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San Bernardino County Employees'
Retirement Association

Actuarial Experience Study

**Analysis of Actuarial Experience During the Period
July 1, 2019 through May 31, 2022**

May 24, 2023

Board of Retirement
San Bernardino County Employees' Retirement Association
348 West Hospitality Lane, Third Floor
San Bernardino, CA 92415-0014

RE: Review of Actuarial Assumptions for the June 30, 2023 Actuarial Valuation

Dear Members of the Board:

We are pleased to submit this report of our review of the actuarial experience for the San Bernardino County Employees' Retirement Association (SBCERA). This study utilizes the census data for the period July 1, 2019 to May 31, 2022 as well as prior periods for some assumptions, and provides the proposed actuarial assumptions, both economic and demographic, to be used in the June 30, 2023 valuation.

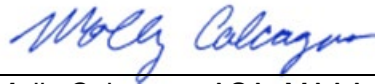
We are members of the American Academy of Actuaries and we meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

We look forward to reviewing this report with you and answering any questions you may have.

Sincerely,



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



Molly Calcagno, ASA, MAAA, EA
Senior Actuary

JY/jl

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1. Introduction, Summary, and Recommendations

To project the cost and liabilities of the pension plan, assumptions are made about all future events that could affect the amount and timing of the benefits to be paid and the assets to be accumulated. Each year actual experience is compared against the projected experience, and to the extent there are differences, the future contribution requirement is adjusted.

If assumptions are modified, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Taking into account one year's gains or losses without making a change in the assumptions means that year's experience is treated as temporary and that, over the long run, experience will return to what was originally assumed. For example, the actuarial assumptions used in the most recent valuation did not include any possible short-term or long-term impacts on mortality of the covered population that emerged due to COVID-19.¹ Changing assumptions reflects a basic change in thinking about the future, and has a much greater effect on the current contribution requirements than recognizing gains or losses as they occur.

The use of realistic actuarial assumptions is important in maintaining adequate funding, while paying the promised benefit amounts to participants already retired and to those near retirement. The actuarial assumptions used do not determine the "actual cost" of the plan. The actual cost is determined solely by the benefits and administrative expenses paid out, offset by investment income received. However, it is desirable to estimate as closely as possible what the actual cost will be so as to permit an orderly method for setting aside contributions today to provide benefits in the future, and to maintain equity among generations of participants and taxpayers.

This study was undertaken in order to review the economic and demographic actuarial assumptions and to compare the actual experience with that expected under the current assumptions during the three-year experience period from July 1, 2019 through May 31, 2022. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27 "Selection of Economic Assumptions for Measuring Pension Obligations"² and ASOP No. 35 "Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations." These Standards of Practice provide guidance for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected future experience, we are recommending various changes in the current actuarial assumptions.

The actuarial valuation report as of June 30, 2022 was based on demographic data as of May 31, 2022. As such, we have adjusted the exposure when analyzing certain demographic experience to account for the 11-month period used in the June 30, 2022 valuation.

¹ An analysis of the ongoing impact of COVID-19 is beyond the scope of the current experience study.

² References made later in this report are with respect to the revised ASOP 27 adopted in June 2020.

We are recommending changes in the assumptions for: inflation, merit and promotion salary increases, administrative expenses, retirement from active employment, retirement age for deferred vested members, percentage of members electing the unmodified option with an eligible spouse or domestic partner, reciprocal salary increases, pre-retirement mortality, post-retirement healthy, disabled life post-retirement mortality, beneficiary mortality, termination (refunds and deferred vested retirements), disability incidence (service and non-service), leave cashouts, and percent of members receiving supplemental disability and survivor assumptions for use in the Survivor Benefit Valuation.

Our recommendations for the major actuarial assumption categories are as follows:

Pg #	Actuarial Assumption Categories	Recommendation
11	Inflation: Future increases in the Consumer Price Index (CPI), which drives investment returns and active member salary increases.	Reduce the inflation assumption from 2.75% to 2.50% per annum as discussed in Section (3)(A).
14	Retiree Cost-of-Living Increases: Future increases in the cos- of-living adjustment for retirees.	Maintain the current assumption of 2.00% per annum as discussed in Section (3)(A).
15	Investment Return: The estimated average future net rate of return on current and future assets of the Association as of the valuation date. This rate is used to discount liabilities.	Maintain the current investment return assumption at 7.25% per annum as discussed in Section (3)(B).
25	<p>Individual Salary Increases: Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components:</p> <ul style="list-style-type: none"> • Inflationary salary increases • Real “across the board” salary increases • Merit and promotion increases 	<p>Reduce the current inflationary salary increase assumption from 2.75% to 2.50% and maintain the current real “across the board” salary increase assumption at 0.50%. This means that the combined inflationary and real “across the board” salary increases will decrease from 3.25% to 3.00%.</p> <p>Adjust the merit and promotion rates of salary increase as developed in Section 3(C) to reflect past experience. Future merit and promotion salary increases are higher in some service categories and lower in other service categories under the proposed assumptions.</p> <p>The recommended <u>total</u> rates of salary increase anticipate lower increases overall than the current assumptions for General and Safety members when taking into account the lower inflation component.</p>
31	Administrative Expenses: Fees for administration, legal, accounting, and actuarial services, and other functions carried out by the Association.	Increase the explicit administrative expense load from 0.85% to 0.90% of projected payroll as discussed in Section (3)(D).

Pg #	Actuarial Assumption Categories	Recommendation
32	<p>Retirement Rates: The probability of retirement at each age at which participants are eligible to retire.</p> <p>Other Retirement Related Assumptions including:</p> <ul style="list-style-type: none"> • Retirement age for deferred vested members • Future reciprocal members and reciprocal salary increases • Percent married and spousal age differences for members not yet retired 	<p>For active members, adjust the current retirement rates to those developed in Section (4)(A).</p> <p>For General members, maintain the assumed retirement age for both reciprocal and non-reciprocal deferred vested members at 59. For Safety members, maintain the assumed retirement age for reciprocal deferred vested members at 53 and decrease the assumed retirement age for non-reciprocal deferred vested members from 53 to 52.</p> <p>Maintain the current proportion of future deferred vested members expected to be covered by a reciprocal system at 40% for General members and 65% for Safety members. In addition, decrease the reciprocal salary increase assumption from 4.55% to 4.30% for General members and maintain the assumption at 4.75% for Safety members.</p> <p>For active and deferred vested members, maintain the current percent married at retirement assumption at 65% for males and decrease the assumption to 50% for females. Maintain the spouse age difference assumption that male retirees are three years older than their spouses and female retirees are two years younger than their spouses.</p>
42	<p>Mortality Rates: The probability of dying at each age. Mortality rates are used to project life expectancies.</p>	<p>Healthy Retirees:</p> <p>Current & recommended base table for General Members: Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 10% for males and females.</p> <p>Current base table for Safety Members: Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table.</p> <p>Recommended base table for Safety Members: Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates decreased by 5% for females.</p> <p>All Beneficiaries:</p> <p>Current base table: Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table with rates increased by 10% for males and females.</p> <p>Recommended base table: Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and 15% for females.</p> <p>For the purposes of the actuarial valuations (for funding and financial reporting), when calculating the liability for the continuance to a beneficiary of a surviving member we recommend that the General Healthy Retiree mortality tables be used for beneficiary mortality both before and after the expected death of the General or Safety member. Upon the actual death of the member (i.e., for all beneficiaries in pay status as of the valuation date), we recommend for the purposes of the actuarial valuations that we use the Contingent Survivor mortality tables as stated above.</p> <p>Pre-Retirement Mortality:</p> <p>Current & recommended base table for General Members: Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table.</p> <p>Current & recommended base table for Safety Members: Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table.</p>

Pg #	Actuarial Assumption Categories	Recommendation
	Mortality Rates (continued)	<p>Disabled Retirees:</p> <p>Current base table for General Members: Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table.</p> <p>Recommended base table for General Members: Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with rates decreased by 5% for females.</p> <p>Current & recommended base table for Safety Members: Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table.</p> <p>All current tables are projected generationally with the two-dimensional mortality improvement scale MP-2019.</p> <p>All recommended tables are projected generationally with the two-dimensional mortality improvement scale MP-2021. This is the most recent projection scale, as an updated projection scale was not published in 2022.</p> <p>For member contribution rates, optional forms, and reserves: change the mortality rates to those developed in Section (4)(B).</p>
54	Termination Rates: The probability of leaving employment at each age and receiving either a refund of member contributions or a deferred vested retirement benefit.	Adjust the termination rates to those developed in Section (4)(D) to reflect a higher incidence of termination overall. In addition, a slightly lower proportion of members is expected to elect a refund of member contributions with a higher proportion electing instead to receive a deferred vested benefit under the recommended assumptions.
62	Disability Incidence Rates: The probability of becoming disabled at each age.	Adjust the disability rates to those developed in Section (4)(E) to reflect slightly lower incidence of disability for General members and slightly higher incidence of disability for Safety members.
65	Leave Cashouts: Additional pay elements that are expected to be received during the member's final average earnings period.	Decrease assumption to anticipate leave cashouts at retirement for General Tier 1 members from 1.00% to 0.75% and for Safety Tier 1 members from 2.00% to 1.75% as developed in Section (4)(F).
67	Survivor Assumptions for Survivor Benefit Valuation: The probability of being married or having eligible children upon pre-retirement death.	Adjust the survivor assumption to those consistent with the 2021 U.S. Census data to those developed in Section (4)(G). Overall, there will be slight decreases in the assumed percent of members with survivors.

