



San Mateo County Employees' Retirement Association

Investigation of Experience July 1, 2020 – April 30, 2023

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July 18, 2023

Board of Retirement
San Mateo County Employees' Retirement Association
100 Marine Parkway, Suite 125
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Dear Members of the Board:

It is a pleasure to submit this report of our investigation of the experience of the San Mateo County Employees' Retirement Association (SamCERA) for the period July 1, 2020 through April 30, 2023. The results of this investigation are the basis for the actuarial assumptions and methods to be used in the actuarial valuation to be performed as of June 30, 2023.

The purpose of this report is to communicate the results of our review of the actuarial methods and the economic and demographic assumptions to be used in the completion of the upcoming valuation. Several of our recommendations represent changes from the prior methods or assumptions and are designed to better anticipate the emerging experience of SamCERA.

We have provided financial information showing the estimated hypothetical impact of the recommended assumptions, if they had been reflected in the June 30, 2022 actuarial valuation. We believe the recommended assumptions provide a reasonable estimate of anticipated experience affecting SamCERA. Nevertheless, the emerging costs will vary from those presented in this report to the extent that actual experience differs from that projected by the actuarial assumptions. Future actuarial measurements may differ significantly from the current measurements presented in this report due to factors such as the following:

- Plan experience differing from the actuarial assumptions,
- Future changes in the actuarial assumptions,
- Increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as potential additional contribution requirements due to changes in the Plan's funded status), and
- Changes in the plan provisions or accounting standards.

Due to the scope of this assignment, we did not perform an analysis of the potential range of such measurements.

The results for the estimated financial impact were developed using models employing standard actuarial techniques. We have reviewed the models, including their inputs, calculations, and outputs for consistency, reasonableness, and appropriateness to the intended purpose and in compliance with generally accepted actuarial practice and relevant actuarial standards of practice. Reliance on other experts is reflected in Milliman's capital market assumptions, and in Milliman's expected return model maintained by Milliman investment consultants.

In preparing this report, we relied without audit on information (some oral and some in writing) supplied by SamCERA's staff. This information includes, but is not limited to, statutory provisions, employee data, and financial information. We used SamCERA's benefit provisions as stated in our June 30, 2022 Actuarial Valuation

report. In our examination, after discussion with SamCERA and making certain adjustments, we have found the data to be reasonably consistent and comparable with data used for other purposes. The experience study results are dependent on the integrity of this information. If any of this information is inaccurate or incomplete, our determinations may need to be revised.

We certify that the assumptions developed in this report satisfy ASB Standards of Practice, in particular, No. 27 (Selection of Economic Assumptions for Measuring Pension Obligations) and No. 35 (Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations).

This investigation of experience report recommends assumptions to be used in the valuation to provide an estimate of the System's financial condition as of a single date. The valuation can neither predict the System's future condition nor guarantee future financial soundness. Actuarial valuations do not affect the ultimate cost of System benefits, only the timing of System contributions. While the valuation is based on an array of individually reasonable assumptions, other assumption sets may also be reasonable and valuation results based on those assumptions would be different. No one set of assumptions is uniquely correct. Determining results using alternative assumptions is outside the scope of our engagement.

Milliman's work is prepared solely for the internal business use of SamCERA. To the extent that Milliman's work is not subject to disclosure under applicable public records laws, Milliman's work 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 retirement 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 Sponsor. We are not aware of any relationship that would impair the objectivity of our work.

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 would like to acknowledge the help in the preparation of the data for this investigation given by the SamCERA staff. We look forward to our discussions and the opportunity to respond to your questions and comments at your next meeting.

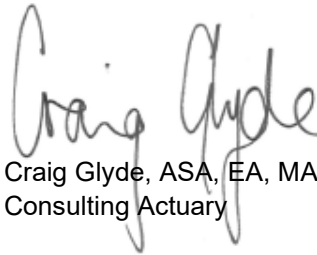
We are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely,



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NC/CG/va



Craig Glyde, ASA, EA, MAAA
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Table of Contents

1. Executive Summary	1
2. Economic Assumptions	11
3. Actuarial Methods and Miscellaneous Assumptions	22
4. Salary Increases Due to Promotion and Longevity (Merit)	26
Exhibit 4-1 Total Annual Rates of Increase in Salary for General Members Due to Merit and Longevity	27
Exhibit 4-2 Total Annual Rates of Increase in Salary for Safety/Probation Members Due to Merit and Longevity	27
5. Mortality	28
Exhibit 5-1 Mortality for Service Retirees General Males	32
Exhibit 5-2 Mortality for Service Retirees General Females	32
Exhibit 5-3 Mortality for Service Retirees Safety Males	33
Exhibit 5-4 Mortality for Disabled Retirees General Males	33
Exhibit 5-5 Mortality for Disabled Retirees General Females	34
Exhibit 5-6 Mortality for Disabled Retirees Safety Males	34
6. Service Retirements	35
Exhibit 6-1 Retirement Rates General Members (Plans 1, 2, and 4); Less than 20 Years of Service	37
Exhibit 6-2 Retirement Rates General Members (Plans 1, 2, and 4); 20 to 29 Years of Service	37
Exhibit 6-3 Retirement Rates General Members (Plans 1, 2, and 4); 30 or more Years of Service	38
Exhibit 6-4 Retirement Rates General Members (Plans 5, and 7); Less than 20 Years of Service	38
Exhibit 6-5 Retirement Rates Safety Members (Plans 1, 2, and 4); Less than 15 Years of Service	39
Exhibit 6-6 Retirement Rates Safety Members (Plans 1, 2, and 4); 15 to 19 Years of Service	39
Exhibit 6-7 Retirement Rates Safety Members (Plans 1, 2, and 4); 20 to 24 Years of Service	40
Exhibit 6-8 Retirement Rates Safety Members (Plans 1, 2, and 4); 25 or more Years of Service	40
7. Disability Retirement	41
8. Other Terminations of Employment	42
Exhibit 8-1 Termination by Years of Service* – General Members	44
Exhibit 8-2 Termination by Years of Service* – Safety Members	44
9. Probability of Refund Upon Vested Termination	45
Exhibit 9-1 Probability of Refund upon Vested Termination – General	46
Exhibit 9-2 Probability of Refund upon Vested Termination – Safety	46

Appendix A Actuarial Procedures and Assumptions	47
Table A-1 Summary of Valuation Assumptions as of June 30, 2023	55
Table A-2 Mortality for Members Retired for Service ⁽¹⁾	56
Table A-3 Mortality for Members Retired for Disability	57
Table A-4 Immediate Refund of Contributions upon Termination of Employment (Excludes Plan 3)	58
Table A-5 Annual Increase in Salary	59
Table A-6 Rate of Separation from Active Service (other than Service Retirement) General Plans– Male and Female	61
Table A-7 Rates of Service Retirement from Active Service General Plans – Male and Female	62
Table A-8 Rate of Separation from Active Service (other than Service Retirement) Safety and Probation – Male and Female.....	63
Table A-9 Rates of Service Retirement from Active Service Safety and Probation – Male and Female	64

1. Executive Summary

Overview

Any actuarial valuation is based on certain underlying assumptions. Determining the adequacy of the contribution rate is highly dependent on the assumptions that the actuary uses to project the future benefit payments and then to discount the value of future benefits to determine the present values. Thus, the assumptions are critical in assisting the system in adequately pre-funding for the benefits prior to retirement.

To assess the reasonableness of the assumptions used in the valuation, they should be studied regularly. This process is called an investigation of experience (or experience study).

The triennial study period of July 1, 2020 to April 30, 2023 overlapped with the COVID pandemic which likely influenced the results for that three-year period; however, for SamCERA there did not appear to be large differences from past results. As with past studies, we have considered both the current study and the results of prior studies in making our recommendations.

Summary of Results

This section describes the key findings of this investigation of experience of the San Mateo County Employees' Retirement Association (SamCERA) We are recommending several changes to the demographic assumptions. If adopted, these proposed changes (primarily the economic assumption changes) will result in an increase in the Statutory Contribution Rate (SCR), as discussed at the end of this section. The Board previously adopted the economic assumptions at the May 2023 Board of Retirement meeting.

The following table shows a summary of our recommendations for all assumptions and methods studied.

Assumption	Recommendation
National Price Inflation	No Change / Increase 0.25% to 2.50%
Local Price Inflation	No Change / Increase 0.25% to 2.75%
Investment Return	No Change
General Wage Growth	No Change / Increase 0.25% to 3.25%
Payroll Increase Assumption	No Change / Increase 0.25% to 3.25%
Retiree COLA Assumption	No Change / Increase 0.25% Plans 1 and 2
Acutarial Cost Method	No Change
Funding Method	15-Year Level % with Fresh Start and minimum rate
Merit Salary Scale	Decrease General rates; Increase Safety rates
Death while Active	Decrease base table rates 10%
Service Retirement	Overall increase in rates
Disability Retirement	Decrease General and Safety rates
Termination	No change
Probability of Refund	Decrease General and Safety rates
Mortality after Retirement	Decrease healthy base table rates 10%; no change to disability base table rates
Mortality Improvement Scale	Update to MP-2021
Probability of Eligible Survivor	No Change
Reciprocity	Increase probability of reciprocity for < 5 yrs of svc
Retirement for Deferreds	No Change

If adopted, the new assumptions would result in an increase in the statutory employer contribution rate and a decrease in the Funded Ratio calculated in the next valuation, as compared to the current assumptions. A further discussion is included in the Financial Impact section at the end of the Executive Summary.

Economic Assumptions

Section 2 discusses the economic assumptions: price inflation (both local and national), general wage growth (includes local price inflation and productivity), payroll growth, COLA increases and the investment return. As with all actuarial assumptions, there is not one right answer. We believe that the 6.25% investment return assumption adopted by the Board for the June 30, 2022 valuation remains appropriate for SamCERA. The assumption is somewhat less than the 30-year expected return of 6.6% (net of expenses) projected by Verus's capital market assumptions; however, we note that the increase in the expected return over last year is, at least in part, due to a significant rise in interest rates that may not be permanent.

The current national price inflation assumption of 2.25% (local price inflation assumption of 2.50%) is in the neighborhood of what most economists are forecasting for national CPI; however, both national and Bay Area price inflation have been significantly higher recently. Therefore, we have included an alternative scenario which reflects both local and national price inflation assumptions that are 0.25% higher. The general wage growth, payroll growth, and COLA assumptions are directly related to the local price inflation assumption, and the PEPRA compensation limit assumption is based on national price inflation assumption. Given this relationship, if the local and national price inflation assumptions are increased by 0.25%, these other assumptions should be increased a comparable amount.

The following table shows the economic assumptions: the current set of assumptions and an alternative based on a higher inflation assumption that was adopted by the Board last May.

Economic Assumptions	Current Assumptions	Alternative Assumptions ⁽³⁾
Investment Return ⁽¹⁾	6.25%	6.25%
GASB Discount Rate	6.42%	6.42%
National Price Inflation	2.25%	2.50%
Local Price Inflation	2.50%	2.75%
PEPRA Compensation Limit	2.25%	2.50%
General Wage Growth	3.00%	3.25%
Payroll Growth	3.00%	3.25%
COLAs for Retirees ⁽²⁾	2.50% / 2.40% / 1.90%	2.75% / 2.65% / 1.90%

1. Net of both investment and administrative expenses.
2. Plan 1 / Plan 2 / Plans 4-7. An adjustment is made for existing Plan 1 COLA accumulation balances in the valuation for current retirees and beneficiaries to reflect the COLA Accumulation Bank.
3. The Board adopted the alternative assumptions at its May 2023 meeting

A detailed analysis of the economic assumptions is provided in Section 2.

Actuarial Methods and Miscellaneous Assumptions

Section 3 discusses the actuarial methods and other miscellaneous assumptions used in the valuation and administration of the system.

We are recommending changes in this area as follows:

- A one-time adjustment (Fresh Start) to re-amortize the June 30, 2023 Unfunded Actuarial Accrued Liability (UAAL) over a 15-year period as a level percentage of payroll. Future amortization layers would continue to use a 15-year layered approach as a level percentage of payroll. We further recommend that the Statutory Contribution Rate be set equal to the employer normal cost rate plus the greater of 1) the UAAL rate under the 15-year layered amortization; and 2) the current UAAL contribution rate (the rate effective July 2023) before reflecting any Supplemental Contribution Accounts less any offsets from the Supplemental Contribution Accounts as of any future valuation date. This minimum contribution rate approach should create a smoother employer contribution rate pattern and result in higher future funding levels than under just the current method.
- A change to the member contribution rates should be made to reflect the new mortality, general wage growth and merit salary assumptions if they are adopted. The impact of this is discussed later in this section.
- A change to the factors used for determining optional benefits and service purchase costs, as well as the Plan 3 early retirement age factors, should be considered to reflect the new mortality assumptions if they are adopted.

Demographic Assumptions

Sections 4-9 discuss the demographic assumptions. Unlike the economic assumptions, which are more global in nature, the demographic assumptions are based heavily on recent SamCERA experience. Demographic assumptions are used to predict future member behavior (e.g., when will a member retire? How long will the member live?).

Based on the results of this study, we are recommending changes to several of the demographic assumptions. In cases where we have recommended changes, the changes for the most part only partially reflect recent experience due to the long-term nature of actuarial assumptions.

When reviewing the sections on demographic assumptions, please note the following:

- Our analysis uses the Actual-to-Expected (A/E) ratio to measure how well the current assumptions fit actual experience. For example, if the service retirement A/E is 80%, it indicates that there were 20% fewer service retirements than expected, and that we should consider decreasing the assumption. By decreasing the expected rates, this results in a higher ratio, in this case closer to 100%.
- In our analysis of the active demographic assumptions (merit salary, active member mortality, service retirement, disability, and termination), we weighted the results based on compensation. That is, a member with annual compensation of \$80,000 has twice the impact on the observed rates in comparison to a member with annual compensation of \$40,000. This is a valuable analysis tool since two members similar in all ways except for compensation level have different amounts of liability. The financial impact on the valuation is more dependent on the behavior of the member with the larger liability. Compensation is a useful proxy for liability. We observed some differences in member behavior based on compensation level. For example, members with higher levels of compensation tended to have higher probabilities of retiring at a given age.

- Similarly, we reflected the impact of benefit amounts on the retired mortality analysis. In general, we observed that retired members with higher benefits have longer life expectancies than members with smaller benefits.
- Due to scheduling considerations, the data provided to us by SamCERA for the current period was as of April 30, 2023. The use of an April 30 date (instead of June 30) was necessary to allow sufficient time to complete both the experience investigation and the valuation for inclusion in the Annual Comprehensive Financial Report (ACFR). Thus, the study period was two years and 10 months instead of the three years implied by the “triennial” description. We do not believe this two-month difference has a material impact on the results.
- When we refer to “Safety” members in this report, we are including both Safety and Probation members.
- For many of the assumptions, we show detailed graphs of our analysis showing the actual experience for the study (blue bar), the actual experience from the prior study (black bar), the current assumption (green line), and the new proposed assumptions (orange line).

The proposed rates are shown in detail in Appendix A.

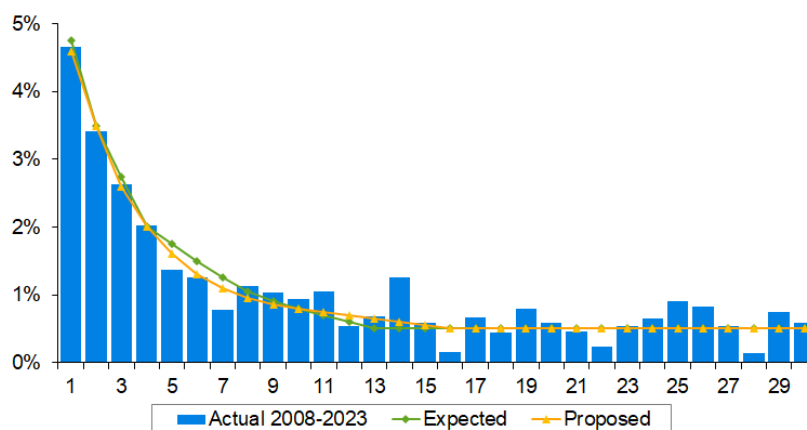
Individual Salary Increases due to Promotion and Longevity (Merit)

Section 4 discusses the individual salary increases due to promotion and longevity – the merit component of salaries. Overall, the results show increases close to what the current rates predicted for General members, and increases higher than predicted for Safety members.

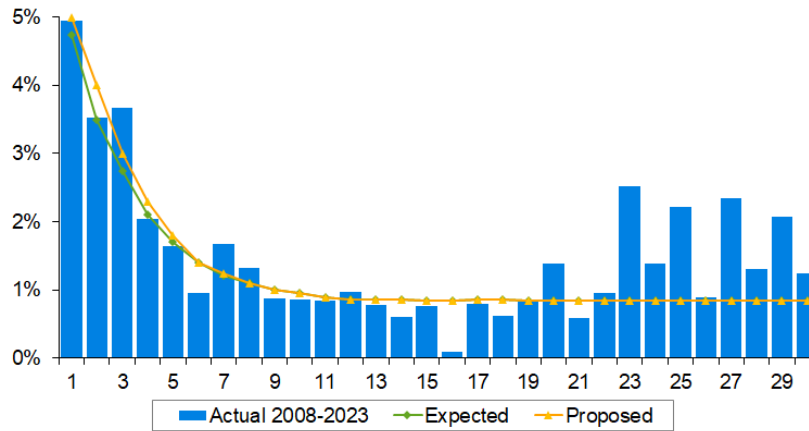
We considered longer term experience in our analysis of salary increases by reviewing experience over the period 2008-2023 in addition to the period 2020-2023. We believe that including a study of salary increases over a longer period than the three-year period of the study helps to smooth out short-term differences, provides additional context for salary increases over a period at least as long as a full economic cycle, and generally presents a more representative analysis of salary increase patterns.

We are recommending small changes to the merit salary assumption for both General and Safety members to better reflect the long-term experience.

Merit Salary Increases by Years of Service – General Members



Merit Salary Increases by Years of Service – Safety Members

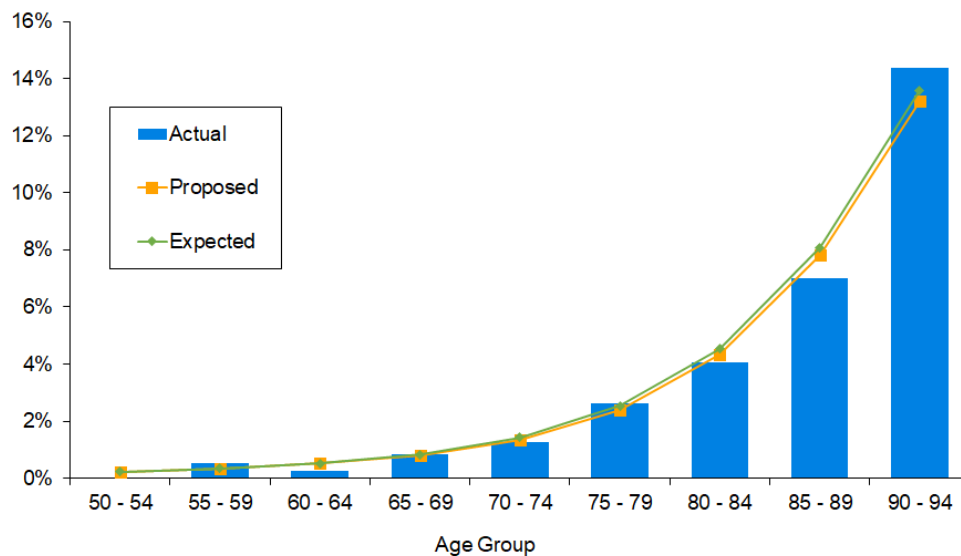


Additional details are included in Section 4.

Mortality

The mortality assumption is used to predict the life expectancy of both members currently in pay status and those expected to receive a benefit in the future. Our analysis focuses on a benefit-weighted approach (i.e., greater weight is given to retirees with larger benefits) as it is a better predictor of liabilities. The results of the study showed fewer deaths on a benefit-weighted basis for service retirees than predicted by the current assumption. The following shows a summary of the combined results for the last two study periods.

