age 55.*

Final Compensation:

Plans 1 and 2: Monthly average of a member's highest 12 consecutive months of compensation. (31462.1)

All other Plans: Monthly average of a member's highest compensation during any three years. Years do not have to be consecutive, except for Plan 7. [31462, 31496.3(d)]

Compensation Limit:

All Plans, except Plan 7: The amount of compensation that is taken into account in computing benefits payable to any person who first becomes a member on or after July 1, 1996, shall not exceed the dollar limitations in Section 401(a)(17) of Title 26 of the US Code. (31671)

Plan 7: The amount of compensation taken into account shall not exceed the following applicable percentage of the Social Security Taxable Wage Base:

- 100% for a member covered by Social Security (County and Courts General members);
- 120% for a member not covered by Social Security (all other members).

The amount of compensation taken into account shall be adjusted based on changes in the Consumer Price Index for All Urban Consumers. Adjustments shall be effective annually on January 1.

Monthly Allowance:

Plans 1, 2, 4, and 5:

General members: (31676.14)
 $1/60 \times \text{Final Compensation} \times \text{General age factor} \times \text{years of service.}$ (31676.1)

Safety & Probation members: (31664.1)
 $3\% \times \text{Final Compensation} \times \text{Safety age factor} \times \text{years of service.}$ (31664.2)

Plan 6: **Safety & Probation members:** (31664)
 $2\% \times \text{Final Compensation} \times \text{Safety age factor} \times \text{years of service.}$

Plan 7: **General members:**
 $2\% \times \text{Final Compensation} \times \text{General age factor} \times \text{years of service.}$

Safety and Probation members:
 $2\% \times \text{Final Compensation} \times \text{Safety age factor} \times \text{years of service.}$

SERVICE RETIREMENT ALLOWANCE (Continued)

Plan 3: **General members: (a)+(b)-(c) where:** (31496)
 (a) 2% x Final Compensation x (Years of Service, (up to 35 years), plus
 (b) 1% x Final Compensation x Years of Service in excess of 35 (up to 10)
 (c) Estimated Primary Insurance Amount (PIA) x Years of Covered Service
 (up to 35) divided by 35.

The PIA is calculated based on certain assumptions specified by statute, and an assumed Social Security retirement age of 65.

If retirement occurs prior to age 65, benefit amount is adjusted by an actuarial equivalent factor (see Sample Plan Age Factors).

Percentage of Final Average Compensation at Sample Ages:

Plan	Age 50	Age 55	Age 60	Age 65	
County General 1,2&4	1.475%	1.948%	2.440%	2.611%	(31676.14)
SMCM&VCD*	1.475%	1.948%	2.440%	2.611%	(31676.14)
General Plan 3**	N/A	0.780%	1.220%	2.000%	(31496)
General Plan 5	1.182%	1.492%	1.917%	2.432%	(31676.1)
General Plan 7	N/A	1.300%	1.800%	2.300%	(7522.20(a))
Safety/Probation 1,2,&4	3.000%	3.000%	3.000%	3.000%	(31664.1)
Safety/Probation Plan 5	2.290%	3.000%	3.000%	3.000%	(31664.2)
Safety/Probation Plan 6	2.000%	2.620%	2.620%	2.620%	(31664)
Safety/Probation Plan 7	2.000%	2.500%	2.700%	2.700%	(7522.25(d))

* As of the June 30, 2010 actuarial valuation, SMCM&VCD has adopted the same benefit structure as County General.

** Prior to reduction for PIA benefit. Actual percentage will be less.

SERVICE RETIREMENT ALLOWANCE (Continued)

Maximum Allowance:

- All Plans** Allowance may not exceed 100% of final compensation.
- Except 3:**
- Plan 3:** The sum of the normal retirement allowance and the estimated PIA cannot exceed 70% of Final Compensation for a member with 35 or less years of service, and cannot exceed 80% of Final Compensation if service exceeds 35 years. (31496)

Unmodified Retirement Allowance (Normal Form):

- All Plans** Life Annuity payable to retired member with 60% continuance to an eligible survivor (or eligible children). (31760.1)
- Except 3:**
- Plan 3:** Life Annuity payable to retired member with 50% continuance to an eligible survivor (or eligible children). (31497.71)

Eligible survivor includes certain domestic partners. (31780.2)

Optional Retirement Allowance:

A member may elect to have the actuarial equivalent of the service or disability retirement allowance applied to a lesser retirement allowance during the retired member's life in order to provide an optional survivor allowance.

- Option 1:** Member's allowance is reduced to pay a cash refund of any unpaid annuity payments (up to the amount of the member's contributions at retirement) to the member's estate or to a beneficiary having an insurable interest in the life of the member. (31761)
- Option 2:** 100% of member's reduced allowance is payable to an eligible survivor or beneficiary having an insurable interest in the life of the member. (31762)
- Option 3:** 50% of member's reduced allowance is payable to an eligible survivor or beneficiary having an insurable interest in the life of the member. (31763)
- Option 4:** Other % of member's reduced allowance is payable to an eligible survivor or beneficiary(ies) having an insurable interest in the life of the member. (31764)

For Options 2, 3 or 4, the continuance will not be paid if the member revokes their election and names another beneficiary after retirement. (31782)

All Allowances: All allowances are made on a pro rata basis (based on the number of days in that month) if not in effect for the entire month of retirement. For deaths that occur mid-month, the full month's payment is made. (31600)

SERVICE-CONNECTED DISABILITY RETIREMENT ALLOWANCE

<u>Eligibility:</u>		
All Plans	Any age or years of service; disability must result from occupational injury or disease, and member must be permanently incapacitated for the performance of duty.	(31720, 31720.5, 31720.6, 31720.7, 31720.9)
Except 3:		
Plan 3:	Not available under Plan 3.	(31487)
<u>Monthly Allowance:</u>	Greater of (1) 50% of final compensation, and (2) the service retirement allowance, if eligible to retire.	(31727.4)
<u>Normal Form Of Payment:</u>	Life Annuity with 100% continuance to a surviving spouse (or eligible children).	(31760, 31786)

RECIPROCAL SERVICE-CONNECTED DISABILITY ALLOWANCE

<u>Eligibility:</u>		
All Plans	Any member regardless of age or years of service who leaves their accumulated contributions on deposit and receives a disability retirement allowance from CalPERS or another '37 Act system. The member must be eligible for a reciprocal benefit and the disability must be service-connected.	(31837)
Except 3:		
Plan 3:	Not available under Plan 3.	
<u>Monthly Allowance:</u>	Same as nonservice-connected disability, but in no case shall the allowance be greater than if all service was with one entity.	(31837, 31838.5)
<u>Normal Form of Payment:</u>	Life Annuity with 100% continuance to a surviving spouse (or eligible children).	(31760, 31786)

NONSERVICE-CONNECTED DISABILITY RETIREMENT ALLOWANCE

Eligibility:

All Plans Except 3: Any age with five years of service and permanently incapacitated for the performance of duty. (31720, 31836)

Plan 3: Not available under Plan 3. (31487)

Monthly Allowance: The monthly allowance is equal to a service retirement allowance if the member is eligible to retire, otherwise allowance equals (a) or (b) where: (31726, 31726.5)

General Members: (a) 90% of 1/60th of Final Compensation x years of service, if member must rely on service in another retirement system in order to be eligible to retire, or allowance exceeds 1/3 of final compensation. (31727(a))

(b) 90% of 1/60th of Final Compensation x years of service projected to age 65, not to exceed 1/3 of Final Compensation. (31727(b))

Safety Members: 1/60 is replaced by 1/50 and age 65 is replaced by age 55 in (a) and (b) above. (31727.2)

Normal Form Of Payment: Life Annuity with 60% continuance to a surviving spouse (or eligible children). (31760.1)

SERVICE-CONNECTED DEATH BENEFITS

Eligibility

All Plans Except 3: Active members who die in service as a result of injury or disease arising out of and in the course of employment. (31787)

Plan 3: Not available under Plan 3. (31487)

Monthly Allowance: An annual death allowance is payable monthly to an eligible survivor (or eligible children) equal to 50% of the member's Final Compensation. (31787)

SERVICE-CONNECTED DEATH BENEFITS (Continued)

Optional Combined Benefit: (31781.3)

In lieu of the monthly allowance above, an eligible survivor may elect:

- (a) A lump sum equal to 1/12 of the compensation earned in the preceding 12 months x years of service (benefit not to exceed 50% of the 12 months' compensation), plus
- (b) A monthly payment equal to 50% of the member's Final Compensation, reduced by a monthly amount, which is the actuarial equivalent of (a) above based on the age of eligible survivor.

Death Benefit (Lump Sum): (31781)

The member's normal contributions and interest, plus 1/12 of the compensation earned in the preceding 12 months x years of service (benefit not to exceed 50% of the 12 months' compensation).

Additional Allowance for Children: (31787.5)

25% of death allowance (whether or not the monthly allowance or combined benefit is chosen) for one child, 40% for two children, and 50% for three or more children.

Additional Amount for Spouse of Safety Member: (31787.6)

An eligible survivor of a safety member is also entitled to receive a lump sum death benefit equal to 12 x monthly rate of compensation at the time of member's death in addition to all other benefits.

Note: For valuation purposes, an unmarried member is assumed to take the lump sum benefit. A married member is assumed to take the monthly allowance or the lump sum, whichever is more valuable.

NONSERVICE-CONNECTED DEATH BENEFITS

Eligibility:

All Plans Except 3: Active members who die while in service or while physically or mentally incapacitated for the performance of duty. (31780)

Plan 3: Not available under Plan 3.

Death Benefit (Lump Sum): (31781)

The member's normal contributions and interest, plus 1/12 of the Compensation earned in preceding 12 months x the number of completed years of service (benefit not to exceed 50% of the 12 months' compensation).

Optional Death Benefit:

In lieu of the lump sum death benefit, several optional death benefits are available to provide flexibility to survivors, as follows.

First Optional Death Benefit: (31781.1)

If a member who would have been entitled to a nonservice-connected disability retirement allowance dies prior to retirement as a result of such disability, the eligible survivor (or eligible children) may elect to receive an optional death allowance equal to 60% of the monthly retirement allowance to which the member would have been entitled as of the date of death.

Second Optional Death Benefit: (31781.2, 31765.2)

If a member dies prior to reaching the minimum retirement age but has 10 or more years of service, an eligible survivor (or eligible children) may elect to leave the amount of the death benefit on deposit until the earliest date the member could have retired and at that time receive the allowance provided for in 31765.2 (a 60% continuance).

Third Optional Death Benefit:

An eligible survivor of a member who dies after five years of service may elect a combined benefit equal to:

(a) A lump sum equal to 1/12 of the compensation earnable in the preceding 12 months x the number of completed years of service (benefit not to exceed 50% of the 12 months' compensation), plus (31781.3)

(b) A monthly payment equal to 60% of the monthly retirement allowance to which the member would have been entitled if the member retired or had been retired for a nonservice-connected disability as of the date of death, reduced by a monthly amount which is the actuarial equivalent of (a) above based on the age of the eligible survivor. (31781.1)

NONSERVICE-CONNECTED DEATH BENEFITS (Continued)

Fourth Optional Death Benefit:

If a member dies while eligible for a service retirement and the eligible survivor is designated as beneficiary, the spouse (or eligible children) may elect to receive 60% of the monthly retirement allowance to which the member would have been entitled as of the date of death. (31765.1)

Note for Third and Fourth Optional Death Benefits: In order to leave the eligible survivor the greatest benefit, the member is assumed to have retired for nonservice-connected disability, elected the Option 2 retirement allowance, and then died the next day.

Fifth Optional Death Benefit:

If a member dies while eligible for a service retirement and the eligible survivor is designated as beneficiary and survives the member by not less than 30 days the spouse (or eligible children) may elect to receive the same retirement allowance as the spouse would have received had the member retired on the date of death and selected Option 3. (31765)

Note: For valuation purposes, an unmarried member is assumed to take the lump sum benefit. A married member is assumed to receive an annuity or a lump sum, whichever is more valuable. The annuity is equal to the Option 2-100% Continuance calculation for the larger of either (1) a non-service connected disability benefit or (2) the member's earned service retirement benefit (if eligible).

DEFERRED RETIREMENT BENEFITS

Eligibility:

All Plans, except Plans 3 and 7: Age 50 with 10 years of membership. (31700)

Member contributions must be left on deposit and the member must have terminated with five years of service or entered a reciprocal agency. Members are eligible for service retirement when they would have reached eligibility if they would have remained in an active position.

Plan 3: Age 55 with 10 years of service. (31496)

Plan 7: **General members:**
 Age 52 with 5 years of service.

Safety and Probation members:
 Age 50 with 5 years of service.

All Plans: Member contributions must be left on deposit and the member must have terminated with 5 years of service or entered a reciprocal agency. Members (except for Plan 7) are eligible for service retirement when they would have reached eligibility if they would have remained in an active position.

Monthly Allowance:

All Plans Except 3: Same as service retirement allowance; payable any time after the member would have been eligible for service retirement. (31703, 31704, 31705)

If a terminated member dies before the effective date of the deferred retirement allowance, the member's accumulated contributions are paid to the estate or to the named beneficiary. (31702)

Plan 3: Same as service retirement allowance at normal retirement age 65 or in an actuarially equivalent reduced amount at early retirement, after age 55. (31496)

No benefit is paid for death while inactive.

COST-OF-LIVING INCREASES

Cost-of-living increases (or decreases) are applied to all retirement allowances (service and disability), optional death allowances, and annual death allowances effective April 1, based on changes in the Consumer Price Index (CPI) from the previous January 1 to the current January 1, to the nearest ½ of 1%. (31870, 31870.1, 31870.2, 31874.4)

Plan 1: General & Safety (31870.2)
 Members (and their beneficiaries) are limited to a maximum 5% cost-of-living increase.

Probation (31870.1)
 Members (and their beneficiaries) are limited to a maximum 3% cost-of-living increase.

Plan 2: All members (31870.1)
 Members (and their beneficiaries) are limited to a maximum 3% cost-of-living increase.

Plan 3: Plan 3 does not have a COLA. (31487)

Other Plans: All members (31870)
 Members (and their beneficiaries) are limited to a maximum 2% cost-of-living increase.

COLA Bank

Plan 1: When the CPI exceeds the applicable percentage (3% or 5%), the difference between the actual CPI and the maximum cost-of-living increase given in any year is credited to the COLA Accumulation (COLA Bank). It may be used in future years to provide cost-of-living increases when the CPI falls below the applicable percentage. (31870.1, 31870.2)

Other Plans: All other Plans do not have a COLA bank. (31874.4)

Appendix C Valuation Data and Schedules



Data on SamCERA membership as of June 30, 2017 was supplied to us by SamCERA staff. On the following table, Exhibit C-1, we present a summary of SamCERA membership at June 30, 2017 for active members. Similar information is shown in Exhibit C-2 for inactive members and Exhibits C-3a and C-3b for retired members.

Note that salary amounts shown are annualized amounts based on the biweekly pay for the period prior to the valuation date. If the annualized amount was less than the total prior earnings, total prior year earnings were used.

Additional statistical data on both active and retired members is shown in the following tables.

Exhibit C-4: Age, Service, Compensation Distribution of Active Members

Exhibit C-5: Age, Retirement Year, Benefit Amount and Plan Distribution of Retired Members

Exhibits C-4 and C-5 are shown for all plans combined as well as for classification separately.

Exhibit C-1 SamCERA Membership – Active Members as of June 30, 2017

	Total Number	Annual Salary	Average Age	Average Monthly Salary	Average Credited Service
General Members					
Plan 1	11	\$ 1,492,224	64.5	\$ 11,305	35.8
Plan 2	658	71,015,755	55.9	8,994	25.5
Plan 3	76	6,825,344	48.5	7,484	14.6
Plan 4	2,109	205,848,221	48.2	8,134	12.5
Plan 5	279	30,066,543	43.1	8,980	4.0
Plan 7	1,427	115,365,797	37.9	6,737	1.9
Total	4,560	\$ 430,613,886	45.8	\$ 7,869	10.6
Safety Members					
Plan 1	1	\$ 173,210	72.0	\$ 14,434	42.9
Plan 2	64	10,389,471	52.6	13,528	24.2
Plan 4	250	34,142,578	45.5	11,381	12.6
Plan 5	59	7,465,324	39.7	10,544	3.8
Plan 7	129	12,934,534	33.3	8,356	2.1
Total	503	\$ 65,105,116	42.7	\$ 10,786	10.4
Probation Members					
Plan 1	1	\$ 92,667	66.0	\$ 7,722	34.8
Plan 2	38	4,135,586	50.0	9,069	23.4
Plan 4	189	18,756,569	44.1	8,270	14.4
Plan 5	7	639,411	33.7	7,612	4.7
Plan 6	1	88,164	34.0	7,347	4.9
Plan 7	38	2,791,226	31.5	6,121	2.0
Total	274	\$ 26,503,623	43.0	\$ 8,061	13.7
Grand Total	5,337	\$ 522,222,625	45.4	\$ 8,154	10.8

Exhibit C-2 SamCERA Membership – Inactive Members as of June 30, 2017

	Deferred Vested Number	Deferred Vested Average Age	Contingent Vested Number	Contingent Vested Average Age
General Members				
Plan 1	10	62.5	-	-
Plan 2	323	54.7	1	49.0
Plan 3	89	55.9	-	-
Plan 4	695	45.9	30	46.7
Plan 5	28	39.5	22	40.2
Plan 7	34	38.5	118	39.1
Total	1,179	48.8	171	40.7
Safety Members				
Plan 1	1	66.0	-	-
Plan 2	22	50.8	-	-
Plan 4	43	46.5	2	49.5
Plan 5	3	43.7	2	35.0
Plan 7	-	-	4	44.0
Total	69	48.0	8	43.1
Probation Members				
Plan 1	-	-	-	-
Plan 2	19	49.3	-	-
Plan 4	38	42.6	-	-
Plan 5	-	-	1	37.0
Plan 6	-	-	-	-
Plan 7	-	-	2	29.0
Total	57	44.8	3	31.7
Grand Total	1,305	48.6	182	40.6

Exhibit C-3a SamCERA Membership – Retired Members as of June 30, 2017

	Number	Average Age	Monthly Allowance	Average Monthly Benefit
General Members				
Plan 1	1,603	78.9	\$ 5,300,211	\$ 3,292
Plan 2	1,913	68.7	5,477,897	2,806
Plan 3	130	70.8	146,101	471
Plan 4	675	64.4	1,322,705	1,937
Plan 5	1	57.0	493	246
Total	4,322	71.9	\$ 12,247,406	\$ 2,834
Safety Members				
Plan 1	276	73.4	\$ 1,862,584	\$ 6,513
Plan 2	194	61.0	1,397,960	6,887
Plan 4	59	57.6	230,962	3,609
Total	529	67.1	\$ 3,491,506	\$ 6,600
Probation Members				
Plan 1	28	72.3	\$ 380,965	\$ 3,594
Plan 2	54	60.0	400,988	4,266
Plan 4	23	61.7	68,162	2,622
Total	105	63.6	\$ 850,115	\$ 8,096
Grand Total	4,956	71.2	\$ 16,589,028	\$ 3,347

**Exhibit C-3b SamCERA Membership – Retired Members as of June 30, 2017
 Subtotaled by Class and Retirement Type**

<u>Plan</u>	<u>Retirement Type</u>	<u>Number</u>	<u>Monthly Benefit</u>	<u>Average Monthly Benefit</u>
General Plans:				
	Healthy	3,446	\$ 10,324,089	\$ 2,822
	Disabled	355	983,644	2,755
	Beneficiaries	521	939,673	1,734
	Total	4,322	\$ 12,247,406	\$ 2,834
Safety Plans:				
	Healthy	332	\$ 2,554,415	\$ 7,278
	Disabled	105	601,251	5,516
	Beneficiaries	92	335,841	3,611
	Total	529	\$ 3,491,506	\$ 6,600
Probation Plans:				
	Healthy	91	\$ 768,249	\$ 3,981
	Disabled	9	42,211	3,837
	Beneficiaries	5	39,655	1,803
	Total	105	\$ 850,115	\$ 8,096
Grand Totals				
	Healthy	3,869	\$ 13,646,753	\$ 3,527
	Disabled	469	1,627,105	3,469
	Beneficiaries	618	1,315,170	2,128
	Total	4,956	\$ 16,589,028	\$ 3,347