We have estimated the impact of all the recommended economic and demographic assumptions as if they were applied to the June 30, 2022 actuarial valuation. The table below shows the changes in the employer and member contribution rates due to the proposed assumption changes separately for the recommended economic assumption changes (as recommended in Section 3 of this report) and the recommended demographic assumption changes (as recommended in Section 4 of this report).

The cost associated with the administrative expense load has continued to be allocated to both the employer and the member based on the components of the total contribution rate (before administrative expenses) for the employer and the member.³

³ The actual allocation of contribution rates for administrative expenses will be determined in each actuarial valuation to reflect the relative proportion of employer and member contributions.

Cost Impact of the Recommended Assumptions Based on June 30, 2022 Actuarial Valuation

Assumption	Impact on Average Employer Contribution Rates
Decrease due to changes in economic assumptions	(0.33%)
Decrease due to changes in demographic assumptions	<u>(0.28%)</u>
Total decrease in average employer rate	(0.61%)
Total estimated decrease in annual dollar amount (\$000s)⁴	\$(14,393)

Assumption	Impact on Weighted Average Member Contribution Rates
Decrease due to changes in economic assumptions	(0.21%)
Decrease due to changes in demographic assumptions	<u>(0.21%)</u>
Total decrease in average member rate	(0.42%)
Total estimated decrease in annual dollar amount (\$000s)³¹	\$(8,416)

Assumption	Impact on UAAL (\$000s)
Decrease due to changes in economic assumptions	\$(90,390)
Decrease due to changes in demographic assumptions	<u>(27,459)</u>
Total decrease in UAAL (\$000s)	\$(117,849)

	Impact on Funded Percentage
Change in Funded Percentage	84.8% to 85.5%

Of the various recommended assumption changes, the most significant cost impact is from the change in inflation.

Section 2 provides some background on the basic principles and methodology used for the experience study and for the review of the economic and demographic actuarial assumptions. A detailed discussion of each assumption and reasons for the proposed changes are found in Section 3 for the economic assumptions and Section 4 for the demographic assumptions. The cost impact of the proposed changes is detailed in Section 5.

⁴ Based on June 30, 2022 projected annual payroll as determined under each set of assumptions.

2. Background and Methodology

In this report, we analyzed both economic and demographic (“non-economic”) assumptions. The primary economic assumptions reviewed are inflation, investment return, salary increases, and administrative expenses. Demographic assumptions include the probabilities of certain events occurring in the population of members, referred to as “decrements,” e.g., termination from service, disability retirement, service retirement, and death before and after retirement. In addition to decrements, other demographic assumptions reviewed in this study include the percentage of members electing the unmodified option with an eligible spouse or domestic partner, spousal age difference, percent of members assumed to go on to work for a reciprocal system, reciprocal salary increase, leave cashouts and survivor assumptions for use in the Survivor Benefit Valuation.

Economic Assumptions

Economic assumptions consist of:

- **Inflation:** Increases in the price of goods and services. The inflation assumption reflects the basic return that investors expect from securities markets. It also reflects the expected basic salary increase for active employees and drives increases in the allowances of retired members (if any).
- **Investment Return:** Expected long-term rate of return on the Association’s investments after investment expenses. This assumption has a significant impact on contribution rates.
- **Salary Increases:** In addition to inflationary increases, it is assumed that salaries will also grow by real “across the board” pay increases in excess of price inflation. It is also assumed that employees will receive raises above these average increases as they advance in their careers. These are commonly referred to as merit and promotion increases. Payments to amortize any Unfunded Actuarial Accrued Liability (UAAL) are assumed to increase each year by the price inflation rate plus any real “across the board” pay increases that are assumed.
- **Administrative Expenses:** These include expenses incurred in connection with the Plan’s operation.

The setting of these economic assumptions is described in Section 3.

Demographic Assumptions

In order to determine the probability of an event occurring, we examine the “decrements” and “exposures” of that event. For example, taking termination from service, we compare the number of employees who actually terminate in a certain age and/or service category (i.e., the number of “decrements”) with those who could have terminated (i.e., the number of “exposures”). For example, if there were 500 active employees in the 20-24 age group at the beginning of the year and 50 of them left during the year, we would say the probability of termination in that age group is $50 \div 500$ or 10%.

The reliability of the resulting probability is highly dependent on both the number of decrements and the number of exposures. For example, if there are only a few people in a high age category at the beginning of the year (number of exposures), we would not lend as much credibility to the probability of termination developed for that age category, especially if it is out of line with the pattern shown for the other age groups. Similarly, if we are considering the death decrement, there may be a large number of exposures in the age 20-24 category, but very few decrements (actual deaths); therefore, we would not be able to rely heavily on the probability developed for that category.

One reason we use several years of experience for such a study is to have more exposures and decrements, and therefore more statistical reliability. Another reason for using several years of data is to smooth out fluctuations that may occur from one year to the next. However, we also calculate the rates on a year-to-year basis to check for any trend that may be developing in the later years.

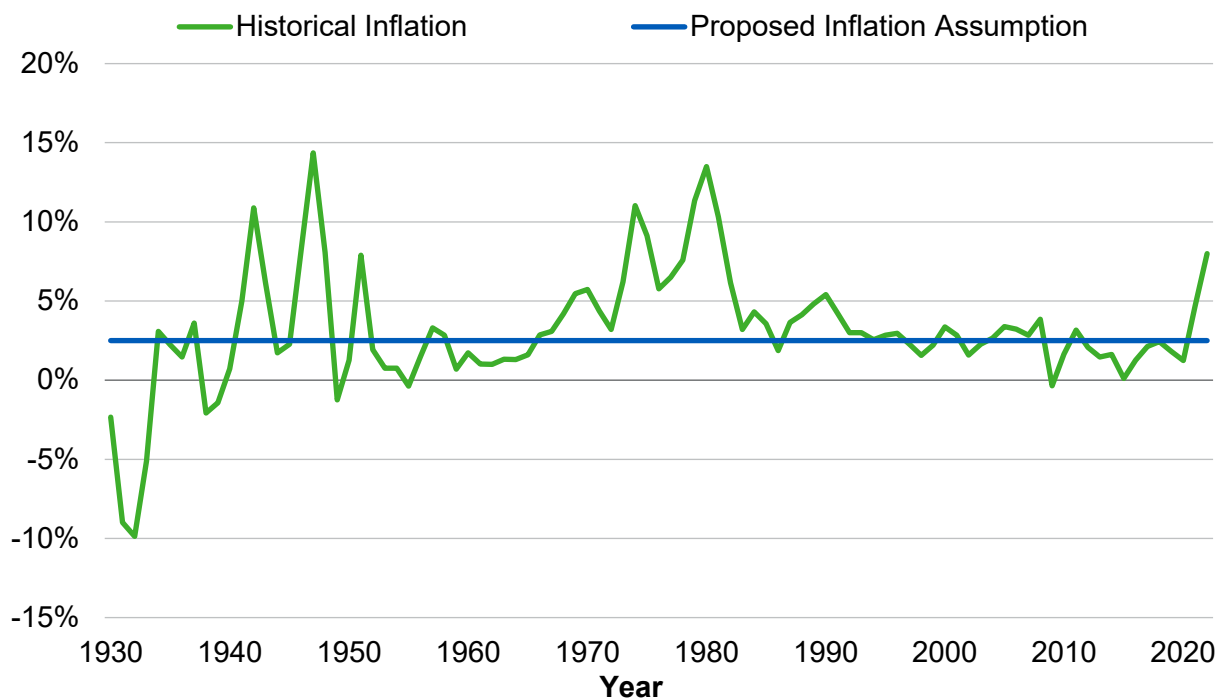
3. Economic Assumptions

A. Inflation

Unless an investment grows at least as fast as prices increase, investors will experience a reduction in the inflation-adjusted value of their investment. There may be times when “riskless” investments return more or less than inflation, but over the long term, investment market forces will generally require an issuer of fixed income securities to maintain a minimum return which protects investors from inflation.

The inflation assumption is long term in nature, so our analysis begins with a review of historical information. Following is a graph showing historical inflation rates and a comparison with the inflation assumption of 2.50% that we recommend in this report:

Historical Consumer Price Index – 1930 to 2022⁵
(U.S. City Average - All Urban Consumers)



There has been a spike in inflation that started in the second quarter of 2021 and continued into 2022. However, the rate of inflation, while still elevated, has been relatively steady since the Federal Reserve began to increase interest rates starting around the second quarter of 2022.

Based on information found in the Public Plans Database, which is produced in partnership with the National System of State Retirement Administrators (NASRA), the median inflation assumption used by 194 large public retirement funds in their 2021 fiscal year valuations was

⁵ Source: Bureau of Labor Statistics – Based on annual-to-annual CPI for All Items in U.S. city average, all urban consumers, not seasonally adjusted (Series ID: CUUR0000SA0).