Service Retiree Mortality 2017 - 2023



Due to the recent mortality experience being lower than the current assumptions, we recommend a reduction in the service retiree mortality assumptions. In addition, we recommend updating the mortality projection scale, which projects future improvements in mortality (i.e., increases in life expectancies over time), to the most current

scale. We believe this is a reasonable estimate of future changes in mortality. Overall, the new mortality assumptions will result in a small increase in life expectancy compared to the prior assumption. Note that mortality experience for disabled retirees was close to the current assumption, so we are not recommending a change to the base mortality table for that group.

Additional details are provided in Section 5.

Service Retirement

Overall, the actual number of service retirements was higher than expected by the assumptions, particularly for Safety members. We have observed that rates of retirement typically differ based on years of service as well as age, so we studied the rates of retirement based on age and service. We found that, in general, members with more years of service have a greater probability of retiring at a given age than those with less years of service. The following table shows the results for all members eligible for service retirement.

	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
<i>By Headcount</i>					
General	481	432	436	111%	110%
Safety	115	88	97	130%	119%
Total	596	520	533	115%	112%
<i>Compensation Weighted</i>					
General	\$62,200,440	\$54,653,737	\$55,062,096	114%	113%
Safety	18,394,823	13,929,455	15,400,762	132%	119%
Total	80,595,263	68,583,192	70,462,859	118%	114%

We recommend revised service retirement rates for General and Safety members (shown in Appendix A). These revisions result in higher expected retirements overall for General and Safety Members, and the proposed retirement rates more closely follow the pattern of actual retirements.

Additionally, we recommend continuing the 100% probability of retirement at certain age and service combinations (shown in Appendix A) where the benefit is approximately 100% or more of final average compensation.

There were not enough Plan 3 service retirements to perform a statistically meaningful study. We believe the current assumptions are reasonable; therefore, we recommend no change to these rates.

Further analysis is shown in Section 6 of this report.

Disability Retirement

We have found that in many systems, including SamCERA, there is generally at least a six-month lag between the actual occurrence of a disability retirement and the subsequent approval and reporting of that same retirement. To account for this, we considered a study period of July 1, 2017 to April 30, 2023 and also included those retired members that have been reclassified from service to disability retirement over the period of the study and considered those in our recommendation.

Overall, the actual number of disability retirements from active service was lower than expected by the assumptions, both on a headcount and compensation-weighted basis.

Disability Retirements (2017-2023)					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
<u>By Headcount</u>					
General	54	61	43	89%	126%
Safety	26	24	24	108%	108%
Total	80	85	67	94%	119%
<u>Compensation Weighted</u>					
General	\$3,058,813	\$6,921,477	\$4,878,877	44%	63%
Safety	3,038,878	3,306,775	3,312,848	92%	92%
Total	3,058,813	6,921,477	4,878,877	44%	63%

Members may take a disability retirement on account of service connected, or non-service connected disability. We recommend changes to the rates of disability retirement for General and Safety members better reflect observed experience. For General members these changes lower rates of disability retirement at most ages for both service connected and non-service connected disabilities. For Safety members the changes lower rates of disability below age 50, and increase rates of disability between age 50 and age 60.

We recommend no change to the assumption for Safety members that 100% of disabilities are service connected.

Further analysis is shown in Section 7 of this report.

Termination

The actual number of terminations for both General and Safety members was higher than the assumptions predicted. The following table shows the results for the two groups.

Terminations of Employment					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
<i>By Headcount</i>					
General members	745	676	676	110%	110%
Safety members	79	45	45	176%	176%
Total	824	721	721	114%	114%
<i>Compensation Weighted</i>					
General members	\$77,414,286	\$71,004,027	\$71,004,027	109%	109%
Safety members	8,933,640	5,332,185	5,332,185	168%	168%
Total	86,347,927	76,336,212	76,336,212	113%	113%

Rates of termination during the pandemic-era were higher than in past years for most public employers. This was also true for SamCERA's employers, particularly among Safety members. Given this may only be a temporary fluctuation, we recommend no changes to the current assumed rates of termination for General and Safety members. However, if this pattern of higher rates of termination persists, we will likely recommend adjustments at the next experience study in 2026.

Further analysis is shown in Section 8 of this report.

Probability of Refund upon Vested Termination

The actual number of refunds for vested members at termination, shown in the following table, was lower than expected for General and Safety members, which is consistent with experience from prior studies.

Refunds of Contributions (weighted by Final Average Compensation) (members with 5 or more Years of Vesting Service)					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
General members	\$522,254	\$1,061,423	\$912,466	49%	57%
Safety members	85,115	138,662	126,123	61%	67%
Total	607,369	1,200,084	1,038,589	51%	58%

Based on the experience of this and prior studies we are recommending reductions to the probabilities at which members with at least five years of service at termination of employment withdraw their contributions from SamCERA.

We are also recommending a reduction to the probabilities at which members with less than five years of service at termination withdraw their contributions from SamCERA. We recommend that this probability be lowered from 100% to 80% for General members and from 100% to 60% for Safety members. These members that are assumed to leave their contributions on deposit will be assumed to be employed at a reciprocal agency.

Additional discussion of the reciprocity assumption is included in Section 3 of this report. Further analysis and discussion of the refund of contributions assumption is included in Section 9 of this report.

Financial Impact of the Recommended Assumptions

The following exhibit shows the estimated financial impact the proposed changes (including the economic assumption changes adopted by the Board at its May 2023 meeting) would have on SamCERA's funding. The proposed assumption changes would increase the expected statutory employer contribution rate and decrease the reported Funded Ratio of the system, primarily due to the economic changes.

The financial impact was evaluated by performing additional valuations with the June 30, 2022 valuation data and reflecting the proposed assumption and method changes. Note that the estimated 0.31% increase is a blended average of all plans. The Safety and Probation plans are expected to have greater increases than the General plans.

	Funded Ratio	Statutory Contribution Rate
June 30, 2022 Valuation	90.7%	26.19%
Economic Assumptions	-1.5%	1.74%
Retired Mortality Rates	-0.4%	0.46%
Active Demographics	-0.1%	0.16%
Funding Method Change	0.0%	-2.05%
Total Change	-2.0%	0.31%
June 30, 2022 Valuation with Changes	88.7%	26.50%

The actual financial impact of the proposed assumption changes will vary to some extent for the June 30, 2023 valuation due to year-to-year changes in the member population and investment experience. In particular, the impact of the proposed funding method change is expected to be significantly different (an increase instead of a decrease) if implemented for the June 30, 2023 valuation; however, the estimated Statutory Contribution Rate based on the June 30, 2023 valuation is still projected to be close to the 26.50% shown in the table, as the funding method change would offset the impact of the projected decrease due to the full amortization of the 2008 UAAL layer.

Impact of the Recommended Assumptions on Member Contribution Rates

If adopted, the recommended assumptions would result in an increase in the member contribution rates for all members except members of General Plan 7. The following table shows sample member rates (entry age 35 for General and 25 for Safety and Probation) based on the 2022 valuation, but using the recommended assumptions for 2023. The final member rates will be determined with the 2023 valuation.

Estimated Changes in Member Rates due to Proposed Assumption Changes (Based on June 30, 2022 Actuarial Valuation⁽¹⁾)					
	<u>Entry Age</u>	<u>Current</u>	<u>Proposed</u>	<u>Increase</u>	<u>Range of Changes for All Entry Ages</u>
General Members - County					
Plan 1	35	15.15%	15.56%	0.41%	0.16% to 0.58%
Plan 2	35	15.19%	16.02%	0.83%	0.69% to 0.91%
Plan 4	35	14.07%	14.42%	0.35%	0.11% to 0.49%
Plan 5	35	9.94%	9.92%	-0.02%	-0.04% to -0.01%
Plan 7	All	9.30%	9.27%	-0.03%	-0.03% to -0.03%
Probation Members					
Plan 1	25	19.89%	20.57%	0.68%	0.29% to 0.80%
Plan 2	25	19.95%	21.68%	1.73%	1.65% to 1.76%
Plan 4	25	18.01%	18.67%	0.66%	0.26% to 0.76%
Plan 5	25	17.59%	18.07%	0.48%	0.04% to 0.59%
Plan 6	25	13.45%	13.97%	0.52%	0.13% to 0.63%
Plan 7	All	15.78%	16.26%	0.48%	0.48% to 0.48%
Safety Members -- Other than Deputy Sheriffs					
Plan 1	25	20.83%	21.48%	0.65%	0.28% to 0.77%
Plan 2	25	21.38%	23.13%	1.75%	1.66% to 1.77%
Plan 4	25	19.60%	20.18%	0.58%	0.16% to 0.70%
Plan 5	25	18.32%	18.63%	0.31%	-0.18% to 0.45%
Plan 6	25	13.66%	14.19%	0.53%	0.13% to 0.64%
Plan 7	All	15.81%	16.32%	0.51%	0.51% to 0.51%

1. Estimates only. Final FYB 2024 member rates will be determined based on the June 30, 2023 valuation.

Note that the sample member contribution rates are total rates and include the COLA and Cost Share portions where applicable.

Proposed Assumptions and Methods

Appendix A illustrates the Summary of Actuarial Assumptions as it will appear in the June 30, 2023 valuation report if all recommended assumptions and methods are adopted.

2. Economic Assumptions

Actuarial Standard of Practice (ASOP) No. 27, Selection of Economic Assumptions for Measuring Pension Obligations, provides guidance to actuaries giving advice on selecting economic assumptions for measuring obligations under defined benefit plans. Because no one knows what the future holds, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes. These estimates are based on a mixture of past experience, future expectations, and professional judgment. The actuary should consider a number of factors, including the purpose and nature of the measurement, and appropriate recent and long-term historical economic data. However, the standard explicitly advises the actuary not to give undue weight to recent experience. To meet the standard, the assumption should reflect “the actuary’s estimate of future experience” and “it has no significant bias (i.e., it is not significantly optimistic or pessimistic).”

Each economic assumption should individually satisfy this standard. Furthermore, with respect to any particular valuation, each economic assumption should be consistent with every other economic assumption over the measurement period.

After completing the selection process, the actuary should review the set of economic assumptions for consistency. This may lead the actuary to recommend the same inflation component in each of the economic assumptions proposed.

This section will discuss the economic assumptions. We believe the current economic assumptions are reasonable and satisfy ASOP No. 27. We have not recommended any changes, although we have provided an alternative set that reflects the recent high level of price inflation. The following table shows these assumptions.

Economic Assumptions	Current Assumptions	Alternative Assumptions ⁽³⁾
Investment Return ⁽¹⁾	6.25%	6.25%
GASB Discount Rate	6.42%	6.42%
National Price Inflation	2.25%	2.50%
Local Price Inflation	2.50%	2.75%
PEPRA Compensation Limit	2.25%	2.50%
General Wage Growth	3.00%	3.25%
Payroll Growth	3.00%	3.25%
COLAs for Retirees ⁽²⁾	2.50% / 2.40% / 1.90%	2.75% / 2.65% / 1.90%

1 Net of both investment and administrative expenses.

2 Plan 1 / Plan 2 / Plans 4-7. An adjustment is made for existing Plan 1 COLA accumulation balances in the valuation for current retirees and beneficiaries.

3 The Board adopted the alternative assumptions at its May meeting

1. Price Inflation and COLA Assumptions

Use in the Valuation

When we refer to inflation in this report, we are generally referring to price inflation. The local price inflation and national price assumptions affect different aspects of the valuation. The local price inflation assumption is not directly used in the valuation; however, it is used in the development of the assumptions for general wage increases, payroll increases and retiree COLA increases, which directly impact the valuation results. Local price inflation is more specific to the Bay Area economy, as that economy will have a greater impact on SamCERA's wage growth, payroll growth, and retiree COLA increases than will national CPI.

National inflation is often referred to as CPI inflation, or inflation over the entire economy. The national price inflation assumption is used to set the assumption for future growth in the PEPRA compensation limit, as the limit is based on national CPI. The national price inflation assumption is also considered in the development of the assumption for future investment returns. The long-term relationship between CPI inflation and investment return has long been recognized by economists. The basic principle is that the investors demand a "real return" – the excess of actual investment returns over inflation. If inflation rates are expected to be high, investors will demand investment returns that are also expected to be high enough to exceed inflation, while lower inflation rates will result in lower expected investment returns, at least in the long run.

Historical Perspective

The data for inflation shown below is based on the national Consumer Price Index, US City Average, All Urban Consumers (CPI-U) as published by the Bureau of Labor Statistics.

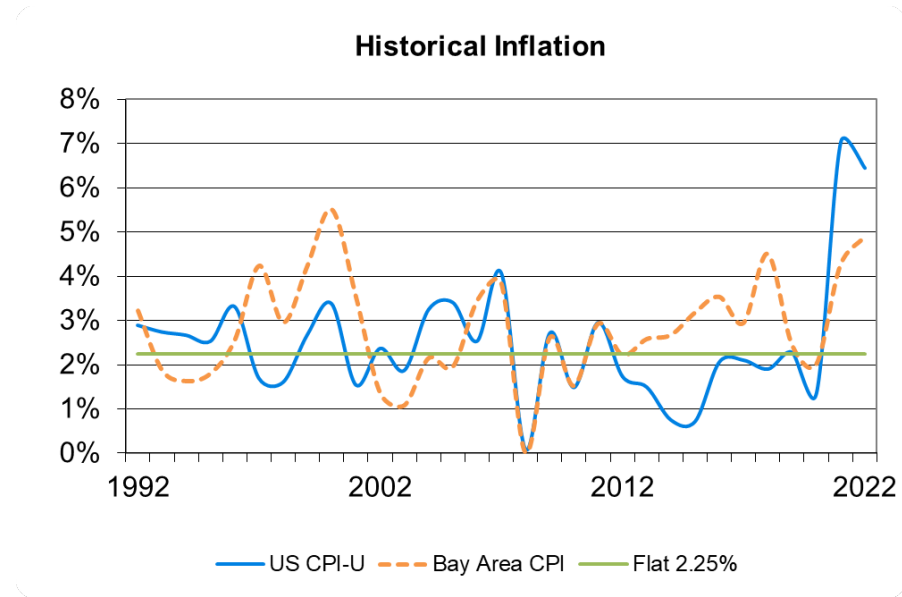
Although economic activities in general, and inflation in particular, do not lend themselves to prediction on the basis of historical analysis, historical patterns and long-term trends are a factor to be considered in developing the inflation assumption.

There are numerous ways to review historical data, with significantly differing results. The table below shows the compounded annual inflation rate for various 10-year periods, and for the 50-year period ended in December 2022. Note that the 50-year average is heavily influenced by the inflation of the late 1970s and early 1980s. The last 30 years have averaged closer to the current assumption, with a 30-year average of 2.5%.

Decade	CPI Increase
2013-2022	2.6%
2003-2012	2.4%
1993-2002	2.5%
1983-1992	3.8%
1973-1982	8.7%
Prior 50 Years	
1973-2022	4.0%

These are national statistics. The inflation assumption as it relates to the investment return assumption should be based more on national and even global inflation, whereas the inflation assumption used in the wage growth, payroll growth, and COLA increase assumptions is tied to inflation in the Bay Area. We believe that although there have been historical differences between U.S. and Bay Area CPI changes, in the long term there should be a high correlation. For comparison, the average CPI increase for the Bay Area has been about 0.32% higher than the national average for the 30-year period 1992-2022.

The following graph shows historical CPI increases since 1992. The national CPI increase has generally been less than the 2.25% national price inflation assumptions over the 10 years through 2020; however, for the last two years national CPI increases have significantly exceeded the assumption and appears on track to exceed the assumption again in 2023. Also shown for comparison are CPI increases specific to the Bay Area. These were tracking fairly closely to the national statistics, although over the last ten years, local CPI significantly exceeded the national CPI for eight years by over 1.0% on average but has been less the last two years.



Forecasts of Inflation

Since the U.S. Treasury started issuing inflation indexed bonds, it is possible to determine the approximate rate of inflation anticipated by the financial markets by comparing the yields on inflation indexed bonds with traditional fixed government bonds. Current market prices as of July 2023 suggest investors expect inflation to be about 2.3% over the next 30 years. Most forecasts of future price inflation by economists and investment professionals are 2.5% or less. Milliman investment consultants' long-term expectation for CPI inflation is currently about 2.4% for the next 30 years.

Additionally, we reviewed the expected increase in the CPI by the Office of the Chief Actuary for the Social Security Administration. In the 2022 Trustees Report, the projected average annual increase in the CPI over the next 75 years under the intermediate cost assumptions was 2.4%.

CPI Inflation / Price Inflation Recommendation

Based on Milliman investment experts' expectations of 2.4% and other forecasts, we believe a long-term CPI inflation assumption of between 2.0% and 2.75% is reasonable. Therefore, keeping the national price inflation at 2.25% is reasonable. However, given the current high inflationary environment, a higher assumption would also be reasonable. We have shown 2.5% as an alternative.

SamCERA's current assumption is that local inflation is 0.25% higher than national price inflation based on historical differences.

At the May 2023 meeting, the Board adopted the alternative assumption of 2.50% national price inflation and 2.75% local price inflation.

Postretirement Cost-of-Living Adjustments (COLA)

The current assumption is that retiree COLAs for Plan 1 will be equal to the local price inflation assumption. We recommend continuing this practice. In reality, some years, price inflation will be higher than the assumption and some years it will be lower. Over the long term, if local price inflation increases on average 2.75%, Plan 1 COLAs should average close to 2.75%, since the maximum COLA is much higher at 5% (3% for Probation) and there is a COLA bank.

For the other contributory plans, the maximum COLA is lower (3% for Plan 2 and 2% for the other plans) and there is no COLA bank. Since when Bay Area CPI increases are higher than 2% (or 3% for Plan 2) the COLA will be limited, but when they are lower, COLAs will reflect that (except in rare cases), we expect the actual COLAs granted will be less than the average local price inflation assumption (or the maximum COLA in the case of Plans 4-7). Our current assumption for the Plan 2 COLA is that it will be 0.1% less than the local price inflation assumption, and the COLAs for Plans 4-7 will be 0.1% less than the maximum COLA amount. We feel this continues to be a reasonable assumption for Plans 2 and 4-7. For Plan 2, our modelling shows the 3% cap restricts the impact of the increased inflation assumption on the COLA, so we are recommending Plan 2 COLA assumption be set 0.15% less than the local price inflation assumption. Similarly, for Plans 4-7, we are recommending the COLA assumption be set 0.10% less than the maximum 2.0% amount.

Our analysis shows that when reflecting future variability in price inflation, the COLAs granted for Plans 2-7 are projected to be fractionally less than the current assumption on average, so the current assumption reflects a small level of conservatism. For purposes of this analysis, we assumed that the future local price inflation averages 2.75%. We also assumed there is variability in price inflation with a 1.0% standard deviation, and that each future year is correlated to the prior year with a 50% reversion to the current assumption.

General Plan 3 does not have a COLA. Therefore, the assumed COLA is 0.0%.

COLA Recommendation

We recommend the current COLA assumptions be retained if the price inflation assumption is not changed and that the alternative assumptions be adopted if a 2.50% national price inflation assumption is adopted.

Plan	Annual Cost of Living Adjustment	
	Current	Alternative
Plan 1	2.50%	2.75%
Plan 2	2.40%	2.60%
Plan 3	0.00%	0.00%
Plans 4, 5, 6, and 7	1.90%	1.90%

2. Wage, Payroll and PEPR Compensation Limit Growth

Use in the Valuation

Estimates of future salaries are based on two types of assumptions: 1) general wage increase and 2) merit increase. Rates of increase in the general wage level of the membership are directly related to inflation, while individual salary increases due to promotion and longevity generally occur even in the absence of inflation. The promotion and longevity assumptions, referred to as the merit scale, will be reviewed with the other demographic assumptions (see Section 4).

The current assumption is for wage growth of 0.50% above the local price inflation assumption.

Historical Perspective

We have used statistics from the Social Security Administration on the National Average Wage back to 1972.

There are numerous ways to review this data. For consistency with our observations of other indices, the table below shows the compounded annual rates of wage growth for various 10-year periods and for the 50-year period ending in 2022. The excess of wage growth over price inflation represents “productivity” (or the increase in the standard of living, also called the real wage inflation rate).