Exhibit C-4 Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2017
All Members

Age	Years of Service										Total Count
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
Under 25	28	18	0	0	0	0	0	0	0	0	46
25-29	108	234	16	0	0	0	0	0	0	0	358
30-34	120	372	109	46	2	0	0	0	0	0	649
35-39	87	231	159	174	41	0	0	0	0	0	692
40-44	52	155	139	236	195	20	1	0	0	0	798
45-49	46	124	119	201	219	97	20	1	0	0	827
50-54	25	94	82	129	172	91	85	21	0	0	699
55-59	23	73	79	116	144	79	82	43	12	0	651
60-64	10	46	65	105	73	35	55	34	14	0	437
65 & Over	3	15	34	41	30	14	22	11	10	0	180
Total Count	502	1,362	802	1,048	876	336	265	110	36	0	5,337

Age	Years of Service										Average Comp.
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
Under 25	64,111	69,203	-	-	-	-	-	-	-	-	66,103
25-29	73,021	79,964	79,919	-	-	-	-	-	-	-	77,867
30-34	78,198	84,293	94,858	83,170	60,045	-	-	-	-	-	84,786
35-39	81,277	89,514	107,027	94,841	91,514	-	-	-	-	-	93,961
40-44	85,755	92,885	106,015	100,663	103,186	93,786	88,976	-	-	-	99,542
45-49	89,573	100,159	111,046	104,357	108,605	112,090	116,301	118,219	-	-	106,205
50-54	91,310	90,970	108,428	95,086	108,765	113,926	109,624	110,054	-	-	103,999
55-59	75,234	92,120	95,507	100,783	98,131	115,069	115,028	112,771	108,961	-	102,153
60-64	90,400	100,481	107,479	97,542	99,213	103,485	113,638	97,584	122,868	-	102,762
65 & Over	79,626	119,753	120,384	101,493	105,257	119,287	104,068	106,077	131,501	-	110,492
Avg. Annual Compensation	79,426	88,475	104,865	98,684	103,900	111,602	112,094	106,938	120,630	-	97,849



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Exhibit C-4a Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2017
General Members

Age	Years of Service										Total Count
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
Under 25	21	12	0	0	0	0	0	0	0	0	33
25-29	87	182	14	0	0	0	0	0	0	0	283
30-34	108	327	86	38	2	0	0	0	0	0	561
35-39	80	210	138	134	33	0	0	0	0	0	595
40-44	48	142	121	186	132	15	1	0	0	0	645
45-49	45	114	100	171	156	64	15	1	0	0	666
50-54	23	84	73	116	135	71	70	21	0	0	593
55-59	23	66	70	110	130	72	78	40	12	0	601
60-64	9	45	55	101	72	33	50	33	14	0	412
65 & Over	3	15	33	39	27	14	21	10	9	0	171
Total Count	447	1,197	690	895	687	269	235	105	35	0	4,560

Age	Years of Service										Average Comp.
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
Under 25	58,929	61,346	-	-	-	-	-	-	-	-	59,808
25-29	70,547	75,614	77,688	-	-	-	-	-	-	-	74,159
30-34	76,870	82,372	89,169	75,959	60,045	-	-	-	-	-	81,841
35-39	79,784	87,856	106,082	89,652	82,459	-	-	-	-	-	91,103
40-44	83,930	91,085	103,733	97,460	97,485	85,939	88,976	-	-	-	95,950
45-49	89,698	96,585	106,392	100,159	101,632	101,214	108,359	118,219	-	-	100,435
50-54	90,000	87,469	106,214	92,571	104,640	102,702	101,717	110,054	-	-	99,087
55-59	75,234	88,923	88,988	99,104	95,775	112,386	112,927	107,662	108,961	-	99,326
60-64	84,410	100,057	102,805	95,641	99,575	102,949	111,045	95,195	122,868	-	100,866
65 & Over	79,626	119,753	119,643	100,586	104,757	119,287	101,220	107,418	126,867	-	109,628
Avg. Annual Compensation	78,129	86,335	101,698	95,393	99,183	104,899	107,748	104,299	119,128	-	94,433



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Exhibit C-4b Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2017
Safety Members

Age	Years of Service									Total Count	
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
Under 25	6	5	0	0	0	0	0	0	0	0	11
25-29	14	41	1	0	0	0	0	0	0	0	56
30-34	9	34	18	5	0	0	0	0	0	0	66
35-39	5	17	13	18	6	0	0	0	0	0	59
40-44	4	11	14	22	23	2	0	0	0	0	76
45-49	1	9	19	19	34	15	3	0	0	0	100
50-54	2	9	8	8	22	15	7	0	0	0	71
55-59	0	7	9	3	7	6	4	2	0	0	38
60-64	1	1	9	3	0	0	4	1	0	0	19
65 & Over	0	0	1	2	2	0	1	0	1	1	7
Total Count	42	134	92	80	94	38	19	3	1	1	503

Age	Years of Service									Average Comp.	
	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
Under 25	82,447	88,145	-	-	-	-	-	-	-	-	85,037
25-29	91,707	99,274	104,354	-	-	-	-	-	-	-	97,473
30-34	97,527	103,095	127,313	131,327	-	-	-	-	-	-	111,080
35-39	123,059	114,135	128,275	134,487	136,983	-	-	-	-	-	126,540
40-44	107,659	118,971	132,700	134,504	135,402	138,543	-	-	-	-	130,888
45-49	83,953	140,522	135,539	146,674	145,167	162,097	171,330	-	-	-	145,918
50-54	106,380	125,325	131,303	134,480	136,691	169,757	176,014	-	-	-	144,403
55-59	-	122,268	146,215	173,970	116,060	149,497	156,000	192,409	-	-	142,419
60-64	144,312	119,561	134,690	163,697	-	-	153,120	176,420	-	-	145,057
65 & Over	-	-	144,836	119,184	116,964	-	163,862	-	173,210	-	136,315
Avg. Annual Compensation	98,649	109,203	132,826	139,381	137,504	161,891	165,601	187,079	173,210	-	129,434



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Exhibit C-4c Age & Service Distribution of Active Members by Count and Average Compensation as of June 30, 2017
Probation Members

Count	Years of Service										Total Count	
	Age	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
	Under 25	1	1	0	0	0	0	0	0	0	0	2
	25-29	7	11	1	0	0	0	0	0	0	0	19
	30-34	3	11	5	3	0	0	0	0	0	0	22
	35-39	2	4	8	22	2	0	0	0	0	0	38
	40-44	0	2	4	28	40	3	0	0	0	0	77
	45-49	0	1	0	11	29	18	2	0	0	0	61
	50-54	0	1	1	5	15	5	8	0	0	0	35
	55-59	0	0	0	3	7	1	0	1	0	0	12
	60-64	0	0	1	1	1	2	1	0	0	0	6
	65 & Over	0	0	0	0	1	0	0	1	0	0	2
Total Count		13	31	20	73	95	29	11	2	0	0	274

Compensation	Years of Service										Average Comp.	
	Age	0-1	1-4	5-9	10-14	15-19	20-24	25-29	30-34	35&Over		
	Under 25	62,920	68,773	-	-	-	-	-	-	-	-	65,846
	25-29	66,402	79,955	86,724	-	-	-	-	-	-	-	75,318
	30-34	68,015	83,264	75,869	94,253	-	-	-	-	-	-	81,002
	35-39	36,581	71,955	88,796	94,012	104,511	-	-	-	-	-	88,122
	40-44	-	77,186	81,649	95,347	103,474	103,185	-	-	-	-	98,691
	45-49	-	144,312	-	96,529	103,249	109,087	93,323	-	-	-	104,108
	50-54	-	75,886	87,036	90,403	104,938	105,818	120,719	-	-	-	105,253
	55-59	-	-	-	89,164	123,960	101,650	-	157,876	-	-	116,228
	60-64	-	-	119,620	91,060	73,140	112,339	85,347	-	-	-	98,974
	65 & Over	-	-	-	-	95,327	-	-	92,667	-	-	93,997
Avg. Annual Compensation		61,919	81,502	85,485	94,426	104,763	107,881	112,522	125,271	-	-	96,729



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**Exhibit C-5 Distribution of Retired Members by Age and Retirement Year as of June 30, 2017
 All Plans Combined**

Age	Retirement Year								Total Count	Average Monthly Benefit
	Pre-1984	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19		
Under 35	-	-	1	5	2	3	2	-	13	\$ 813
35-39	-	-	-	-	-	-	2	4	6	2,911
40-44	-	-	-	-	1	4	8	3	16	3,713
45-49	-	1	1	-	5	7	12	8	34	2,830
50-54	-	1	1	5	9	13	33	90	152	3,576
55-59	1	1	2	11	18	39	172	132	376	3,358
60-64	-	1	7	14	51	165	255	187	680	3,748
65-69	3	8	21	54	139	266	364	139	994	3,696
70-74	8	12	40	118	213	345	199	47	982	3,854
75-79	9	29	112	165	186	132	51	8	692	3,127
80-84	29	51	95	129	75	19	5	4	407	2,698
85-89	57	59	105	57	11	5	4	2	300	2,262
90-94	83	81	41	10	2	1	-	-	218	2,111
95-99	50	25	6	-	-	-	-	1	82	2,251
100 & Over	4	-	-	-	-	-	-	-	4	954
Total Count	244	269	432	568	712	999	1,107	625	4,956	
Avg Monthly Benefit	\$ 1,738	\$ 2,289	\$ 2,367	\$ 2,541	\$ 3,323	\$ 4,223	\$ 3,734	\$ 3,785		\$ 3,347



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**Exhibit C-5a Distribution of Retired Members by Age and Retirement Year as of June 30, 2017
 General Plans Combined**

Age	Retirement Year								Total Count	Average Monthly Benefit
	Pre-1984	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19		
Under 35	-	-	1	5	2	3	2	-	13	\$ 813
35-39	-	-	-	-	-	-	2	2	4	3,057
40-44	-	-	-	-	1	3	6	2	12	3,009
45-49	-	1	1	-	2	4	10	5	23	2,464
50-54	-	1	1	2	5	6	24	46	85	1,892
55-59	1	1	1	10	14	31	131	108	297	2,227
60-64	-	1	5	11	43	128	226	174	588	3,125
65-69	2	3	13	44	113	237	341	132	885	3,242
70-74	5	7	30	94	157	325	192	45	855	3,348
75-79	5	17	91	117	176	130	46	8	590	2,607
80-84	24	46	88	125	73	19	5	4	384	2,507
85-89	53	55	104	57	11	5	4	2	291	2,147
90-94	77	80	41	10	2	1	-	-	211	2,067
95-99	48	25	6	-	-	-	-	1	80	2,180
100 & Over	4	-	-	-	-	-	-	-	4	954
Total Count	219	237	382	475	599	892	989	529	4,322	
Avg Monthly Benefit	\$ 1,524	\$ 2,058	\$ 2,026	\$ 1,950	\$ 2,563	\$ 3,707	\$ 3,219	\$ 3,214		\$ 2,834



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**Exhibit C-5b Distribution of Retired Members by Age and Retirement Year as of June 30, 2017
 Safety Plans Combined**

Age	Retirement Year								Total Count	Average Monthly Benefit
	Pre-1984	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19		
Under 35	-	-	-	-	-	-	-	-	-	\$ -
35-39	-	-	-	-	-	-	-	2	2	2,619
40-44	-	-	-	-	-	1	1	1	3	6,848
45-49	-	-	-	-	3	3	2	-	8	3,524
50-54	-	-	-	3	3	6	5	30	47	5,937
55-59	-	-	1	1	4	8	31	17	62	7,806
60-64	-	-	2	3	6	31	21	13	76	7,672
65-69	1	5	8	8	25	25	19	7	98	6,942
70-74	3	5	10	21	50	14	4	2	109	6,715
75-79	4	12	19	38	10	1	2	-	86	5,690
80-84	5	5	7	2	1	-	-	-	20	5,083
85-89	4	4	1	-	-	-	-	-	9	5,986
90-94	6	1	-	-	-	-	-	-	7	3,419
95-99	2	-	-	-	-	-	-	-	2	5,120
100 & Over	-	-	-	-	-	-	-	-	-	-
Total Count	25	32	48	76	102	89	85	72	529	
Avg Monthly Benefit	\$ 3,612	\$ 3,994	\$ 4,808	\$ 5,197	\$ 6,718	\$ 8,442	\$ 8,048	\$ 7,319		\$ 6,600



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**Exhibit C-5c Distribution of Retired Members by Age and Retirement Year as of June 30, 2017
 Probation Plans Combined**

Age	Retirement Year								Total Count	Average Monthly Benefit
	Pre-1984	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-19		
Under 35	-	-	-	-	-	-	-	-	-	\$ -
35-39	-	-	-	-	-	-	-	-	-	-
40-44	-	-	-	-	-	-	1	-	1	2,754
45-49	-	-	-	-	-	-	-	3	3	3,786
50-54	-	-	-	-	1	1	4	14	20	5,184
55-59	-	-	-	-	-	-	10	7	17	6,907
60-64	-	-	-	-	2	6	8	-	16	7,977
65-69	-	-	-	2	1	4	4	-	11	11,281
70-74	-	-	-	3	6	6	3	-	18	10,561
75-79	-	-	2	10	-	1	3	-	16	8,531
80-84	-	-	-	2	1	-	-	-	3	11,330
85-89	-	-	-	-	-	-	-	-	-	-
90-94	-	-	-	-	-	-	-	-	-	-
95-99	-	-	-	-	-	-	-	-	-	-
100 & Over	-	-	-	-	-	-	-	-	-	-
Total Count	-	-	2	17	11	18	33	24	105	
Avg Monthly Benefit	\$ -	\$ -	\$ 8,831	\$ 7,183	\$ 13,238	\$ 8,924	\$ 8,046	\$ 5,773		\$ 8,096



This work product was prepared solely for SamCERA for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product. C-13

Appendix D Member Contribution Rates



This section illustrates the member basic contribution rates and COLA sharing contribution rates by entry age for Plans 1 through 6. For different COLA sharing percentages, the COLA contribution rates may be adjusted ratably, and should be rounded to two decimal places.

Member contribution rates for Plan 7 are not defined by entry age. Plan 7 members contribute 50% of the total Normal Cost rate. For the 2018-2019 fiscal year, Plan 7 member contribution rates are:

- General Plan 7 members: 8.71%
- SMCM&VCD Plan 7 members: 8.84%
- Safety Plan 7 members: 14.51%
- Probation Plan 7 members: 14.33%

Please refer to Appendix B for a detailed description of member contribution rates.

Exhibit D-1 General Member Contribution Rates (including SMCM&VCD)

Entry Age ⁽¹⁾	Basic Member Rates				
	General & SMCM&VCD			General	SMCM&VCD
	Plans 1&2	Plan 4	Plan 5	Plan 7	Plan 7
16	5.67%	5.48%	4.72%	8.71%	8.84%
17	5.77%	5.58%	4.81%	8.71%	8.84%
18	5.88%	5.68%	4.90%	8.71%	8.84%
19	5.99%	5.79%	5.00%	8.71%	8.84%
20	6.10%	5.90%	5.09%	8.71%	8.84%
21	6.22%	6.01%	5.19%	8.71%	8.84%
22	6.33%	6.12%	5.29%	8.71%	8.84%
23	6.45%	6.24%	5.38%	8.71%	8.84%
24	6.57%	6.35%	5.49%	8.71%	8.84%
25	6.69%	6.47%	5.59%	8.71%	8.84%
26	6.82%	6.59%	5.69%	8.71%	8.84%
27	6.94%	6.71%	5.80%	8.71%	8.84%
28	7.07%	6.83%	5.91%	8.71%	8.84%
29	7.20%	6.96%	6.02%	8.71%	8.84%
30	7.33%	7.09%	6.13%	8.71%	8.84%
31	7.47%	7.22%	6.24%	8.71%	8.84%
32	7.61%	7.35%	6.36%	8.71%	8.84%
33	7.75%	7.49%	6.47%	8.71%	8.84%
34	7.89%	7.62%	6.59%	8.71%	8.84%
35	8.03%	7.76%	6.71%	8.71%	8.84%
36	8.18%	7.91%	6.84%	8.71%	8.84%
37	8.34%	8.06%	6.96%	8.71%	8.84%
38	8.49%	8.21%	7.09%	8.71%	8.84%
39	8.65%	8.36%	7.22%	8.71%	8.84%
40	8.82%	8.52%	7.36%	8.71%	8.84%
41	8.99%	8.68%	7.49%	8.71%	8.84%
42	9.17%	8.84%	7.63%	8.71%	8.84%
43	9.34%	9.00%	7.78%	8.71%	8.84%
44	9.51%	9.16%	7.92%	8.71%	8.84%
45	9.68%	9.31%	8.07%	8.71%	8.84%
46	9.85%	9.45%	8.23%	8.71%	8.84%
47	10.01%	9.59%	8.38%	8.71%	8.84%
48	10.16%	9.71%	8.53%	8.71%	8.84%
49	10.31%	9.82%	8.67%	8.71%	8.84%
50	10.44%	9.89%	8.82%	8.71%	8.84%
51	10.56%	9.92%	8.95%	8.71%	8.84%
52	10.62%	9.92%	9.08%	8.71%	8.84%
53	10.62%	10.20%	9.20%	8.71%	8.84%
54	10.62%	10.53%	9.30%	8.71%	8.84%
55	10.62%	10.53%	9.37%	8.71%	8.84%
56	10.62%	10.53%	9.40%	8.71%	8.84%
57	10.62%	10.53%	9.40%	8.71%	8.84%
58	10.62%	10.53%	9.66%	8.71%	8.84%
59	10.62%	10.53%	9.97%	8.71%	8.84%
60	10.62%	10.53%	9.97%	8.71%	8.84%

1. For General and SMCM&VCD members (except plan 5 members) entering after age 55, the rate equals the rate at age 55. For General and SMCM&VCD plan 5 members entering after age 60, the rate equals the rate at age 60.