2.50%.⁶ In California, CalSTRS and ten⁷ 1937 Act CERL systems (including SBCERA) currently use an inflation assumption of 2.75%, the other ten 1937 Act CERL systems use an inflation assumption of 2.50%⁸ and CalPERS uses an inflation assumption of 2.30%.

SBCERA's investment consultant, New England Pension Consultants (NEPC), anticipates an annual inflation rate of 2.60% over a 30-year horizon,⁹ while the average inflation assumption provided by NEPC and five other investment advisory firms retained by Segal's California public sector clients, as well as Segal's investment advisory division (Segal Marco Advisors),¹⁰ was 2.43%. Note that, in general, investment consultants use a time horizon for this assumption that is shorter than the time horizon we use for the actuarial valuation.¹¹

To find a forecast of inflation based on a longer time horizon, we referred to the Social Security Administration's (SSA) 2023 report on the financial status of the Social Security program.¹² The projected average increase in the Consumer Price Index (CPI) over the next 75 years under the intermediate cost assumptions used in that report was 2.40%. The SSA report also includes alternative projections using lower and higher inflation assumptions of 1.80% and 3.00%, respectively.

We also compared the yields on the thirty-year inflation indexed U.S. Treasury bonds to comparable traditional U.S. Treasury bonds.¹³ This "break-even rate" is commonly regarded as a market-based gauge of future inflation expectations. As of February 2023, the difference in yields is about 2.29% which provides a measure of market expectations of inflation. This market expectation for long term inflation can be quite volatile and has dropped from the high of 2.55% over the last 12 months, which is illustrated in the table below. It is worth noting that even during the peak of the recent inflation spike this break-even rate exceeded 2.50% in only a single month, April 2022.

⁶ Among 219 large public retirement funds, the 2021 fiscal year inflation assumption was not available for 25 of the public retirement funds in the survey data as of March 2023.

⁷ We note that out of these ten 1937 Act CERL Systems, five of those are served by Segal and we would generally expect to recommend 2.50% as the inflation assumption in their next experience study. SBCERA is included in this count.

⁸ Four of these 1937 Act CERL systems use a 2.50% inflation assumption with a 2.75% COLA assumption.

⁹ The annual inflation assumption used by NEPC is 2.5% over a 10-year horizon.

¹⁰ We note that this is the first time we have included inflation and real rate of return assumptions used by Segal Marco Advisors in our review of economic assumptions for SBCERA.

¹¹ The time horizon used by the six investment consultants included in our review, with the exception of one investment consultant that uses a 1-year horizon, generally ranges from 20 years to 30 years, with NEPC using a 30-year horizon.

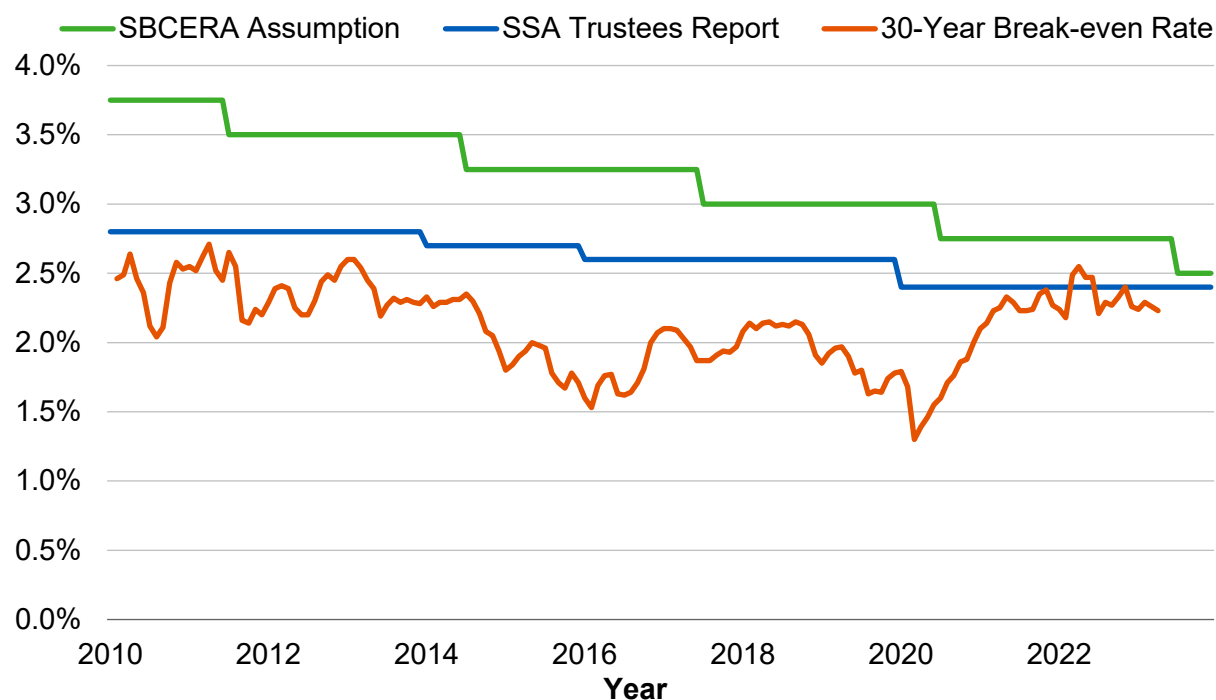
¹² Source: Social Security Administration: The 2023 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds.

¹³ Source: Board of Governors of the Federal Reserve System.

Observation Month	Difference in Yields	Observation Month	Difference in Yields
November 2021	2.38%	August 2022	2.29%
December 2021	2.27%	September 2022	2.27%
January 2022	2.24%	October 2022	2.33%
February 2022	2.18%	November 2022	2.40%
March 2022	2.49%	December 2022	2.26%
April 2022	2.55%	January 2023	2.24%
May 2022	2.47%	February 2023	2.29%
June 2022	2.47%	March 2023	2.26%
July 2022	2.21%	April 2023	2.23%

The following graph shows Segal's historical and proposed inflation assumptions compared to the two other measures just discussed, going back to 2010. In effect, this compares Segal's assumption to two separate independent forecasts, one based on market observations and one developed by economists at the SSA. The graph shows that over this period, Segal's assumption has been higher but consistently moving towards these other forecasts.

Historical Inflation Forecasts



The setting of the inflation assumption using the information outlined above is a somewhat subjective process, and Segal does not apply a specific weight to each of the metrics in determining our recommended inflation assumption. Based on a consideration of all of the above metrics, beginning in 2021 we are generally recommending the same 2.50% inflation assumption in our experience studies for our California public retirement system clients.

Based on all of the above information, we recommend reducing the annual inflation assumption from 2.75% to 2.50%.

Retiree Cost-of-Living Increases

In our last experience study as of June 30, 2020, consistent with the 2.75% annual inflation assumption adopted by the Board, the Board maintained the 2.00% retiree cost-of-living adjustment for all General and Safety tiers.

We recommend that the current retiree cost-of-living assumption of 2.00% per year be continued in the June 30, 2023 valuation for all tiers.

In developing the COLA assumption, we also considered the results of a stochastic approach that would attempt to account for the possible impact of low inflation that could occur before COLA banks are able to be established for the member. Although the results of this type of analysis might justify the use of a lower COLA assumption, we are not recommending that at this time. The reasons for this conclusion include the following:

- The results of the stochastic modeling are significantly dependent on assuming that lower levels of inflation will persist in the early years of the projections. If this is not assumed, then the stochastic modeling will produce results similar to our proposed COLA assumptions.
- Using lower long-term COLA assumptions based on a stochastic analysis would mean that an actuarial loss would occur even when the inflation assumption of 2.50% is met in a year. We question the reasonableness of this result.

We do not see the stochastic possibility of COLAs averaging less than those predicted by the assumed rate of inflation as a reliable source of cost savings that should be anticipated in our COLA assumptions. Therefore, we continue to recommend setting the COLA assumptions based on the lesser of the provision adopted by the employers to provide an up to 2.0% retiree cost-of-living adjustment or the maximum annual long-term annual inflation assumption, as we have in prior years.

B. Investment Return

The investment return assumption is comprised of two primary components, inflation and real rate of investment return, with adjustments for expenses and risk.

Real Rate of Investment Return

This component represents the portfolio's incremental investment market returns over inflation. Generally, when an investor takes on greater investment risk, the return on the investment is expected to also be greater, at least in the long run. This additional risk and return is expected to vary by asset class and empirical data supports that expectation. For that reason, the real rate of return assumptions are developed by asset class. Therefore, the real rate of return assumption for a retirement plan's portfolio will vary with the Board's asset allocation among asset classes.

The Association's current target asset allocation and the assumed real rate of return assumptions by asset class are shown in the following table. The first column of real rate of return assumptions are determined by reducing NEPC's total or "nominal" 2023 return assumptions by their assumed 2.60% inflation rate. The second column of returns (except for Non-Core Real Estate, Real Assets, Absolute Return, and International Credit) represents the average of a sample of real rate of return assumptions. The sample includes the expected annual real rate of return provided to us by NEPC and five other investment advisory firms retained by Segal's public sector clients, as well as Segal's investment advisory division. We believe these averages are a reasonable consensus forecast of long-term future market returns in excess of inflation.¹⁴

¹⁴ Note that, just as for the inflation assumption, in general the time horizon used by the investment consultants in determining the real rate of return assumption is shorter than the time horizon encompassed by the actuarial valuation.