Decade	Wage Growth	CPI Increase	Real Wage Inflation
2013-2022	3.9%	2.6%	1.3%
2003-2012	2.9%	2.4%	0.5%
1993-2002	3.8%	2.5%	1.3%
1983-1992	4.7%	3.8%	0.9%
1973-1982	7.4%	8.7%	-1.3%
Prior 50 Years			
1973--2022	4.5%	4.0%	0.5%

Forecasts of Future Wages

Wage inflation has been projected by the Office of the Chief Actuary of the Social Security Administration. In the 2023 Trustees Report, the ultimate long-term annual increase in the National Average Wage is estimated to be 1.1% higher than the Social Security intermediate inflation assumption of 2.4% per year.

Recommendation

Over the last 50 years, the actual experience, on a national basis, has been close to the current assumption. We believe that wages will continue to grow at a greater rate than prices over the long term, although not to the extent projected by Social Security. We are recommending that the long-term assumed real wage inflation rate remain at 0.50% per year.

Real Wage Inflation Rate	
Current assumption	0.50%
Recommended Assumption	0.50%

The wage growth assumption is the total of the consumer price inflation assumption and the real wage inflation rate. If the real wage inflation assumption remains 0.50% and the local price inflation remains 2.50%, this would

result in a total wage growth assumption of 3.00%. Under the alternative inflation assumption of 2.75%, this would result in a total wage growth assumption of 3.25%.

Payroll Increase Assumption

In addition to setting salary assumptions for individual members, the aggregate payroll of SamCERA is expected to increase, without accounting for the possibility of an increase in membership. See comments on growth in membership discussed below.

The current payroll increase assumption is equal to the general wage growth assumption. It is our general recommendation to set these two assumptions to be equal unless there is a specific circumstance that would call for an alternative assumption. We are recommending that the payroll increase assumption continue to be equal to the wage growth assumption (3.00% current assumption or 3.25% alternative assumption) for the next valuation. This assumption affects the Unfunded Actuarial Accrued Liability (UAAL) amortization payment rate.

It should be noted that employees first hired in 2013 or later (PEPRA members) are subject to a lower pensionable compensation limit than those hired prior to 2013 (Legacy members). If the PEPRA compensation limit grows at a slower rate than the general wage growth, this would likely cause future payroll increases to grow at a rate less than the general wage growth. The current assumption is that CPI-U, which increases in the PEPRA compensation limit are based upon, will increase at a slower rate than the general wage growth, so the impact on future payroll growth should be monitored going forward.

Growth in Membership

We propose continuing the assumption that no future growth in membership will occur. This assumption affects the UAAL amortization payment rate. With no assumed growth in membership, future payroll is assumed to grow due to wage growth increases. If increases should occur because of additional members, there will be a larger pool of salaries over which to spread the UAAL, if any, resulting in a reduction in the Statutory Contribution Rate. Note that the opposite occurs in the event of a shrinking workforce.

Growth in PEPRA Compensation Limit

Future adjustments to the pensionable compensation limit under PEPRA are based on the annual changes to the Consumer Price Index for All Urban Consumers: U.S. City Average. The current assumption is that the PEPRA compensation limit will increase at the same rate as the national price inflation assumption. We recommend that this assumption be retained (2.25% under current assumptions and 2.50% under alternate assumptions).

3. Investment Return

Use in the Valuation

The investment return assumption is one of the primary determinants in the calculation of the projected contributions needed to pay for SamCERA's benefits, providing a discount of the future benefit payments that reflects the time value of money. This assumption has a direct impact on the calculation of liabilities, normal costs, member contribution rates, and the factors for optional forms of benefits. The current investment return assumption for SamCERA is 6.25% per year, net of all administrative and investment-related expenses.

Expected Long-Term Investment Return

Verus calculated the 30-year investment return based on their December 31, 2022 assumptions for capital markets and SamCERA's current target asset allocation as 6.8%. As discussed later in this section, administrative expenses and fixed investment expenses are assumed to be approximately 0.2% and netted out of this expected return to get the number that is comparable to the investment return assumption. The expected return is the median return on a geometric basis for SamCERA's assets. That is, there is estimated to be a 50% probability the return (after adjustment for expenses) will exceed 6.6% and a 50% probability the return will be less than 6.6%.

We independently calculated the expected return using Milliman's capital market assumptions and SamCERA's target asset allocation using a 20-year time horizon. The 20-year period reflects the time horizon over which the majority of the benefits associated with the current actuarial accrued liability are expected to be paid. Our calculated expected return was close to that calculated by Verus as shown below. Of particular note, the expected returns are significantly higher than the values calculated in 2022 due primarily to rising interest rates (and bond yields), and P/E equity ratios declining from their historic highs towards historical averages.

Expected Return Based on 2023 Capital Market Assump.	2022 Expected Return ¹	2023 Expected Return ¹	Change
Verus (30-Year Horizon)			
Median Annualized Return	5.6%	6.6%	1.0%
Assumed Inflation	2.3%	2.1%	-0.2%
Milliman (20-Year Horizon)			
Median Annualized Return	5.9%	6.7%	0.8%
Assumed Inflation	2.4%	2.4%	0.0%

1. Returns are net of assumed expenses of 0.2% of assets. Capital market assumptions are as of the start of each year.

We have shown Milliman's expected net return based on a 20-year time horizon as we believe this reflects the duration of SamCERA's liabilities. For comparison, Milliman's 30-year net expected return is 0.2% higher at 6.9%.

We did the analysis using the average of capital market assumptions of other investment consulting firms based on the Horizon Survey of Capital Market Assumptions, 2022 edition. Based on this analysis, which reflects 20-year to 30-year time horizons, the expected return (net of expected expenses) is approximately 6.3%. It should be noted that the Horizon Survey was completed in 2022, and there have been significant changes in the economic environment since then. If the Horizon Survey reflected 2023 capital market assumptions, we would expect that the expected return would be higher.

Administrative and Investment-Related Expenses

The investment return used for the valuation is assumed to be net of all administrative and investment-related expenses. The following table shows the ratio of administrative expenses to the SamCERA Plan assets over the last 10 fiscal years beginning July 1. The expense ratio is calculated as the expense amount divided by the ending asset balance at fair market value.

Fiscal Year Beginning	Beginning Market Assets	Administrative Expenses		
		Admin. Amount	Tech. Amount	Total Ratio
2012	\$2,360	\$4.3	\$0.7	0.21%
2013	2,728	4.9	0.7	0.21
2014	3,292	5.4	0.6	0.18
2015	3,454	6.0	0.7	0.19
2016	3,541	6.0	1.0	0.20
2017	4,039	5.8	1.4	0.18
2018	4,374	6.1	2.5	0.20
2019	4,723	6.4	2.0	0.18
2020	4,781	7.1	1.4	0.18
2021	5,982	7.2	1.6	0.15

Note that for purposes of this calculation we have included both regular administrative expenses and technology-related expenses.

For the administrative expenses, we are recommending retaining the current assumption of 0.17% of market assets. The actual ratio for administrative expenses has been close to 0.17% over the last five years.

Investment expenses have been slightly less than 1% of the market value of assets on average over the last few years. However, for purposes of our analysis of the investment return assumption, we have only accounted for passive management fees and other fixed investment expenses. The reasoning for this is that for asset classes where passive management is available, SamCERA would not use active management unless there was an expectation that the returns net of fees would be at least as great as the net return using passive management. For asset classes where passive management is not available, our understanding is that Verus' capital market assumptions are net of investment expenses. This is consistent with Milliman's approach.

In addition to accounting for passive management fees, we adjust for other expected investment-related expenses, such as outside investment consultants and the fund's master custodian. We have assumed these fixed investment expenses to be approximately 0.05% of assets.

The expense assumption does not have a direct impact on the actuarial valuation results under the current methods, but it does provide a measure of gross return on investments that will be needed to meet the actuarial assumption used for the valuation.

Additionally, we recommend the 0.17% adjustment for administrative expenses be added to the investment return assumption adopted to determine the discount rate used in SamCERA's GASB 67 and 68 valuations, as GASB requires the discount rate to be the long-term expected rate of return gross of administrative expenses.

Explicit Recognition of Administrative Expenses

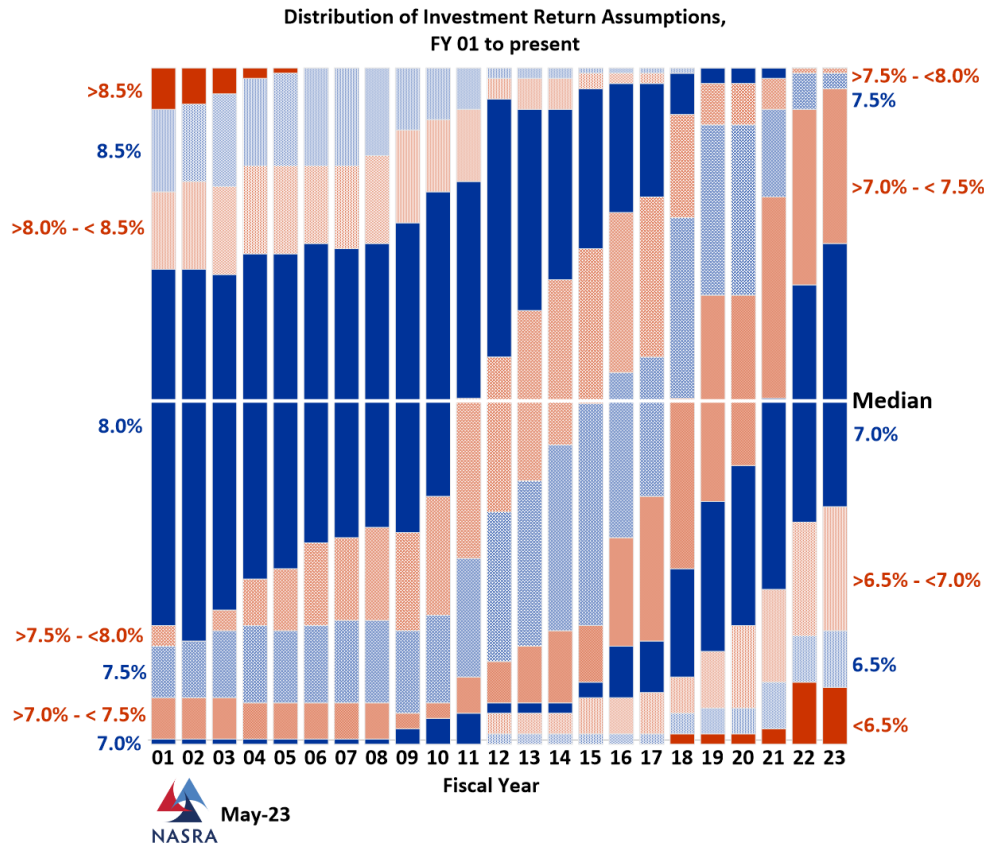
The investment return assumption used for the valuation is assumed to be net of all administrative and investment related expenses. By deducting both of these categories of expenses, the investment return assumption is less than if just the investment related expenses were deducted, resulting in higher employer and member contribution rates. A portion of these higher contribution rates is assumed to pay for administrative expenses. Consequently, the administrative expense is “implicitly” included in the rates.

About half of the '37 Act systems only deduct the investment related expenses from the investment return assumption, which does not decrease the investment return assumption as much and, correspondingly, does not increase the contribution rates as much. For these systems, however, the administrative costs are separately accounted for and then “explicitly” included in the contribution rates, which, in turn, increases the rates. For the systems that explicitly include the administrative expenses in the contribution rates, the costs can be applied to either the member or the employer or shared between the two. A sharing of these costs would be required for the PEPRA Plan 7 members if the administrative expenses are assumed to be part of the normal cost rate.

Switching from the “implicit” to “explicit” method would in essence redistribute the payment of the administrative costs among the different employers and different plan members. Either method is acceptable. Given that SamCERA currently uses the implicit method and there would be some administrative issues in changing, we are recommending continuing with the current method of implicitly recognizing administrative expenses for the 2023 valuation.

Peer System Comparison

According to the Public Fund Survey, the average investment return assumption for statewide systems has been steadily declining. As of the most recent study, the median rate is 7.00%. The following graph shows a progression of the distribution of the investment return assumptions. In 2001, very few systems had an assumption of 7.5% or lower and over 80% had an assumption of 8.0% or greater. This has continued to trend down, and as of May 2023 over 50% have an assumption of 7.00% or less.



Crediting of Reserves

Section 31592.2 of the 1937 Act provides the Retirement Board with the authority to set aside surplus earnings of the retirement fund that are in excess of the total interest credited to reserves, provided this surplus exceeds 1.00% of the total assets of the retirement system. Historically, some '37 Act systems have used these surplus earnings to increase benefits as allowed under the law. This creates a drag on the investment return, if not all earnings are used to pay for the current benefits. If this is the case, the actuary may recommend reducing the investment return assumption to account for this impact.

SamCERA's current interest crediting policy requires that any available earnings first go to crediting the basic reserves. Any remaining available earnings are then used to fill up the contingency reserve up to 3% of assets. All remaining available earnings or losses are then credited to the Undistributed Earnings/Losses Reserve. Since there is no provision for spending investment earnings on anything but the current benefits, no adjustment in the investment return assumption is needed.

Variability of Future Returns

Our focus in this analysis has been on the median expected future return. The median return indicates there is a 50% probability, based on the capital market assumptions, that the actual return will meet or exceed this amount. For comparison, the following are the probabilities based on Milliman’s capital market assumptions that the actual return, net of all expenses, will exceed the following thresholds over a 20-year time period.

20-Year Average Return	Probability of Achieving
8.00%	31%
7.00%	46%
6.25%	58%
6.00%	62%
5.00%	76%

Note: Average return is net of assumed administrative and investment expenses.

Note that the above analysis reflects a median 6.7% expected return, which is based on the expected return for SamCERA’s portfolio of 6.9% using Milliman’s capital market assumptions, reduced by 0.2% for expenses. For purposes of the analysis, we have used a 11.2% standard deviation.

Recommendation

Based on Verus’ long-term (30-year) capital market assumptions and Milliman’s capital market assumptions (both 20-year and 30-year), we find there is greater than a 50% probability that the current investment return of 6.25% (net of all expenses) will be met. This compares with 2022 expected returns that were at or less than the 6.25%. We believe that the increase in expected returns is at least in part due to short-term fluctuations in interest rates. Therefore, we are recommending SamCERA retain the current 6.25% assumption and continue to monitor this assumption annually.

	Investment Return
Current assumption	6.25%
Recommendation	6.25%

3. Actuarial Methods and Miscellaneous Assumptions

As part of the triennial investigation, we have reviewed the actuarial methods and other issues related to the actuarial assumptions.

- **Cost Method:** The actuarial valuation is prepared using the entry age actuarial cost method (CERL 31453.5). We believe that this cost method is appropriate for SamCERA's valuation. It is also the cost method that is required for GASB Statements 67 and 68. We recommend no change. Note that this is the most common method used for public sector retirement systems, as it results in more stability in normal cost rates and provides a level allocation of costs over each individual's working lifetime.
- **Funding Method (amortization of UAAL):** The current method uses a 15-year closed period layered approach (a shorter period should be considered for liability changes due to benefit increases if they were to occur in the future). This method is consistent with guidelines published by the California Actuarial Advisory Panel (CAAP) and the Conference of Consulting Actuaries (CCA). As we have previously discussed with the Board, as layers become fully amortized, it can create year-to-year swings in the Statutory Contribution Rate. We recommend that the UAAL as of June 30, 2023 be re-amortized over a 15-year period and the existing layers be eliminated (fresh-start method). To strengthen SamCERA's future funding levels and provide more employer contribution rate stability, we further recommend that the Statutory Contribution Rate be set equal to the employer normal cost rate plus the greater of 1) the UAAL rate under the 15-year layered amortization with fresh-start in 2023; and 2) the current UAAL contribution rate (the rate effective July 2023) before reflecting any Supplemental Contribution Accounts less any offsets from the Supplemental Contribution Accounts as of any future valuation date. The minimum rate would need to be reviewed if SamCERA reaches a 100% Funded Ratio in the future. We have one additional technical recommendation that any new 15-year amortization period begin at the date the contribution for the UAAL layer begins, as opposed to the current method of starting at that valuation date.
- **Valuation of Assets:** We believe that the current asset valuation method which includes an 80% to 120% corridor around the market value of assets and smooths gains and losses over five years (actually 10 six-month periods) after offsetting current period gains or losses against prior period gains or losses is appropriate for SamCERA's valuation. A five-year smoothing period is used by a majority of large public retirement systems. This method is consistent with guidelines published by CAAP and CCA. We recommend no change.
- **Adjustment to Plan 3 Normal Cost Rate:** The current method increases the Plan 3 Normal Cost rate to account for Plan 3 members being eligible to transfer to Plans 2, 4 or 5 (depending on entry date) after five years of service. Under this method, the Plan 3 Normal Cost rate is 50% of the unadjusted Plan 3 Normal Cost rate and 50% of the Plan 4 Normal Cost rate. We believe this method continues to be appropriate and recommend no change.
- **Plan 3 Retirement Age Factors:** Plan 3 retirement age factors are intended to provide an early retirement benefit that is the actuarial equivalent of an age 65 benefit. Specifically, CERL 31497.3(f) states: "The ERA (early retirement age) factors set forth in this subdivision shall be used until adjusted by the board in accordance with the interest and mortality tables adopted by the board." If new mortality assumptions are adopted, we recommend the Board consider adopting new ERA factors to reflect the new assumptions. The expected impact would be a small change in the ERA factors.

Analysis by Compensation / Benefit Level

In our analysis of the active demographic assumptions (merit salary, service retirement, disability, and termination), we reflected the impact of compensation levels by weighting the observations by compensation. That is, a member with annual compensation of \$80,000 has twice the impact on the observed rates in

comparison to a member with annual compensation of \$40,000. We observed that member behavior was correlated with compensation level. For example, members with higher levels of compensation tended to have higher probabilities of retiring at a given age. These compensation-weighted probabilities are shown as the "Actual" bars in the graphs in Section 4 through Section 9.

Similarly, we reflected the impact of benefit amounts on the retired mortality analysis. In general, we observed that retired members with higher benefits have longer life expectancy than members with smaller benefits.

Miscellaneous Assumptions

- **Reciprocity:** Members who terminate may go to work for a reciprocal employer. This can result in an increase in the member's final average compensation used in the calculation of their SamCERA benefit. We currently assume that 30% of future General terminated vested members and 40% of future Safety terminated vested members retire with a reciprocal employer. A terminated vested member is generally one that has separated from service after earning at least five years of vesting service. We have observed that former members that separated from service with less than five years of service also have a significant probability of going to work for a reciprocal employer and earning additional vesting service towards their eligibility for a SamCERA retirement benefit in addition to increases in final average compensation. As a result, we are proposing a change to the assumption at this time to include the likelihood of reciprocity for non-vested former members. The results of the study are included in the following table.

Probability of Reciprocal Employer (former members - separated since June 30, 2017)						
Class	Years of Vesting Service at Separation	All former members	Former members with Reciprocity	Actual	Expected	Proposed ¹
General	5+ years	455	143	31%	30%	30%
Safety	5+ years	44	17	39%	40%	40%
General	<5 years	777	174	22%	0%	20%
Safety	<5 years	63	25	40%	0%	40%

In applying this assumption for former members separated with less than five years of service, we will lower the probability of refund of contributions assumptions upon termination to 80% (General) and 60% (Safety) and assume 100% of those former members have reciprocity.

We studied this experience over the period July 1, 2017 to April 30, 2023 to account for any lag in a former member's reciprocity being provided.

- **Probability of Eligible Survivor:** Eligible surviving beneficiaries (spouses or qualified domestic partners of members) generally receive a 60% continuance of the member's benefit (100% continuance for service-connected disabilities and 50% for Plan 3 members). The valuation assumes a certain percentage of members will have an eligible survivor at retirement. We studied this assumption and found the results to be consistent with the current assumptions, so we recommend no change to the assumption. The results of the study are included in the following table.

Retirees with Eligible Survivor			
Gender	Actual	Expected	Proposed
Male	74%	75%	75%
Female	55%	55%	55%

- Survivor age difference:** The current assumption is that survivors are three years younger than male members and two years older than female members. We studied the beneficiary age difference compared to the member age based on retirements during the study period where the unmodified 60% continuance was elected and found the results to be consistent with the assumptions. Based on this analysis, we recommend no change to the assumption. The results of the study are included in the following table.