Exhibit D-2 Safety/Probation Member Contribution Rates

Entry Age ⁽¹⁾	Basic Member Rates			
	Safety & Probation		Safety	Probation
	Plans 1&2	Plans 4&5&6	Plan 7	Plan 7
16	7.99%	7.70%	14.51%	14.33%
17	8.13%	7.83%	14.51%	14.33%
18	8.26%	7.96%	14.51%	14.33%
19	8.40%	8.10%	14.51%	14.33%
20	8.54%	8.23%	14.51%	14.33%
21	8.68%	8.37%	14.51%	14.33%
22	8.83%	8.51%	14.51%	14.33%
23	8.97%	8.65%	14.51%	14.33%
24	9.12%	8.79%	14.51%	14.33%
25	9.27%	8.94%	14.51%	14.33%
26	9.43%	9.09%	14.51%	14.33%
27	9.58%	9.24%	14.51%	14.33%
28	9.74%	9.39%	14.51%	14.33%
29	9.90%	9.54%	14.51%	14.33%
30	10.06%	9.70%	14.51%	14.33%
31	10.23%	9.86%	14.51%	14.33%
32	10.40%	10.03%	14.51%	14.33%
33	10.58%	10.20%	14.51%	14.33%
34	10.75%	10.37%	14.51%	14.33%
35	10.94%	10.54%	14.51%	14.33%
36	11.12%	10.72%	14.51%	14.33%
37	11.32%	10.91%	14.51%	14.33%
38	11.51%	11.10%	14.51%	14.33%
39	11.72%	11.28%	14.51%	14.33%
40	11.93%	11.47%	14.51%	14.33%
41	12.13%	11.64%	14.51%	14.33%
42	12.32%	11.80%	14.51%	14.33%
43	12.51%	11.95%	14.51%	14.33%
44	12.67%	12.07%	14.51%	14.33%
45	12.83%	12.17%	14.51%	14.33%
46	12.96%	12.23%	14.51%	14.33%
47	13.05%	12.23%	14.51%	14.33%
48	13.09%	12.60%	14.51%	14.33%
49	13.09%	13.01%	14.51%	14.33%
50	13.09%	13.01%	14.51%	14.33%

1. For Safety and Probation members entering after age 50, the rate equals the rate at age 50.

Exhibit D-3 General Member Contribution Rates (except SMCM&VCD)

Entry Age ⁽¹⁾	50% Member COLA Rates			
	Plan 1	Plan 2	Plan 4	Plan 5
16	2.05%	1.92%	1.44%	1.20%
17	2.09%	1.96%	1.47%	1.22%
18	2.13%	1.99%	1.49%	1.24%
19	2.17%	2.03%	1.52%	1.27%
20	2.21%	2.07%	1.55%	1.29%
21	2.25%	2.11%	1.58%	1.32%
22	2.29%	2.15%	1.61%	1.34%
23	2.33%	2.19%	1.64%	1.37%
24	2.38%	2.23%	1.67%	1.39%
25	2.42%	2.27%	1.70%	1.42%
26	2.47%	2.31%	1.73%	1.44%
27	2.51%	2.35%	1.77%	1.47%
28	2.56%	2.40%	1.80%	1.50%
29	2.61%	2.44%	1.83%	1.53%
30	2.65%	2.48%	1.87%	1.56%
31	2.70%	2.53%	1.90%	1.58%
32	2.75%	2.58%	1.93%	1.61%
33	2.80%	2.63%	1.97%	1.64%
34	2.86%	2.67%	2.00%	1.67%
35	2.91%	2.72%	2.04%	1.70%
36	2.96%	2.77%	2.08%	1.74%
37	3.02%	2.83%	2.12%	1.77%
38	3.07%	2.88%	2.16%	1.80%
39	3.13%	2.93%	2.20%	1.83%
40	3.19%	2.99%	2.24%	1.87%
41	3.25%	3.05%	2.28%	1.90%
42	3.32%	3.11%	2.33%	1.94%
43	3.38%	3.17%	2.37%	1.97%
44	3.44%	3.22%	2.41%	2.01%
45	3.50%	3.28%	2.45%	2.05%
46	3.56%	3.34%	2.49%	2.09%
47	3.62%	3.39%	2.52%	2.13%
48	3.68%	3.44%	2.55%	2.16%
49	3.73%	3.49%	2.58%	2.20%
50	3.78%	3.54%	2.60%	2.24%
51	3.82%	3.58%	2.61%	2.27%
52	3.84%	3.60%	2.61%	2.30%
53	3.84%	3.60%	2.68%	2.33%
54	3.84%	3.60%	2.77%	2.36%
55	3.84%	3.60%	2.77%	2.38%
56	3.84%	3.60%	2.77%	2.39%
57	3.84%	3.60%	2.77%	2.39%
58	3.84%	3.60%	2.77%	2.45%
59	3.84%	3.60%	2.77%	2.53%
60	3.84%	3.60%	2.77%	2.53%

1. For County General members (except plan 5 members) entering after age 55, the rate equals the rate at age 55. For County General plan 5 members entering after age 60, the rate equals the rate at age 60.

Exhibit D-4 Safety Member Contribution Rates

Entry Age ⁽¹⁾	50% Member COLA Rates				
	Plan 1	Plan 2	Plan 4	Plan 5	Plan 6
16	3.83%	4.00%	2.90%	2.68%	2.50%
17	3.90%	4.07%	2.95%	2.72%	2.54%
18	3.96%	4.14%	3.00%	2.77%	2.58%
19	4.03%	4.21%	3.05%	2.82%	2.63%
20	4.09%	4.28%	3.10%	2.86%	2.67%
21	4.16%	4.35%	3.16%	2.91%	2.72%
22	4.23%	4.42%	3.21%	2.96%	2.76%
23	4.30%	4.49%	3.26%	3.01%	2.81%
24	4.37%	4.57%	3.31%	3.06%	2.85%
25	4.44%	4.64%	3.37%	3.11%	2.90%
26	4.52%	4.72%	3.43%	3.16%	2.95%
27	4.59%	4.80%	3.48%	3.21%	3.00%
28	4.67%	4.88%	3.54%	3.26%	3.05%
29	4.75%	4.96%	3.60%	3.32%	3.10%
30	4.82%	5.04%	3.66%	3.37%	3.15%
31	4.90%	5.12%	3.72%	3.43%	3.20%
32	4.98%	5.21%	3.78%	3.49%	3.26%
33	5.07%	5.30%	3.85%	3.55%	3.31%
34	5.15%	5.38%	3.91%	3.60%	3.37%
35	5.24%	5.48%	3.97%	3.66%	3.42%
36	5.33%	5.57%	4.04%	3.73%	3.48%
37	5.43%	5.67%	4.11%	3.79%	3.54%
38	5.52%	5.76%	4.19%	3.86%	3.60%
39	5.62%	5.87%	4.25%	3.92%	3.66%
40	5.72%	5.97%	4.33%	3.99%	3.72%
41	5.81%	6.07%	4.39%	4.05%	3.78%
42	5.90%	6.17%	4.45%	4.10%	3.83%
43	6.00%	6.26%	4.51%	4.15%	3.88%
44	6.07%	6.34%	4.55%	4.20%	3.92%
45	6.15%	6.42%	4.59%	4.23%	3.95%
46	6.21%	6.49%	4.61%	4.25%	3.97%
47	6.25%	6.53%	4.61%	4.25%	3.97%
48	6.27%	6.55%	4.75%	4.38%	4.09%
49	6.27%	6.55%	4.91%	4.52%	4.22%
50	6.27%	6.55%	4.91%	4.52%	4.22%

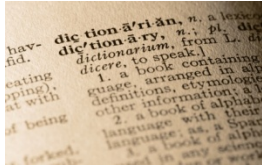
1. For Safety members entering after age 50, the rate equals the rate at age 50.

Exhibit D-5 Probation Member Contribution Rates

Entry Age ⁽¹⁾	50% Member COLA Rates				
	Plan 1	Plan 2	Plan 4	Plan 5	Plan 6
16	4.25%	4.10%	2.91%	2.67%	2.34%
17	4.33%	4.17%	2.96%	2.71%	2.38%
18	4.40%	4.24%	3.01%	2.76%	2.42%
19	4.47%	4.31%	3.07%	2.81%	2.47%
20	4.54%	4.38%	3.11%	2.85%	2.51%
21	4.62%	4.46%	3.17%	2.90%	2.55%
22	4.70%	4.53%	3.22%	2.95%	2.59%
23	4.77%	4.61%	3.27%	3.00%	2.63%
24	4.85%	4.68%	3.33%	3.04%	2.68%
25	4.93%	4.76%	3.38%	3.10%	2.72%
26	5.02%	4.84%	3.44%	3.15%	2.77%
27	5.10%	4.92%	3.50%	3.20%	2.81%
28	5.18%	5.00%	3.55%	3.25%	2.86%
29	5.27%	5.08%	3.61%	3.30%	2.90%
30	5.35%	5.16%	3.67%	3.36%	2.95%
31	5.44%	5.25%	3.73%	3.42%	3.00%
32	5.53%	5.34%	3.80%	3.47%	3.05%
33	5.63%	5.43%	3.86%	3.53%	3.10%
34	5.72%	5.52%	3.92%	3.59%	3.16%
35	5.82%	5.62%	3.99%	3.65%	3.21%
36	5.92%	5.71%	4.06%	3.71%	3.26%
37	6.02%	5.81%	4.13%	3.78%	3.32%
38	6.12%	5.91%	4.20%	3.85%	3.38%
39	6.24%	6.02%	4.27%	3.91%	3.43%
40	6.35%	6.12%	4.34%	3.97%	3.49%
41	6.45%	6.23%	4.40%	4.03%	3.54%
42	6.56%	6.33%	4.47%	4.09%	3.59%
43	6.66%	6.42%	4.52%	4.14%	3.64%
44	6.74%	6.50%	4.57%	4.18%	3.67%
45	6.83%	6.59%	4.61%	4.22%	3.70%
46	6.90%	6.65%	4.63%	4.24%	3.72%
47	6.94%	6.70%	4.63%	4.24%	3.72%
48	6.97%	6.72%	4.77%	4.36%	3.84%
49	6.97%	6.72%	4.92%	4.51%	3.96%
50	6.97%	6.72%	4.92%	4.51%	3.96%

1. For Probation members entering after age 50, the rate equals the rate at age 50.

Appendix E



Glossary

The following definitions include excerpts from a list adopted by the major actuarial organizations in the United States. In some cases, the definitions have been modified for specific applicability to SamCERA and include terms used exclusively by SamCERA. Defined terms are capitalized throughout this Appendix.

Accrued Benefit

The amount of an individual's benefit (whether or not vested) as of a specific date, determined in accordance with the terms of a pension plan and based on compensation and service to that date.

Actuarial Accrued Liability

That portion, as determined by a particular Actuarial Cost Method, of the Actuarial Present Value of pension plan benefits and expenses which is not provided for by future Normal Costs.

Actuarial Assumptions

Assumptions as to the occurrence of future events affecting pension costs, such as: mortality, withdrawal, disability, and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; procedures used to determine the Actuarial Value of Assets; and other relevant items.

Actuarial Gain (Loss)

A measure of the difference between actual experience and that expected based on a set of Actuarial Assumptions during the period between two Actuarial Valuation dates, as determined in accordance with a particular Actuarial Cost Method.

Actuarial Present Value

The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions.

Actuarial Valuation

The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a pension plan.

Actuarial Value of Assets

The value of cash, investments and other property belonging to a pension plan, as used by the actuary for the purpose of an Actuarial Valuation.

Actuarially Equivalent

Of equal Actuarial Present Value, determined as of a given date with each value based on the same set of Actuarial Assumptions.

Amortization Payment

That portion of the pension plan contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

COLA

Cost of living adjustments to benefit payments are made each April 1. See full description in Appendix B.

County Supplementary Contributions Account (CSCA) Reserve

This is a reserve for supplemental contributions from the County of San Mateo that are over and above the County's required statutory contribution rates.

District Supplementary Contributions Account (DSCA) Reserve	This is a reserve for supplemental contributions from the San Mateo County Mosquito and Vector Control District ("District") that are over and above the District's required statutory contribution rates.
Employer Reserve	The accumulation of employer contributions for future retirement benefit payments. Additions include contributions from employers and related earnings. Deductions include annuity payments to retired members and survivors, lump sum death benefit payments to member survivors, and supplemental disability payments.
Entry Age Actuarial Cost Method	A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit ages. The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.
Funded Ratio	A measurement of the funded status of the system. The Funded Ratio is calculated by dividing the Valuation Assets by the Actuarial Accrued Liability. For example, a Funded Ratio of 90% indicates assets are 10% less than liabilities.
Member Reserve	The accumulation of member contributions. Additions include member contributions and related earnings. Deductions include annuity payments to retirees and refunds to members.
Non-Valuation Reserves	Reserves excluded from the calculation of contribution rates.
Normal Cost	That portion of the Actuarial Present Value of pension plan benefits and expenses which is allocated to a valuation year by the Actuarial Cost Method.
Plan Year	A 12-month period beginning July 1 and ending June 30.
Projected Benefits	Those pension plan benefit amounts which are expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age and past and anticipated future compensation and service credits.
Unfunded Actuarial Accrued Liability	The excess, if any, of the Actuarial Accrued Liability over the Actuarial Value of Assets.
Valuation Date	The date upon which the Normal Cost, Actuarial Accrued Liability, and Actuarial Value of Assets are determined. Generally, the Valuation Date will coincide with the ending of a Plan Year.
Valuation Reserves	All reserves excluding the Non-Valuation Reserves.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 16, 2017

Agenda Item 3

TO: Board of Retirement

FROM: Scott Hood, Chief Executive Officer 

SUBJECT: Presentation of the June 30, 2017, Actuarial Valuation Audit by the Segal Company

Recommendation

The Segal Company will present the results of their audit of the June 30, 2017, Actuarial Valuation as produced by Milliman, Inc. This is an information-only item.

Background

As part of our actuarial auditing process, every three years the auditing actuary, Segal Company, audits both the Triennial Experience Study and the annual Actuarial Valuation. In June, Segal presented its audit of the Investigation of Experience July 1, 2014 – April 30, 2017. Today, it will present its audit of the June 30, 2017, Actuarial Valuation.

Discussion

The overriding purpose of the valuation audit is to verify the calculations completed by Milliman and to offer comments on the methodology and the results of their actuarial valuation. Segal noted in their audit report that, *"Our audit confirms that the results of the actuarial calculations as of June 30, 2017 are reasonable, and that those calculations are based on generally accepted actuarial principles and practices."*

Segal noted further that:

- The valuation results were prepared using the actuarial assumptions approved by the Board for the 2017 valuation. Segal has previously reviewed those assumptions and found them to be reasonable and in accordance with generally accepted actuarial standards and principles.
- Segal's results differed, as set forth below, but Segal believes that the difference is within an acceptable range and provide assurance that the significant plan liabilities are properly valued.
 - Segal's total actuarial accrued liability as of June 30, 2017 is 102% of Milliman's liability.
 - Segal's total employer contribution rate as of June 30, 2017 is 101% of Milliman's rate.

- Segal's net employer normal cost contribution rate is 99% of Milliman's net employer normal cost rate. (As a percentage of projected payroll)
- Segal's individual entry age based member normal cost rates are about 100% of those calculated by Milliman.
- Segal verified that Milliman's calculations of the UAAL and the total employer contribution rate as a percentage of payroll are reasonable and consistent with past practices.
- Segal verified that Milliman's calculated employee contribution rates are reasonable and consistent with the relevant provisions of the County Employees' Retirement Law (CERL) and past practices.

Segal made the following recommendations:

- For financial and accounting reporting purposes, assets have been maintained by SamCERA on a combined basis for all of the twenty-two Plans as a whole rather than for each of the three membership groups: (i) combined General – County and Courts, and General – SMCM&VCD, (ii) Safety and (iii) Probation. Segal recommends that the assets be separated for the three membership groups and will discuss its reasoning for that at the meeting.
- The California Actuarial Advisory Panel has recommended the asset and liability volatility ratios be included in the valuation report and Milliman has included those ratios for the current and for the Plan as a whole. Segal recommends that disclosure be expanded to include:
 - A history of those ratios. This would allow the Board to observe trends over the last several years. This recommendation has been incorporated in the valuation in Exhibit 17.
 - A more detailed breakdown for the General, Safety and Probation membership groups. This is because there is usually higher volatility associated with membership group receiving higher benefits.

Attachment

Segal's Audit of June 30, 2017 Actuarial Valuation



**San Mateo County Employees'
Retirement Association**

**AUDIT OF JUNE 30, 2017
ACTUARIAL VALUATION**

September 20, 2017



100 Montgomery Street Suite 500 San Francisco, CA 94104-4308
T 415.263.8200 www.segalco.com

September 20, 2017

Board of Retirement
San Mateo County Employees' Retirement Association
100 Marine Parkway, Suite 125
Redwood Shores, California 94065-5208

Re: Audit of June 30, 2017 Actuarial Valuation

Dear Members of the Board:

We are pleased to present the results of our audit of the June 30, 2017 Actuarial Valuation for the San Mateo County Employees' Retirement Association (SamCERA). The purpose of this audit was to verify the calculations completed by Milliman and to offer comments on the methodology and the results of their actuarial valuation.

Our audit confirms that the results of the actuarial calculations as of June 30, 2017 are reasonable, and that those calculations are based on generally accepted actuarial principles and practices.

This review was conducted by Paul Angelo, a Fellow of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA, and Andy Yeung, an Associate of the Society of Actuaries, Member of the American Academy of Actuaries, and an Enrolled Actuary under ERISA. This review was conducted in accordance with the standards of practice prescribed by the Actuarial Standards Board.

The assistance of Milliman and SamCERA is gratefully acknowledged. We appreciate the opportunity to be of service to SamCERA's Board of Retirement, and we are available to answer any questions you may have on this report.

We are Members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

Sincerely,

Handwritten signature of Paul Angelo in blue ink.

Paul Angelo, FSA, MAAA, FCA, EA
Senior Vice President & Actuary

Handwritten signature of Andy Yeung in blue ink.

Andy Yeung, ASA, MAAA, FCA, EA
Vice President & Actuary

TJH/bbf

cc: Nick Collier, ASA, MAAA, EA
Craig Glyde, ASA, MAAA, EA

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AUDIT OF JUNE 30, 2017 ACTUARIAL VALUATIONS

September 20, 2017

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Summary of Findings and Recommendations

This report has been prepared by Segal Consulting (Segal) to present an audit of the June 30, 2017 Actuarial Valuation performed by Milliman for SamCERA. As described in SamCERA's Agreement for actuarial audit services, the scope of our audit is to review the liabilities and the contribution rates for the twenty-two Plans that were included in SamCERA's June 30, 2017 Actuarial Valuation Report.

Summary of Results

This audit report includes an independent reproduction of the detailed valuation results that appear in the draft June 30, 2017 valuation report dated September 13, 2017 prepared by Milliman. This audit was based on actuarial reports, employee data and supplemental information provided by both SamCERA and Milliman.

We have performed this actuarial audit of SamCERA's June 30, 2017 Actuarial Valuation to provide assurance to SamCERA's Board of Retirement that the actuarial calculations are reasonable and that the actuarial process was conducted according to generally accepted actuarial principles and practices. *Our audit confirms that the results of the actuarial calculations as of June 30, 2017 are reasonable, and that those calculations are based on generally accepted actuarial principles and practices.*

The following is a high-level summary of the results from our audit of the June 30, 2017 Actuarial Valuation:

- The valuation results were prepared using the actuarial assumptions approved by the Board for the 2017 valuation. Segal has previously reviewed those assumptions and found that Milliman had employed generally accepted actuarial practices and principles in studying plan experience, selecting assumptions, computing employer contribution rates, and presenting the results of their work.
- Segal's present value of future benefits is 102% of Milliman's present value of future benefits. This key result is the basis for all other liability and cost calculations in the valuation.

- Segal’s total employer contribution rate is 35.51% of payroll and Milliman’s total employer contribution rate is 35.31% of payroll. The total employer contribution rate calculated by Segal is about 101% of that calculated by Milliman. It should be noted that there was a somewhat larger difference in the employer contribution rates at the last audit as of June 30, 2014¹. This kind of difference can generally be explained by differences in procedures and methods used by Segal and Milliman in allocating the present value of future benefit between past actuarial accrued liability and future normal cost.
- Segal’s individual entry age based member contribution rates are about 100% of those that Milliman included in Appendix D of their 2017 Actuarial Valuation Report.
- The demographic data used in the 2017 valuation by Milliman was primarily supplied by SamCERA. It included significant changes made by Milliman.

As part of the June 30, 2017 valuations, SamCERA has switched to providing the membership data using a new pension administration system. As part of that transition, there were some manual adjustments made by Milliman to the membership data upon review and consultation with SamCERA.

We believe those adjustments to be reasonable and we understand that Milliman and SamCERA have already discussed making some of those adjustments directly in the pension administration system so that no manual adjustments will be necessary in future valuations.

- Assets have been maintained by SamCERA only on a combined basis for all twenty-two Plans. The split or allocation of the assets among the General², Safety and Probation membership groups is needed for the valuation, and so currently that allocation has to be made by Milliman. As the current methodology used to split the assets among the three membership groups is affected by actuarial liability gains or losses that might be experienced by one group of members but not by the other two groups, we continue to recommend that a

¹ During that audit, Segal’s total employer rate was 34.90% of payroll and Milliman’s total employer contribution rate was 35.56% of payroll.