SBCERA's Target Asset Allocation and Assumed Arithmetic Net Real Rate of Return Assumptions by Asset Class and for the Portfolio

Asset Class	Percentage of Portfolio	NEPC's Assumed Net Real Rate of Return ¹⁵	Average Assumed Net Real Rate of Return from a Sample of Consultants to Segal's California Public Sector Clients ¹⁶
Large Cap U.S. Equity	14.50%	5.60%	6.00%
Small Cap U.S. Equity	2.50%	6.70%	6.65%
Developed International Equity	7.00%	5.80%	7.01%
Emerging Markets Equity	6.00%	10.30%	8.80%
U.S. Core Fixed Income	2.00%	2.20%	1.97%
Emerging Market Debt	6.00%	5.00%	4.76%
Real Estate - Core	2.50%	3.50%	3.86%
Cash & Equivalents	2.00%	0.80%	0.63%
Private Equity	18.00%	10.30%	9.84%
High Yield/Credit Strategies ¹⁷	13.00%	7.10%	6.48%
Absolute Return	7.00%	7.10%	7.10% ¹⁸
Real Estate - Non Core	2.50%	5.40%	5.40% ¹⁸
Real Assets	6.00%	10.10%	10.10% ¹⁸
International Credit	<u>11.00%</u>	<u>7.10%</u>	<u>7.10%</u> ¹⁸
Total	100.00%	7.25%	7.12%

Generally, the above are representative of “indexed” returns for securities that are publicly traded, returns net of fees for securities that are non-publicly traded and do not include any additional returns (“alpha”) from active management. Consideration of returns without alpha is consistent with the Actuarial Standard of Practice No. 27, Section 3.8.3.d, which states:

“Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (or pessimistic). The actuary should not assume that superior or inferior returns will be achieved, net of investment expenses, from an active investment management strategy compared to a passive investment management strategy unless the actuary has reason to believe, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the long term.”

¹⁵ The rates shown have been estimated by Segal by taking NEPC's nominal projected arithmetic returns and reducing by NEPC's assumed 2.60% inflation rate to develop the assumed real rate of return shown.

¹⁶ These are based on the projected arithmetic returns provided by NEPC and five other investment advisory firms serving the county retirement association of San Bernardino and 16 other city and county retirement systems in California, as well as Segal's investment advisory division. These return assumptions are net of any applicable investment management expenses.

¹⁷ For this asset class, NEPC's assumption was averaged with the private credit asset category reported by other investment advisory firms in our survey.

¹⁸ For these asset classes, NEPC's assumption is applied in lieu of the average because there is a larger disparity in returns for these asset classes among the firms surveyed and using NEPC's assumption should more closely reflect the underlying investments made specifically for SBCERA.

The following are some observations about the returns provided above:

1. The investment consultants to our California public sector clients, as well as Segal's investment advisory division, have each provided us with their expected real rates of return for each asset class, over various future periods of time. However, in general, the returns available from investment consultants are projected over time periods that are shorter than the durations of a retirement plan's liabilities.
2. As discussed in the next section, the real rates of return provided this year by the investment consultants reflect a change in how investment expenses are reported.
3. Using a sample average of expected net real rates of return allows the Association's investment return assumption to reflect a broader range of capital market information and should help reduce year to year volatility in the investment return assumption.
4. Therefore, we recommend that the 7.12% portfolio net real rate of return be used to determine SBCERA's investment return assumption, but with some caution. This return is 1.01% higher than the 6.11% gross return that was used three years ago in the review of the recommended investment return assumption for the June 30, 2020 valuation even before we consider the approximately 0.85% in investment management expense that, as discussed in the next section, will no longer be subtracted from the 7.12% gross return.
5. The 1.01% increase in the portfolio net real rate of return since the 2020 review is due to changes in the real rate of return assumptions provided to us by the investment advisory firms (+0.81% under the 2020 asset allocation), changes in SBCERA's target asset allocation (+0.23%) and the interaction effect between these changes (-0.03%). We believe the increase in the real rates of return may be due to the very low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate during 2022, and so should be used with caution in selecting a long-term investment return assumption.

Investment Expenses

For funding purposes, the real rate of return assumption for the portfolio needs to be adjusted for investment expenses expected to be paid from investment income. In the prior experience studies, we had adjusted the gross real rate of return developed using the target asset allocation by the investment expenses expected to be paid by SBCERA.

However, as prevailing practice by investment advisory firms is to provide us with the real rates of return net of expected investment expenses, especially for active portfolio management, we now need to make adjustments only for investment consulting fees, custodian fees and other miscellaneous investment expenses. The following table provides these investment expenses in relation to the actuarial value of assets as of the beginning of the year, for the six-year period ending June 30, 2022.

Investment Expenses as a Percentage of Actuarial Value of Assets (Dollars in 000's)

Year Ending June 30	Actuarial Value of Assets ¹⁹	Investment Expenses ²⁰	Investment %
2017	\$8,736,959	\$57,131	0.65%
2018	9,385,977	60,417	0.64
2019	10,020,863	66,358	<u>0.66</u>
Three-Year Average (2017-2019)			0.65
2020	10,642,401	54,091	0.51
2021	11,133,173	28,383	0.25
2022	12,258,925	50,792	<u>0.41</u>
Three-Year Average (2020-2022)			0.39
Six-Year Average			0.52
Current Assumption (including investment management fees)			1.35
Proposed Assumption (excluding investment management fees)			0.50

Based on the above experience, we recommend reducing the investment expense component of the investment return assumption from 1.35% to 0.50%.

Note related to investment expenses paid to active managers – As cited above, under Section 3.8.3.d of ASOP No. 27, the effect of an active investment management strategy should be considered “net of investment expenses...unless the actuary believes, based on relevant data, that such superior or inferior returns represent a reasonable expectation over the measurement period.”

We have not performed a detailed analysis to measure how much of the investment expenses paid to active managers might have been offset by additional returns (“alpha”) earned by that active management. For this study, we will continue to use the current approach that any “alpha” that may be identified would be treated as an increase in the risk adjustment and corresponding confidence level that are discussed in the next section. However, as discussed above, the real return assumptions provided by the investment advisory firms assume that active management will generate additional returns to cover the expense of such management, an assumption that is consistent with ASOP No. 27.

Risk Adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. SBCERA’s asset allocation determines this portfolio risk, since risk levels are driven by the variability of returns for the various asset classes and the correlation of returns among those asset classes. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment.

¹⁹ As of beginning of plan year.

²⁰ Equals the sum of consultant fees, custodian fees, legal fees, and other investment expenses. Excludes investment manager fees.

The purpose of the risk adjustment (as measured by the corresponding confidence level) is to increase the likelihood of achieving the actuarial investment return assumption in the long term.²¹ This is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

The 7.12% expected real rate of return developed earlier in this report was based on expected arithmetic average returns. A retirement system using an expected arithmetic average return as the discount rate in a funding valuation is expected on average to have no surplus or asset shortfall relative to its expected obligations assuming all actuarial assumptions are met in the future.²² That is the basis used in Segal's previous experience studies for SBCERA.

Beginning with this study, in addition to no longer including an explicit adjustment for investment management fees, we are converting the portfolio's expected arithmetic average return to an expected geometric average return. A retirement system using an expected geometric average return as the discount rate in a funding valuation will, over long periods of time, have an equal likelihood of having a surplus or asset shortfall relative to its expected obligations assuming all actuarial assumptions are met in the future.²³

Under either the arithmetic or geometric model, the confidence level associated with a particular risk adjustment represents a relative likelihood that future investment earnings would equal or exceed the assumed earnings over a 15-year period. The 15-year time horizon represents an approximation of the "duration" of the fund's liabilities, where the duration of a liability represents the sensitivity of that liability to interest rate variations.

For comparison purposes we first consider how the earlier model would look if used in this year's study. Three years ago, the Board adopted an investment return assumption of 7.25%. Under the model used in that experience study, that return implied a risk adjustment of 0.26%, corresponding to a 15-year confidence level of 53%, based on an annual portfolio return standard deviation of 11.60% provided by NEPC in 2020.

If we use the same 53% 15-year confidence level from our last study to set this year's risk adjustment and the current annual portfolio return standard deviation of 11.40% provided by NEPC, the corresponding risk adjustment would be 0.26%. Together with the other investment return components (including for this comparison updated expected arithmetic average returns and the same expense adjustment as used in the prior study), this would result in an investment return assumption of 8.01%, which is higher than the current assumption of 7.25%.

Based on the general practice of using one-quarter percentage point increments for economic assumptions, we evaluated the effect on the confidence level of other alternative investment return assumptions. We also considered that, as discussed above, the extraordinary increase in the real rates of return provided by the investment consultants may reflect the very low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate during 2022, and so could be overly optimistic when used for selecting a long-term investment return assumption.²⁴ For that reason, for this comparison value we considered maintaining a net investment return assumption of 7.25% which, together with the other investment return

²¹ This type of risk adjustment is referred to in the Actuarial Standards of Practice as a "margin for adverse deviation."