Member's Age at Retirement (as Compared to Spouse)			
Gender*	Actual	Expected	Proposed
Male	2.9	3.0	3.0
Female	-2.1	-2.0	-2.0

* Member

- Assumed Commencement Age for Deferred Members:** We studied the actual retirement ages of members who previously terminated and chose to defer their retirement. The results of the study and our proposed assumptions are shown in the following table. We are recommending no changes in the assumed retirement ages. Note that experience has shown higher retirement ages than assumed for General members Plans 1, 2, 4, and 5, but this is not fully an apples-to-apples comparison, because a number of current vested terminations are over age 58 at termination. These members are more likely to retire shortly thereafter and bring up the average deferred retirement age. For Safety, we assume age 50, since for all Plans 1, 2, and 4 members this is the most valuable age.

Plan	Deferred Retirements		Assumed Retirement Age	
	Count	Average Age	Current	Proposed
G1, G2, G4, G5	123	59.3	58	58
G3	2	65.1	65	65
G7	3	61.6	62	62
Safety / Probation	17	52.6	50	50

Note that in other situations we have observed that members with reciprocity may tend to retire later than members without reciprocity since their retirement benefit is still growing. At the current time, the available information regarding former members of SamCERA with reciprocity is inconclusive whether that is also the case for those members. Therefore, we do not currently have make a separate recommendation for those former members of SamCERA. However, we will continue to observe this data in future studies.

- Sick Leave Service Credit:** Some county retirement systems allow the conversion of unused sick leave to retirement service credit at retirement. In those cases, an assumption for an increase in service credit at retirement due to sick leave service credit may be appropriate. San Mateo County employees may convert unused sick leave to contributions for purchasing health benefits but cannot convert to retirement service credit, and therefore there is no impact on the retirement service credit. Accordingly, we recommend continuing with the current assumption of no sick leave service being converted to retirement service.

Non-Valuation Methods

- **Operating Tables:** We recommend the operating tables be updated to reflect the new mortality assumptions.
- **Member Contribution Rates:** The proposed changes to the mortality and merit salary scale will impact the basic member contribution rates. New member rates will need to be calculated during the June 30, 2023 actuarial valuation. Additionally, the Cost-of-Living portion of the member rates will be updated at that time. A sample of the estimated impact to member rates due to these proposed changes is shown in the table below.

Estimated Changes in Member Rates due to Proposed Assumption Changes (Based on June 30, 2022 Actuarial Valuation ⁽¹⁾)					
	Entry Age	Current	Proposed	Increase	Range of Changes for All Entry Ages
General Members - County					
Plan 1	35	15.15%	15.56%	0.41%	0.16% to 0.58%
Plan 2	35	15.19%	16.02%	0.83%	0.69% to 0.91%
Plan 4	35	14.07%	14.42%	0.35%	0.11% to 0.49%
Plan 5	35	9.94%	9.92%	-0.02%	-0.04% to -0.01%
Plan 7	All	9.30%	9.27%	-0.03%	-0.03% to -0.03%
Probation Members					
Plan 1	25	19.89%	20.57%	0.68%	0.29% to 0.80%
Plan 2	25	19.95%	21.68%	1.73%	1.65% to 1.76%
Plan 4	25	18.01%	18.67%	0.66%	0.26% to 0.76%
Plan 5	25	17.59%	18.07%	0.48%	0.04% to 0.59%
Plan 6	25	13.45%	13.97%	0.52%	0.13% to 0.63%
Plan 7	All	15.78%	16.26%	0.48%	0.48% to 0.48%
Safety Members -- Other than Deputy Sheriffs					
Plan 1	25	20.83%	21.48%	0.65%	0.28% to 0.77%
Plan 2	25	21.38%	23.13%	1.75%	1.66% to 1.77%
Plan 4	25	19.60%	20.18%	0.58%	0.16% to 0.70%
Plan 5	25	18.32%	18.63%	0.31%	-0.18% to 0.45%
Plan 6	25	13.66%	14.19%	0.53%	0.13% to 0.64%
Plan 7	All	15.81%	16.32%	0.51%	0.51% to 0.51%

1. Estimates only. Final FYB 2024 member rates will be determined based on the June 30, 2023 valuation.

Note that the sample member contribution rates are total rates and include the COLA and Cost Share portions where applicable.

For purposes of calculating the member contribution rates we recommend the valuation mortality tables use a static projection to 2044 for the calculation of member rates to reflect future mortality improvement. The year 2044 was selected because it represents the discounted weighted average of when all future payments are projected to be made to the active members whose contribution rates vary by entry age.

We are recommending no change to the male/female blend for either General (33%/67%) or Safety/Probation (75%/25%) based on the make-up of the active population.

- **Implementation:** For the Plan 3 ERA factors, the operating tables and the member contribution rates, we recommend the implementation date be July 1, 2024.

4. Salary Increases Due to Promotion and Longevity (Merit)

Results

Estimates of future salaries are based on assumptions for two types of increases:

1. Increases in each individual's salary due to promotion or longevity, which occur even in the absence of inflation (merit increases); and
2. Increases in the general wage level of the membership, which are directly related to inflation and increases in productivity.

In Section 2, we discuss the second of these rates, the general wage inflation, which is 3.00% under the current assumptions and 3.25% under the alternative assumptions.

We study the merit patterns of General and Safety members separately, as we have seen differences between the two groups in previous Investigations of Experience, and this is also consistent with the patterns we generally see in other systems. The results are shown in Exhibit 4-1 (General members) and Exhibit 4-2 (Safety members).

Exhibit 4-1 and Exhibit 4-2 shows the actual merit increases, over the period July 1, 2017-April 30, 2023 and also for the period July 1, 2008-April 30, 2023. We believe that including a study of salary increases over a longer period than the three-year period of the study helps to smooth out short-term differences, provides additional context for salary increases over a period at least as long as a full economic cycle, and generally presents a more representative analysis of salary increase patterns. Comparing the long-term pattern with the results of the three-year study helps to identify any changes in trend.

Increases were generally higher earlier in a member's career (lower service) and then decreased over time, consistent with the current assumptions.

In forming our recommendations, we also considered the wage increases that have been negotiated by the County with different bargaining groups but are not effective until after the next valuation date (June 30, 2023). Since the negotiated increases did not significantly differ from the current assumptions, we are not recommending any additional adjustments to the merit salary assumption or the general wage growth assumption because of the bargained increases.

Recommendation

Based on the results of this analysis we are recommending the following:

- Changes in the merit component of the salary increase assumption for General members to reduce the amount of assumed increases early in a member's career (years less than 10), and to raise the amount of assumed increases in years 11 through 15.
- Changes in the merit component of the salary increase assumption for Safety members to raise the amount of assumed increased early in a member's career (through year 7).

Additionally, for SamCERA members currently working for a reciprocal employer (or assumed to in the future), we recommend using a 3.77% annual increase for General members and a 4.13% annual increase for Safety members based on the 2.75% local price inflation adopted by the Board. These assumptions are equal to the wage growth assumption plus the ultimate assumed merit increase for the respective class.

Exhibit 4-1
Total Annual Rates of Increase in Salary for General Members
Due to Merit and Longevity

(Excluding the General Wage Growth Assumption)

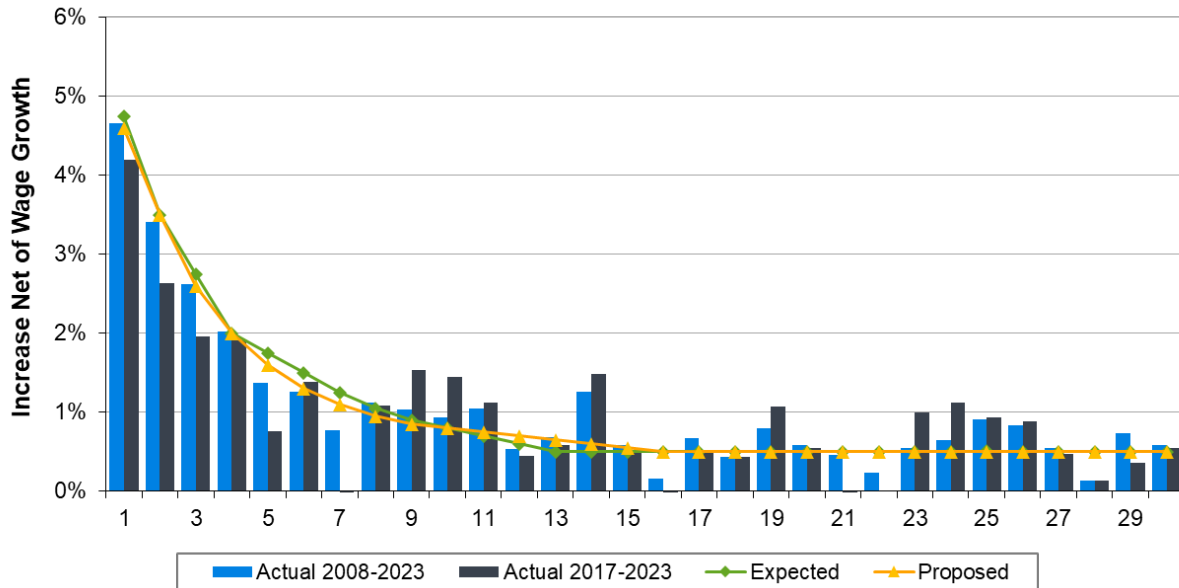
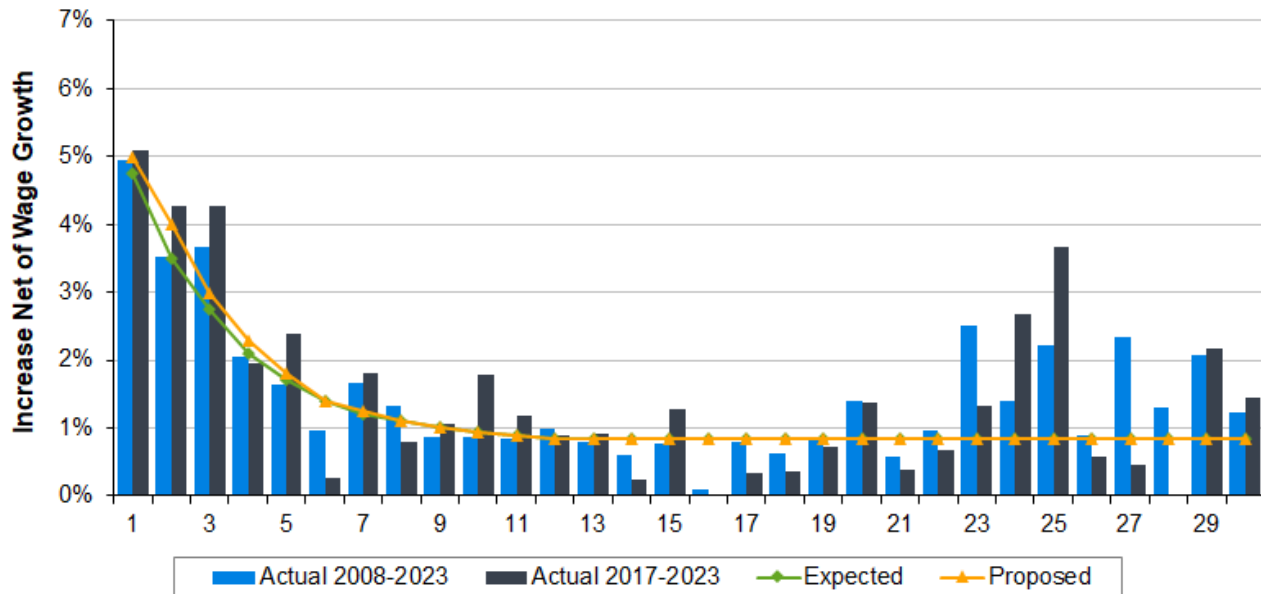


Exhibit 4-2
Total Annual Rates of Increase in Salary for Safety/Probation Members
Due to Merit and Longevity

(Excluding the General Wage Growth Assumption)



5. Mortality

In this section we look at the results of the study of actual and expected death rates of retired members. We studied rates of mortality among healthy and disabled retired members.

Although there has been a recent deviation due to the pandemic, mortality has been improving in the U.S. and is expected to continue to improve. As such, we recommend continued use of generational mortality tables (see later discussion) to account for projected future improvements in mortality. Generational mortality is reflected by including a mortality improvement scale that projects small annual decreases in mortality rates. Therefore, generational mortality explicitly assumes that members born more recently will live longer than the members born before them.

The Actuarial Standards of Practice require expected future mortality improvements to be considered in selecting the assumption. Using generational mortality tables achieves this.

Generational Mortality Tables

Most actuarial valuations for public sector retirement systems use generational mortality tables, which explicitly reflect expected improvements in mortality. Generational mortality tables include a base table and a projection scale. The projection scale reflects the expected annual reduction in mortality rates at each age. Therefore, each year in the future, the mortality at a specific age is expected to decline slightly (and people born in succeeding years are expected to live slightly longer). This can result in significant differences in life expectancies when projecting improvements 30-plus years into the future.

One of the main benefits of generational mortality tables is that the valuation assumptions should effectively update each year to reflect improved mortality, and the mortality tables should need to be changed less frequently.

Projection Scale for Mortality Improvement

There is a strong consensus in the actuarial community that future improvements in mortality should be reflected in the valuation assumptions. There is less consensus, however, about how much mortality improvement should be reflected. Beginning in 2014, the Society of Actuaries (SOA) began publishing a mortality improvement scale (MP-2014) that varies by age and birth year. This results in a complex matrix of rates that is projected forwards and backwards. Ultimately, in any mortality improvement table, the mortality improvement scale stops at a future year, and that year's rate is used for all later years.

An updated projection scale (MP-2021) was issued last year. This new scale relies heavily on Social Security experience for years 1958 through 2018, and assumes flat 1.35% ultimate annual improvements in mortality for individuals 62 and younger. Note that since this scale includes experience through 2018 there are no effects of pandemic mortality included, nor any adjustments to account for its impact. The ultimate improvement decreases gradually between the ages of 62 and 80, then more steeply for individuals aged 80 and older. Compared to MP-2014, the ultimate portion of the new scale projects bigger improvements in mortality for individuals younger than 83, and smaller improvements for individuals 83 and older. For example, the ultimate improvement under MP-2021 drops to 0.30% at age 100, compared to 0.64% when using MP-2014.

Public Plan-Specific Mortality Tables

The Society of Actuaries publishes mortality tables based on data from public sector retirement systems. In particular, tables specific to general and safety members were included. We compared how well the current SamCERA mortality tables, and the new class-specific mortality table matched the actual experience. Based on our analysis, we found that SamCERA's retired mortality experience was slightly better (i.e., lower mortality rates) than the standard public plan-specific mortality tables.

Results – Service and Disabled Retirees

Overall, we found there were 318 deaths compared to 319 expected by the assumptions. We also studied how the amount of an individual's benefits affected their mortality. As in past studies, we found that the mortality rates decreased as the amount of benefit increased. When we weighted the experience by benefit amount, we found that the amount of benefits of members who died was lower than expected for service retirees and more than expected for disabled retirees. The following is a comparison of the actual-to-expected deaths of retired members by class and gender for the study period, weighted by benefit amount.

Retiree Mortality (weighted by benefit amounts)					
Service Retirement					
Group	Deaths			Actual to Expected	Actual to Proposed
	Actual	Expected	Proposed		
General Male	\$339,258	\$403,509	\$374,816	84%	91%
General Female	427,726	502,483	469,006	85%	91%
Safety Male	191,518	200,987	186,639	95%	103%
Safety Female	26,740	19,446	18,272	138%	146%
Total Svc Ret	985,242	1,126,425	1,048,733	87%	94%
Disability Retirement					
Group	Deaths			Actual to Expected	Actual to Proposed
	Actual	Expected	Proposed		
General Male	\$23,948	\$25,992	\$27,303	92%	88%
General Female	62,426	51,483	53,709	121%	116%
Safety Male	38,402	36,479	37,661	105%	102%
Safety Female	5,116	4,815	5,131	106%	100%
Total Dis Ret	129,892	118,769	123,804	109%	105%
Grand Total	1,115,134	1,245,194	1,172,537	90%	95%

The values in the table are weighted by monthly benefit amount, so the first line of the table indicates the General male service retirees with total monthly benefits of \$339,258 died compared to the expected value of monthly benefits associated with General male service retiree deaths of \$403,509 based on the valuation assumption.

Results are shown graphically on the following pages. Note that analysis of Safety females is not shown in graph form due to the small number of actual and expected deaths.

Results – Active Member Mortality

Compared to retiree mortality, active member mortality is a less material assumption. Typically, the number of deaths from active status is quite low. In this study period there were 11 total deaths from active service (10 General and 1 Safety).

The following is a comparison of the actual-to-expected deaths of active members by plan and gender for this study period, weighted by compensation level. There were more deaths than expected among General males (weighted by compensation level) and fewer deaths than expected among other classes / genders. Given the small number of deaths observed, it is not surprising the expected and proposed rates to do not closely match the observed experience.

Active Mortality (weighted by compensation)					
Group	Deaths			Actual to Expected	Actual to Proposed
	Actual	Expected	Proposed		
General Male	\$211,693	\$757,919	\$784,380	28%	27%
General Female	753,976	763,591	775,640	99%	97%
Safety Male	124,293	173,432	186,339	72%	67%
Safety Female	-	33,315	35,313	0%	0%
Total	1,089,962	1,728,257	1,781,672	63%	61%

Recommendation

We recommend a reduction in the service retiree mortality assumptions by applying a 90% factor to the public plan specific mortality tables and updating to the most current mortality projection scale (including year-specific adjustments). For the disabled retirees, we are recommending no change to the mortality assumptions for disabled retirees which includes adjustments to the standard table at ages less than 85. Combining the results of this study with the prior study yields an actual / proposed ratio of close to 100%. We believe the combination of the recommended mortality tables and projection scale allows for a reasonable expectation of future life expectancy increases.

SamCERA uses standard mortality tables adjusted to best fit the patterns of mortality among its retirees. The table below describes the mortality tables being recommended for healthy (i.e., service retirees) and disabled retirees. These standard tables are based on a study of mortality specific to public plan retirees. Note that for beneficiaries of healthy and disabled retirees, we recommend that the mortality for healthy general retirees be used.

The recommended retiree mortality rates are based on the PubG-2010 and PubS-2010 Healthy Retiree and Disabled Retiree mortality tables and all assume generational mortality improvement based on the MP-2021 projection scale, as shown in the table below.

Class	Type ⁽¹⁾	Sex	Mortality Tables ⁽²⁾	
			Current Table	Proposed Table
General	Healthy	Male	PubG-2010 (100%) Healthy Retiree Male	PubG-2010 (90%) Healthy Retiree Male
General	Healthy	Female	PubG-2010 (100%) Healthy Retiree Female	PubG-2010 (90%) Healthy Retiree Female
Safety	Healthy	Male	PubS-2010 (100%) Healthy Retiree Male	PubS-2010 (90%) Healthy Retiree Male
Safety	Healthy	Female	PubS-2010 (100%) Healthy Retiree Female	PubS-2010 (90%) Healthy Retiree Female
General	Disabled	Male	PubG-2010 (100%) Disabled Retiree Male ⁽³⁾	PubG-2010 (100%) Disabled Retiree Male ⁽³⁾
General	Disabled	Female	PubG-2010 (100%) Disabled Retiree Female ⁽³⁾	PubG-2010 (100%) Disabled Retiree Female ⁽³⁾
Safety	Disabled	Male	PubS-2010 (100%) Disabled Retiree Male	PubS-2010 (100%) Disabled Retiree Male
Safety	Disabled	Female	PubS-2010 (100%) Disabled Retiree Female	PubS-2010 (100%) Disabled Retiree Female

1. Beneficiaries are assumed to have the same mortality as a healthy General member of the same sex.
2. Generational Projections using 100% of the MP-2021 projection scale.
3. Disabled General mortality rates are applied at 100% at ages 85 and above; 60% at ages 65 and below; and graded from 60% to 100% at 2% per year between age 65 and age 85.

For active employees, we recommend for consistency that the same 90% adjustment used for service retirees be applied to the standard public plan mortality tables (PubG-2010 and PubS-2010 Employee) with generational mortality based on the MP-2021 projection scale.