² In the funding valuation report, Milliman has grouped the employer contribution rates for General – County with General – Court in Exhibit 10a. The employer contribution rates for General – SMCM&VCD are reported separately in Exhibit 10b. This separation is required to track the different contributions made by the different employers in the County Supplementary Contribution Account and District Supplementary Contribution Account.

different methodology be considered for future valuations, such as the maintenance of the asset share by SamCERA's pension and accounting administration system.

Detailed Findings and Recommendations

Our detailed findings and recommendations are summarized as follows:

- As indicated in our Actuarial Review of 2017 Investigation of Experience report dated July 19, 2017, we found the actuarial assumptions and the methods used by Milliman to be reasonable and in accordance with generally accepted actuarial standards and principles.
- Our comparison of the demographics of the 2017 data provided by SamCERA with the valuation data used by Milliman for the June 30, 2017 actuarial valuation indicated that Milliman made significant changes³ to the original data before the valuation was performed.
- Segal's *total present value of future benefits* as of June 30, 2017 is 102% of Milliman's present value.
- A comparison of Segal's present value of future benefits (PVB) to Milliman's present values by plan indicates that the total liabilities of each plan are reasonable as shown in the following table.

³ Some of those changes are discussed in Step 1 of Section II under of this report.

Plan	Ratio of Segal's PVB to Milliman's PVB
General – County and Court	
General – Plan 1	100%
General – Plan 2	101%
General – Plan 3	99%
General – Plan 4	102%
General – Plan 5	100%
General – Plan 7	98%
General – SMCM&VCD⁴	
General – Plan 1	100%
General – Plan 2	100%
General – Plan 4	101%
General – Plan 7	102%
Safety	
Safety – Plan 1	100%
Safety – Plan 2	101%
Safety – Plan 4	104%
Safety – Plan 5	108%
Safety – Plan 6	90%
Safety – Plan 7	104%
Probation	
Probation – Plan 1	100%
Probation – Plan 2	101%
Probation – Plan 4	105%
Probation – Plan 5	104%
Probation – Plan 6	104%
Probation – Plan 7	107%

For this audit, our first focus was on matching the core numbers on which the Plans' ultimate costs depend: the present values of future benefits. The results of this analysis were shown in the previous table. We also focused on more detailed analyses of (i) the correct implementation of the actuarial assumptions as determined by the 2017 Investigation of Experience, (ii) the

⁴ SMCM&VCD is the acronym for San Mateo County Mosquito and Vector Control District.

breakdown of the total normal cost contribution rate into portion paid by each of the employer and the member, and (iii) the determination of the UAAL contribution rate. Those detailed analyses produced the following findings and recommendations:

- Segal's *total actuarial accrued liability* as of June 30, 2017 is 102% of Milliman's liability.
- Segal's *total employer contribution rate* as of June 30, 2017 is 101% of Milliman's rate.
- As a percentage of projected payroll, Segal's net employer normal cost contribution rate is 99% of Milliman's net employer normal cost rate and Segal's employer Unfunded Actuarial Accrued Liability (UAAL) contribution rate is 101% of Milliman's UAAL rate.
- Segal's individual entry age based member normal cost rates are about 100% of those calculated by Milliman.
- For financial and accounting reporting purposes, assets have only been maintained by SamCERA on a combined basis for all of the twenty-two Plans as a whole. Assets have not been maintained for each of the three membership groups: (i) combined⁵ General – County and Courts, and General – SMCM&VCD, (ii) Safety and (iii) Probation. Therefore, for the purpose of determining the asset share among the three membership groups for use in determining the UAAL, Milliman uses a method that “backs into” the valuation assets for each of the three membership groups at each valuation date.

Underlying that methodology is the presumption that, before considering any assumption changes adopted by the Board, the relative proportion of the total UAAL for each of the three membership groups⁶ would remain constant from one valuation to the next. Once the total UAAL is split among the three membership groups based on that constant allocation, an asset share for each of the three membership groups is “backed into” by taking the difference between the actuarial accrued liability calculated in the current valuation for each group and the UAAL allocated to that group.

⁵ Note that there is a separate calculation done by Milliman to track the additional contributions made into the County Supplementary Contribution Account and the District Supplementary Contribution Account.

⁶ The three membership groups are (i) combined General – County and Courts, and General – SMCM&VCD, (ii) Safety and (iii) Probation.

Similar to a comment we made as part of the last audit as of June 30, 2014, we believe that this methodology would only provide a fair allocation of assets if there are no disproportional changes in liabilities from actuarial gains or losses among the three membership groups. However, in practice if SamCERA experiences liability gains or losses only for a particular membership group (e.g., when salary increases received by one group of members were less than those received by the other two groups), then the change in the UAAL and the associated UAAL rate impact for that one group due to that group's experience would effectively be shared with the two other membership groups.

While this may not have much impact for the total contribution rate paid by the largest employer (i.e., the County), this may result in less transparency in reflecting the true cost of providing retirement benefits for each of the three membership groups.

We are aware of other approximation techniques used by some retirement systems that rely on projected contributions and estimated benefit payments by membership groups that would increase the accuracy of the asset share calculations. However, the emerging practice in California public retirement systems is to move towards more robust tracking of actual contributions and actual benefit payments by membership group using the retirement systems' pension and accounting administration systems. We are available to discuss this particular refinement in the methodology if this would be of interest to the Board of Retirement.

- In determining the UAAL contribution rate, Milliman uses a methodology that first projects the outstanding balances of the various UAAL layers to the next valuation date (i.e. one year in the future). Based on those projected outstanding balances and the remaining amortization periods as of that same date, they determine the UAAL amortization payments for each layer. The total of these amortization payments is then converted to a percent of the expected payroll for the year that begins on the next valuation date. It is our understanding that the purpose of this methodology is to adjust for the one-year delay between the valuation date and the date that the contribution rates are implemented and to more accurately reflect the payroll for the fiscal year that begins one year after the valuation date. We believe that the methodology they are applying is reasonable for this purpose.
- Overall, we have verified that Milliman's calculations of the UAAL and the total employer contribution rate as a percentage of payroll are reasonable and consistent with past practices.

Section I – Purpose and Scope of the Actuarial Audit

Purpose of the Audit

Segal Consulting has performed an actuarial audit of SamCERA's June 30, 2017 Actuarial Valuation to provide assurance to SamCERA's Board of Retirement that the actuarial calculations are reasonable and that the actuarial process was conducted according to generally accepted actuarial principles and practices.

Scope of the Audit

The scope of the audit, as described in SamCERA's Actuarial Audit Services Agreement with Segal, includes the following:

- Evaluation of the available data for the performance of such valuation, the degree to which such data is sufficient to support the conclusions of the valuation, and the use and appropriateness of any assumptions made regarding such data.
- Completion of a parallel valuation as of June 30, 2017 using the assumptions, methodologies and funding methods used by SamCERA's consulting actuary in their performance of the June 30, 2017 valuation.
- Evaluation of the parallel valuation results for the twenty-two Plans that were included in the June 30, 2017 Actuarial Valuation Report and reconciliation of any discrepancies between the findings, assumptions, methodology, rates, and/or adjustments with SamCERA's consulting actuary.

Section II – Results of the Audit

Several steps are involved in conducting an actuarial audit of a retirement benefits program. Outlined below are the primary steps we took to comply with the scope of the audit services. Following each step is a description of our observations.

Since our analysis was performed concurrently with Milliman’s actuarial valuation, we were able to discuss our observations with Milliman while they were preparing the June 30, 2017 valuation. Our results confirm and support the results of that valuation.

Step 1: Compare the demographics of the 2017 data provided by SamCERA with the valuation data used by Milliman for the June 30, 2017 actuarial valuation.

Results

EXHIBIT-A provides a comparison, by membership type (i.e., General, Safety and Probation), of the number of participants, their average ages, average salaries (active members), average service (active members) and average benefits (pensioners). This exhibit indicates that Milliman had made significant adjustments, estimations or corrections to the data received from SamCERA. In general, the data received by Milliman from SamCERA was not “valuation ready.”

Observations

(1) For some retirees who elected the unmodified option, there were some discrepancies between the benefit form, continuance percent and beneficiary date of birth reported in the original data this year by the new pension administration system when compared to similar data provided last year by the prior pension administration system. Also, the sex code reported for some of the spouses/domestic partners by the new pension administration system was not the one used by Milliman in this year’s valuation. The percent of members who retired during 2016/2017 and elected to cover their spouses/domestic partners with an automatic continuance benefit appeared to be lower than comparable percent for members who retired either during 2015/2016 or before July 1, 2015.

- (2) If we compared this year's data to last year's data, clean ups were made to the data for some inactive members as Milliman no longer had to estimate the deferred vested benefits for those members reported with an inaccurate final average salary. As a result of this data refinement, there was an increase in the calculated benefit amounts for continued inactive vesteds of about 50% compared to last year.

Step 2: Develop a valuation program based on the relevant provisions of the County Employees' Retirement Law (CERL) as summarized in the Summary Plan Descriptions, using the actuarial methods and assumptions outlined in the most recent valuation report, and further defined by Milliman.

Observations

- (1) There have not been any changes in the plan of benefits since our last audit of the June 30, 2014 valuation. However, there were changes to the layout for the membership data files, so we made some changes to our valuation programs accordingly.

Step 3: Run the valuation program with specific individuals (test lives) who illustrate particular benefit provisions and compare results to Milliman's results.

Results

EXHIBIT-B provides a comparison of Segal's and Milliman's test life results for (i) the present value of future benefits, (ii) the present value of future normal costs, and (iii) the actuarial accrued liability.

- *Present Value of Future Benefits:* This liability represents the current value of the member's projected benefits, recognizing the time value of money (*i.e.*, the investment return assumption), the salary increase assumption and the probabilities of retirement, death, disability and turnover. This value is the cornerstone for the entire valuation as it represents the amount needed to provide all future expected benefit payouts for current members, based on the valuation assumptions.

The ratios of Segal's results to Milliman's results, on a *total present value of future benefits basis*, range from 93% to 106% for the active test lives and is about 100% for the terminated vested and retired test lives. For the active member in General Plan 5 where Segal's result to Milliman's result is 93%, we believe that variation is due to the different methods used by Segal and Milliman to: (a) calculate the present value of future salary and (b) apply the demographic assumptions in the valuation. As the ratio of Segal's to Milliman's total present value of future benefit for all 28 active members in General Plan 5 (see page 23) is 100%, we are not concerned with the variation for this test life. For the active member in Probation Plan 7 where Segal's result to Milliman's result is 106%, we believe that variation is due to the different methods used by Segal and Milliman to estimate benefits when retirement and other decrements are assumed to take place during the middle of the plan year (as discussed in Observation (1) below).

We believe our results are within an acceptable range of Milliman's results to provide assurance that the significant plan liabilities are properly valued.

- *Present Value of Future Normal Costs and Actuarial Accrued Liability:* The funding method adopted by the Board for SamCERA, the Entry Age Actuarial Cost Method, separates the present value of future benefits for active members into two components, the actuarial accrued liability and the present value of future normal costs. Simply stated, the

Entry Age Actuarial Cost Method determines a level cost as a percentage of pay for each year of service, called the normal cost. The actuarial accrued liability is the sum of past normal costs (less any expected benefits, and assuming all actuarial assumptions were exactly realized), while the present value of future normal costs represents the current value of future normal costs required to fully fund the member's projected benefits before the member is expected to retire.

The method used to separate the present value of projected benefits into its two components can differ somewhat from valuation system to valuation system, even though the underlying funding method used in the systems is the same.

For the active test lives, the ratios of Segal's results to Milliman's range from 93% to 109% for the present value of future normal costs and from 75% to 114% for the actuarial accrued liability. The difference is primarily due to the difference in the method used by Segal and Milliman's valuation software to divide the present value of benefits between present values future normal costs and actuarial accrued liability. The difference in the present value of future normal costs is also due to the timing of the decrement as described in Observation (1) below. For the active member in General Plan 7, where Segal to Milliman actuarial accrued liability results is 75%, that member has less than 0.5 years of service.

Observations

- (1) Segal's valuation system generally assumes active members decrement (i.e., retire, terminate, etc.) at the beginning of each plan year (July 1). The Milliman system, on the other hand, assumes decrements occur in the middle of the plan year (January 1) except for those retirement ages where the probability of service retirement are 100% (e.g., on or after age 65 for Safety members) or when a member has attained a benefit that equals to 100% of final average compensation (e.g., Safety members with 33 1/3 years of service), where the decrement is assumed to occur at the beginning of the year.

For the SamCERA audit, we have prepared a customized version of our valuation software that mimics the timing of the decrements as used by Milliman (i.e., the middle of the plan year). However, our program continues to assume the middle of year timing for decrements even for those members at ages where the probabilities of retirement are 100%. In addition, the middle of the year timing affects our programs calculation of projected benefits for future retirees.

Either methodology is acceptable, with each actuarial firm establishing its standard for the assumed timing of decrements.

- (2) The new actuarial assumptions recommended by the 2017 Investigation of Experience were used to value the test lives.

Step 4: Run the valuation program with all participant data, compile results, and compare to Milliman's results.

Results

EXHIBIT-C provides a comparison, by Plan, of Segal's results and Milliman's results for (i) the present value of future benefits, (ii) the present value of future normal costs, (iii) the unfunded actuarial accrued liability (UAAL), (iv) the normal cost for the period from July 1, 2017 – June 30, 2018 and (v) the employer normal cost and UAAL contribution rates.

- The ratios of Segal's results to Milliman's results, on a total present value of future benefits basis, range from 90% to 108% for active members. The 90% ratio is calculated for the only active member in Safety Plan 6 and that member has service with another Plan. For the terminated vested and the retirees combined, the results are virtually identical and the ratio is close to 100%. In total, our present value of future benefits is 102% of Milliman's present value as shown in the column labeled "TOTAL" on page 26.
- The present value of future normal costs is allocated between member contributions and employer contributions.
- For the purpose of calibrating our valuation software to independently calculate the contribution rates for the June 30, 2017 valuation, we had attempted to reproduce the test live results determined in the June 30, 2016 valuation but updated by Milliman to reflect the new actuarial assumptions approved by the Board for use in the June 30, 2017 valuation. (Note though that the test live results shown in Exhibit B are those generated using the membership data and assumptions used in the June 30, 2017 valuation.)
- As shown in the column labeled "TOTAL" on Page 33, Segal's individual entry age based member normal cost contribution rates are 100% of the member normal cost contribution rates, calculated by Milliman.

- In order to provide an “apples-to-apples” comparison of the aggregate member contribution rates, we have used Milliman’s individual entry age based normal cost rates in comparing the results in this report. The ratio of Segal’s net employer normal cost contribution rates to Milliman’s is 99% as shown in the “TOTAL” column on page 33.
- The actuarial accrued liability depends in part on the valuation system’s methodology for separating the present value of projected benefits into its two components – the actuarial accrued liability and the present value of future normal costs. The unfunded actuarial accrued liability (UAAL) is simply the difference between the actuarial accrued liability and the actuarial value of assets (and we have used the actuarial value of assets allocated by Milliman among the three membership groups). Therefore, differences in the actuarial accrued liabilities due to the variations in the valuation systems impact the unfunded actuarial accrued liabilities, and the related employer contribution rates.
- As a percentage of projected payroll, Segal’s net employer normal cost contribution rate (Item 3 on page 33) is 99% of Milliman’s net employer normal cost rate and Segal’s employer UAAL amortization contribution rate (Item 4) is 101% of Milliman’s UAAL rate. Segal’s total employer contribution rate (Item 5) as of June 30, 2017 is 101% of Milliman’s rate.
- While Segal’s allocation of the total normal cost into the projected member rates, and the net employer normal cost rates (Items 2 and 3) were different from Milliman’s for General and Probation Plans 1 where there were only 11 and 1 active members, respectively, as of June 30, 2017.
- In determining the UAAL contribution rate, Milliman uses a methodology that first projects the outstanding balances of the various UAAL layers to the next valuation date (i.e. one year in the future). Based on those projected outstanding balances and the remaining amortization periods as of that same date, they determine the UAAL amortization payments for each layer. The total of these amortization payments is then converted to a percent of the expected payroll for the year that begins on the next valuation date. It is our understanding that the purpose of this methodology is to adjust for the one-year delay between the valuation date and the date that the contribution rates are implemented and to more accurately reflect the payroll for the fiscal year that begins one year after the valuation date. We believe that the methodology they are applying is reasonable for this purpose.

Step 5: Evaluate the valuation results and methodology as presented in the Milliman actuarial valuation report.

Observations

- (1) Due to the changes in assumptions implemented from the 2017 Investigation of Experience, new member contribution rates were calculated. We have verified that Milliman’s calculated employee contribution rates are reasonable and consistent with the relevant provisions of the County Employees’ Retirement Law (CERL) and past practices.
- (2) We reviewed the Milliman draft actuarial report in detail and most of our comments based on that draft report were minor. After communicating and discussing those comments with Milliman, we understand that they would make those changes before they finalize their actuarial report.
- (3) We have included one main comment on the content of the report for Milliman to follow up with SamCERA before they prepare their valuation for June 30, 2018:
 - The California Actuarial Advisory Panel⁷ has recommended the asset and liability volatility ratios be included in the valuation report. These ratios provide an indication of the potential contribution volatility for any given level of investment and liability volatility. A plan with asset volatility ratio of 10 would have double the level of invested related contribution volatility of a plan with an asset volatility ratio of 5. This is a current measure since it is based on the current level of assets. Similarly, a liability volatility ratio provides an indication of potential contribution volatility due to liability experience (gains and losses) and liability remeasurements (assumption changes).
 - While Milliman has included those ratios for the current and for the Plan as a whole in Section 7 of their report, we recommend that disclosure be expanded to include:
 - a) A history of those ratios. This would allow the Board to observe trends over the last several years.

⁷ The CAAP was created by Senate Bill 1123 and chaptered in State law in September 2008. Even though the recommendations provided by the CAAP are non-binding, we find that those recommendations are generally followed by public plan actuaries practicing in California.

- b) A more detailed breakdown for the General, Safety and Probation membership groups. This is because there is usually higher volatility associated with membership group receiving higher benefits.

Exhibits A Through C

EXHIBIT – A
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
ANALYSIS OF PARTICIPANT DATA

Active Members						
Members		Number	Annual Salary (Thousands)	Age	Average Monthly Salary	Average Credited Service
General	SamCERA Data	4,549	\$428,771	45.8	\$7,855	10.6
	Milliman Data	4,560	\$430,614	45.8	\$7,869	10.6
	% Difference	0.2%	0.4%	0.0%	0.2%	0.0%
Safety	SamCERA Data	501	\$64,768	42.6	\$10,773	10.3
	Milliman Data	503	\$65,105	42.7	\$10,786	10.4
	% Difference	0.4%	0.5%	0.2%	0.1%	1.0%
Probation	SamCERA Data	273	\$26,399	42.9	\$8,058	13.7
	Milliman Data	274	\$26,504	43.0	\$8,061	13.7
	% Difference	0.4%	0.4%	0.2%	0.0%	0.0%
Total						
	SamCERA Data	5,323*	\$519,938**	45.4	\$8,140	10.8
	Milliman Data	5,337	\$522,223	45.4	\$8,154	10.8
	% Difference	0.3%	0.4%	0.0%	0.2%	0.0%

* This is the net number of records after taking 5,750 active and leave of absence members with code “ACT” and “LVE” reported in the original SamCERA data and eliminating: (a) members with code “ACT” and a date of refund, (b) alternate payee members with code “ACT” and Person Type “AE”, and (c) duplicate records with service under multiple membership groups.