²² The mathematical terminology for this is that the mean (or average) surplus or asset shortfall is expected to be zero.

²³ The mathematical terminology for this is that over time the median surplus or asset shortfall is expected to be zero.

²⁴ For example, the SBCERA's expected return over 30-year time horizon calculated by NEPC using 2023 capital market assumptions is almost 1% higher when compared to using the 2022 capital market assumptions.

components, would produce a risk adjustment of 1.02% which corresponds to a confidence level of 63% under the model and expense adjustment used in prior studies. We believe this increase in confidence level would be appropriate given the concerns stated.

As noted above, beginning with this study, in addition to no longer including an explicit adjustment for investment management fees, we are converting the portfolio’s expected arithmetic average return to an expected geometric average return. For any given asset portfolio, the expected geometric average return will be less than expected arithmetic average return.²⁵ The difference depends on the variability of the portfolio as measured by its standard deviation. Based on the annual portfolio return standard deviation of 11.40% provided by NEPC, the adjustment to an expected geometric average return reduces the expected return by 0.60%.

Together with the other investment return components (now excluding investment management expenses) and prior to any risk adjustment, this would result in a median expected assumption of 8.52%, which is higher than the current assumption of 7.25%. In applying this model to SBCERA for the first time we again considered a net investment return assumption of 7.25% which, together with the other investment return components, would produce a risk adjustment of 1.27% which under the expected geometric average return model corresponds to a confidence level of 67%. **We recommend this increased confidence level given our stated concerns that current capital market assumptions could be overly optimistic when used for selecting a long-term investment return assumption.**

Recommended Investment Return Assumption

The following table summarizes the components of the recommended investment return assumption developed in the previous discussion. For comparison purposes, we have also included similar values from the last study as well as the comparison values discussed above that apply the prior year’s model using this year’s information.

Assumption Component	June 30, 2023 Recommended Value	June 30, 2023 Comparison Values	June 30, 2020 Adopted Value
Inflation	2.50%	2.50%	2.75%
Portfolio Expected Arithmetic Real Rate of Return	7.12%	7.12%	6.11%
Expense Adjustment	(0.50)%	(1.35)% ²⁶	(1.35)%
Adjustment to Expected Geometric Real Rate of Return	(0.60)%	N/A	N/A
Risk Adjustment	<u>(1.27)%</u>	<u>(1.02)%</u>	<u>(0.26)%</u>
Total	7.25%	7.25%	7.25%
Confidence Level	67%	63%	53%

Based on this analysis, we recommend maintaining the investment return assumption at 7.25% per annum. Because of our stated concerns that current capital market assumptions could be overly optimistic, we also recommend that Segal review this

²⁵ This is because the expected geometric average return reflects expected median outcomes, while the expected arithmetic average return reflects expected average or mean outcomes. Expected median outcomes are lower than expected average outcomes because they are less affected by the possibility of extraordinary (“outlier”) favorable outcomes.

²⁶ For purposes of these comparison values we have assumed the same investment expenses as in the previous study, which included investment management fees.

assumption next year based on 2024 capital market assumptions and based on that review consult with SBCERA staff to determine whether to recommend to the Board a formal out-of-cycle review of the investment return assumption in 2024.

The table below shows SBCERA’s recommended investment return assumption and the corresponding risk adjustment and confidence level compared to the similar values for prior studies.

Historical Investment Return Assumptions, Risk Adjustments and Confidence Levels based on Assumptions Adopted by the Board

Years Ending June 30	Investment Return²⁷	Risk Adjustment	Corresponding Confidence Level
2008 - 2010	8.00%	0.94%	64%
2011 - 2013	7.75%	0.38%	56%
2014 - 2016	7.50%	0.26%	53%
2017 - 2019	7.25%	0.05%	51%
2020 - 2022	7.25%	0.26%	53%
2023 (Comparison)	7.25%	1.02%	63%
2023 (Recommended)	7.25%	1.27%	67%

As we have discussed in prior experience studies, the risk adjustment model and associated confidence level is most useful as a means for comparing how SBCERA has positioned itself relative to risk over periods of time.²⁸ The use of either a 63% or 67% confidence level should be considered in context with other factors, including:

- As noted above, the confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparisons. This is particularly true when comparing confidence levels developed using different models, as we are doing in this transitional year from one model to another.
- The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by NEPC. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a “soft” number.
- We have not taken into account any additional returns (“alpha”) that might be earned on active management. This means that if active management generates enough alpha to cover its related expenses, this would increase returns. This aspect of Segal’s model is further evaluated below.
- As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the later section on “Comparison with Other Public Retirement Systems.”

²⁷ The investment returns starting in 2014 are gross of administrative expenses.

²⁸ In particular, it would not be appropriate to use this type of risk adjustment as a measure of determining an investment return rate that is “risk-free.”

- As noted earlier, we believe the increased confidence level is appropriate given our stated concerns that current capital market assumptions could be overly optimistic when used for selecting a long-term investment return assumption.

Comparison with Alternative Model used to Review Investment Return Assumption

In previous studies, we have consistently reviewed investment return assumptions based on our model that incorporates expected arithmetic real returns for the different asset classes and for the entire portfolio as one component of that model.²⁹ The use of “forward looking expected arithmetic returns” is one of the approaches discussed for use in the Selection of Economic Assumptions for measuring Pension Obligations under Actuarial Standards of Practice (ASOP) No. 27.

Besides using forward looking expected arithmetic returns, ASOP No. 27 also discusses setting investment return assumptions using an alternative “forward looking expected geometric returns” approach, which is the model we have used in this study.³⁰ Even though as noted earlier expected geometric returns are lower than expected arithmetic returns, public retirement systems that have set investment return assumptions using this geometric approach have in practice adopted investment return assumptions that are comparable to those adopted by the Board for SBCERA under the arithmetic approach. This is because under the model used by those retirement systems and by Segal in this report, the investment return assumption is not reduced to anticipate future investment management expenses. That is also why the comparison values and recommended values discussed earlier reach the same 7.25% expected return with generally comparable confidence levels.

In the interest of still having an alternative model for comparison, we evaluated the recommended 7.25% assumption based on the expected geometric return for the entire portfolio gross of management investment expenses, but using a fully stochastic approach and a different source for capital market assumptions. Under this alternative model, over a 15-year period, there is a 56% likelihood that future average geometric returns will meet or exceed 7.25%³¹ developed using the capital market assumptions compiled by Horizon Actuarial Services based their most recent survey published in August 2022. This 56% likelihood is somewhat lower than the corresponding likelihood of 58% that we observed in this comparison during the assumption review in 2020. We also note that some of the investment advisory firms that participated in the 2022 Horizon survey have since raised their capital market assumptions and it is reasonable to expect the 56% likelihood to increase if we were to revise these results using the updated capital market assumptions when the 2023 Horizon survey becomes available.

²⁹ Again, as discussed earlier in this section, if a retirement system uses the expected arithmetic average return as the discount rate in the funding valuation, that retirement system is expected to have no surplus or asset shortfall relative to its expected obligations assuming all actuarial assumptions are met in the future.

³⁰ As also noted earlier in slightly different terms, if a retirement system uses the expected geometric average return as the discount rate in the funding valuation, that retirement system is expected to have an asset value that generally converges to the median accumulated value as the time horizon lengthens assuming all actuarial assumptions are met in the future.

³¹ We performed this stochastic simulation using the capital market assumptions included in the 2022 survey prepared by Horizon Actuarial Services. That simulation was performed using 10,000 trial outcomes of future market returns, using assumptions from 20-year arithmetic returns, standard deviations and correlation matrix that were found in the 2022 survey that included responses from 24 investment advisors.

Comparing with Other Public Retirement Systems

One final test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide.

We note that an investment return of 7.00% or lower is becoming more common among California public sector retirement systems. In particular, of the twenty 1937 Act CERL systems, seven use a 7.00% investment return assumption, eight use 6.75%, two use 6.50% and one uses 6.25%. The remaining two 1937 Act CERL systems, including SBCERA, currently use a 7.25% investment return assumption. Furthermore, CalSTRS currently uses a 7.00% investment return assumption and CalPERS uses a 6.80% investment return assumption, while the San Jose and San Diego City retirement systems use investment return assumptions of 6.625% and 6.50%, respectively.

The following table compares SBCERA’s recommended net investment return assumption against those of the 210 large public retirement funds in their 2021 fiscal year valuations based on information found in the Public Plans Database, which is produced in partnership with NASRA.³²

Assumption	SBCERA	Public Plans Data ³³		
		Low	Median	High
Net Investment Return	7.25%	4.25%	7.00%	8.25%

The detailed survey results show that over 80% of the systems have an investment return assumption in the range of 6.75% to 7.50%. Also, over half of the systems have reduced their investment return assumption from 2017 to 2021. State systems outside of California tend to change their economic assumptions less frequently and so may lag behind emerging practices in this area.

In summary, we believe the recommended assumption of 7.25% provides for an appropriate risk margin within the risk adjustment model and is consistent with SBCERA’s historical practice relative to other public systems.