Exhibit 5-1
Mortality for Service Retirees
General Males

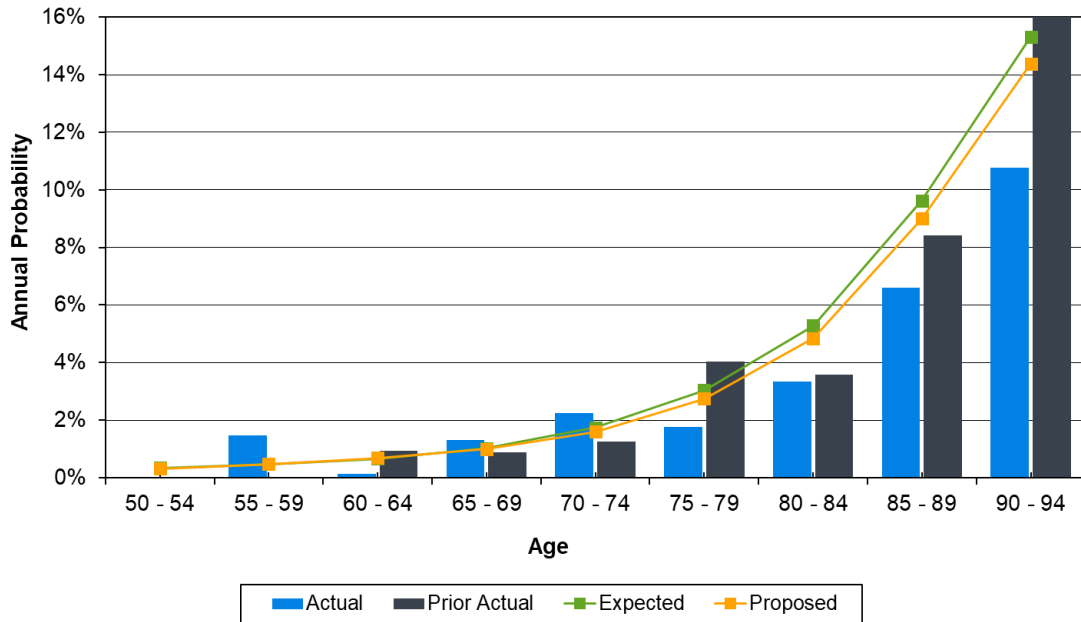


Exhibit 5-2
Mortality for Service Retirees
General Females

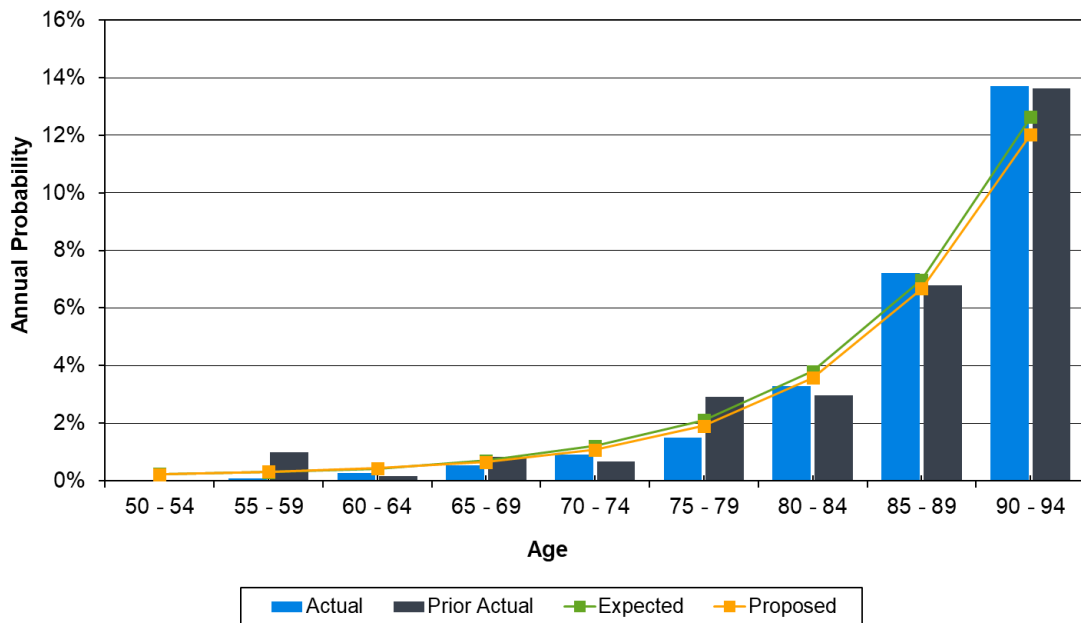


Exhibit 5-3
Mortality for Service Retirees
Safety Males

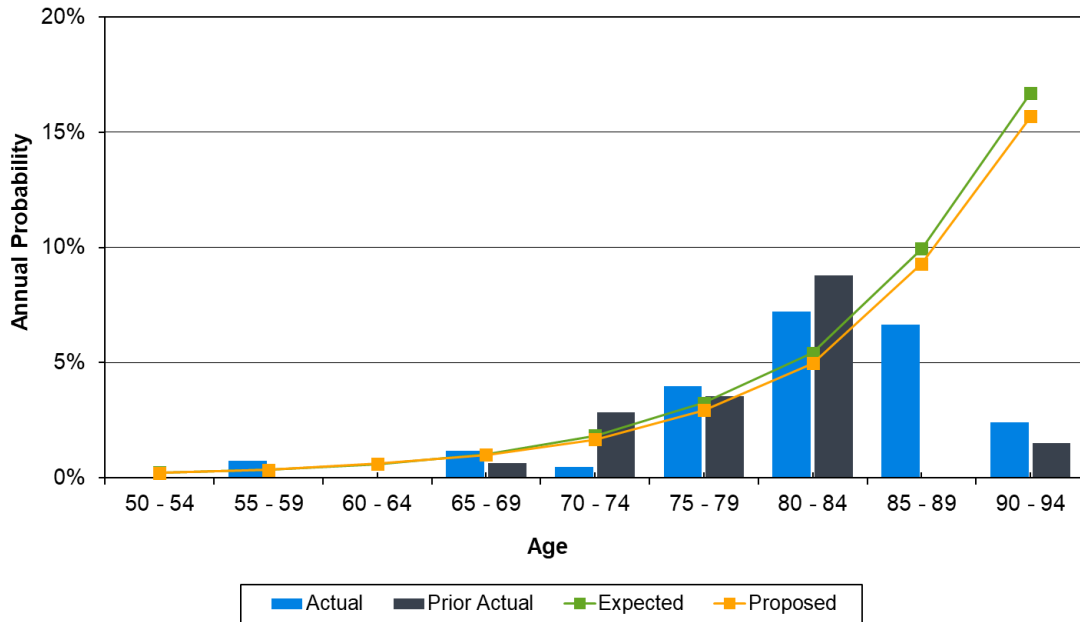


Exhibit 5-4
Mortality for Disabled Retirees
General Males

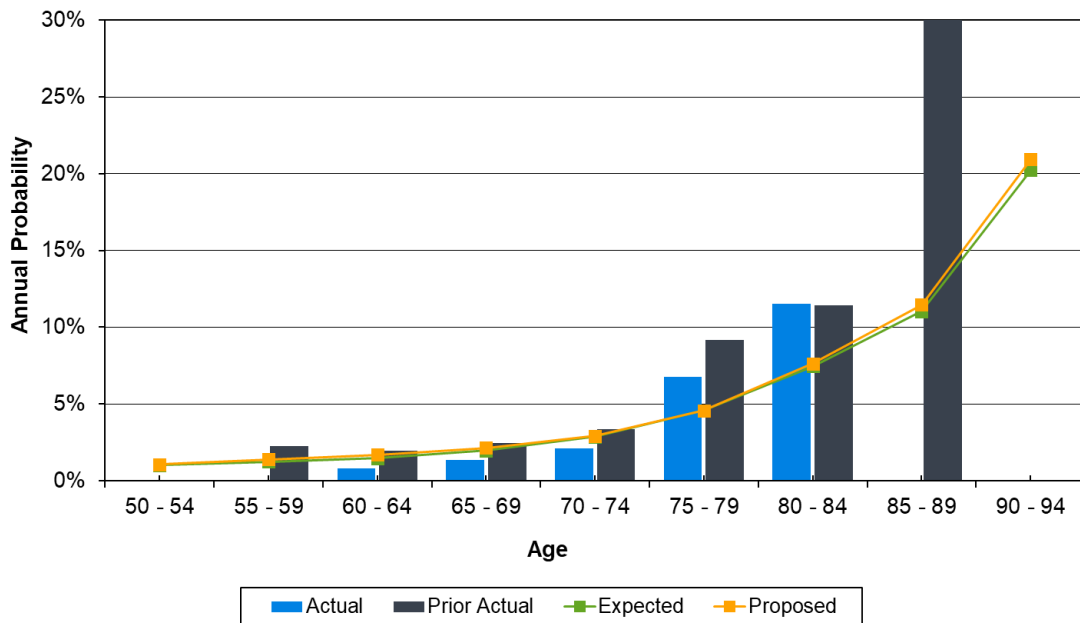


Exhibit 5-5
Mortality for Disabled Retirees
General Females

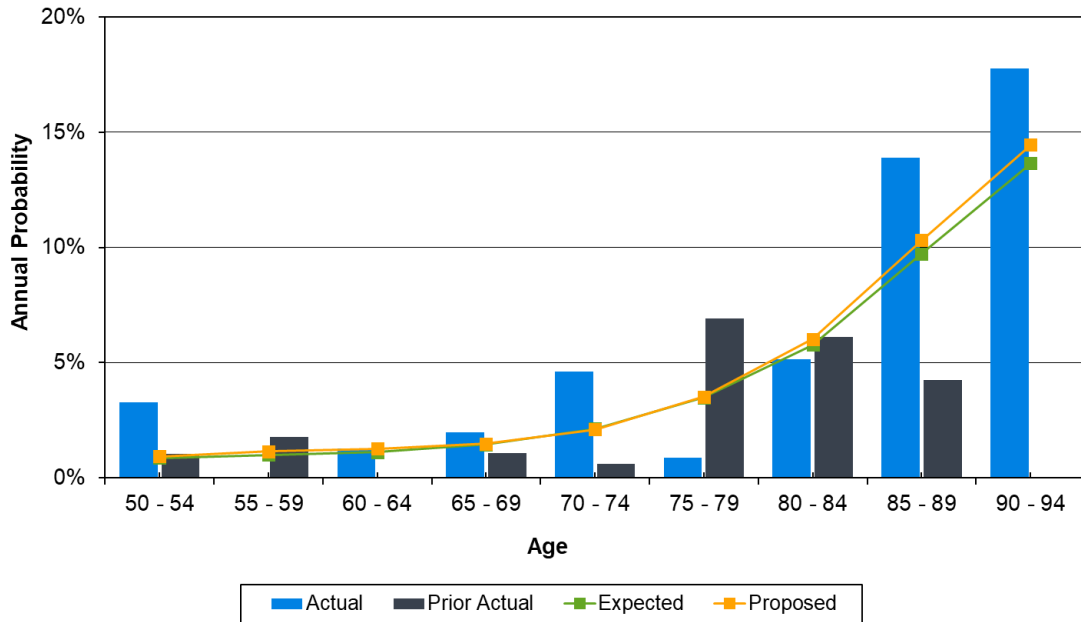
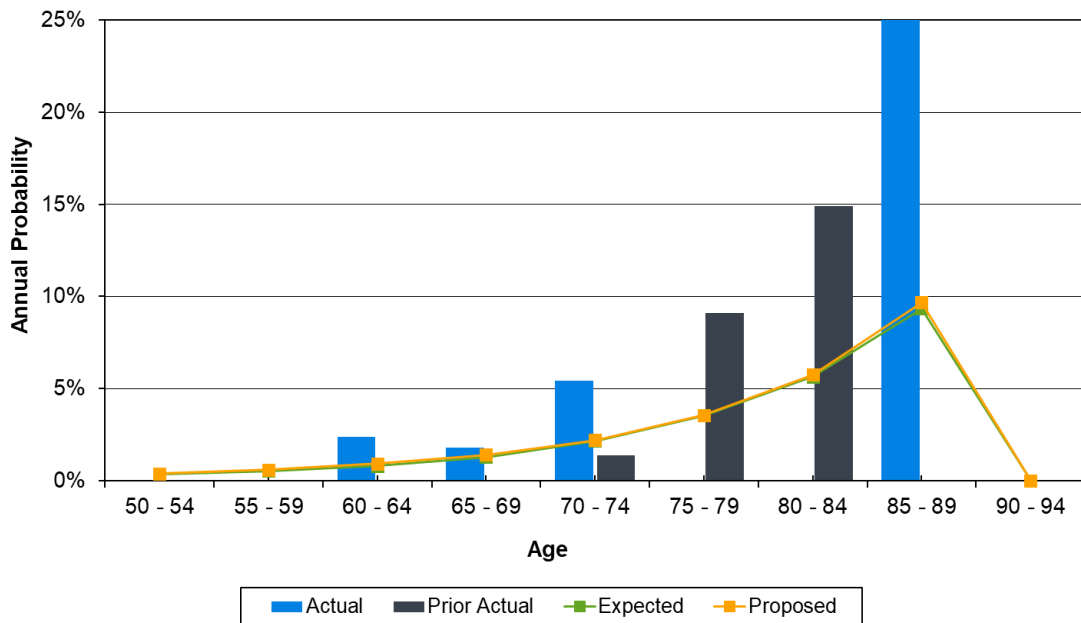


Exhibit 5-6
Mortality for Disabled Retirees
Safety Males



6. Service Retirements

We have observed that rates of retirement differ based on number of years of service as well as age, so we studied the rates of retirement based on age and service. We found that, in general, members with more years of service have a greater probability of retiring at a given age than those with less years of service.

Exhibits 6-1 through 6-3 shows the total actual and expected rates of service retirement for General Members in Plans 1,2 and 4 in different years of service groupings. Exhibit 6-4 shows the total actual and expected rates of service retirement for General Members in Plans 5 and 7 with less than 20 years of service, and Exhibits 6-4 through 6-8 shows the total actual and expected rates of service retirement for Safety Members in Plans 1, 2, and 4 in different years of service groupings.

General Plans 5 and 7, and Safety Plans 5, 6, and 7 have very few actual retirements since most members in those Plans entered SamCERA within the last 10 years. However, General Plans 5 and 7 are beginning to experience service retirements so we have included the observed experience for the group with less than 20 years of service. There were not enough service retirements in other plans and years of service groupings to perform a statistically meaningful study of that Plan.

General Plan 3 also has very few actual retirements.

As discussed in Section 3, we have observed differences in decrements based upon compensation levels, and therefore we apply a weighting based on compensation level.

We believe that service retirement experience during this study period, which included the COVID pandemic, may not be entirely representative of anticipated future experience. Specifically, there may have been certain members that chose to retire earlier than they otherwise would have due to either direct or indirect impacts of the pandemic. Therefore, in an effort to not rely too heavily on pandemic-era experience we have only recommended changes where they are also supported by data from the prior study period.

Results

As shown below, the actual number of retirements from active service of General members, weighted by compensation level, was generally higher than expected by the assumptions. However, as can be seen in Exhibits 6-1 through 6-4, the pattern of retirements varied somewhat based on a member's plan and years of service.

Service Retirements (weighted by compensation) - General Members					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
<u>Plans 1, 2 and 4</u>					
Less than 20 Years of Service	\$21,911,463	\$16,818,177	\$17,352,399	130%	126%
20 to 29 Years of Service	19,685,248	20,596,033	20,606,465	96%	96%
30 or more Years of Service	14,044,508	10,542,060	10,405,765	133%	135%
Total	55,641,219	47,956,270	48,364,629	116%	115%
<u>Plans 5 and 7</u>					
Less than 20 Years of Service	5,989,720	5,893,476	5,893,476	102%	102%
Total	61,630,939	53,849,746	54,258,105	114%	114%

The numbers shown in the previous table are for ages 50 to 74 for General Members. The values in the table are weighted by compensation, so the first line of the table indicates the individuals with total annual compensation of \$21,911,463 retired from active status compared to the expected value of \$16,618,177 based on the valuation assumption.

As shown below, the actual number of retirements from active service of Safety members, weighted by compensation level, was generally higher than expected by the assumptions. However, as can be seen in Exhibits 6-5 through 6-8, the pattern of retirements varied somewhat based on a member's years of service.

Service Retirements (weighted by compensation) - Safety Members					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
<u>Plans 1, 2 and 4</u>					
Less than 15 Years of Service	\$1,922,552	\$1,134,231	\$1,640,318	170%	117%
15 to 19 Years of Service	3,265,358	2,687,504	2,712,002	122%	120%
20 to 24 Years of Service	8,369,884	5,867,170	6,166,358	143%	136%
25 or more Years of Service	3,849,200	3,576,572	3,916,800	108%	98%
Total	17,406,994	13,265,477	14,435,478	131%	121%

The numbers shown above are for ages 45 to 64 for Safety Members. Since the values in the table are weighted by compensation, the first line of the table indicates the individuals with total annual compensation of \$1,922,552 retired from active status compared to the expected value of \$1,134,231 based on the valuation assumption.

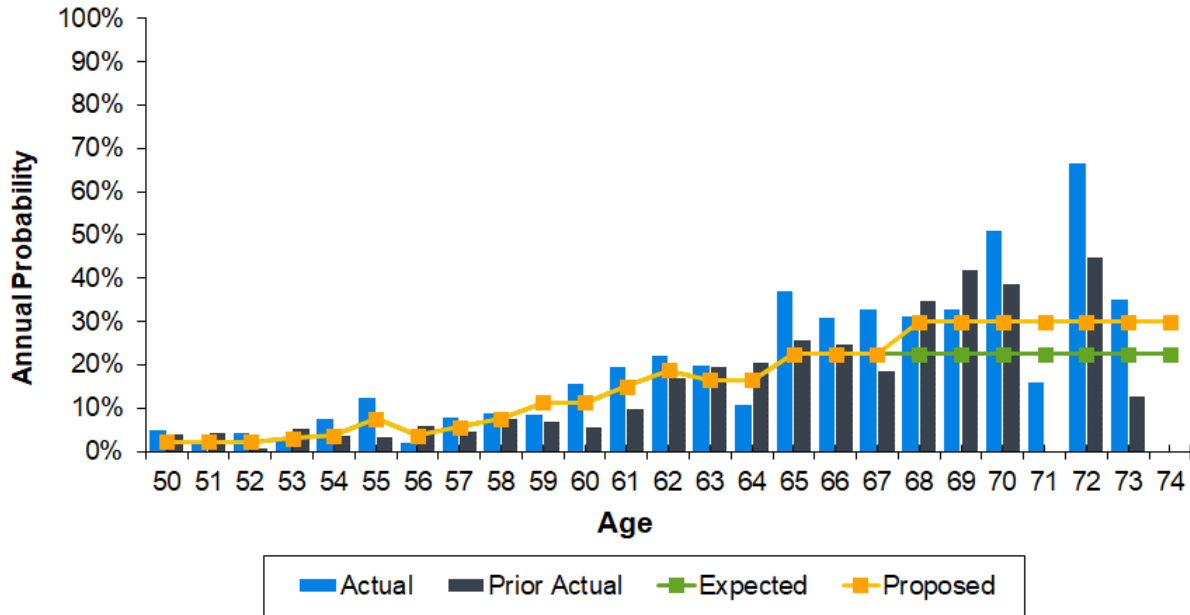
Recommendation

We recommend revised service retirement rates for General and Safety members (shown in Appendix A). These revisions result in higher expected retirements overall for General and Safety Members, and the proposed retirement rates more closely follow the pattern of actual retirements.

Additionally, we recommend continuing the 100% probability of retirement at certain age and service combinations (shown in Appendix A) where the benefit is approximately 100% or more of final average compensation.

There were not enough Plan 3 service retirements to perform a statistically meaningful study. We believe the current assumptions are reasonable; therefore, we recommend no change to these rates.