**Based on both bi-weekly pensionable compensation for the most recent period and pensionable pay as reported in the original SamCERA data. This result is the greater of the annualized bi-weekly pay (by multiplying by 26) and pensionable pay. For members in Plan 7, both Milliman and Segal have applied the salary limit as required under Government Code Section 7522.10. However, for the purposes of compiling the membership demographic summary display in the valuation report, Milliman has used the salary limit for 2018 instead of 2017. We understand after discussion with Milliman that they have agreed to apply the limit for the current year when they compile the membership demographic summary display in their future valuation reports. Note that this affects only the membership demographic summary data and not the results in the valuation.

EXHIBIT – A (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
ANALYSIS OF PARTICIPANT DATA

		Pensioners (Service Retirees, Beneficiaries, and Disabled Retirees)			
Members		Number	Monthly Total Allowances (Thousands)	Age	Average Monthly Benefit
General	SamCERA Data	4,314	\$12,219	72.0	\$2,833
	Milliman Data	4,322	\$12,247	71.9	\$2,834
	% Difference	0.2%	0.2%	-0.1%	0.0%
Safety	SamCERA Data	524	\$3,473	67.2	\$6,628
	Milliman Data	529	\$3,492	67.1	\$6,600
	% Difference	1.0%	0.5%	-0.1%	-0.4%
Probation	SamCERA Data	103	\$845	63.6	\$8,208
	Milliman Data	105	\$850	63.6	\$8,096
	% Difference	1.9%	0.6%	0.0%	-1.4%
Total					
	SamCERA Data	4,941*	\$16,537**	71.3	\$3,347
	Milliman Data	4,956	\$16,589	71.2	\$3,347
	% Difference	0.3%	0.3%	-0.1%	0.0%

* This is the net number of records after taking 5,294 pensioners reported in the original SamCERA data and eliminating: (a) duplicate records with service under multiple membership groups and (b) deceased records.

** Excludes 2 records with blank benefit amount. Benefits for retirees in original file were revised in a second file. However, benefits for General Plan 3 members were not included in the second file.

EXHIBIT – A (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
ANALYSIS OF PARTICIPANT DATA

Inactive Vested Participants		Deferred Vested		Contingent Vested*	
Members		Number	Age	Number	Age
General	SamCERA Data	1,166	48.8	171	40.6
	Milliman Data	1,179	48.8	171	40.7
	% Difference	1.1%	0.0%	0.0%	0.2%
Safety	SamCERA Data	66	48.4	8	43.2
	Milliman Data	69	48.0	8	43.1
	% Difference	4.5%	-0.8%	0.0%	-0.2%
Probation	SamCERA Data	56	44.8	3	31.8
	Milliman Data	57	44.8	3	31.7
	% Difference	1.8%	0.0%	0.0%	-0.3%
Total					
	SamCERA Data	1,288**	48.6	182***	40.6
	Milliman Data	1,305	48.6	182	40.7
	% Difference	1.3%	0.0%	0.0%	0.2%

* These are the members assumed by Milliman in the valuation to receive only a refund of contribution.

** This is the net number of records after taking 1,536 inactive vested members with code “DEF” and alternate payee members with code “ACT” and Person Type “AE” reported in the original SamCERA data and eliminating: (a) General Plan 3 members with less than 10 years of service in one plan or 5 year of service in two plans and (b) duplicate records.

*** There were 1,903 terminated members with code “TRM” reported in the original SamCERA data, 182 of these records were classified as inactive due a return of contribution in the 2016 actuarial valuation. Milliman was instructed by SamCERA to use the same designation as the prior year.

EXHIBIT – B
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
TEST LIFE COMPARISON

ACTIVES	General Plan 4		General Plan 2		General Plan 3		Vector Control Plan 4		General Plan 5*	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
PVB	\$437,279	\$447,460	\$1,014,169	\$1,042,807	\$111,146	\$116,357	\$435,263	\$438,345	\$305,137	\$282,279
PV - Future Normal Costs	\$199,187	\$201,676	\$154,215	\$157,248	\$48,146	\$51,679	\$221,212	\$224,344	\$201,560	\$187,627
Actuarial Accrued Liability	\$238,092	\$245,784	\$859,954	\$885,559	\$63,000	\$64,678	\$214,051	\$214,001	\$103,577	\$94,652
RATIO OF SEGAL/MILLIMAN										
PVB		102%		103%		105%		101%		93%
PV - Future Normal Costs		101%		102%		107%		101%		93%
Actuarial Accrued Liability		103%		103%		103%		100%		91%

INACTIVES	Retiree General Plan 1		Retiree General Plan 2		Disabled General Plan 4		Retiree Probation Plan 1		Retiree Safety Plan 1	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Total PVB	\$4,214,085	\$4,227,075	\$579,765	\$599,227	\$643,579	\$644,233	\$53,071	\$53,466	\$1,562,948	\$1,568,398
RATIO OF SEGAL/MILLIMAN										
		100%		103%**		100%		101%		100%

* For this member, there is a bigger difference between how Segal and Milliman calculate the present value of future salary and how the valuation assumptions are applied.

** For this retiree, we note that the spouse is of the same sex as the retiree, Milliman has used the opposite sex in the valuation.

EXHIBIT – B (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
TEST LIFE COMPARISON

ACTIVES	General Plan 7		General Plan 7		Safety Plan 4		Safety Plan 5		Safety Plan 7	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Total PVB	\$92,257	\$87,818	\$259,588	\$262,375	\$1,168,183	\$1,203,997	\$791,607	\$822,250	\$536,476	\$560,971
PV - Future Normal Costs	\$84,862	\$82,273	\$117,087	\$117,797	\$495,796	\$514,707	\$597,927	\$615,672	\$425,529	\$438,177
Actuarial Accrued Liability	\$7,395	\$5,545	\$142,501	\$144,578	\$672,387	\$689,290	\$193,680	\$206,578	\$110,947	\$122,794
RATIO OF SEGAL/MILLIMAN										
Total PVB		95%		101%		103%		104%		105%
PV - Future Normal Costs		97%		101%		104%		103%*		103%*
Actuarial Accrued Liability		75%**		101%		103%		107%*		111%*

INACTIVES	Retiree Safety Plan 2		Retiree Safety Plan 4		Disabled Safety Plan 1		Terminated Vested General Plan 1		Terminated Vested General Plan 4	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Total PVB	\$2,037,503	\$2,039,372	\$1,016,340	\$1,017,437	\$798,463	\$799,638	\$270,307	\$270,837	\$8,339	\$8,415
RATIO OF SEGAL/MILLIMAN										
		100%		100%		100%		100%		101%

* The difference in the present value of future normal costs is primarily due to the assumed timing of the service retirement decrements as described in Observation (1) on page 12.

** This member has less than 0.5 years of service. There is a difference between how Segal and Milliman calculate the actuarial accrued liability for this member with such small service.

EXHIBIT – B (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
TEST LIFE COMPARISON

ACTIVES	Probation Plan 4		Probation Plan 5		Probation Plan 7	
	Milliman	Segal	Milliman	Segal	Milliman	Segal
Total PVB	\$610,450	\$631,347	\$586,223	\$609,701	\$518,673	\$550,868
PV - Future Normal Costs	\$326,982	\$306,862	\$372,076	\$380,115	\$315,173	\$342,018
Actuarial Accrued Liability	\$283,468	\$324,485	\$214,147	\$229,586	\$203,500	\$208,850
RATIO OF SEGAL/MILLIMAN						
Total PVB	103%		104%		106%	
PV - Future Normal Costs	94%**		102%*		109%	
Actuarial Accrued Liability	114%**		107%*		103%	

INACTIVES	Terminated Vested Safety Plan 4		Terminated Vested Probation Plan 2	
	Milliman	Segal	Milliman	Segal
Total PVB	\$409,861	\$409,965	\$175,074	\$175,405
RATIO OF SEGAL/MILLIMAN				
	100%		100%	

* The difference in the present value of future normal costs is primarily due to the assumed timing of the service retirement decrements as described in Observation (1) on page 12.

** This is a member with 85% part time employment during 2016/2017. There is a difference between how Segal and Milliman adjust for the part time service in calculating the historical actuarial accrued liability.

EXHIBIT – C
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

PRESENT VALUE OF FUTURE BENEFITS (PVB)	General- County and Court (No SMCM&VCD)							
	Plan 1		Plan 2		Plan 3		Plan 4	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$19,631	\$19,446	\$690,587	\$706,747	\$23,211	\$22,378	\$1,089,600	\$1,121,178
Retirees	677,141	680,134	902,726	905,053	18,311	18,344	224,614	225,061
Inactive Vesteds	3,224	3,235	74,332	74,911	9,497	9,661	104,012	104,561
Total PVB	\$699,996	\$702,815	\$1,667,645	\$1,686,711	\$51,019	\$50,383	\$1,418,226	\$1,450,800
RATIO OF SEGAL/MILLIMAN								
Actives		99%		102%		96%		103%
Retirees		100%		100%		100%		100%
Inactive Vesteds		100%		101%		102%		101%
Total PVB		100%		101%		99%		102%

PRESENT VALUE OF FUTURE BENEFITS (PVB)	General- County and Court (No SMCM&VCD)					
	Plan 5		Plan 7		Subtotal	
	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$80,497	\$80,662	\$220,634	\$217,157	\$2,124,160	\$2,167,568
Retirees	89	90	0	0	1,822,881	1,828,682
Inactive Vesteds	1,429	1,428	1,877	1,871	194,371	195,667
Total PVB	\$82,015	\$82,180	\$222,511	\$219,028	\$4,141,412	\$4,191,917
RATIO OF SEGAL/MILLIMAN						
Actives		100%		98%		102%
Retirees		101%		N/A		100%
Inactive Vesteds		100%		100%		101%
Total PVB		100%		98%		101%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

PRESENT VALUE OF FUTURE BENEFITS (PVB)	General - SMCM&VCD Only							
	Plan 1		Plan 2		Plan 4		Plan 7	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$0	\$0	\$0	\$0	\$5,703	\$5,740	\$1,258	\$1,285
Retirees	4,030	4,044	2,062	2,066	0	0	0	0
Inactive Vesteds	0	0	552	558	811	818	0	0
Total PVB	\$4,030	\$4,044	\$2,614	\$2,624	\$6,514	\$6,558	\$1,258	\$1,285
RATIO OF SEGAL/MILLIMAN								
Actives		N/A		N/A		101%		102%
Retirees		100%		100%		N/A		N/A
Inactive Vesteds		N/A		101%		101%		N/A
Total PVB		100%		100%		101%		102%

PRESENT VALUE OF FUTURE BENEFITS (PVB)	General - SMCM&VCD Only	
	Subtotal	
	Milliman	Segal
Actives	\$6,961	\$7,025
Retirees	6,092	6,110
Inactive Vesteds	1,363	1,376
Total PVB	\$14,416	\$14,511
RATIO OF SEGAL/MILLIMAN		
Actives		101%
Retirees		100%
Inactive Vesteds		101%
Total PVB		101%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

PRESENT VALUE OF FUTURE BENEFITS (PVB)	Safety							
	Plan 1		Plan 2		Plan 4		Plan 5	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$2,185	\$2,120	\$128,943	\$132,498	\$256,333	\$269,169	\$37,258	\$40,313
Retirees	285,487	286,280	275,891	276,331	46,644	46,761	0	0
Inactive Vesteds	0	0	8,513	8,528	11,054	11,064	622	623
Total PVB	\$287,672	\$288,400	\$413,347	\$417,357	\$314,031	\$326,994	\$37,880	\$40,936
RATIO OF SEGAL/MILLIMAN								
Actives		97%		103%		105%		108%
Retirees		100%		100%		100%		N/A
Inactive Vesteds		N/A		100%		100%		100%
Total PVB		100%		101%		104%		108%

PRESENT VALUE OF FUTURE BENEFITS (PVB)	Safety					
	Plan 6		Plan 7		Subtotal	
	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$260	\$235	\$53,025	\$55,386	\$478,004	\$499,721
Retirees	0	0	0	0	608,022	609,372
Inactive Vesteds	0	0	89	89	20,278	20,304
Total PVB	\$260	\$235	\$53,114	\$55,475	\$1,106,304	\$1,129,397
RATIO OF SEGAL/MILLIMAN						
Actives		90%*		104%		105%
Retirees		N/A		N/A		100%
Inactive Vesteds		N/A		100%		100%
Total PVB		90%		104%		102%

* This member is currently active in another Plan.

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

PRESENT VALUE OF FUTURE BENEFITS (PVB)	Probation							
	Plan 1		Plan 2		Plan 4		Plan 5	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$837	\$826	\$52,222	\$53,861	\$158,330	\$166,703	\$3,717	\$3,855
Retirees	56,416	56,602	76,529	76,599	12,167	12,199	0	0
Inactive Vesteds	0	0	4,096	4,101	9,349	9,353	55	55
Total PVB	\$57,253	\$57,428	\$132,847	\$134,561	\$179,846	\$188,255	\$3,772	\$3,910
RATIO OF SEGAL/MILLIMAN								
Actives		99%		103%		105%		104%
Retirees		100%		100%		100%		N/A
Inactive Vesteds		N/A		100%		100%		100%
Total PVB		100%		101%		105%		104%

PRESENT VALUE OF FUTURE BENEFITS (PVB)	Probation						TOTAL	
	Plan 6		Plan 7		Subtotal		Milliman	Segal
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
Actives	\$458	\$477	\$12,459	\$13,304	\$228,023	\$239,026	\$2,837,148	\$2,913,340
Retirees	0	0	0	0	145,112	145,400	\$2,582,107	2,589,564
Inactive Vesteds	0	0	32	32	13,532	13,541	\$229,544	230,888
Total PVB	\$458	\$477	\$12,491	\$13,336	\$386,667	\$397,967	\$5,648,799	\$5,733,792
RATIO OF SEGAL/MILLIMAN								
Actives		104%		107%		105%		103%
Retirees		N/A		N/A		100%		100%
Inactive Vesteds		N/A		100%		100%		101%
Total PVB		104%		107%		103%		102%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	General – County and Court (No SMCM&VCD)							
	Plan 1*		Plan 2		Plan 3		Plan 4	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	24.12%	22.61%	22.18%	21.66%	8.11%	7.92%	22.92%	22.52%
2. Member Contribution Rate	<u>13.38%</u>	<u>13.29%</u>	<u>12.94%</u>	<u>12.91%</u>	<u>0.00%</u>	<u>0.00%</u>	<u>12.99%</u>	<u>13.00%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	10.74%	9.32%	9.24%	8.75%	8.11%	7.92%	9.93%	9.52%
4. Employer UAAL Amortization Contribution Rate	<u>20.55%</u>	<u>20.91%</u>	<u>20.63%</u>	<u>20.99%</u>	<u>20.55%</u>	<u>20.91%</u>	<u>20.67%</u>	<u>21.02%</u>
5. Total Employer Contribution Rate (3. + 4.)	31.29%	30.23%	29.87%	29.74%	28.66%	28.83%	30.60%	30.54%
RATIO OF SEGAL/MILLIMAN								
1. Normal Cost Contribution Rate		94%		98%		98%		98%
2. Member Contribution Rate		99%		100%		N/A		100%
3. Net Employer Normal Cost Contribution Rate		87%**		95%		98%		96%
4. Employer UAAL Amortization Contribution Rate		102%		102%		102%		102%
5. Total Employer Contribution Rate		97%		100%		101%		100%

* Note that there are only 11 active members in the Plan.

** The difference in the annual normal cost contribution is about \$22,000.

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	General – County and Court (No SMCM&VCD)					
	Plan 5		Plan 7		Subtotal	
	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	20.91%	20.45%	17.42%	17.44%	20.95%	20.64%
2. Member Contribution Rate	<u>9.30%</u>	<u>9.30%</u>	<u>8.71%</u>	<u>8.72%</u>	<u>11.37%</u>	<u>11.37%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	11.61%	11.15%	8.71%	8.72%	9.58%	9.27%
4. Employer UAAL Amortization Contribution Rate	<u>20.60%</u>	<u>20.96%</u>	<u>20.62%</u>	<u>20.98%</u>	<u>20.64%</u>	<u>21.00%</u>
5. Total Employer Contribution Rate (3. + 4.)	32.21%	32.11%	29.33%	29.70%	30.22%	30.27%
RATIO OF SEGAL/MILLIMAN						
1. Normal Cost Contribution Rate		98%		100%		99%
2. Member Contribution Rate		100%		100%		100%
3. Net Employer Normal Cost Contribution Rate		96%		100%		97%
4. Employer UAAL Amortization Contribution Rate		102%		102%		102%
5. Total Employer Contribution Rate		100%		101%		100%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	General – SMCM&VCD							
	Plan 2		Plan 4		Plan 7		Subtotal	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	N/A	N/A	21.74%	21.67%	17.68%	17.72%	20.40%	20.36%
2. Member Contribution Rate	N/A	N/A	<u>7.70%</u>	<u>7.73%</u>	<u>8.84%</u>	<u>8.86%</u>	<u>8.08%</u>	<u>8.11%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	N/A	N/A	14.04%	13.94%	8.84%	8.86%	12.32%	12.25%
4. Employer UAAL Amortization Contribution Rate	N/A	N/A	<u>12.37%</u>	<u>12.89%</u>	<u>12.37%</u>	<u>12.89%</u>	<u>12.37%</u>	<u>12.89%</u>
5. Total Employer Contribution Rate (3. + 4.)	N/A	N/A	26.41%	26.83%	21.21%	21.75%	24.69%	25.14%
RATIO OF SEGAL/MILLIMAN								
1. Normal Cost Contribution Rate		N/A		100%		100%		100%
2. Member Contribution Rate		N/A		100%		100%		100%
3. Net Employer Normal Cost Contribution Rate		N/A		99%		100%		99%
4. Employer UAAL Amortization Contribution Rate		N/A		104%		104%		104%
5. Total Employer Contribution Rate		N/A		102%		103%		102%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	Safety							
	Plan 1		Plan 2		Plan 4		Plan 5	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	39.29%	38.60%	36.87%	38.06%	35.97%	36.74%	36.64%	37.24%
2. Member Contribution Rate	<u>5.00%</u>	<u>5.00%</u>	<u>18.39%</u>	<u>18.41%</u>	<u>18.32%</u>	<u>18.52%</u>	<u>18.18%</u>	<u>18.23%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	34.29%	33.60%	18.48%	19.65%	17.65%	18.22%	18.46%	19.01%
4. Employer UAAL Amortization Contribution Rate	<u>45.57%</u>	<u>45.68%</u>	<u>45.57%</u>	<u>45.68%</u>	<u>45.57%</u>	<u>45.68%</u>	<u>45.57%</u>	<u>45.68%</u>
5. Total Employer Contribution Rate (3. + 4.)	79.86%	79.28%	64.05%	65.33%	63.22%	63.90%	64.03%	64.69%
RATIO OF SEGAL/MILLIMAN								
1. Normal Cost Contribution Rate		98%		103%		102%		102%
2. Member Contribution Rate		100%		100%		101%		100%
3. Net Employer Normal Cost Contribution Rate		98%		106%		103%		103%
4. Employer UAAL Amortization Contribution Rate		100%		100%		100%		100%
5. Total Employer Contribution Rate		99%		102%		101%		101%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	Safety					
	Plan 6		Plan 7		Subtotal	
	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	N/A	N/A	29.02%	30.08%	34.80%	35.68%
2. Member Contribution Rate	N/A	N/A	<u>14.51%</u>	<u>15.04%</u>	<u>17.52%</u>	<u>17.74%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	N/A	N/A	14.51%	15.04%	17.28%	17.94%
4. Employer UAAL Amortization Contribution Rate	N/A	N/A	<u>45.57%</u>	<u>45.68%</u>	<u>45.57%</u>	<u>45.68%</u>
5. Total Employer Contribution Rate (3. + 4.)	N/A	N/A	60.08%	60.72%	62.85%	63.62%
RATIO OF SEGAL/MILLIMAN						
1. Normal Cost Contribution Rate		N/A		104%		103%
2. Member Contribution Rate		N/A		104%		101%
3. Net Employer Normal Cost Contribution Rate		N/A		104%		104%
4. Employer UAAL Amortization Contribution Rate		N/A		100%		100%
5. Total Employer Contribution Rate		N/A		101%		101%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	Probation							
	Plan 1*		Plan 2		Plan 4		Plan 5	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	36.14%	38.93%	36.69%	37.02%	34.30%	35.12%	31.52%	32.62%
2. Member Contribution Rate	<u>3.50%</u>	<u>3.50%</u>	<u>17.39%</u>	<u>17.41%</u>	<u>16.84%</u>	<u>16.95%</u>	<u>16.36%</u>	<u>16.49%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	32.64%	35.43%	19.30%	19.61%	17.46%	18.17%	15.16%	16.13%
4. Employer UAAL Amortization Contribution Rate	<u>32.87%</u>	<u>33.87%</u>	<u>32.87%</u>	<u>33.87%</u>	<u>32.87%</u>	<u>33.87%</u>	<u>32.87%</u>	<u>33.87%</u>
5. Total Employer Contribution Rate (3. + 4.)	65.51%	69.30%	52.17%	53.48%	50.33%	52.04%	48.03%	50.00%
RATIO OF SEGAL/MILLIMAN								
1. Normal Cost Contribution Rate		108%		101%		102%		103%
2. Member Contribution Rate		100%		100%		101%		101%
3. Net Employer Normal Cost Contribution Rate		109%		102%		104%		106%
4. Employer UAAL Amortization Contribution Rate		103%		103%		103%		103%
5. Total Employer Contribution Rate		106%		103%		103%		104%

* Note that there is only one active members in this Plan.