However, as discussed earlier, the increase in the real rates of return provided by the investment consultants may reflect the very low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate during 2022, and so could be overly optimistic when used for selecting a long-term investment return assumption. For that reason, we are also recommending that Segal review this assumption next year based on 2024 capital market assumptions and based on that review consult with SBCERA staff to determine whether to recommend to the Board a formal out-of-cycle review of the investment return assumption in 2024.

³² Among 219 large public retirement funds, the 2021 fiscal year investment return assumption was not available for 9 of the public retirement funds in the Public Plans Database as of March 2023.

³³ Public Plans Data website – Produced in partnership with the National System of State Retirement Administrators (NASRA).

As an alternative, and consistent with the general trend towards lower investment return assumptions, we believe it would also be reasonable to reduce the investment return assumption by 0.25% from 7.25% to 7.00% this year, to reflect the reduction in the inflation assumption component from 2.75% to 2.50%. This action would be in lieu of considering performing an out-of-cycle review next year.

C. Salary Increase

Salary increases impact plan costs in two ways: (i) by increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and (ii) by increasing total active member payroll which in turn generates lower UAAL contribution rates as a percent of payroll. These two impacts are discussed separately as follows:

As an employee progresses through his or her career, increases in pay are expected to come from three sources:

1. **Inflation:** Unless pay grows at least as fast as consumer prices grow, employees will experience a reduction in their standard of living. There may be times when pay increases lag or exceed inflation, but over the long term, labor market forces may require an employer to maintain its employees' standards of living.

As discussed earlier in this report, we are recommending that the assumed rate of inflation be reduced from 2.75% to 2.50% per annum. This inflation component is used as part of the salary increase assumption.

2. **Real "Across the Board" Pay Increases:** These increases are typically termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board". The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real "across the board" pay increases have averaged about 0.5% – 0.8% annually during the last ten to twenty years.

We also referred to the annual report on the financial status of the Social Security program published in June 2022. In that report, real "across the board" pay increases are forecast to be 1.15% per year under the intermediate assumptions.

The real pay increase assumption is generally considered a more "macroeconomic" assumption that is not necessarily based on individual plan experience. However, recent salary experience with public systems in California as well as anecdotal discussions with plans and plan sponsors indicate lower future real wage growth expectations for public sector employees. We note that for SBCERA's active members, the actual average inflation plus "across the board" increase (i.e., wage inflation) over the three year period ending June 30, 2022 was 3.53% for General and Safety members combined, which is lower than the change in CPI of 5.77% during that same period, largely as a result of the inflation spike discussed above:

Valuation Date	Actual Average Increase ³⁴	Actual Annual-to-Annual Change in CPI ³⁵
June 30, 2020	3.22%	1.93%
June 30, 2021	4.98%	7.90%
June 30, 2022	<u>2.38%</u>	<u>7.49%</u>
Three-Year Average	3.53%	5.77%

³⁴ Reflects the increase in average salary for members at the beginning of the year versus those at the end of the year. It does not reflect the average salary increases received by members who worked the full year.

³⁵ Based on the change in the November CPI for the Riverside-San Bernardino-Ontario Area compared to the prior year.

Even though the actual average salary increase was lower than the average change in the CPI over the 3-year period ending June 30, 2022, this was in part due to the spike in inflation in 2021-2022.

Based on all of the above information, we recommend maintaining the real “across the board” salary increase assumption at 0.50%. This means that the combined inflation and “across the board” salary increase assumption will decrease from 3.25% to 3.00%.

3. **Merit and Promotion Increases:** As the name implies, these increases come from an employee’s career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For SBCERA, there are service-specific merit and promotion increases.

The annual merit and promotion increases are determined by measuring the actual increases received by members over the experience period, net of the inflationary and real “across the board” pay increases. Increases are measured separately for General and Safety members. This is accomplished by:

- a. Measuring each continuing member’s actual salary increase over each year of the experience period on a salary-weighted basis, with higher weights assigned to experience from members with larger salaries;
- b. Excluding any members with increases of more than 50% or a decrease of more than 10% during any particular year;
- c. Categorizing these increases according to member demographics;
- d. Removing the wage inflation component from these increases (assumed to be equal to the increase in the members’ average salary during the year);
- e. Averaging these annual increases over the experience period; and
- f. Modifying current assumptions to reflect some portion of these measured increases reflective of their “credibility.”

To be consistent with the other economic assumptions, these merit and promotion assumptions should be used in combination with the 3.00% assumed inflation and real “across the board” increases recommended in this study.

Due to the high variability of the actual salary increases, we have analyzed this assumption using data for the past six years. We believe that when the experience from the current and prior studies is combined, it provides a more reasonable representation of potential future merit and promotion salary increases over the long term.

The following table shows the General members' actual average merit and promotion increases by years of service over the three-year period from July 1, 2019 through May 31, 2022 along with the actual average increases based on combining the current three-year period with the three-year period from the prior experience study. The current and proposed assumptions are also shown. The actual increases were reduced by the actual average inflation plus "across the board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year during the experience period (3.54% on average for the most recent three-year period, 2.38% on average for the prior three-year period).

General
Rate (%)

Years of Service	Current Assumption	Actual Average Increase (Last 3 Years)	Actual Average Increase from Current and Prior Studies (Last 6 Years)	Proposed Assumption
Less than 1	9.50	3.23	5.22	5.00
1 – 2	7.00	5.25	5.81	6.50
2 – 3	4.75	4.45	4.65	4.75
3 – 4	4.25	4.15	4.27	4.25
4 – 5	4.00	3.94	4.08	4.00
5 – 6	3.50	3.48	3.61	3.50
6 – 7	3.25	3.46	3.55	3.25
7 – 8	3.00	3.31	3.49	3.25
8 – 9	2.50	3.42	3.25	3.00
9 – 10	2.00	3.05	2.45	2.50
10 – 11	1.75	2.33	2.17	2.00
11 – 12	1.50	1.98	1.80	1.75
12 – 13	1.45	1.57	1.65	1.50
13 – 14	1.40	1.27	1.47	1.40
14 – 15	1.35	1.38	1.80	1.35
15 – 16	1.30	1.61	2.00	1.30
16 – 17	1.30	0.69	1.64	1.30
17 – 18	1.30	0.87	1.36	1.30
18 – 19	1.30	0.62	1.06	1.30
19 – 20	1.30	0.78	1.29	1.30
20 & Over	1.30	0.68	1.24	1.30

The following table shows the Safety members' actual average merit and promotion increases by years of service over the three-year period from July 1, 2019 through May 31, 2022 along with the actual average increases based on combining the current three-year period with the three-year period from the prior experience study. The current and proposed assumptions are also shown. The actual increases were reduced by the actual average inflation plus "across the board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year during the experience period (5.72% on average for the most recent three-year period, 2.91% on average for the prior three-year period).

Safety Rate (%)

Years of Service	Current Assumption	Actual Average Increase (Last 3 Years)	Actual Average Increase from Current and Prior Studies (Last 6 Years)	Proposed Assumption
Less than 1	9.00	7.05	5.87	7.00
1 – 2	5.50	3.12	3.60	4.75
2 – 3	4.00	2.85	3.24	3.75
3 – 4	3.80	2.73	3.18	3.75
4 – 5	3.70	3.93	4.24	3.75
5 – 6	3.60	4.08	4.24	3.75
6 – 7	3.50	4.89	5.03	3.75
7 – 8	3.25	4.82	4.57	3.75
8 – 9	3.00	4.76	4.46	3.50
9 – 10	2.75	4.54	4.27	3.25
10 – 11	2.25	2.91	2.80	2.50
11 – 12	2.00	1.61	2.31	2.00
12 – 13	1.90	1.94	2.55	1.90
13 – 14	1.85	1.34	1.90	1.85
14 – 15	1.80	0.63	1.73	1.80
15 – 16	1.75	0.82	1.71	1.75
16 – 17	1.70	1.20	1.95	1.75
17 – 18	1.65	1.27	2.26	1.75
18 – 19	1.60	1.18	2.22	1.75
19 – 20	1.55	2.05	2.41	1.75
20 & Over	1.50	1.85	2.59	1.75

Based on this experience, we are proposing changes in the merit and promotion salary increases for both General and Safety members, with increases in some service categories and decreases in other service categories. Overall, merit and promotion salary increases are assumed to be slightly lower for General and about the same for Safety members. However, the overall salary increases for both General and Safety will decrease due to the lower inflation component of the salary increase assumption.

Chart 1 that follows later in the section compares actual experience with the current and proposed rates of actual merit and promotion increases for General members. Also shown is the actual merit and promotion increases based on an average of both the current and previous three-year experience periods.

Chart 2 compares actual experience with the current and proposed rates of actual merit and promotion increases for Safety members. Also shown is the actual merit and promotion increases based on an average of both the current and previous three-year experience periods.

Active Member Payroll

Projected active member payrolls are used to develop the UAAL contribution rate. Future values are determined as a product of the number of employees in the workforce and the average pay for all employees. The average pay for all employees increases only by inflation and real “across the board” pay increases. The merit and promotion increases are not an influence, because this average pay is not specific to an individual.