**Exhibit 6-1
Retirement Rates
General Members (Plans 1, 2, and 4); Less than 20 Years of Service**



**Exhibit 6-2
Retirement Rates
General Members (Plans 1, 2, and 4); 20 to 29 Years of Service**

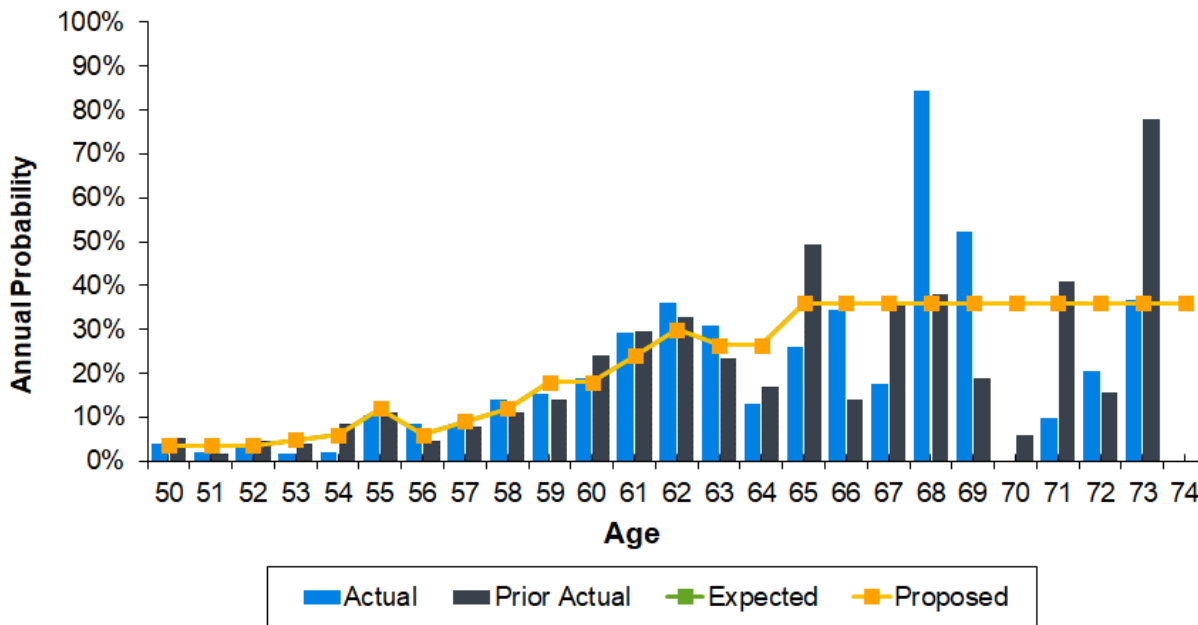


Exhibit 6-3
Retirement Rates
General Members (Plans 1, 2, and 4); 30 or more Years of Service

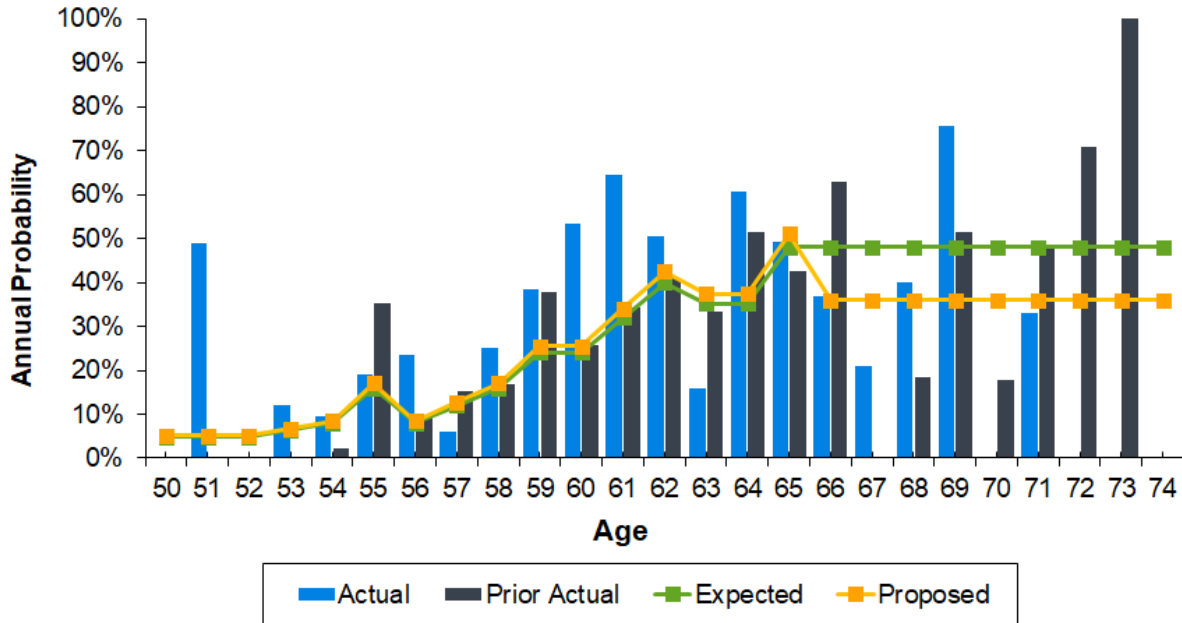
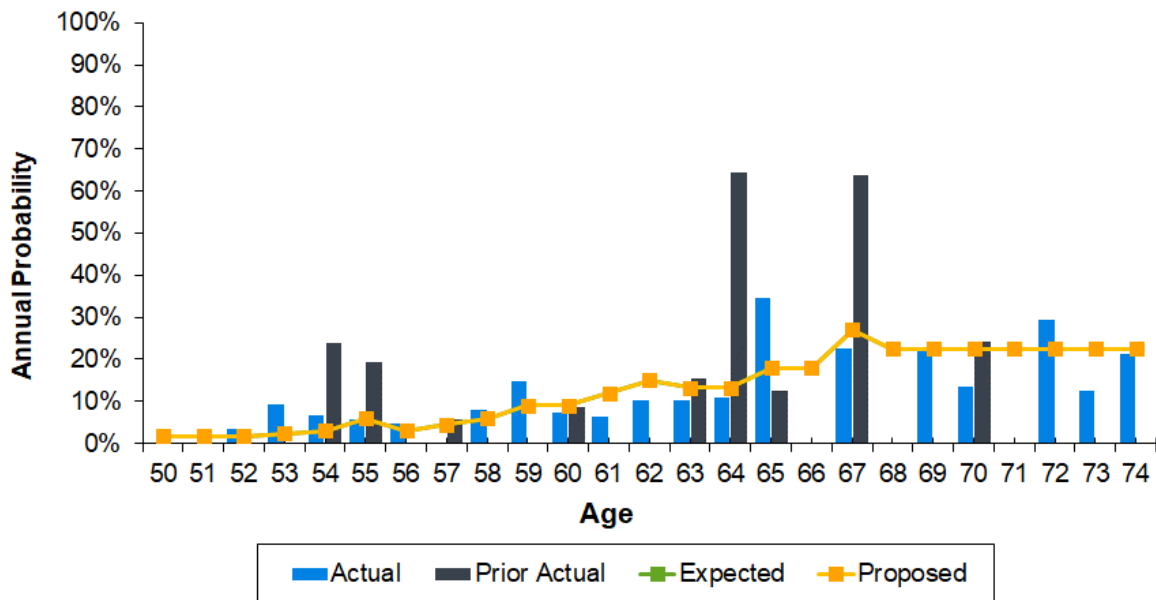
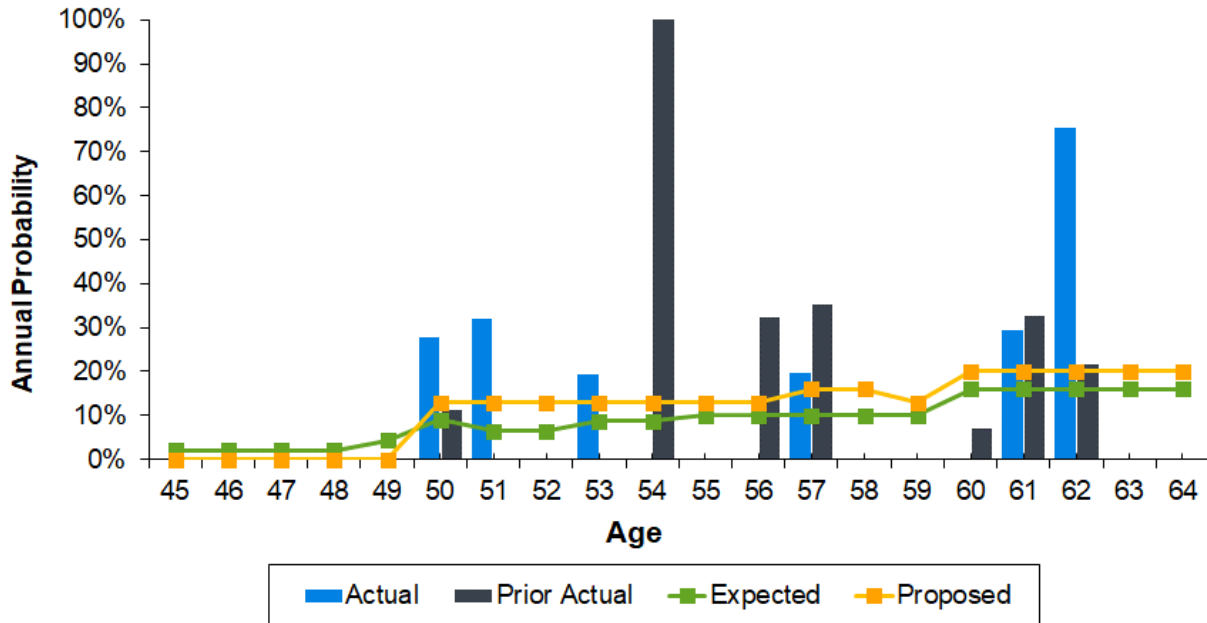


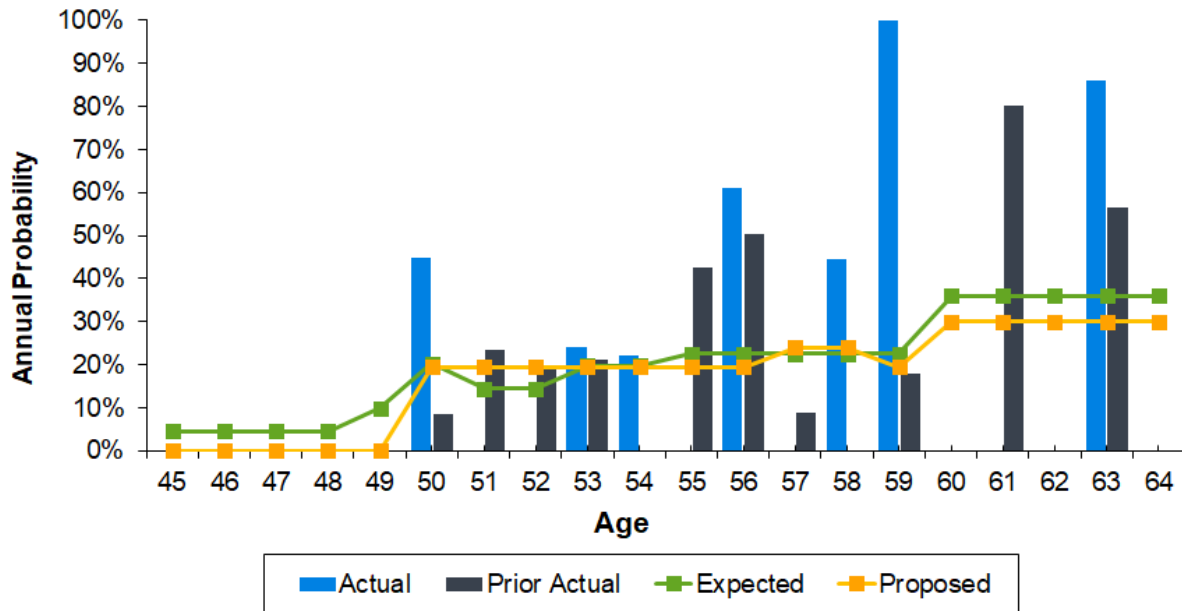
Exhibit 6-4
Retirement Rates
General Members (Plans 5, and 7); Less than 20 Years of Service



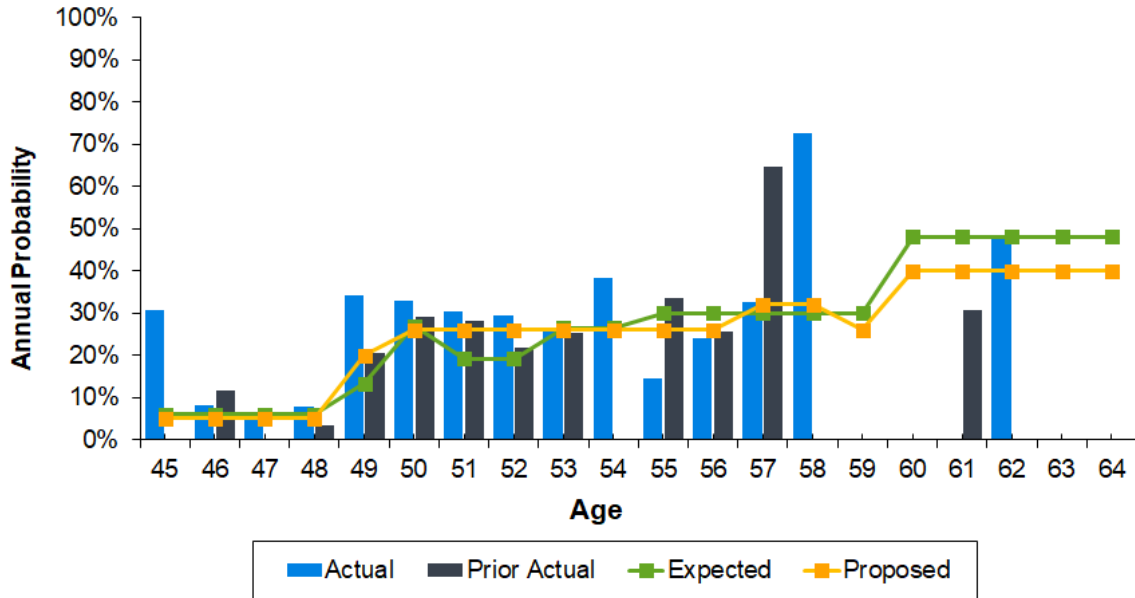
**Exhibit 6-5
Retirement Rates
Safety Members (Plans 1, 2, and 4); Less than 15 Years of Service**



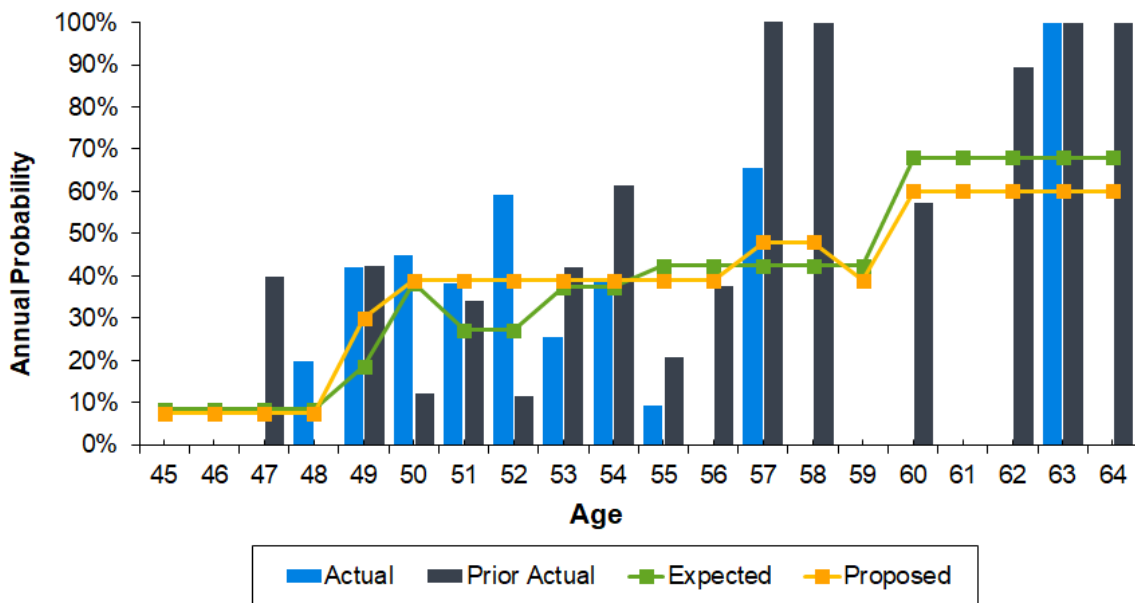
**Exhibit 6-6
Retirement Rates
Safety Members (Plans 1, 2, and 4); 15 to 19 Years of Service**



**Exhibit 6-7
Retirement Rates
Safety Members (Plans 1, 2, and 4); 20 to 24 Years of Service**



**Exhibit 6-8
Retirement Rates
Safety Members (Plans 1, 2, and 4); 25 or more Years of Service**



7. Disability Retirement

SamCERA allows a member to start receiving benefits prior to eligibility for service retirement if they become disabled. There are two types of disability:

1. **Non-service-Connected Disability:** This is available to a disabled member only if they have satisfied the vesting requirement.
2. **Service-Connected Disability:** This is available only to members who are disabled for the performance of duty. There is no service requirement, and the service-connected disability benefit generally pays a larger benefit than Non-service-connected disability.

We have found that in many systems, including SamCERA, there is generally at least a six-month lag between the actual occurrence of a disability retirement and the subsequent approval and reporting of that same retirement. To account for this, we considered a study period of July 1, 2017 to April 30, 2023 and also included those retired members that have been reclassified from service to disability retirement over the period of the study and considered those in our recommendation.

The small number of disability retirements make it difficult to perform a statistically meaningful analysis of disability retirements. Due to the small number of disability retirements, we study males and females as one group for each of General and Safety Members.

Results

The actual number of disability retirements from active service (service and non-service connected), weighted by compensation level, were lower than expected for both General and Safety Members. These are shown in the table below.

Disability Retirements (weighted by compensation)					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
General Service Connected	\$2,002,358	\$4,849,733	\$3,267,416	41%	61%
General Non-Service Connected	1,056,455	2,071,744	1,611,461	51%	66%
General Total	3,058,813	6,921,477	4,878,877	44%	63%
Safety Service Connected	3,038,878	3,306,775	3,312,848	92%	92%
Safety Non-Service Connected	N/A	N/A	N/A	N/A	N/A
Safety Total	3,038,878	3,306,775	3,312,848	92%	92%

There were 54 actual disability retirements among General members compared to 61 expected by the assumptions. There were 26 actual disability retirements among Safety members compared to 24 expected by assumptions.

Recommendation

We recommend changes to the rates of disability retirement for General and Safety members (shown in Appendix A) to better reflect observed experience. For General members these changes lower rates of disability retirement at most ages. For Safety members these changes lower rates of disability below age 50, and increase rates of disability between age 50 and age 60.

We recommend no change to the assumption for Safety members that 100% of disabilities are service connected.

8. Other Terminations of Employment

This section of the report summarizes the results of our study of terminations of employment for reasons other than death, service retirement, or disability. A member who terminates, but does not retire, is assumed to either take a refund (a withdrawal) or to terminate employment but leave their member contributions with the system (a vested termination). We will refer to the combination of the two rates as the aggregate termination rate. This approach sets a probability that the member will terminate, and then assumes a certain portion of the members terminating will elect a refund. The probability of refund is discussed in more detail in Section 9.

We have observed that rates of termination from employment are affected by a member's years of service. That is, the greater the years of service, the less likely a member is to terminate employment. Rates of termination also vary by membership class. While there may be some differences in rates of termination between male and female General members, overall we do not believe there is a significant reason to have slightly different termination assumptions for male and female General members. Due to the small number of female Safety members, a single unisex termination rate for Safety members is reasonable.

Similar to service retirement experience, we believe that rates of termination during this study period, which included the COVID pandemic, may not be entirely representative of anticipated future experience. Specifically, there may have been certain members that chose to leave employment due to either direct or indirect impacts of the pandemic. Therefore, in an effort to not rely too heavily on pandemic-era experience we have only recommended changes where they are also supported by data from the prior study period.

Results

As shown in the table below overall, the actual number of terminations, weighted by compensation level, was higher than expected for both General and Safety members. This is also consistent with the experience from the prior study, when we strengthened the rates of termination so that the actual to proposed ratio was 110%. That is, an expectation of 10% more terminations than expected by the assumptions, when weighted by compensation.