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS

NORMAL COST	Probation							
	Plan 6		Plan 7		Subtotal		TOTAL	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
1. Normal Cost Contribution Rate	27.61%	28.81%	28.65%	29.64%	34.01%	34.76%	23.35%	23.23%
2. Member Contribution Rate	<u>12.44%</u>	<u>12.61%</u>	<u>14.33%</u>	<u>14.82%</u>	<u>16.59%</u>	<u>16.72%</u>	<u>12.40%</u>	<u>12.43%</u>
3. Net Employer Normal Cost Contribution Rate (1. - 2.)	15.17%	16.20%	14.32%	14.82%	17.42%	18.04%	10.95%	10.80%
4. Employer UAAL Amortization Contribution Rate	<u>32.87%</u>	<u>33.87%</u>	<u>32.87%</u>	<u>33.87%</u>	<u>32.87%</u>	<u>33.87%</u>	<u>24.36%</u>	<u>24.71%</u>
5. Total Employer Contribution Rate (3. + 4.)	48.04%	50.07%	47.19%	48.69%	50.29%	51.91%	35.31%	35.51%
RATIO OF SEGAL/MILLIMAN								
1. Normal Cost Contribution Rate		104%		103%		102%		99%
2. Member Contribution Rate		101%		103%		101%		100%
3. Net Employer Normal Cost Contribution Rate		107%		103%		104%		99%
4. Employer UAAL Amortization Contribution Rate		103%		103%		103%		101%
5. Total Employer Contribution Rate		104%		103%		103%		101%

EXHIBIT – C (CONTINUED)
SAN MATEO COUNTY EMPLOYEES’ RETIREMENT ASSOCIATION
JUNE 30, 2017 VALUATION
COMPARISON OF RESULTS
(All Dollar Amounts are in Thousands)

UNFUNDED ACTUARIAL LIABILITY	General-COMBINED*		Safety		Probation		Total	
	Milliman	Segal	Milliman	Segal	Milliman	Segal	Milliman	Segal
	Present Value of Future Benefits	\$4,155,828	\$4,206,428	\$1,106,304	\$1,129,397	\$386,667	\$397,967	\$5,648,799
PV Future NC Contributions	687,600	679,791	173,096	185,108	68,253	72,503	928,949	937,402
Actuarial Accrued Liability	3,468,228	3,526,637	933,208	944,289	318,414	325,464	4,719,850	4,796,390
Current Assets at Actuarial Value	2,947,173	2,947,173	764,910	764,910	264,634	264,634	3,976,717	3,976,717
Unfunded Actuarial Liability	521,055	579,464	168,298	179,379	53,780	60,830	743,133	819,673
Unfunded Actuarial Liability Combined Amortization Contribution Rate	20.64%**	21.00%**	45.57%	45.68%	32.87%	33.87%	24.36%	24.71%
RATIO OF SEGAL/MILLIMAN								
Present Value of Future Benefits		101%		102%		103%		102%
PV Future NC Contributions		99%		107%		106%		101%
Actuarial Accrued Liability		102%		101%		102%		102%
Current Assets at Actuarial Value		100%		100%		100%		100%
Unfunded Actuarial Liability		111%		107%		113%		110%
Amortization Contribution Rate		102%		100%		103%		101%

* Includes results for County, Court, and SMCM&VCD.

** Amortization contribution rates for SMCM&VCD are 12.37% calculated by Milliman and 12.89% calculated by Segal.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 16, 2017

Agenda Item 4

TO: Board of Retirement
FROM: Scott Hood, Chief Executive Officer 
SUBJECT: Acceptance of the Fiscal-Year 2018-2019 Employer and Member Contribution Rates

Recommendation

Approve the "Resolution Accepting Contribution Rates to Recommend to the Board of Supervisors for the 2018-2019 Fiscal Year."

Background

At its June 6, 2016 meeting, the Board adopted Milliman's recommended economic assumptions to be used in the June 30, 2017 actuarial valuation: 6.75% investment return assumption; 2.5% price inflation; 3% general wage growth; 3% payroll growth; 2.5% COLA for Plan 1; 2.4% COLA for Plan 2; no COLA for Plan 3; and 1.9% COLA for Plans 4, 5, 6 & 7. In July, the Board adopted, among other demographic assumptions, a change in the mortality assumption that predicts how long members are currently living and the addition of a projection scale that reflects the gradual year-to-year improvement in mortality that is expected to occur in the future. The new mortality assumption results in an increase in assumed life expectancy compared to the prior assumption.

Discussion

The highlights of the June 2017 actuarial valuation report include the following elements:

Funding: SamCERA's funded ratio increased by 1.2 percentage points from 83.1% to 84.3%. This increase was mainly due to employer contributions to amortize the Unfunded Actuarial Accrued Liability ("UAAL") and investment earnings in excess of the assumed rate of return and was offset somewhat by the increase in the UAAL due to revised economic and demographic assumptions. This last fiscal year, the County contributed \$33.6 million to its Supplementary Contribution Account (CSCA), which resulted in increasing the funded ratio by 0.8%. The San Mateo County Mosquito and Vector Control District (District) contributed \$0.25 million to its Supplementary Contribution Account (DSCA). Without the CSCA and DSCA, the funded ratio would have been 81.7%.

Contribution Rates: The Employer Normal Cost increased from 10.25% to 10.95% of pay. The increase was primarily due to the changes in actuarial assumptions.

The employer's portion of the Statutory Contribution Rate (SCR) that is used to finance the UAAL increased from 23.52 to 24.36% of pay. This increase is largely driven by the new economic assumptions which lowered expectation for future investment returns as well as salary increases and cost-of-living-adjustments that were greater than the previous assumed rate. Recognition of investment gains, strong funding (including the CSCA and DSCA) and data

adjustments resulting from the change to the new PASS system partially offset these UAAL rate increases. The overall result is an increase in the SCR from the prior valuation report of 1.55% (from 33.76% to 35.31% of payroll).

The County’s contribution rate to finance the UAAL would have increased to 37.84% of payroll. However, when the value of the County’s CSCA account is factored in the calculation, the County’s contribution rate increases to 35.48% of payroll instead. Similarly, when the District’s DSCA was factored in, its rate increases to 24.69% rather than 34.9% of payroll, an offset of 10.21% of payroll.

Investment Returns: SamCERA’s investment return on the market value of assets of 12.6% for fiscal year 2016-17, was more than the actuarial assumed rate of 7.0 %. Combined with the recognition of investment gains from prior years, the net result was a return on the actuarial value of valuation assets of 7.8%, which is greater than the assumed return.

Member Rates: Basic member rates and member COLA rates will increase for all plans (except Safety and Probation Plan 1 and 2) due to the new economic assumptions adopted by the Board at its June 6, 2017 meeting and the new demographic assumptions adopted by the Board at its July 25, 2017 meeting.

Summary of Recommendation

The following tables summarize Milliman’s 2018-19 recommended Statutory Contribution Rates and Employer and Member Contribution rates for the Board. Staff provided this rate information to the County Manager’s Office, the County’s Human Resources Director, to the Court Executive Officer and to the Manager of the Mosquito Abatement and Vector Control District.

Recommendation #1: Adopt the following new Statutory Contribution Rates for fiscal year beginning July 1, 2018:

	Fiscal Year Beginning		Increase / (Decrease)
	July 1, 2018	July 1, 2017	
Gross Normal Cost	23.35%	22.31%	1.04%
Member Contributions	(12.40)%	(12.07)%	(0.33)%
Employer Normal Cost	10.95%	10.24%	0.71%
UAAL Amortization	24.36%	23.52%	0.84%
Total Employer Rate	35.31%	33.76%	1.55%

Note: Detailed contribution rates by plan are shown in Milliman's full report.

Recommendation #2: Adopt the new member contribution rates for fiscal year beginning July 1, 2018 as shown in the actuarial valuation.

SamCERA staff reviewed the valuation report and its recommendations and discussed them with Milliman, Inc. in order to confirm our understanding. Staff supports the results and recommendations of the valuation.

Attachment

Resolution Accepting Contribution Rates to Recommend to the Board of Supervisors for the 2018-2019 Fiscal Year

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

RESOLUTION 2017-13

**RESOLUTION ACCEPTING CONTRIBUTION RATES TO RECOMMEND TO THE BOARD OF SUPERVISORS
FOR THE 2018-2019 FISCAL YEAR.**

WHEREAS, Government Code §31453 mandates the periodic actuarial valuation of the Retirement Fund and requires that the Board “...shall, at least 45 days prior to the beginning of the succeeding fiscal year, recommend to the Board of Supervisors such changes in the rates of interest, in the rates of contributions of members, and in the county and district appropriations as are necessary...;” and

WHEREAS, the Board has received and accepted the June 30, 2017, valuation report from its actuarial firm, Milliman, Inc., and

WHEREAS, the Chief Executive Officer has recommended, in agreement with Milliman, Inc., the contribution rates necessary to assure the actuarial soundness of the Retirement Fund,

THEREFORE, BE IT RESOLVED, that the Board hereby accepts the employer and member contribution rates as recommended by Milliman, Inc. in its June 30, 2017, Actuarial Valuation of the San Mateo County Employees' Retirement Association effective for the fiscal year 2018-2019.

BE IT FURTHER RESOLVED, that the Board recommends that the Board of Supervisors adopt the recommended **employer contribution rates** for the County of San Mateo, the San Mateo Superior Court and the San Mateo County Mosquito & Vector Control District in accordance with the schedules provided by Milliman, Inc. in its June 30, 2017, Actuarial Valuation, effective July 1, 2018.

BE IT FURTHER RESOLVED, that the Board of Retirement hereby recommends that the Board of Supervisors adopt the recommended **member contribution rates** for SamCERA active members of the County of San Mateo, the San Mateo County Superior Court and the San Mateo County Mosquito & Vector Control District in accordance with the schedules provided by Milliman, Inc. in its June 30, 2017, Actuarial Valuation, effective July 1, 2018.

BE IT FURTHER RESOLVED, that the Chief Executive Officer is hereby authorized to transmit the attached rates and recommendations to the Board of Supervisors and to take all actions necessary to provide for their implementation effective July 1, 2018.

* * * * *

Regularly passed and adopted, by the San Mateo County Employees' Retirement Association, Board of Retirement, on October 16, 2017.

Ayes, Trustees:

Noes, Trustees:

Absent, Trustees:

Abstain, Trustees:

David Spinello, Board Secretary, SamCERA

**SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
RATES OF CONTRIBUTIONS FOR ALL ACTIVE MEMBERS AND PARTICIPATING EMPLOYERS
FOR THE 2018-2019 FISCAL YEAR**

1. ACTIVE MEMBER CONTRIBUTION RATES

Appendix D	Member Contribution Rates-Plan7
Exhibit D-1	General Member Contribution Rates (including SMCM&VCD*)
Exhibit D-2	Safety/Probation Member Rates
Exhibit D-3	General Member Contribution Rates (excluding SMCM&VCD)
Exhibit D-4	Safety Member Rates
Exhibit D-5	Probation Member Rates

2. EMPLOYER CONTRIBUTION RATES

Exhibit 10	Employer Statutory Rates-All Plans
Exhibit 10a	Employer Statutory Rates-General Members
Exhibit 10b	Employer Statutory Rates- SMCM&VCD
Exhibit 10c	Employer Statutory Rates-Safety Members
Exhibit 10d	Employer Statutory Rates-Probation Members

*"SMCM&VCD" refers to the San Mateo County Mosquito and Vector Control District.

Appendix D Member Contribution Rates



This section illustrates the member basic contribution rates and COLA sharing contribution rates by entry age for Plans 1 through 6. For different COLA sharing percentages, the COLA contribution rates may be adjusted ratably, and should be rounded to two decimal places.

Member contribution rates for Plan 7 are not defined by entry age. Plan 7 members contribute 50% of the total Normal Cost rate. For the 2018-2019 fiscal year, Plan 7 member contribution rates are:

- General Plan 7 members: 8.71%
- SMCM&VCD Plan 7 members: 8.84%
- Safety Plan 7 members: 14.51%
- Probation Plan 7 members: 14.33%

Please refer to Appendix B for a detailed description of member contribution rates.

Exhibit D-1 General Member Contribution Rates (including SMCM&VCD)

Entry Age ⁽¹⁾	Basic Member Rates				
	General & SMCM&VCD			General	SMCM&VCD
	Plans 1&2	Plan 4	Plan 5	Plan 7	Plan 7
16	5.67%	5.48%	4.72%	8.71%	8.84%
17	5.77%	5.58%	4.81%	8.71%	8.84%
18	5.88%	5.68%	4.90%	8.71%	8.84%
19	5.99%	5.79%	5.00%	8.71%	8.84%
20	6.10%	5.90%	5.09%	8.71%	8.84%
21	6.22%	6.01%	5.19%	8.71%	8.84%
22	6.33%	6.12%	5.29%	8.71%	8.84%
23	6.45%	6.24%	5.38%	8.71%	8.84%
24	6.57%	6.35%	5.49%	8.71%	8.84%
25	6.69%	6.47%	5.59%	8.71%	8.84%
26	6.82%	6.59%	5.69%	8.71%	8.84%
27	6.94%	6.71%	5.80%	8.71%	8.84%
28	7.07%	6.83%	5.91%	8.71%	8.84%
29	7.20%	6.96%	6.02%	8.71%	8.84%
30	7.33%	7.09%	6.13%	8.71%	8.84%
31	7.47%	7.22%	6.24%	8.71%	8.84%
32	7.61%	7.35%	6.36%	8.71%	8.84%
33	7.75%	7.49%	6.47%	8.71%	8.84%
34	7.89%	7.62%	6.59%	8.71%	8.84%
35	8.03%	7.76%	6.71%	8.71%	8.84%
36	8.18%	7.91%	6.84%	8.71%	8.84%
37	8.34%	8.06%	6.96%	8.71%	8.84%
38	8.49%	8.21%	7.09%	8.71%	8.84%
39	8.65%	8.36%	7.22%	8.71%	8.84%
40	8.82%	8.52%	7.36%	8.71%	8.84%
41	8.99%	8.68%	7.49%	8.71%	8.84%
42	9.17%	8.84%	7.63%	8.71%	8.84%
43	9.34%	9.00%	7.78%	8.71%	8.84%
44	9.51%	9.16%	7.92%	8.71%	8.84%
45	9.68%	9.31%	8.07%	8.71%	8.84%
46	9.85%	9.45%	8.23%	8.71%	8.84%
47	10.01%	9.59%	8.38%	8.71%	8.84%
48	10.16%	9.71%	8.53%	8.71%	8.84%
49	10.31%	9.82%	8.67%	8.71%	8.84%
50	10.44%	9.89%	8.82%	8.71%	8.84%
51	10.56%	9.92%	8.95%	8.71%	8.84%
52	10.62%	9.92%	9.08%	8.71%	8.84%
53	10.62%	10.20%	9.20%	8.71%	8.84%
54	10.62%	10.53%	9.30%	8.71%	8.84%
55	10.62%	10.53%	9.37%	8.71%	8.84%
56	10.62%	10.53%	9.40%	8.71%	8.84%
57	10.62%	10.53%	9.40%	8.71%	8.84%
58	10.62%	10.53%	9.66%	8.71%	8.84%
59	10.62%	10.53%	9.97%	8.71%	8.84%
60	10.62%	10.53%	9.97%	8.71%	8.84%

1. For General and SMCM&VCD members (except plan 5 members) entering after age 55, the rate equals the rate at age 55. For General and SMCM&VCD plan 5 members entering after age 60, the rate equals the rate at age 60.



This work product was prepared solely for SamCERA for the purposes described herein and may not be appropriate to use for other purposes. Milliman does not intend to benefit and assumes no duty or liability to other parties who receive this work. Milliman recommends that third parties be aided by their own actuary or other qualified professional when reviewing the Milliman work product.