Under the Board’s current practice, the UAAL contribution rate is developed by assuming that the total payroll for all active members will increase annually over the amortization periods at the same assumed rates of inflation plus real “across the board” salary increase assumptions as are used to project the member’s future benefits.

Consistent with the combined recommended inflation and real “across the board” salary increase assumptions, we recommend reducing the payroll growth assumption from 3.25% to 3.00% annually.

Chart 1: Merit and Promotion Salary Increase Rates
General Members

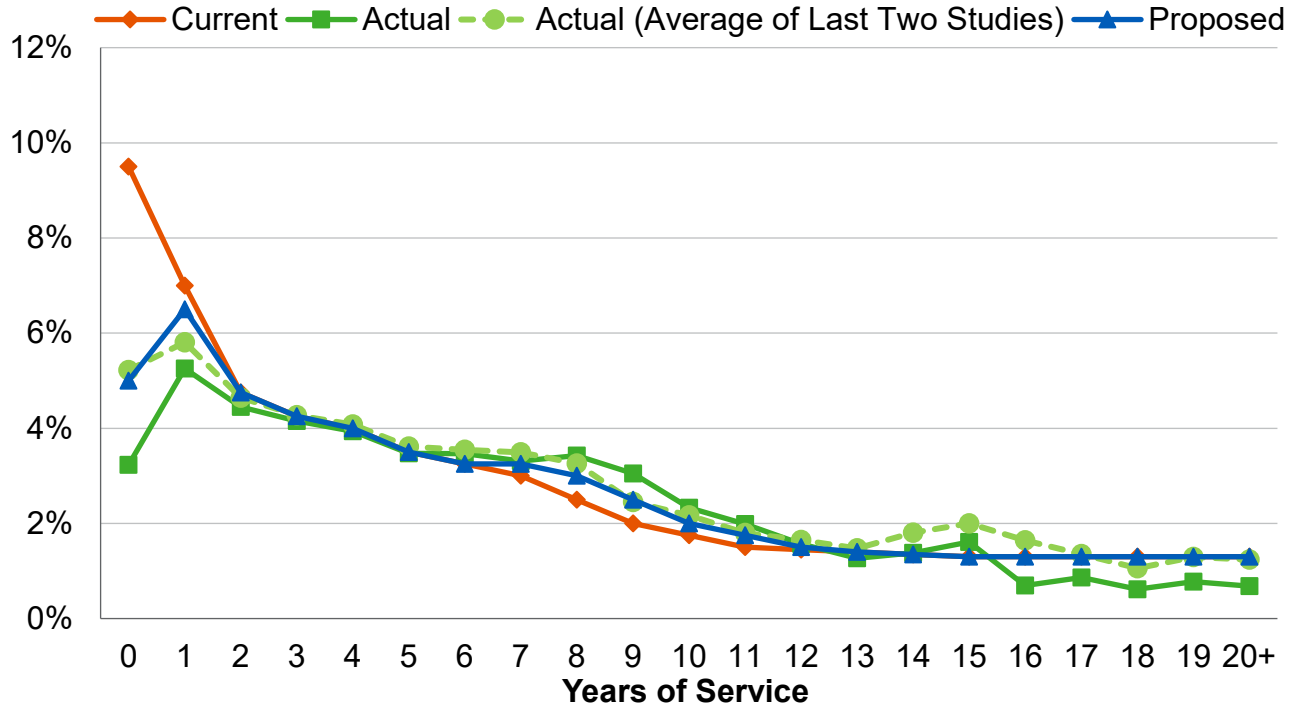
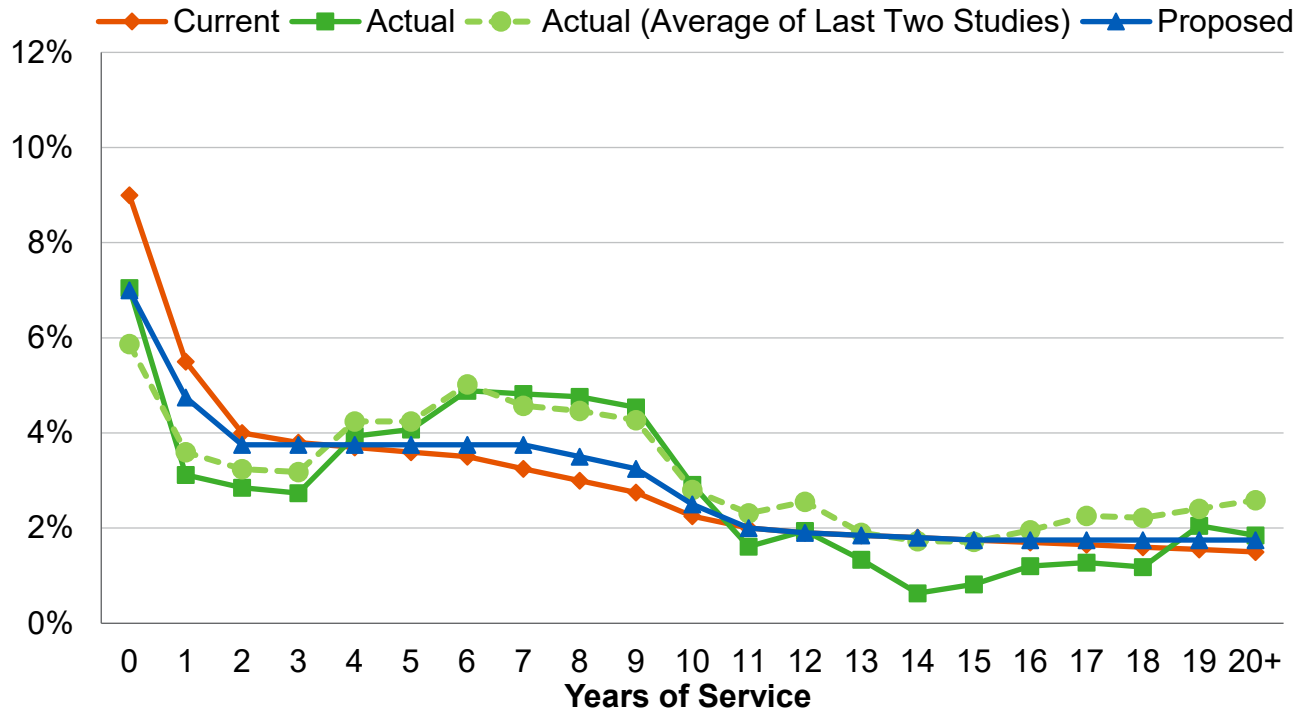


Chart 2: Merit and Promotion Salary Increase Rates
Safety Members



D. Administrative Expenses

Like benefit payments made to members, expenses incurred in connection with the plan's operation are paid from SBCERA's assets. These expenses include fees for administrative, legal, accounting, and actuarial services, as well as routine costs for printing, mailings, computer-related activities, and other functions carried out by the plan. They do not include investment-related expenses.

The current administrative expense assumption is 0.85% of projected payroll. The following table provides the administrative expenses in relation to the projected payroll for each of the six years ending June 30, 2022.

Administrative Expenses as a Percentage of Projected Payroll (Dollars in 000's)

Year Ending June 30	Projected Payroll	Administrative Expenses	Administrative %
2017	\$1,346,408	\$13,163	0.98%
2018	1,406,470	12,092	0.86
2019	1,477,131	12,675	<u>0.86</u>
Three-Year Average (2017-2019)			0.90
2020	1,542,495	14,627	0.95
2021	1,587,324	14,511	0.91
2022	1,626,449	14,323	<u>0.88</u>
Three-Year Average (2020-2022)			0.91
Six-Year Average			0.91
Current Assumption			0.85
Proposed Assumption			0.90

Based on this experience, we recommend increasing the current administrative expense assumption from 0.85% to 0.90% of projected payroll.

This expense will be allocated to the employer and member based on the total average contribution rates in the upcoming June 30, 2023 actuarial valuation, as determined before including the administrative expenses. The allocation of the total administrative expenses between employer and member is subject to change with each actuarial valuation.

4. Demographic Assumptions

A. Retirement Rates

The age at which a member retires from service (i.e., who did not retire on a disability pension) will affect both the amount of the benefits that will be paid to that member as well as the period over which funding must take place.

As of the last experience study, we recommended that retirement rates be structured as a function of both age and years of service for General Tier 1 and Safety Tier 1. The new structure of retirement assumptions applied different sets of age-based retirement assumptions for those with less than 30 years of service and for those with more than 30 years of service. For General Tier 2 and Safety Tier 2, we recommended that retirement rates be structured as a function of only age until more data on actual retirement experience is available to review the retirement rates based on both age and service. For this experience study, we continue to recommend that the retirement rates be structured in this manner.

The table on the following page shows the observed service retirement rates for General Tier 1 members based on the actual experience over the past three years, separately for those with less than 30 years of service and more than 30 years of service. The observed service retirement rates were determined by comparing those members who actually retired from service to those eligible to retire from service. This same methodology is followed throughout this report and was described in Section 2. Also shown are the current assumed rates and the rates we propose.