Terminations of Employment (weighted by compensation)					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
General members	\$77,414,286	\$71,004,027	\$71,004,027	109%	109%
Safety members	8,933,640	5,332,185	5,332,185	168%	168%
Total	86,347,927	76,336,212	76,336,212	113%	113%

On a headcount basis, there were 745 General members (all plans except plan 3) that terminated employment compared to 676 expected by the assumptions, which is largely in line with expectations based on the prior study. There were 79 Safety member terminations of employment compared to 45 expected by the assumptions, which is significantly larger than expected by the assumptions, and significantly larger than was experienced in the prior study.

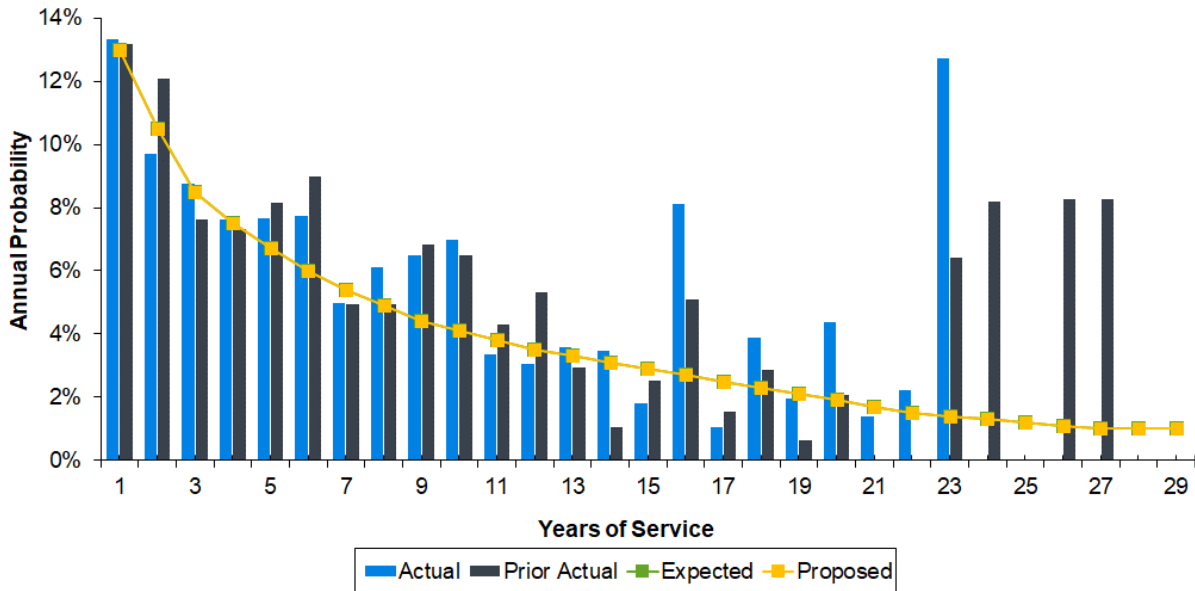
Recommendation

Rates of termination during the pandemic era were higher than in past years for most public employers. This was also true for SamCERA's employers, particularly among Safety members. Given this may only be a temporary fluctuation, we recommend no changes to the current assumed rates of termination for General and Safety

members. However, if this pattern of higher rates of termination persists, we will likely recommend adjustments at the next experience study in 2026.

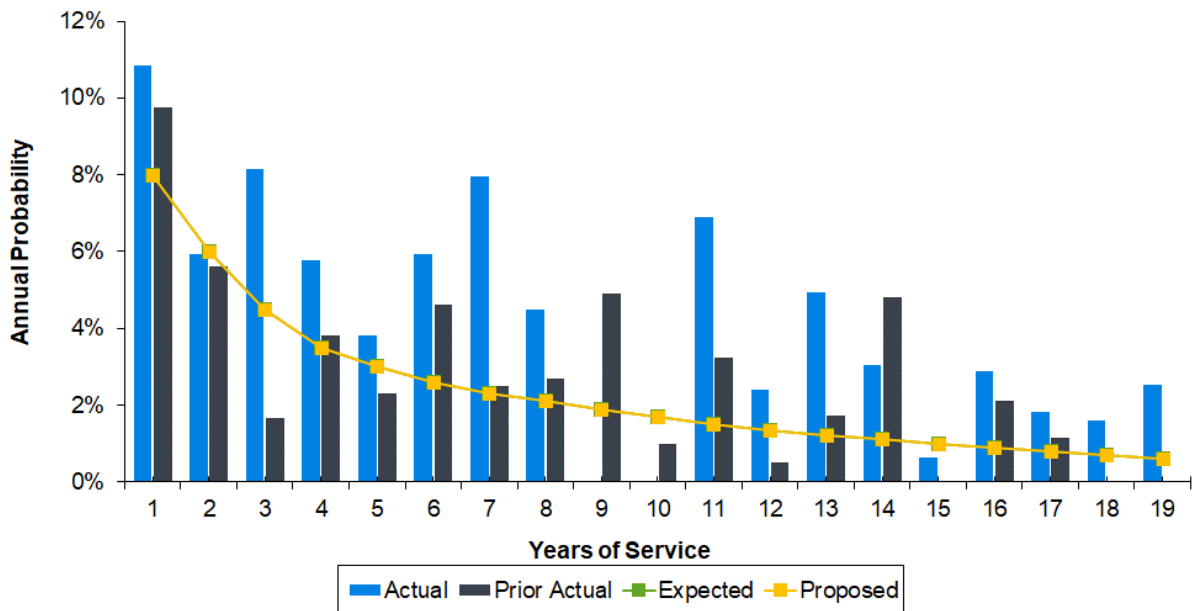
We continue to recommend adopting the same termination assumption for both male and female members of the General class because we do not believe the differences in behavior is significantly material to warrant slightly different assumptions. We also recommend continuing this treatment for Safety members due to the difficulty in creating a specific assumption for the small number of female Safety members.

Exhibit 8-1 Termination by Years of Service* – General Members



* Excludes retirement-eligible members.

Exhibit 8-2 Termination by Years of Service* – Safety Members



* Excludes retirement-eligible members.

9. Probability of Refund Upon Vested Termination

As discussed in Section 8, the aggregate termination rates include both members who terminate and take a refund of their contributions and those who elect to keep their contributions with SamCERA and receive a deferred vested benefit. This section of the report deals with the rates at which employees elect a refund of their contributions upon termination of service.

As discussed in Section 3, we have observed a significant number of members terminating employment before attaining five years of service and then finding employment with a reciprocal agency. This allows the member to continue earning vesting service with SamCERA and receiving increases in their SamCERA benefits due to increases in compensation while employed at the reciprocal agency.

Under the current assumptions, members who terminate with fewer years of service have a greater probability of electing to withdraw their contributions. Currently all non-vested members (those with less than five years of service) are assumed to take a refund of contributions at termination.

We have observed that there is often a lag (sometimes of several years) between when a member terminates from employment and when they elect a refund of contributions. We believe that these elections can be considered as a refund of contribution from active service, except for the timing of the election. To account for these members and this lag, we have studied experience over the period July 1, 2017 to April 30, 2023 and have classified those subsequent refund of contributions as if they occurred upon termination.

Results

Exhibits 9-1 and 9-2 summarize the results of our study for General and Safety members that terminate employment after attaining five years of vesting service. The actual number of members electing a refund of contributions (weighted by Final Average Compensation, and by headcount) is generally lower than expected by the assumptions, which is consistent with trends over the last several study periods.

The table below summarizes the refunds of contributions experience (weighted by Final Average Compensation) compared to the expected number, and the number under the proposed assumptions.

Refunds of Contributions (weighted by Final Average Compensation) (members with 5 or more Years of Vesting Service)					
	Actual	Expected	Proposed	Actual / Expected	Actual / Proposed
General members	\$522,254	\$1,061,423	\$912,466	49%	57%
Safety members	85,115	138,662	126,123	61%	67%
Total	607,369	1,200,084	1,038,589	51%	58%

Recommendation

Based on the experience of this and prior studies we are recommending reductions to the probabilities at which members with at least five years of service at termination of employment withdraw their contributions from SamCERA.

We also recommend a reduction to the probabilities at which members with less than five years of service at termination withdraw their contributions from SamCERA. We recommend that this probability be lowered from 100% to 80% for General members and from 100% to 60% for Safety members. These members that are assumed to leave their contributions on deposit will be assumed to be employed at a reciprocal agency.

Exhibit 9-1
Probability of Refund upon Vested Termination – General

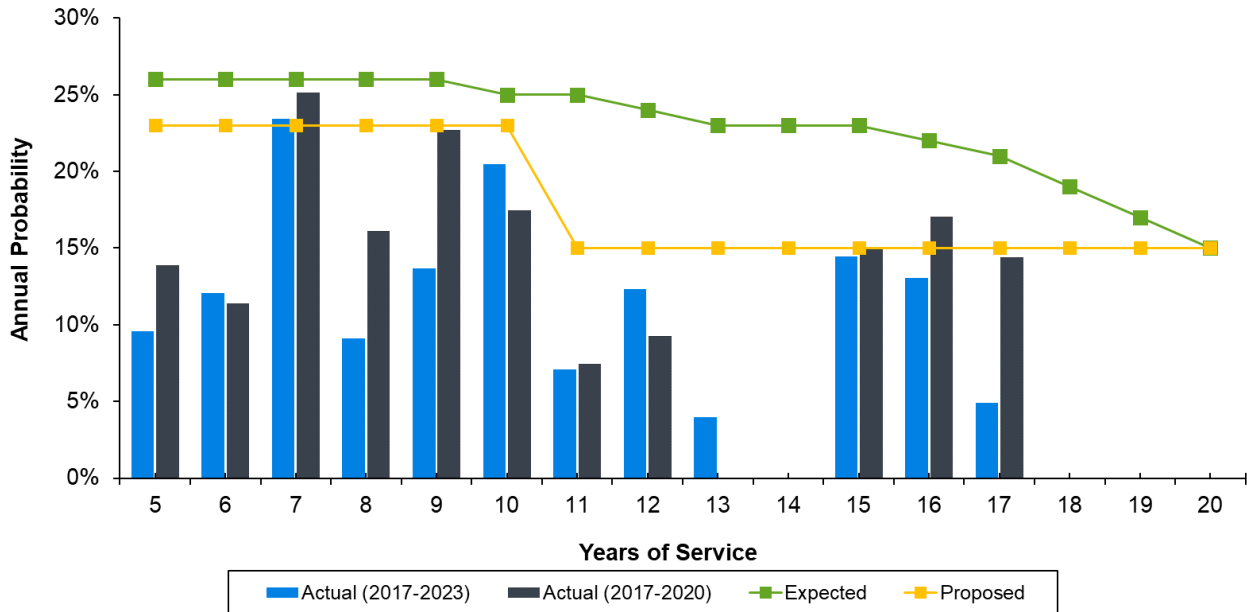
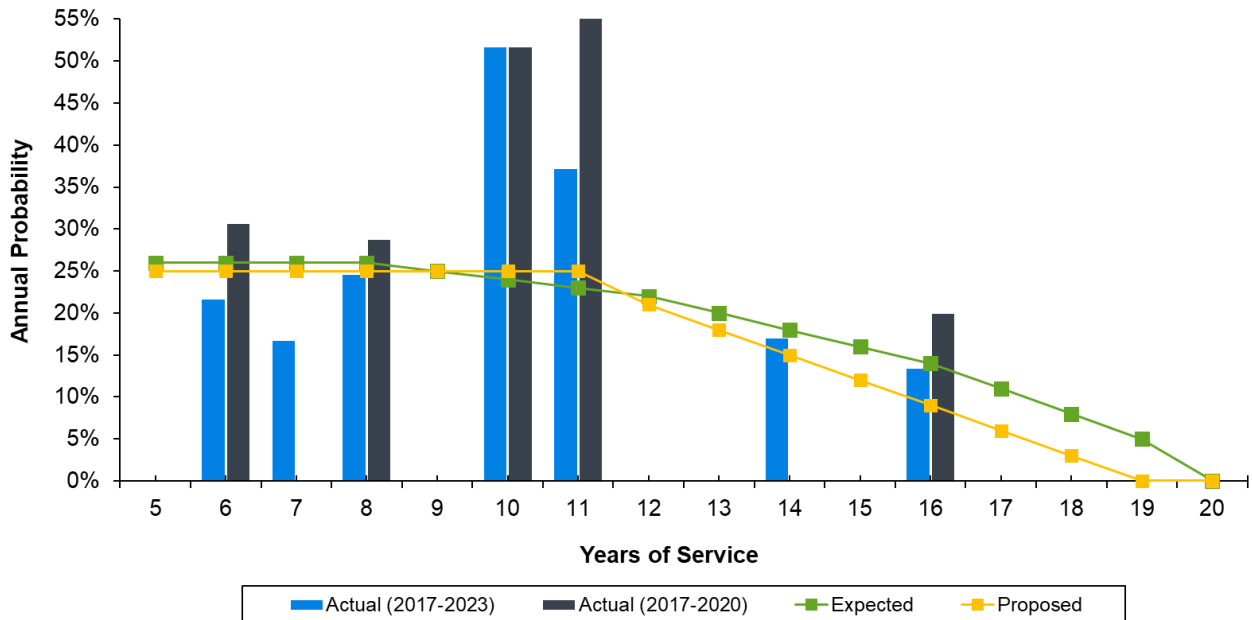


Exhibit 9-2
Probability of Refund upon Vested Termination – Safety



Appendix A Actuarial Procedures and Assumptions

The actuarial procedures and assumptions to be used in the June 30, 2023 valuation are described in this section. The assumptions were reviewed and changed as a result of the 2023 Investigation of Experience Study.

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: 1) All assumptions shown in this appendix reflect the increased inflation and other related economic assumptions adopted at the May 2023 Board meeting.
2) 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).

For members who transferred from Plan 3 to another General plan, entry age is based on the transfer date.

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).

Funding Method

The UAAL as of June 30, 2023 is amortized as a level percentage of the projected salaries of present and future members of SamCERA over a 15-year period effective June 30, 2024. This is commonly referred to as a "closed amortization method". Actuarial gains and losses after the June 30, 2023 valuation are amortized over new closed 15-year periods from the respective dates the new contribution layers are effective.

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 Plans 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 (SMCM&VCD). 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.

For each UAAL contribution rate group (General, Safety, and Probation), the UAAL contribution rate is the greater of 1) the UAAL rate under the 15-year layered amortization; and 2) the UAAL contribution rate that was effective July 2023 before reflecting any Supplemental Contribution Accounts. The Statutory Contribution Rate is then set equal to the employer normal cost rate for the plan plus the greater of 1) and 2) for each UAAL contribution rate group reduced for any offsets from the Supplemental Contribution Accounts as of the current valuation date.

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. Any limitation is also reflected in a member's benefit after retirement.

Employer Contributions

The statutory employer contribution rate is set by the Retirement Board based on actuarial valuations.

Member Contributions

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.

The individual member rates by entry age, plan, and class are illustrated in Appendix D of the valuation report.

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.

Effective June 30, 2018 all deferred gains and losses are combined into a single amount to be recognized over a five-year (10 six-month) period. Beginning with the six-month period immediately following the June 30, 2018 valuation, offsetting of current period gains or losses against prior period gains or losses will occur, as follows. First, to the extent there is a loss for the period, it shall be used to offset any unrecognized gains from prior periods in the order of oldest to most recent. Any remaining loss for the period is recognized over a five-year (10 six-month) period. Similarly, any gain for the period shall be offset against unrecognized losses from prior periods.

The gross preliminary Actuarial Value of Assets is equal to the Market Value of Assets less any of the remaining unrecognized differences. A 20% corridor is then applied, so that the gross Actuarial Value of Assets cannot be greater than 120% of the Market Value of Assets nor less than 80% of the Market Value of Assets. The Valuation Assets used in the calculation of the SCR are equal to the gross Actuarial Value of Assets less any non-valuation reserves.

Investment Earnings and Expenses

The future investment earnings of the assets of SamCERA are assumed to accrue at an annual rate of 6.25% compounded annually, net of both investment and administrative expenses. This rate was adopted effective June 30, 2021.

Postretirement Benefit Increases

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

	General	Safety	Probation
Plan 1	2.75%	2.75%	2.75%
Plan 2	2.65%	2.65%	2.65%
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 local inflation assumption of 2.75% per year. Since Plan 2 and Plans 4-7 do 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. This rate was adopted effective June 30, 2023.

Interest on Member Contributions

The annual credited interest rate on member contributions is assumed to be 6.25% compounded semi-annually (3.125% per six-month period) for an annualized rate of 6.35%. This rate was adopted effective June 30, 2021 for valuation purposes; the change in member crediting is effective July 1, 2022.

Individual Salary Increases

Salaries increases of individual members are assumed to include the following components: (1) a general wage growth assumption that applies to all members, and (2) an individual-specific increase due to promotion and longevity based on years of service.

The rates of annual salary increase due to promotion and longevity assumed for the purpose of the valuation are illustrated in Exhibit A-5. The general wage growth assumption is 3.25% per year. This includes a 2.75% local inflation component and a 0.50% productivity (or "real wage growth") component. This assumption was adopted effective June 30, 2023.

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 and then used the greater of the two amounts.

Growth in Payroll

The overall pensionable payroll of SamCERA active members is assumed to increase at 3.25% per annum. This assumption was adopted effective June 30, 2023.

PEPRA Compensation Limit

The PEPRA compensation limit is assumed to increase in line with the Consumer Prices Index for All Urban Consumers (CPI-U) U.S City Average. We assume that CPI-U will increase at the rate of 2.50% per year.

This assumption was adopted effective June 30, 2023.

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 2.75% per year. Note, statutory provisions describe how to compute a member's offset amount at time of termination or retirement. This assumption was adopted effective June 30, 2023.

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, they are also assumed to retire immediately. For purposes of the valuation, immediate retirement is assumed at:

- Age 62 with 38 years of service (General, Plans 1, 2, and 4)
- Age 65 with 41 years of service (General Plan 5)
- Age 67 with 40 years of service (General Plan 7)
- Age 50 with 33 years of service (Safety & Probation, Plans 1, 2, and 4)
- 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)

Deferred vested 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, 2023.

Disability

The rates of disability used in the valuation are also illustrated in Tables A-6 through A-11. The disability rates were adopted effective June 30, 2023.

Retiree Mortality – Other Than Disabled Members

The same postretirement mortality rates are used in the valuation for active members, deferred members, members retired for service, and beneficiaries. These rates are illustrated in Table A-2. Beneficiary mortality is assumed to be the same as for healthy members. Beneficiaries are assumed to be of the opposite sex and have the same mortality as General members.

Class	Gender	Proposed Table
General	Male	PubG-2010 (90%) Healthy Retiree Male
General	Female	PubG-2010 (90%) Healthy Retiree Female
Safety	Male	PubS-2010 (90%) Healthy Retiree Male
Safety	Female	PubS-2010 (90%) Healthy Retiree Female

All mortality rates are projected with the MP-2021 Mortality Improvement Scale.

The rates of retired mortality were adopted effective June 30, 2023.

Retiree Mortality – Disabled Members

For current and future disabled members, the mortality rates used in the valuation are illustrated in Table A-3.

Class	Gender	Proposed Table
General	Male	PubG-2010 (100%) Disabled Retiree Male *
General	Female	PubG-2010 (100%) Disabled Retiree Female *
Safety	Male	PubS-2010 (100%) Disabled Retiree Male
Safety	Female	PubS-2010 (100%) Disabled Retiree Female

* Disabled General mortality rates are 100% of the standard table at ages 85 and above; 60% at ages 65 and below; and graded from 60% to 100% at 2% per year between age 65 and age 85.

All mortality rates are projected with the MP-2021 Mortality Improvement Scale.

The rates of mortality were adopted effective June 30, 2023.

Mortality while in Active Status

For active members, the mortality rates used in the valuation rates are illustrated in Tables A-6 through A-11.

Class	Gender	Proposed Table
General	Male	PubG-2010 (90%) Employee Male
General	Female	PubG-2010 (90%) Employee Female
Safety	Male	PubS-2010 (90%) Employee Male
Safety	Female	PubS-2010 (90%) Employee Female

All mortality rates are projected with the MP-2021 Mortality Improvement Scale.