D-2

Exhibit D-2 Safety/Probation Member Contribution Rates

Entry Age ⁽¹⁾	Basic Member Rates			
	Safety & Probation		Safety	Probation
	Plans 1&2	Plans 4&5&6	Plan 7	Plan 7
16	7.99%	7.70%	14.51%	14.33%
17	8.13%	7.83%	14.51%	14.33%
18	8.26%	7.96%	14.51%	14.33%
19	8.40%	8.10%	14.51%	14.33%
20	8.54%	8.23%	14.51%	14.33%
21	8.68%	8.37%	14.51%	14.33%
22	8.83%	8.51%	14.51%	14.33%
23	8.97%	8.65%	14.51%	14.33%
24	9.12%	8.79%	14.51%	14.33%
25	9.27%	8.94%	14.51%	14.33%
26	9.43%	9.09%	14.51%	14.33%
27	9.58%	9.24%	14.51%	14.33%
28	9.74%	9.39%	14.51%	14.33%
29	9.90%	9.54%	14.51%	14.33%
30	10.06%	9.70%	14.51%	14.33%
31	10.23%	9.86%	14.51%	14.33%
32	10.40%	10.03%	14.51%	14.33%
33	10.58%	10.20%	14.51%	14.33%
34	10.75%	10.37%	14.51%	14.33%
35	10.94%	10.54%	14.51%	14.33%
36	11.12%	10.72%	14.51%	14.33%
37	11.32%	10.91%	14.51%	14.33%
38	11.51%	11.10%	14.51%	14.33%
39	11.72%	11.28%	14.51%	14.33%
40	11.93%	11.47%	14.51%	14.33%
41	12.13%	11.64%	14.51%	14.33%
42	12.32%	11.80%	14.51%	14.33%
43	12.51%	11.95%	14.51%	14.33%
44	12.67%	12.07%	14.51%	14.33%
45	12.83%	12.17%	14.51%	14.33%
46	12.96%	12.23%	14.51%	14.33%
47	13.05%	12.23%	14.51%	14.33%
48	13.09%	12.60%	14.51%	14.33%
49	13.09%	13.01%	14.51%	14.33%
50	13.09%	13.01%	14.51%	14.33%

1. For Safety and Probation members entering after age 50, the rate equals the rate at age 50.

Exhibit D-3 General Member Contribution Rates (except SMCM&VCD)

Entry Age ⁽¹⁾	50% Member COLA Rates			
	Plan 1	Plan 2	Plan 4	Plan 5
16	2.05%	1.92%	1.44%	1.20%
17	2.09%	1.96%	1.47%	1.22%
18	2.13%	1.99%	1.49%	1.24%
19	2.17%	2.03%	1.52%	1.27%
20	2.21%	2.07%	1.55%	1.29%
21	2.25%	2.11%	1.58%	1.32%
22	2.29%	2.15%	1.61%	1.34%
23	2.33%	2.19%	1.64%	1.37%
24	2.38%	2.23%	1.67%	1.39%
25	2.42%	2.27%	1.70%	1.42%
26	2.47%	2.31%	1.73%	1.44%
27	2.51%	2.35%	1.77%	1.47%
28	2.56%	2.40%	1.80%	1.50%
29	2.61%	2.44%	1.83%	1.53%
30	2.65%	2.48%	1.87%	1.56%
31	2.70%	2.53%	1.90%	1.58%
32	2.75%	2.58%	1.93%	1.61%
33	2.80%	2.63%	1.97%	1.64%
34	2.86%	2.67%	2.00%	1.67%
35	2.91%	2.72%	2.04%	1.70%
36	2.96%	2.77%	2.08%	1.74%
37	3.02%	2.83%	2.12%	1.77%
38	3.07%	2.88%	2.16%	1.80%
39	3.13%	2.93%	2.20%	1.83%
40	3.19%	2.99%	2.24%	1.87%
41	3.25%	3.05%	2.28%	1.90%
42	3.32%	3.11%	2.33%	1.94%
43	3.38%	3.17%	2.37%	1.97%
44	3.44%	3.22%	2.41%	2.01%
45	3.50%	3.28%	2.45%	2.05%
46	3.56%	3.34%	2.49%	2.09%
47	3.62%	3.39%	2.52%	2.13%
48	3.68%	3.44%	2.55%	2.16%
49	3.73%	3.49%	2.58%	2.20%
50	3.78%	3.54%	2.60%	2.24%
51	3.82%	3.58%	2.61%	2.27%
52	3.84%	3.60%	2.61%	2.30%
53	3.84%	3.60%	2.68%	2.33%
54	3.84%	3.60%	2.77%	2.36%
55	3.84%	3.60%	2.77%	2.38%
56	3.84%	3.60%	2.77%	2.39%
57	3.84%	3.60%	2.77%	2.39%
58	3.84%	3.60%	2.77%	2.45%
59	3.84%	3.60%	2.77%	2.53%
60	3.84%	3.60%	2.77%	2.53%

1. For County General members (except plan 5 members) entering after age 55, the rate equals the rate at age 55. For County General plan 5 members entering after age 60, the rate equals the rate at age 60.

Exhibit D-4 Safety Member Contribution Rates

Entry Age ⁽¹⁾	50% Member COLA Rates				
	Plan 1	Plan 2	Plan 4	Plan 5	Plan 6
16	3.83%	4.00%	2.90%	2.68%	2.50%
17	3.90%	4.07%	2.95%	2.72%	2.54%
18	3.96%	4.14%	3.00%	2.77%	2.58%
19	4.03%	4.21%	3.05%	2.82%	2.63%
20	4.09%	4.28%	3.10%	2.86%	2.67%
21	4.16%	4.35%	3.16%	2.91%	2.72%
22	4.23%	4.42%	3.21%	2.96%	2.76%
23	4.30%	4.49%	3.26%	3.01%	2.81%
24	4.37%	4.57%	3.31%	3.06%	2.85%
25	4.44%	4.64%	3.37%	3.11%	2.90%
26	4.52%	4.72%	3.43%	3.16%	2.95%
27	4.59%	4.80%	3.48%	3.21%	3.00%
28	4.67%	4.88%	3.54%	3.26%	3.05%
29	4.75%	4.96%	3.60%	3.32%	3.10%
30	4.82%	5.04%	3.66%	3.37%	3.15%
31	4.90%	5.12%	3.72%	3.43%	3.20%
32	4.98%	5.21%	3.78%	3.49%	3.26%
33	5.07%	5.30%	3.85%	3.55%	3.31%
34	5.15%	5.38%	3.91%	3.60%	3.37%
35	5.24%	5.48%	3.97%	3.66%	3.42%
36	5.33%	5.57%	4.04%	3.73%	3.48%
37	5.43%	5.67%	4.11%	3.79%	3.54%
38	5.52%	5.76%	4.19%	3.86%	3.60%
39	5.62%	5.87%	4.25%	3.92%	3.66%
40	5.72%	5.97%	4.33%	3.99%	3.72%
41	5.81%	6.07%	4.39%	4.05%	3.78%
42	5.90%	6.17%	4.45%	4.10%	3.83%
43	6.00%	6.26%	4.51%	4.15%	3.88%
44	6.07%	6.34%	4.55%	4.20%	3.92%
45	6.15%	6.42%	4.59%	4.23%	3.95%
46	6.21%	6.49%	4.61%	4.25%	3.97%
47	6.25%	6.53%	4.61%	4.25%	3.97%
48	6.27%	6.55%	4.75%	4.38%	4.09%
49	6.27%	6.55%	4.91%	4.52%	4.22%
50	6.27%	6.55%	4.91%	4.52%	4.22%

1. For Safety members entering after age 50, the rate equals the rate at age 50.

Exhibit D-5 Probation Member Contribution Rates

Entry Age ⁽¹⁾	50% Member COLA Rates				
	Plan 1	Plan 2	Plan 4	Plan 5	Plan 6
16	4.25%	4.10%	2.91%	2.67%	2.34%
17	4.33%	4.17%	2.96%	2.71%	2.38%
18	4.40%	4.24%	3.01%	2.76%	2.42%
19	4.47%	4.31%	3.07%	2.81%	2.47%
20	4.54%	4.38%	3.11%	2.85%	2.51%
21	4.62%	4.46%	3.17%	2.90%	2.55%
22	4.70%	4.53%	3.22%	2.95%	2.59%
23	4.77%	4.61%	3.27%	3.00%	2.63%
24	4.85%	4.68%	3.33%	3.04%	2.68%
25	4.93%	4.76%	3.38%	3.10%	2.72%
26	5.02%	4.84%	3.44%	3.15%	2.77%
27	5.10%	4.92%	3.50%	3.20%	2.81%
28	5.18%	5.00%	3.55%	3.25%	2.86%
29	5.27%	5.08%	3.61%	3.30%	2.90%
30	5.35%	5.16%	3.67%	3.36%	2.95%
31	5.44%	5.25%	3.73%	3.42%	3.00%
32	5.53%	5.34%	3.80%	3.47%	3.05%
33	5.63%	5.43%	3.86%	3.53%	3.10%
34	5.72%	5.52%	3.92%	3.59%	3.16%
35	5.82%	5.62%	3.99%	3.65%	3.21%
36	5.92%	5.71%	4.06%	3.71%	3.26%
37	6.02%	5.81%	4.13%	3.78%	3.32%
38	6.12%	5.91%	4.20%	3.85%	3.38%
39	6.24%	6.02%	4.27%	3.91%	3.43%
40	6.35%	6.12%	4.34%	3.97%	3.49%
41	6.45%	6.23%	4.40%	4.03%	3.54%
42	6.56%	6.33%	4.47%	4.09%	3.59%
43	6.66%	6.42%	4.52%	4.14%	3.64%
44	6.74%	6.50%	4.57%	4.18%	3.67%
45	6.83%	6.59%	4.61%	4.22%	3.70%
46	6.90%	6.65%	4.63%	4.24%	3.72%
47	6.94%	6.70%	4.63%	4.24%	3.72%
48	6.97%	6.72%	4.77%	4.36%	3.84%
49	6.97%	6.72%	4.92%	4.51%	3.96%
50	6.97%	6.72%	4.92%	4.51%	3.96%

1. For Probation members entering after age 50, the rate equals the rate at age 50.

**Exhibit 10 Employer Statutory Contribution Rates – All Plans
 For the 2018-2019 Fiscal Year**

All Plans

All Plans

	Gross Normal Cost	Member Contributions	Employer Rates					Prior Year Total Contribution Rate ⁽²⁾
			Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾	Total Contribution Rate	
<u>General Members</u>								
County	20.92%	(11.34)%	7.31%	2.27%	9.58%	20.55%	30.13%	28.72%
Courts	21.63%	(11.98)%	7.65%	2.00%	9.65%	22.58%	32.23%	30.39%
Total	20.95%	(11.37)%	7.33%	2.25%	9.58%	20.64%	30.22%	28.82%
SMCM&VCD Members	20.40%	(8.08)%	8.85%	3.47%	12.32%	12.37%	24.69%	24.52%
Safety Members	34.80%	(17.52)%	13.23%	4.05%	17.28%	45.57%	62.85%	60.56%
Probation Members	34.01%	(16.59)%	13.48%	3.94%	17.42%	32.87%	50.29%	47.66%
All Plans	23.35%	(12.40)%	8.39%	2.56%	10.95%	24.36%	35.31%	33.76%
County Only	23.43%	(12.43)%	8.41%	2.59%	11.00%	24.48%	35.48%	33.91%

1. County UAAL Contribution Rate includes an aggregate offset of 2.36% of County payroll to reflect the County Supplementary Contribution Account. Offsets vary by class of member as follows:

- General member UAAL offset is 2.03% of payroll
- Safety member UAAL offset is 4.08% of payroll
- Probation member UAAL offset is 3.21% of payroll

SMCM&VCD UAAL Contribution Rate includes an offset of 10.21% of District payroll to reflect the District Supplementary Contribution Account.

2. The Prior Year Total Contribution Rate reflects the valuation addendums that were issued subsequent to the valuation report.

Exhibit 10a Employer Statutory Contribution Rates – General Members
 For the 2018-2019 Fiscal Year

	General Members							
	Employer Rates							Prior Year
	Gross Normal Cost	Member Contributions	Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾	Total Contribution Rate	Total Contribution Rate ⁽²⁾
Plan 1								
County ⁽³⁾	24.12%	(13.38)%	7.60%	3.14%	10.74%	20.55%	31.29%	28.74%
Courts ⁽³⁾	24.12%	(13.38)%	7.60%	3.14%	10.74%	22.58%	33.32%	30.54%
Total	24.12%	(13.38)%	7.60%	3.14%	10.74%	20.55%	31.29%	28.90%
Plan 2								
County ⁽³⁾	22.18%	(12.94)%	6.45%	2.79%	9.24%	20.55%	29.79%	28.76%
Courts ⁽³⁾	22.18%	(12.94)%	5.71%	3.53%	9.24%	22.58%	31.82%	30.58%
Total	22.18%	(12.94)%	6.42%	2.82%	9.24%	20.63%	29.87%	28.84%
Plan 3								
County	8.11%	0.00%	8.11%	0.00%	8.11%	20.55%	28.66%	27.46%
Courts	8.11%	0.00%	8.11%	0.00%	8.11%	22.58%	30.69%	28.95%
Total	8.11%	0.00%	8.11%	0.00%	8.11%	20.55%	28.66%	27.48%
Plan 4								
County (0%) ⁽³⁾	25.38%	(13.22)%	8.19%	3.97%	12.16%	20.55%	32.71%	34.50%
County (50%) ⁽³⁾	22.91%	(12.99)%	7.60%	2.32%	9.92%	20.55%	30.47%	28.87%
Courts ⁽³⁾	22.91%	(12.99)%	7.60%	2.32%	9.92%	22.58%	32.50%	30.55%
Total	22.92%	(12.99)%	7.60%	2.33%	9.93%	20.67%	30.60%	28.93%
Plan 5								
County	20.91%	(9.30)%	9.44%	2.11%	11.61%	20.55%	32.16%	30.26%
Courts	20.91%	(9.30)%	11.60%	2.11%	11.61%	22.58%	34.19%	30.40%
Total	20.91%	(9.30)%	9.50%	2.11%	11.61%	20.60%	32.21%	30.26%
Plan 7								
County	17.42%	(8.71)%	6.71%	2.00%	8.71%	20.55%	29.26%	27.94%
Courts	17.42%	(8.71)%	8.51%	0.20%	8.71%	22.58%	31.29%	29.43%
Total	17.42%	(8.71)%	6.77%	1.94%	8.71%	20.62%	29.33%	27.99%
All Plans								
County	20.92%	(11.34)%	7.31%	2.27%	9.58%	20.55%	30.13%	28.72%
Courts	21.63%	(11.98)%	7.67%	1.98%	9.65%	22.58%	32.23%	30.39%
Total	20.95%	(11.37)%	7.33%	2.25%	9.58%	20.64%	30.22%	28.82%

Notes:

1. UAAL Contribution Rate includes an offset of 2.03% of payroll to reflect the County Supplementary Contribution Account, except for Courts.
2. The Prior Year Total Contribution Rate reflects the valuation addendums that were issued subsequent to the valuation report.
3. All members pay 50% of the cost of COLA, except for members of the Board of Supervisors whose most recent hire date is before August 7, 2011.

Exhibit 10b Employer Statutory Contribution Rates – SMCM&VCD Members
 For the 2018-2019 Fiscal Year

SMCM&VCD

SMCM&VCD Members

	Employer Rates							Prior Year Total Contribution Rate
	Gross Normal Cost	Member Contributions	Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾	Total Contribution Rate	
Plan 1 ⁽²⁾	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plan 2 ⁽²⁾	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plan 4	21.74%	(7.70)%	9.98%	4.06%	14.04%	12.37%	26.41%	25.61%
Plan 7	17.68%	(8.84)%	6.55%	2.29%	8.84%	12.37%	21.21%	20.64%
All Plans	20.40%	(8.08)%	8.85%	3.47%	12.32%	12.37%	24.69%	24.52%

Notes:

1. UAAL Contribution Rate includes an offset of 10.21% of payroll to reflect the District Supplementary Contribution Account.
2. There are currently no active Plan 1 or Plan 2 SMCM&VCD members. Employer rates will be developed in the future if needed.

Exhibit 10c Employer Statutory Contribution Rates – Safety Members
 For the 2018-2019 Fiscal Year

Safety Members

Safety Members

	Employer Rates							Prior Year Total Contribution Rate
	Gross Normal Cost	Member Contributions	Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾	Total Contribution Rate	
Plan 1	39.29%	(5.00)%	24.31%	9.98%	34.29%	45.57%	79.86%	83.63%
Plan 2	36.87%	(18.39)%	13.10%	5.38%	18.48%	45.57%	64.05%	61.03%
Plan 4	35.97%	(18.32)%	13.78%	3.87%	17.65%	45.57%	63.22%	60.49%
Plan 5	36.64%	(18.18)%	14.52%	3.94%	18.46%	45.57%	64.03%	61.65%
Plan 6 ⁽²⁾	N/A	N/A	N/A	N/A	NA	NA	NA	63.81%
Plan 7	29.02%	(14.51)%	11.04%	3.47%	14.51%	45.57%	60.08%	58.15%
All Plans	34.80%	(17.52)%	13.23%	4.05%	17.28%	45.57%	62.85%	60.56%

Notes:

1. UAAL Contribution Rate includes an offset of 4.08% of payroll to reflect the County Supplementary Contribution Account.
2. There are currently no active Safety Plan 6 members. Employer rates will be developed in the future if needed.

Exhibit 10d Employer Statutory Contribution Rates – Probation Members
 For the 2018-2019 Fiscal Year

Probation Mem

Probation Members

	Gross Normal Cost	Member Contributions	Employer Rates				Prior Year Total Contribution Rate	
			Basic Normal Cost	COLA Normal Cost	Total Normal Cost	UAAL Contribution Rate ⁽¹⁾		Total Contribution Rate
Plan 1	36.14%	(3.50)%	23.86%	8.78%	32.64%	32.87%	65.51%	64.36%
Plan 2	36.69%	(17.39)%	14.11%	5.19%	19.30%	32.87%	52.17%	49.54%
Plan 4	34.30%	(16.84)%	13.72%	3.74%	17.46%	32.87%	50.33%	47.63%
Plan 5	31.52%	(16.36)%	11.72%	3.44%	15.16%	32.87%	48.03%	46.07%
Plan 6	27.61%	(12.44)%	12.09%	3.08%	15.17%	32.87%	48.04%	45.62%
Plan 7	28.65%	(14.33)%	10.99%	3.33%	14.32%	32.87%	47.19%	45.10%
All Plans	34.01%	(16.59)%	13.48%	3.94%	17.42%	32.87%	50.29%	47.66%

Notes:

1. UAAL Contribution Rate includes an offset of 3.21% of payroll to reflect the County Supplementary Contribution Account.

SAN MATEO COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
Board of Retirement

October 16, 2017

Agenda Item 5

TO: Board of Retirement

FROM: Gladys Smith, Assistant Chief Executive Officer



SUBJECT: Annual Review of SamCERA's Actuarial Services Firm, Milliman, Inc.

Recommendation

Accept the annual performance report of Milliman, Inc.'s actuarial services.

Background

The annual evaluation of Milliman has three parts:

1. A survey completed by trustees, staff and the actuary
2. Responses to questions submitted to the actuary
3. A discussion at the Board meeting with Milliman, Inc. regarding its performance as reflected in the surveys and responses to the questions

Discussion

Milliman, Inc. has consistently received high marks, throughout the years, from the Board and staff for the actuarial services it provides to SamCERA. Ratings this year were similar to those of the past.

Overall, Milliman received high marks from the Board and staff. The rating structure was from 1 to 5 with 1 being Low (poor rating) to 5 (high rating). The average self-assessment rating by Milliman was 4.3 while the Board's was 4.4 and staff's 4.8. No concerns or issues were raised by the Board or staff.

Attachment

Milliman Questionnaire



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Seattle, WA 98101-2605
USA

Tel +1 206 624 7940
Fax +1 206 623 3485

milliman.com

Via Email Only

September 14, 2017

To: Gladys Smith
From: Nick Collier, Craig Glyde
Subject: Actuarial Review – Milliman Inc.

As requested, we have completed the questionnaire form. Please note that Milliman is a large, multi-office firm with services covering a variety of types of actuarial and other consulting issues. For purposes of this review we have responded with answers that apply to the Western Region Employee Benefits practice and have provided client information regarding only the public sector clients. If additional information on other offices or other clients is needed, please let us know.

Organizational Update

1) Has the ownership structure of your firm changed? If so, describe.

Milliman's ownership structure has not changed since last year. Milliman is a corporate organization owned by its approximate 400 Principals. No Principal owns 5% or more of the firm. The firm is comprised of profit centers overseen by Principals who have a considerable amount of flexibility with respect to the management of their profit centers.

2) Provide an update on your firm's organization, with particular emphasis on (a) changes to your management structure over the past eighteen months, and (b) clients gained or lost in the past eighteen months. All significant changes should be accompanied by an explanation. An organizational chart should accompany this response.

Milliman is a firm of actuaries and consultants providing actuarial and risk management services, and a range of consulting and technology solutions to private and public businesses, non-profit enterprises, government, and financial organizations in approximately 40 offices around the United States, and worldwide.

(a) Other than the normal growth of the firm, there have been no changes in the management structure of Milliman in the last 18 months. Normal growth includes new Principals being nominated and a few Principals leaving the firm, primarily due to retirement.

(b) The Western Region Employee Benefits practice has had the following changes in its public sector pension clients in the last 18 months.