Safety members have an additional service-connected mortality rate of 0.01% per year.

These rates were adopted effective June 30, 2023.

Other Terminations of Employment

Tables A-6 to A-9 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, 2023.

Probability of Refund

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 vested 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.

The probability of refund assumptions were adopted effective June 30, 2023.

Probability of Eligible Survivor

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.

Valuation of Current Deferred Members

Current non-vested members who have terminated active employment are assumed to take a refund of their contributions.

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.

Reciprocal Benefits

Future former members (i.e., those currently active with SamCERA who are expected to terminate employment in the future but not immediately retire or elect a refund of contributions) are assumed to immediately join a reciprocal agency upon termination of employment at the following rates:

- 100% of General and Safety members who terminate employment before completing five years of service
- 30% of General members who terminate employment after completing at least five years of service.
- 40% of Safety members who terminate employment after completing at least five years of service.

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 3.77% annually for General members and 4.13% annually for Safety members.

This assumption was adopted effective June 30, 2023.

Part-Time Employees

For valuation purposes, part-time employees are assumed to continue working the same number of hours in the future.

Adjustment to Plan 3 Normal Cost Rate

Plan 3 members are eligible to transfer to Plans 2, 4 or 5 (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 2044.
- 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 6.25%.
- C. The Final Compensation is based on the salary paid in the year prior to attaining the retirement age.
- D. 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.
- E. For purposes of calculating the value of the member's future contribution, interest is assumed to be credited at 6.25% semiannually (3.125% for each six-month period) for a 6.35% annual rate.
- F. 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 rates for all Plans 1, 2, 4, 5, and 6 members are loaded to account for a 50% COLA share. The COLA loads are applied to the otherwise applicable basic member rates prior to the addition of any cost-sharing rates.

Table A-1
Summary of Valuation Assumptions as of June 30, 2023

Economic assumptions	
A. General wage increases	3.25%
B. Investment earnings	6.25%
C. Growth in active membership	0.00%
D. CPI-U inflation assumption	2.50%
E. CPI inflation assumption	2.75%
Demographic assumptions	
A. Salary increases due to service	Exhibit A-5
B. Service Retirement from active service	Exhibits A-7 & A-9
C. Separation from active service (other than Service Retirement)	Exhibits A-6 & A-8
D. Probability of refund of contributions upon vested termination	Exhibit A-4
E. Mortality for active members after termination and service retired members	Exhibit A-2
F. Mortality for members retired for disability	Exhibit A-3
G. Mortality for beneficiaries	Exhibit A-2

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

Age	General Male	General Female	Safety Male	Safety Female
20	0.067%	0.032%	0.055%	0.019%
25	0.050%	0.022%	0.050%	0.023%
30	0.065%	0.036%	0.055%	0.032%
35	0.085%	0.056%	0.063%	0.042%
40	0.119%	0.086%	0.079%	0.058%
45	0.176%	0.135%	0.110%	0.078%
50	0.268%	0.200%	0.173%	0.134%
55	0.388%	0.257%	0.275%	0.232%
60	0.554%	0.346%	0.457%	0.401%
65	0.822%	0.552%	0.793%	0.693%
70	1.373%	0.957%	1.411%	1.196%
75	2.404%	1.695%	2.543%	2.066%
80	4.297%	3.024%	4.593%	3.566%
85	7.732%	5.585%	8.222%	6.158%
90	13.205%	10.338%	14.274%	10.634%

1. Mortality rates shown are those applicable for the fiscal year beginning in 2010 (base year).
2. Annual projected improvements are assumed in years after 2010 based on mortality improvement scale MP-2021.

Table A-3
Mortality for Members Retired for Disability

Age	General Male	General Female	Safety Male	Safety Female
20	0.247%	0.140%	0.121%	0.053%
25	0.167%	0.098%	0.110%	0.065%
30	0.212%	0.154%	0.122%	0.089%
35	0.275%	0.241%	0.138%	0.121%
40	0.387%	0.377%	0.174%	0.164%
45	0.604%	0.591%	0.242%	0.223%
50	0.963%	0.890%	0.353%	0.304%
55	1.268%	1.045%	0.480%	0.461%
60	1.502%	1.174%	0.735%	0.699%
65	1.826%	1.354%	1.186%	1.061%
70	2.731%	2.003%	1.907%	1.610%
75	4.154%	3.202%	3.241%	2.443%
80	6.613%	5.406%	5.598%	3.962%
85	10.815%	9.331%	9.213%	6.842%
90	16.253%	13.665%	15.860%	11.815%

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

Years of Service	General	Safety
0	80%	60%
1	80%	60%
2	80%	60%
3	80%	60%
4	80%	60%
5	23%	25%
6	23%	25%
7	23%	25%
8	23%	25%
9	23%	25%
10	23%	25%
11	15%	25%
12	15%	21%
13	15%	18%
14	15%	15%
15	15%	12%
16	15%	9%
17	15%	6%
18	15%	3%
19	15%	0%
20	15%	0%
21	12%	0%
22	9%	0%
23	6%	0%
24	3%	0%
25	0%	0%
26	0%	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%	6.50%	9.96%	9.96%
1	4.60%	5.00%	8.00%	8.41%
2	3.50%	4.00%	6.86%	7.38%
3	2.60%	3.00%	5.94%	6.35%
4	2.00%	2.30%	5.32%	5.63%
5	1.60%	1.80%	4.90%	5.11%
6	1.30%	1.40%	4.59%	4.70%
7	1.10%	1.25%	4.39%	4.54%
8	0.95%	1.10%	4.23%	4.39%
9	0.85%	1.00%	4.13%	4.28%
10	0.80%	0.95%	4.08%	4.23%
11	0.75%	0.90%	4.02%	4.18%
12	0.70%	0.85%	3.97%	4.13%
13	0.65%	0.85%	3.92%	4.13%
14	0.60%	0.85%	3.87%	4.13%
15	0.55%	0.85%	3.82%	4.13%
16	0.50%	0.85%	3.77%	4.13%
17	0.50%	0.85%	3.77%	4.13%
18	0.50%	0.85%	3.77%	4.13%
19	0.50%	0.85%	3.77%	4.13%
20 or More	0.50%	0.85%	3.77%	4.13%

1. The total expected increase in salary is the increase due to promotion and longevity, adjusted for assumed 3.25% per annum increases in the general wage. The total result is compounded rather than additive.

Rates of Separation from Active Service Tables A-6 to A-9

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:

- A-6: Rates of Separation from Active Service (other than Service Retirement) – General members
- A-7: Rates of Service Retirement from Active Service – General members
- A-8: Rates of Separation from Service (other than Service Retirement) – Safety members
- A-9: Rates of Service Retirement from Active Service – Safety members

Table A-6
Rate of Separation from Active Service (other than Service Retirement)
General Plans– Male and Female

Age	Plans 1, 2, 4, 5, 6, 7 ¹			All Plans		Years of Service	All Plans Other Terminations
	Service Disability	Ordinary Disability	Service Death	Ordinary Death (Male)	Ordinary Death (Female)		
18	0.00025	0.00015	0.00000	0.00032	0.00012	0	0.15000
19	0.00025	0.00015	0.00000	0.00034	0.00012	1	0.13000
20	0.00025	0.00015	0.00000	0.00033	0.00012	2	0.10500
21	0.00025	0.00015	0.00000	0.00032	0.00011	3	0.08500
22	0.00025	0.00015	0.00000	0.00030	0.00010	4	0.07500
23	0.00025	0.00015	0.00000	0.00028	0.00009	5	0.06700
24	0.00025	0.00015	0.00000	0.00026	0.00008	6	0.06000
25	0.00025	0.00015	0.00000	0.00025	0.00008	7	0.05400
26	0.00025	0.00015	0.00000	0.00027	0.00009	8	0.04900
27	0.00025	0.00015	0.00000	0.00028	0.00010	9	0.04400
28	0.00025	0.00015	0.00000	0.00030	0.00011	10	0.04100
29	0.00025	0.00015	0.00000	0.00031	0.00012	11	0.03800
30	0.00025	0.00015	0.00000	0.00032	0.00014	12	0.03500
31	0.00025	0.00015	0.00000	0.00034	0.00014	13	0.03300
32	0.00025	0.00015	0.00000	0.00036	0.00016	14	0.03100
33	0.00025	0.00015	0.00000	0.00038	0.00017	15	0.02900
34	0.00025	0.00015	0.00000	0.00040	0.00019	16	0.02700
35	0.00025	0.00015	0.00000	0.00042	0.00021	17	0.02500
36	0.00025	0.00015	0.00000	0.00045	0.00023	18	0.02300
37	0.00025	0.00015	0.00000	0.00048	0.00025	19	0.02100
38	0.00025	0.00015	0.00000	0.00051	0.00027	20	0.01900
39	0.00025	0.00015	0.00000	0.00055	0.00030	21	0.01700
40	0.00035	0.00020	0.00000	0.00059	0.00032	22	0.01500
41	0.00045	0.00025	0.00000	0.00064	0.00036	23	0.01400
42	0.00055	0.00030	0.00000	0.00069	0.00039	24	0.01300
43	0.00065	0.00035	0.00000	0.00075	0.00042	25	0.01200
44	0.00075	0.00040	0.00000	0.00081	0.00046	26	0.01100
45	0.00080	0.00055	0.00000	0.00088	0.00050	27	0.01000
46	0.00085	0.00070	0.00000	0.00096	0.00055	28	0.01000
47	0.00090	0.00085	0.00000	0.00104	0.00059	29	0.01000
48	0.00095	0.00100	0.00000	0.00114	0.00064	30 & Above ⁽³⁾	0.01000
49	0.00100	0.00105	0.00000	0.00124	0.00069		
50	0.00120	0.00110	0.00000	0.00134	0.00075		
51	0.00140	0.00115	0.00000	0.00146	0.00081		
52	0.00160	0.00120	0.00000	0.00158	0.00087		
53	0.00180	0.00120	0.00000	0.00170	0.00095		
54	0.00200	0.00120	0.00000	0.00183	0.00102		
55	0.00215	0.00120	0.00000	0.00197	0.00111		
56	0.00230	0.00120	0.00000	0.00212	0.00120		
57	0.00245	0.00120	0.00000	0.00230	0.00130		
58	0.00245	0.00120	0.00000	0.00248	0.00140		
59	0.00245	0.00120	0.00000	0.00266	0.00153		
60	0.00245	0.00120	0.00000	0.00287	0.00167		
61	0.00245	0.00120	0.00000	0.00310	0.00183		
62	0.00245	0.00120	0.00000	0.00334	0.00200		
63	0.00245	0.00120	0.00000	0.00361	0.00220		
64	0.00245	0.00120	0.00000	0.00390	0.00242		
65	0.00245	0.00120	0.00000	0.00421	0.00266		
66	0.00245	0.00120	0.00000	0.00455	0.00294		
67	0.00245	0.00120	0.00000	0.00493	0.00326		
68	0.00245	0.00120	0.00000	0.00535	0.00360		
69	0.00245	0.00120	0.00000	0.00581	0.00398		
70	0.00245	0.00120	0.00000	0.00633	0.00440		
71	0.00245	0.00120	0.00000	0.00690	0.00487		
72	0.00245	0.00120	0.00000	0.00753	0.00538		
73	0.00245	0.00120	0.00000	0.00824	0.00595		
74	0.00245	0.00120	0.00000	0.00901	0.00658		

1. General Plan 3 does not provide pre-retirement death or disability benefits. No assumptions are made for disability or service connected death benefits for active members of General Plan 3.

Table A-7
Rates of Service Retirement from Active Service
General Plans – Male and Female

Age	Plans 1, 2, 4			Plans 5, 7 ¹			Plan 3
	Less than 20 Years of Service ²	20 to 29 Years of Service	30+ Years of Service ³	Less than 20 Years of Service	20 to 29 Years of Service	30+ Years of Service ³	All Years of Service
50	0.02250	0.03600	0.05100	0.01800	0.02880	0.04080	N/A
51	0.02250	0.03600	0.05100	0.01800	0.02880	0.04080	N/A
52	0.02250	0.03600	0.05100	0.01800	0.02880	0.04080	N/A
53	0.03000	0.04800	0.06800	0.02400	0.03840	0.05440	N/A
54	0.03750	0.06000	0.08500	0.03000	0.04800	0.06800	N/A
55	0.07500	0.12000	0.17000	0.06000	0.09600	0.13600	0.03000
56	0.03750	0.06000	0.08500	0.03000	0.04800	0.06800	0.03000
57	0.05625	0.09000	0.12750	0.04500	0.07200	0.10200	0.03000
58	0.07500	0.12000	0.17000	0.06000	0.09600	0.13600	0.03000
59	0.11250	0.18000	0.25500	0.09000	0.14400	0.20400	0.03000
60	0.11250	0.18000	0.25500	0.09000	0.14400	0.20400	0.03000
61	0.15000	0.24000	0.34000	0.12000	0.19200	0.27200	0.06000
62	0.18750	0.30000	0.42500	0.15000	0.24000	0.34000	0.15000
63	0.16500	0.26400	0.37400	0.13200	0.21120	0.29920	0.10000
64	0.16500	0.26400	0.37400	0.13200	0.21120	0.29920	0.15000
65	0.22500	0.36000	0.51000	0.18000	0.28800	0.40800	0.30000
66	0.22500	0.36000	0.36000	0.18000	0.28800	0.40800	0.30000
67	0.22500	0.36000	0.36000	0.27000	0.43200	0.61200	0.30000
68	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.30000
69	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.30000
70	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.40000
71	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.40000
72	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.40000
73	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.40000
74	0.30000	0.36000	0.36000	0.22500	0.36000	0.36000	0.40000
75	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

1. Rates of retirement are 0% prior to age 52 for Plan 7.
2. Rates of retirement are 0% prior to attaining 10 Years of Service.
3. 100% probability of retirement is assumed as follows:
 - at ages 62 and above with 38 or more years of service for General Plans 1, 2, and 4.
 - at ages 65 and above with 41 or more years of service for General Plan 5.
 - at ages 67 and above with 40 or more years of service for General Plan 7.

Table A-8
Rate of Separation from Active Service (other than Service Retirement)
Safety and Probation – Male and Female

Age	Service Disability	Ordinary Disability	Service Death	Ordinary Death (Male)	Ordinary Death (Female)	Years of Service	Other Terminations
18	0.00100	0.00000	0.00010	0.00033	0.00013	0	0.10000
19	0.00100	0.00000	0.00010	0.00036	0.00014	1	0.08000
20	0.00100	0.00000	0.00010	0.00037	0.00014	2	0.06000
21	0.00100	0.00000	0.00010	0.00037	0.00015	3	0.04500
22	0.00100	0.00000	0.00010	0.00036	0.00015	4	0.03500
23	0.00100	0.00000	0.00010	0.00035	0.00016	5	0.03000
24	0.00100	0.00000	0.00010	0.00034	0.00017	6	0.02600
25	0.00110	0.00000	0.00010	0.00033	0.00018	7	0.02300
26	0.00120	0.00000	0.00010	0.00034	0.00019	8	0.02100
27	0.00130	0.00000	0.00010	0.00035	0.00020	9	0.01900
28	0.00140	0.00000	0.00010	0.00036	0.00022	10	0.01700
29	0.00150	0.00000	0.00010	0.00037	0.00023	11	0.01500
30	0.00165	0.00000	0.00010	0.00037	0.00024	12	0.01350
31	0.00180	0.00000	0.00010	0.00038	0.00025	13	0.01200
32	0.00195	0.00000	0.00010	0.00039	0.00027	14	0.01100
33	0.00210	0.00000	0.00010	0.00040	0.00029	15	0.01000
34	0.00225	0.00000	0.00010	0.00041	0.00031	16	0.00900
35	0.00240	0.00000	0.00010	0.00042	0.00032	17	0.00800
36	0.00255	0.00000	0.00010	0.00044	0.00034	18	0.00700
37	0.00270	0.00000	0.00010	0.00045	0.00037	19	0.00600
38	0.00285	0.00000	0.00010	0.00048	0.00039	20 & Above ⁽³⁾	0.00500
39	0.00300	0.00000	0.00010	0.00050	0.00041		
40	0.00315	0.00000	0.00010	0.00053	0.00044		
41	0.00330	0.00000	0.00010	0.00056	0.00047		
42	0.00345	0.00000	0.00010	0.00060	0.00050		
43	0.00360	0.00000	0.00010	0.00064	0.00053		
44	0.00375	0.00000	0.00010	0.00068	0.00057		
45	0.00390	0.00000	0.00010	0.00074	0.00060		
46	0.00405	0.00000	0.00010	0.00079	0.00064		
47	0.00420	0.00000	0.00010	0.00086	0.00068		
48	0.00435	0.00000	0.00010	0.00092	0.00072		
49	0.00450	0.00000	0.00010	0.00100	0.00077		
50	0.01000	0.00000	0.00010	0.00108	0.00082		
51	0.01200	0.00000	0.00010	0.00116	0.00087		
52	0.01300	0.00000	0.00010	0.00126	0.00093		
53	0.01400	0.00000	0.00010	0.00136	0.00098		
54	0.01500	0.00000	0.00010	0.00146	0.00104		
55	0.02000	0.00000	0.00010	0.00158	0.00111		
56	0.02000	0.00000	0.00010	0.00171	0.00118		
57	0.02000	0.00000	0.00010	0.00185	0.00126		
58	0.02000	0.00000	0.00010	0.00201	0.00133		
59	0.02000	0.00000	0.00010	0.00219	0.00142		
60	0.01750	0.00000	0.00010	0.00238	0.00151		
61	0.01750	0.00000	0.00010	0.00259	0.00160		
62	0.01750	0.00000	0.00010	0.00284	0.00171		
63	0.01750	0.00000	0.00010	0.00310	0.00182		
64	0.01750	0.00000	0.00010	0.00338	0.00194		

Table A-9
Rates of Service Retirement from Active Service
Safety and Probation – Male and Female

Age	Plans 1, 2, 4				Plans 5, 6, 7 ¹			
	Less than 15 Years of Service ²	15 to 19 Years of Service	20 to 24 Years of Service	25+ Years of Service ³	Less than 15 Years of Service ²	15 to 19 Years of Service	20 to 24 Years of Service	25+ Years of Service ³
45	0.00000	0.00000	0.05000	0.07500	0.00000	0.00000	0.04000	0.06000
46	0.00000	0.00000	0.05000	0.07500	0.00000	0.00000	0.04000	0.06000
47	0.00000	0.00000	0.05000	0.07500	0.00000	0.00000	0.04000	0.06000
48	0.00000	0.00000	0.05000	0.07500	0.00000	0.00000	0.04000	0.06000
49	0.00000	0.00000	0.20000	0.30000	0.00000	0.00000	0.16000	0.24000
50	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
51	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
52	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
53	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
54	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
55	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
56	0.13000	0.19500	0.26000	0.39000	0.10400	0.15600	0.20800	0.31200
57	0.16000	0.24000	0.32000	0.48000	0.16000	0.24000	0.32000	0.48000
58	0.16000	0.24000	0.32000	0.48000	0.16000	0.24000	0.32000	0.48000
59	0.13000	0.19500	0.26000	0.39000	0.13000	0.19500	0.26000	0.39000
60	0.20000	0.30000	0.40000	0.60000	0.20000	0.30000	0.40000	0.60000
61	0.20000	0.30000	0.40000	0.60000	0.20000	0.30000	0.40000	0.60000
62	0.20000	0.30000	0.40000	0.60000	0.20000	0.30000	0.40000	0.60000
63	0.20000	0.30000	0.40000	0.60000	0.20000	0.30000	0.40000	0.60000
64	0.20000	0.30000	0.40000	0.60000	0.20000	0.30000	0.40000	0.60000
65	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000

1. Rates of retirement are 0% prior to age 50 for Plan 7.
2. Rates of retirement are 0% prior to attaining 10 Years of Service.
3. 100% probability of retirement is assumed as follows:
 - with 33 or more years of service for Safety and Probation Plans 1, 2, and 4.
 - at ages 55 and above with 33 or more years of service for Safety and Probation Plan 5.
 - at ages 55 and above with 38 or more years of service for Safety and Probation Plan 6.
 - at ages 57 and above with 38 or more years of service for Safety and Probation Plan 7.