Added:(1) SBCERS (actuarial audit)

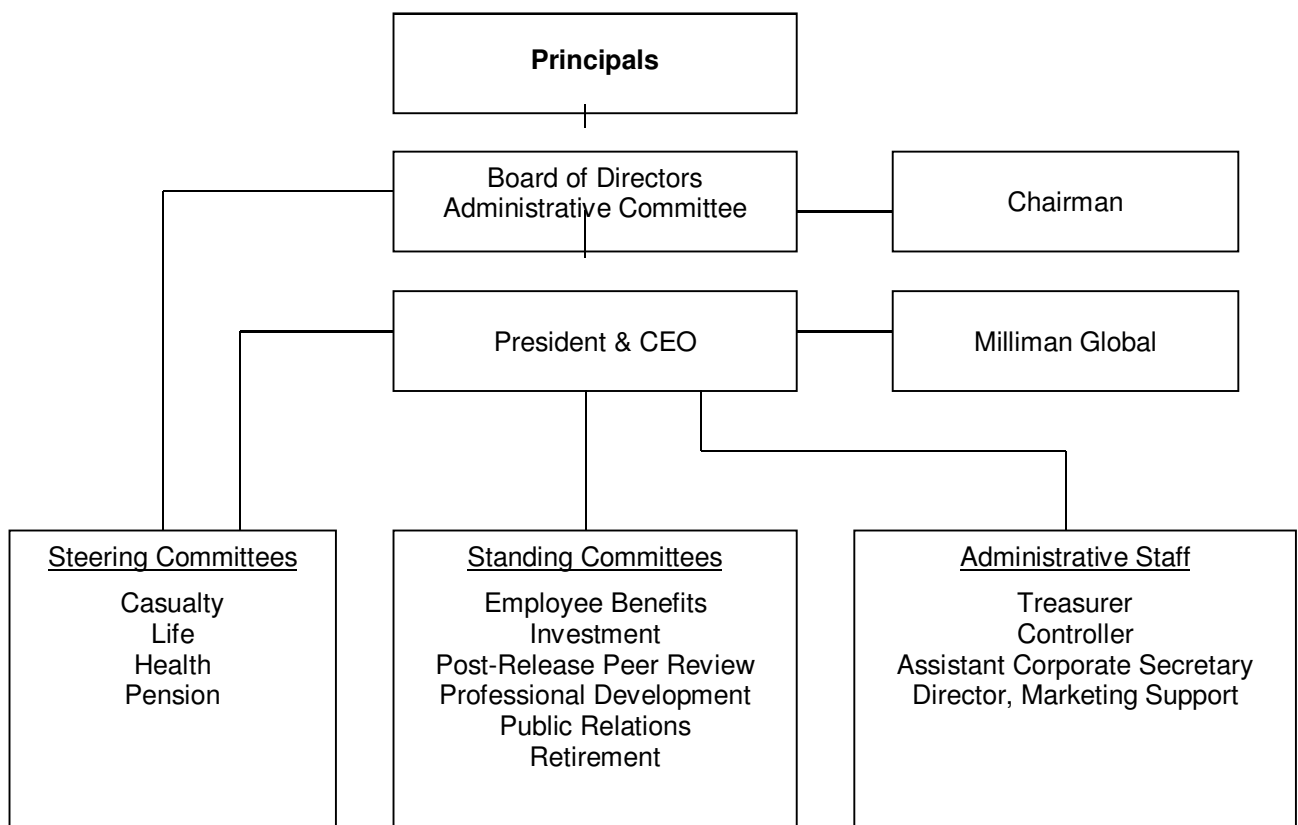
(2) City of Aurora General Employees Retirement Plan

(3) City of Aurora Elected Officials' and Executive Personnel DB Plan

(4) Washington Hospital Healthcare District

Lost: None

(c) Below is an organizational chart of Milliman. The Principals of the firm as a whole are responsible for establishing the governing principles of Milliman. Principals are active senior professionals within Milliman who have been elected in recognition of their technical, professional and business achievements. The Board of Directors of Milliman and the officers of Milliman are delegated the authority by the Principals to assume day-to-day responsibilities for carrying out the management directives established by the Principals. The Board of Directors of Milliman consists of 11 Principals including the President, the Chairman, four National Directors of our major practice areas, and five rotating positions.



3) What is your firm's philosophy and current policy regarding new business?

The West Region Employee Benefits practice believes we can add new business only when we have the capacity to maintain the high level of service we promise to all clients. Within the public sector, the opportunity to attain new business is driven by the RFP process. In order to respond to any RFP situations, we are continuing hiring new actuarial analysts – at the rate of about two per year, and growing from within. In addition, Milliman has access to additional staff from other offices if special projects create a need for a temporary increase in staffing support. We have on occasion, when needed, hired additional experienced staff from other firms, but our preferred method of growth is from within our own staff.

4) Update all significant personnel changes or expected changes to the "SamCERA Team." Describe the relative strength and longevity of your staff.

Most of the senior staff in our practice have been with Milliman for more than 15 years.

The SamCERA team consists of Nick Collier, Craig Glyde, Julie Smith, and John Talbot. Nick (30 years with Milliman) and Craig (14 years with Milliman plus additional experience with a prior firm) have extensive experience. Julie Smith (8 years with Milliman) and John Talbot (2 years with Milliman) perform the valuation calculations and provide valuable support to Nick and Craig. Nick, Craig and Julie have been together on the SamCERA team for about seven years. John joined the team last year and has been a strong contributor and asset.

5) Has your firm or any of its employees been involved in regulatory or litigation actions related to your business in the past eighteen months?

Neither the West Region Employee Benefits practice, nor any members of the SamCERA actuarial team have been involved in any litigation of any kind against Milliman. Milliman does not normally provide disclosures with respect to other litigation which may be pending for other offices or practices not involved in the services for a specific client.

6) Are any of your operations outsourced? If the answer is yes, provide details regarding the firm(s) with which your firm has contracted.?

No. None of our work with SamCERA is outsourced.

7) Other than the actuarial audit performed by Segal Inc. on your SamCERA actuarial services, has an actuarial audit been performed on any of your firm's actuarial products in the past twelve months? If yes, discuss the audit and the findings. Any material findings or recommendations must be accompanied by an explanation.

The following client(s) from our practice have had actuarial audits performed within the past 12 months: Florida Retirement System (by GRS), LACERA (by Segal). There were no material issues found in any of the audit(s).

8) What are your mission critical systems? Has your firm experienced any problems with these systems in the past twelve months? When were these systems implemented and when were they last upgraded? Do you anticipate any changes to these systems in the next twelve months?

The only critical system we use to perform services for SamCERA at the current time is our valuation system called ProVal. We moved to this valuation system in 2017 as it is the most common system used by pension actuaries and has an extensive support network. This system is continuously being updated and improved to reflect changes in the employee benefit arena.

- 9) **Please describe how your firm monitors and manages cyber security risks as they relate to confidential SamCERA data/information. Has your firm experienced any problems with cyber security in the past 18 months? What is your cyber security breach policy? What procedures do you have in place for a cyber security breach?**

Data security is important and Milliman maintains physical, electronic, and managerial safeguards to prevent unauthorized access to confidential, sensitive, and personal information. Milliman has a comprehensive information security policy based on the ISO 27001 risk management framework. Milliman has implemented a number of layered controls and safeguards, including administrative policies and procedures and automated systems. These controls are employed in a defense in depth arrangement to secure electronic information stored on our systems.

Milliman's data handling policy requires that all confidential data be transmitted using an approved, secure method. We also maintain security protocols for our servers and e-mail system, and physical records retention and destruction policies. All hardware and software to be used for this project reside in our Seattle office. We do not contract with a separate entity for computer services.

In addition, we will comply with any written standards communicated to us by our clients. Our preferred data transmittal method is to use Milliman's Secured File Transfer Protocol (SFTP) server. This method only requires that the user be able to access the internet through an internet browser. No software needs to be installed on the user's computer. Milliman will issue the user a user name, a password, and provide the Internet address for the SFTP site. Using Milliman's SFTP server ensures that user names, passwords, and data files are encrypted while traveling through the internet. Milliman has other alternatives available, which can also include using file encryption or a client-provided encrypted method. Depending on the nature and sensitivity of the data sent, file encryption at rest may also be appropriate. We comply with any written standards communicated to us by our clients.

Once data has been securely obtained by Milliman, we undertake extensive precautions to ensure the continuing security of sensitive information. This includes logical security, firewalls, anti-malware software, employee security protocols, and full-disk encryption of personal desktop and laptop computers used by Milliman staff. In addition, we maintain physical security measures for building and data storage facilities, and maintain internal policies to ensure privacy for sensitive client and participant data.

Other security measures we have in place, include:

- **Staff.** Milliman performs employee background checks on all employees before they are allowed to start work. Every Milliman employee signs Milliman's Employee Trade Secret and Client Information Agreement. Mandatory data-handling security training is required for all staff. Security training is monthly for all employees. Milliman has written policies on data handling and acceptable computer use. Terminated users' access is removed on their last day. For involuntary terminations, all access is removed immediately and employees are escorted off the premises.
- **Physical security.** The Seattle office of Milliman is located at 1301 Fifth Avenue, Suite 3800. Keycard access is required to enter the building after hours. The building has security guards on duty 7 days a week, 24 hours a day. The elevators are secured after-hours and only the keycards of Milliman employees and security personnel are code to

allow access a Milliman floor. Milliman floors are secured with keycards and door codes that are individualized to each employee. The data center is locked 24/7. It is secured on a separate keycard/door code system with extremely limited access, controlled by the Information Technology Manager. Each door entry system tracks who opens a door. There are cameras in the elevator lobbies and in the data center. The data center uses a motion detection system to monitor access. The data center has no walls on the outside of the building, and no walls are connected to the elevator lobby.

- **PC security.** All PCs lock after 15-minutes of non-use. All PCs use full-disk hardware encryption. All Notebook PCs use personal firewalls. All PCs and servers utilize anti-malware software.
- **Data access security.** System access requires valid user IDs and passwords. Forced password changes are required every 90 days. Complex password rules are in place. (A minimum of eight characters are required. Passwords must contain three of four categories of characters: uppercase, lowercase, numeric value or symbol. No part of the user's name exceeding two characters is allowed to be part of the password. Passwords in history cannot be re-used. Twenty-five passwords retained in history.) Data access is limited by role. This is controlled by two levels of security. Active Directory group permissions are used to control allowed access to applications. Then role-based permissions are used inside the applications themselves to allow very granular access control.
- **Firewalls, intrusion prevention, and detection, etc.** The database is housed behind an intrusion prevention system is in place. It is updated within a day of newly published patterns. Milliman actively blocks tens of thousands of known malicious IP addresses. Intrusion detection monitoring and alerting is provided 24 hours a day. Operating Systems and application security patches are installed within a few days of release and pushed out from a central server to machines automatically. Anti-malware provides anti-virus and anti-SPAM blocking before mail is routed to Milliman. All PCs and Servers run Anti-virus/Anti-Spyware/Malware software. Every file is scanned upon opening. A central server checks for pattern updates multiple times per day and pushes updates out to all machines.
- **Vulnerability scans, penetration testing, audits.** Periodic vulnerability scanning is performed monthly to find and mitigate risks. Penetration testing is performed annually by an external auditing firm. An annual SSAE16 audit of IT systems is performed annually by an external auditing firm. In addition, Milliman has an Information Security Policy which is reviewed internally on a periodic basis and annually by a third party to ensure it is up to date and continues to cover the appropriate scope, and to identify any existing gaps between the security policy and industry practices.

All security incidents are promptly reported to management, including the chief legal officer and information security officer.

In addition, Milliman has an Information Security Policy which is reviewed internally on a periodic basis and annually by a third party to ensure it is up to date and continues to cover the appropriate scope, and to identify any existing gaps between the security policy and industry practices.

We have an annual independent assessment made of our cyber security processes including annual security penetration testing performed by a third-party. We also have an SSAE18 audit which includes a review of our cyber security controls.

Milliman's cyber security breach policy requires us to notify clients within 48 hours of a confirmed breach. In the event of a cyber security incident, Milliman follows the laws applicable in each state where affected participants reside to notify clients and participants of security breaches. Milliman has a documented Cyber Security Incident Response Plan and a Cyber Security Incident Response Team. Cyber security monitoring and incident response includes the following:

- Preparation & Prevention – includes maintaining a cyber security response team, maintaining firewalls, maintaining access control security, maintaining monitoring systems and alerts
- Identification/Detection – includes user reports, monitoring ingress and egress sensors, event correlation, categorization of incidents by severity (triage) which determines incident response
- Containment – includes possibly isolating hosts depending on the nature of activity associated with a given incident
- Investigation – includes analyzing logs, documenting findings, transferring evidence as needed to law enforcement
- Eradication – includes the use of cleaning utilities, manual reconfigurations, vendor or other approved patches, updated service packs, updated device images
- Post-Incident Recovery – includes verifying that the threat and enabling environment are clear, performing vulnerability scanning and device hardening as applicable, restoring data
- Follow-up – includes conducting effectiveness reviews during each incident response to identify any inadequacies within the process

We have not experienced any cyber security incidents in the past 18 months.

10) Provide an overview of your firm's business continuity plan. Please describe any changes in the last year.

Business continuity and disaster recovery are critical elements of Milliman's strategy to safeguard client information and ensure timely service delivery. Our business unit maintains a formal disaster recovery plan that is periodically tested and updated to ensure its accuracy.

Milliman's servers replicate to multiple Milliman offices throughout the western US. In the event of a server failure, employees access a replica in another city. Data changes are automatically replicated to all servers as the changes are made. Also to minimize downtime, our servers are standardized with the highest level of fault tolerance, redundancy and hot-swappable components are integrated into the servers. Spare servers and components are kept on-site. Dedicated electrical circuits are used to power all data center equipment. All servers are protected by Uninterruptible Power Supplies which protect the systems against surges and spikes and can power servers for a short time. Additionally, they provide orderly shutdown of systems in a power failure to protect against data loss. The data center is equipped with redundant air conditioning systems and redundant chilled water sources. A hardware monitoring system pages technicians 24 hours a day in the event of hardware pre-

failures and failures. Technicians are also paged if something affects system uptime, website uptime, air temperature or chilled water temperature, and for data center entry and motion detection outside of business hours.

Milliman does nightly full tape backups that are encrypted. A tape rotation is stored on-site in fireproof safes and also off-site at a secure data storage facility.

Actuarial Process

11) Provide a description, in detail, of your actuarial process.

The following summarizes our standard valuation procedures (as stated in our proposal):

1. Data Checking and Preliminary Processing

SamCERA supplies us with information for each active, vested, and retired member, along with certain financial items. The data is checked for reasonableness and any data questions and issues are submitted to SamCERA staff for verification.

2. Choosing Assumptions

Actuarial valuations are necessarily based on assumptions as to future rates of retirement, disablement and death among active members, rates of mortality after retirement, rates of investment income, rates of salary increases, and rates of increase in the Consumer Price Index, where applicable. In valuing SamCERA's benefits, we use the assumptions adopted by the Board, based on the most recent experience investigation.

3. Valuation Calculations

Each valuation determines the actuarial present value of all future benefits payable from SamCERA. These benefits are those provided to members under current law. We determine the actuarial present value of future benefit payments using our valuation program. The program can calculate costs under the entry age normal cost method, which is specified in the '37 Act. Liability calculations are checked for accuracy and reasonableness on both an individual and aggregate basis.

We then calculate each valuation group's unfunded actuarial accrued liability (UAAL) as the value of the benefits in excess of the sum of the future normal cost contributions and the current value of assets. Finally, we determine the contribution rate needed for each group to satisfy the amortization period requirements.

4. Funding Valuation Report

Our report includes our conclusions regarding the financial condition SamCERA, the unfunded actuarial accrued liability, recommendations as to future contribution rates, discussion of the calculations, descriptions of the benefit provisions of the applicable laws and summaries of assumptions and data. Our report typically shows a breakdown of liabilities by source of decrement for active members, as well as subtotals for inactive members. We are open to discuss with SamCERA staff and the Board regarding possible changes in the reporting format for their particular needs. We reflect each system's own characteristics in our report.

Our goal is to provide enough information for the Board to make reasonable financial decisions without becoming too complex to undermine the basic intent of disclosing the valuation results. However, we are always open to suggestions for improving the communications of our valuation work, if a modified approach is preferred.

5. GASB Report

We develop the information required to be disclosed by Statement Nos.67 and 68 of the Governmental Accounting Standards Board (GASB). We provide this information both for the system and the participation employers.

12) Describe your peer review procedures in detail, and include whether and the extent it involves other actuarial firms. Highlight any changes to that process.

Peer review is not actually a separate step in our valuation process. Rather it is an ongoing process. We review and check our work at every step of the project.

Our internal peer review processes provide assurances that the highest quality standards are being maintained at all times. Each valuation, study, or projections will be reviewed by at least two consultants. The first level of review will occur within the SamCERA team. Two of the three consultants on the project team will review each step of the project. The final internal SamCERA team review will be performed by Nick Collier and Craig Glyde. Additionally, another Milliman public sector consultant who did not work on the project will review the work prior to its final release. This provides the project with an independent set of eyes. This review will not only verify the calculations, but will evaluate whether or not the assumptions, methods, and results are reasonable, and all appropriate issues are considered.

Outlook

13) What current issues are other clients concerned with in regards to products, services, education and governance?

There are a number of issues concerning our public sector clients right now. Probably the most significant are:

- Investment Allocation and Return Assumption – Always a hot topic in the public sector, the focus has increased partly due to recent changes by CalPERS who adopted a policy to gradually reduce the risk of their portfolio with a corresponding reduction in the investment return assumption.
- GASB 74 & 75 – New GASB statements for Other Post-Employment Benefits that are parallel to GASB 67 & 68. Milliman will be assisting the County with implementation of the new standards.
- Termination vs Funding Basis – Two recent publications have highlighted differences in the way actuarial liabilities can be calculated. The Society of Actuaries has made a paper available on their websites that argues for applying “financial economics” to public retirement plans. In simple, financial economics advocates reporting liabilities at a risk-free discount rate. This approach would significantly increase the values that are currently reported using the traditional actuarial approach. A somewhat related article appeared in the New York Times last week that referred to “two sets of books.” Specifically, it highlighted the increased liability incurred by a district member of CalPERS that terminated and was moved to a separate “termination pool.” We do not see any direct impact on SamCERA.

14) Describe your assessment of the relationship between your firm and SamCERA. How can SamCERA better assist you in accomplishing the goals it has established for your firm? How can we better utilize your firm's capabilities?

We believe we have a strong relationship with SamCERA. As with all relationships, communication is the key factor. We have attempted to reply promptly and effectively to all inquiries. We have attempted to alert SamCERA of any relevant issues as they become apparent to us or are reported to us. Similarly, SamCERA staff has kept us up-to-date on issues that affect our work. We have felt very positive about being supported by SamCERA and we hope the relationship will continue to grow.

There were clearly some stresses this year dealing with a new process for the valuation data provided by SamCERA's new pension administration system. We appreciate SamCERA being out front on this process and working with Vitech to get us the information we needed. This was critical in completing the valuation on time this year. By continuing to improve the consistency and quality of data included in the extract files, SamCERA will help us continue to provide quality service.

Probably the most significant way we can continue to assist SamCERA is in the understanding of the volatility of future investment returns and the impact on future contribution rates. We have provided SamCERA some fairly simple projections in the past, but have the capability to do more sophisticated analysis as the need arises.

Conclusion

15) What actuarial related changes should SamCERA consider?

We do not believe there are any actuarially related changes that need to be made at this moment.

16) Relative to your expertise, what trends are occurring in the retirement industry that SamCERA should be tracking?

We believe the key trends are as follows:

- Lower CPI / wage growth / Investment Return Assumptions – In response to economic experience and trends, changes in asset allocation, and future expectations of CPI and investment returns of asset classes, retirement systems have been adopting lower CPI, wage growth and investment return assumptions over the last 10 years. We believe there will continue to be downward pressure on economic assumptions.
- Plan Maturity – Plans are continuing to become more mature. For example, within the next few years, we project the number of SamCERA retirees will exceed the number of active members. This is not necessarily a problem, but it may increase volatility of contribution rates for SamCERA (and the majority of public sector retirement systems). To address this, we will continue to provide SamCERA with sensitivity analysis showing the impact of various future investment returns on contribution rates. We will also work with Verus when they do their asset allocation study to reflect this impact.