General Tier 1 Rate of Retirement (%)

Age	Less than 30 Years of Service			30 or More Years of Service		
	Current Rate	Actual Rate	Proposed Rate	Current Rate	Actual Rate	Proposed Rate
49	0.00	N/A	0.00	50.00	50.35	50.00
50	2.75	2.13	2.50	2.75	11.30	2.50
51	2.25	1.15	2.00	2.25	0.00	2.00
52	3.00	2.09	2.50	3.00	0.00	2.50
53	3.00	2.20	2.50	3.00	0.00	2.50
54	3.00	2.19	2.50	3.00	4.33	2.50
55	4.50	4.23	4.50	4.50	12.47	10.00
56	5.00	5.19	5.00	5.00	9.31	10.00
57	6.00	4.84	5.50	6.00	12.68	10.00
58	6.50	5.05	6.00	16.25	17.65	17.00
59	8.50	8.74	8.50	21.25	21.97	21.50
60	12.00	10.19	11.00	30.00	24.82	27.50
61	12.00	10.44	11.00	30.00	21.24	27.50
62	16.00	14.80	15.00	40.00	35.12	35.00
63	16.00	13.28	15.00	40.00	28.44	35.00
64	23.00	25.52	24.00	46.00	37.10	42.00
65	37.00	34.95	36.00	55.50	45.86	50.00
66	30.00	30.66	30.00	45.00	40.95	40.00
67	25.00	41.47	30.00	37.50	39.79	40.00
68	25.00	28.62	26.00	37.50	23.38	35.00
69	25.00	23.96	26.00	37.50	18.61	35.00
70	25.00	30.02	26.00	37.50	37.08	35.00
71	20.00	30.39	24.00	30.00	0.00	30.00
72	20.00	27.97	22.00	30.00	34.05	30.00
73	20.00	26.09	22.00	30.00	0.00	30.00
74	20.00	23.60	22.00	30.00	62.10	30.00
75 & Over	100.00	19.73	100.00	100.00	0.00	100.00

As shown above, for General Tier 1 members with less than 30 years of service, we are recommending decreases in some of the earlier ages and increases in some of the later ages. For General Tier 1 members with 30 or more years of service, we have significantly increased the rates for ages 55 through 57 while making minor refinements for all other ages.

Chart 3 that follows later in this section compares actual experience with the current and proposed rates of retirement for General Tier 1 members with less than 30 years of service.

Chart 4 compares actual experience with the current and proposed rates of retirement for General Tier 1 members with 30 or more years of service.

The following table shows the observed retirement rates for Safety Tier 1 members over the past three years. Also shown are the current rates assumed and the rates we propose:

Safety Tier 1
Rate of Retirement (%)

Age	Less than 30 Years of Service			30 or More Years of Service		
	Current Rate	Actual Rate	Proposed Rate	Current Rate	Actual Rate	Proposed Rate
45	1.00	3.67	2.00	1.00	N/A	2.00
46	2.00	4.38	2.50	2.00	N/A	2.50
47	2.50	1.10	2.50	2.50	N/A	2.50
48	2.00	3.42	2.50	2.00	N/A	2.50
49	10.00	7.90	9.00	10.00	0.00	9.00
50	15.00	10.15	13.00	37.50	0.00	35.00
51	10.00	11.21	10.50	25.00	0.00	30.00
52	12.00	13.12	12.00	30.00	47.55	30.00
53	12.00	13.60	12.50	30.00	50.64	30.00
54	14.00	13.85	14.00	35.00	15.29	30.00
55	15.00	10.09	14.00	37.50	26.43	37.50
56	15.00	19.54	15.00	37.50	50.64	37.50
57	15.00	10.75	15.00	37.50	64.88	37.50
58	15.00	18.69	17.00	37.50	28.17	37.50
59	15.00	19.39	17.00	37.50	25.27	37.50
60	25.00	24.37	25.00	37.50	67.62	45.00
61	25.00	21.94	25.00	37.50	40.69	45.00
62	25.00	23.30	25.00	37.50	43.65	45.00
63	25.00	0.00	25.00	37.50	51.08	45.00
64	25.00	66.67	25.00	37.50	68.60	45.00
65 & Over	100.00	30.26	100.00	100.00	0.00	100.00

As shown above, we are recommending adjusting some of the retirement rates for Safety Tier 1 members with less than 30 years of service and for Safety Tier 1 members with 30 or more years of service.

Chart 5 compares actual experience with the current and proposed rates of retirement for Safety Tier 1 members with less than 30 years of service.

Chart 6 compares actual experience with the current and proposed rates of retirement for Safety Tier 1 members with 30 or more years of service.

The following table shows the observed service retirement rates for General and Safety Tier 2 members based on the actual experience over the past three years. Also shown are the current assumed rates and the rates we propose.

Due to the limited actual retirements during the past three years for General Tier 2 and Safety Tier 2, we have continued to structure this assumption as a function of age only. We have based our recommended rates for General and Safety Tier 2 on a combination of the current Tier 2 assumptions and the actual retirement experience that occurred for General and Safety Tier 1 members. This is because the retirement rates for General and Safety Tier 2 were partially developed based on the then current Tier 1 retirement rates when those new tiers were first established.

General Tier 2 and Safety Tier 2 *Rate of Retirement (%)*

Age	Current Rate	Actual Rate	Proposed Rate	Current Rate	Actual Rate	Proposed Rate
50	0.00	N/A	0.00	5.00	12.77	5.00
51	0.00	N/A	0.00	4.00	0.00	4.00
52	1.75	0.84	1.50	5.00	0.00	5.00
53	1.75	0.00	1.50	6.00	0.00	6.00
54	1.75	2.14	1.50	12.00	0.00	12.00
55	4.00	1.08	3.50	18.00	0.00	18.00
56	4.00	2.56	3.50	20.00	14.64	20.00
57	6.00	1.31	5.50	22.00	0.00	22.00
58	7.00	4.99	6.50	25.00	0.00	25.00
59	8.00	2.72	7.00	25.00	0.00	25.00
60	9.00	2.65	8.00	25.00	0.00	25.00
61	11.00	9.54	10.50	25.00	25.27	25.00
62	20.00	7.98	16.00	25.00	25.54	25.00
63	20.00	12.55	16.00	25.00	0.00	25.00
64	20.00	15.87	18.00	25.00	0.00	25.00
65	25.00	19.36	22.00	100.00	0.00	100.00
66	30.00	17.65	22.00	100.00	N/A	100.00
67	30.00	20.48	25.00	100.00	N/A	100.00
68	25.00	16.99	20.00	100.00	N/A	100.00
69	25.00	9.27	20.00	100.00	N/A	100.00
70	40.00	29.85	35.00	100.00	N/A	100.00
71	40.00	0.00	25.00	100.00	N/A	100.00
72	40.00	0.00	25.00	100.00	N/A	100.00
73	40.00	12.50	25.00	100.00	N/A	100.00
74	40.00	12.77	25.00	100.00	N/A	100.00
75 & Over	100.00	10.26	100.00	100.00	N/A	100.00

Chart 7 compares actual experience with the current and proposed rates of retirement for General Tier 2 members.

Chart 8 compares actual experience with the current and proposed rates of retirement for Safety Tier 2 members.

Deferred Vested Members

Under the current assumptions, deferred vested General members are assumed to retire at age 59 regardless of reciprocity status and Safety members are assumed to retire at age 53 regardless of reciprocity status.

The following table shows the observed deferred vested retirement age for General members based on the actual experience over the past three years, separately for those who went on to work at a reciprocal retirement system and those that did not. Also shown are the current assumed retirement ages and the retirement ages we propose.

General Members' Deferred Vested Retirement Age

	Reciprocal Members	Non-Reciprocal Members
Current Assumption	59.0	59.0
Actual Average Age	59.4	58.7
Proposed Assumption	59.0	59.0

Based on this experience, we recommend maintaining the deferred vested retirement age assumption for General members at age 59 regardless of reciprocity status.

The following table shows the observed deferred vested retirement age for Safety members based on the actual experience over the past three years, separately for those who went on to work at a reciprocal retirement system and those that did not. Also shown are the current assumed retirement ages and the retirement ages we propose.

Safety Members' Deferred Vested Retirement Age

	Reciprocal Members	Non-Reciprocal Members
Current Assumption	53.0	53.0
Actual Average Age	53.9	50.9
Proposed Assumption	53.0	52.0

Based on this experience, we recommend maintaining the deferred vested retirement age assumption for Safety reciprocal members at age 53 and decreasing the deferred vested retirement age assumption for Safety non-reciprocal members from age 53 to 52.

Reciprocity

Under the current assumptions, it is assumed that 40% of General and 65% of Safety future deferred vested members would be covered under a reciprocal retirement system. For those covered under a reciprocal retirement system, a General member is assumed to receive 4.55% annual salary increases, while a Safety member is assumed to receive 4.75% annual salary increases from termination until their date of retirement. As of May 31, 2022, after combining the three-year experience, about 41.5% of the total General deferred vested and 64.6% of the total Safety deferred vested members went on to be covered by a reciprocal retirement system.

We recommend maintaining the reciprocal assumption at 40% for General members and at 65% for Safety members.

In addition, we recommend 4.30% and 4.75% annual salary increase assumptions for General and Safety members, respectively, be utilized to anticipate salary increases from the date of termination from SBCERA to the expected date of retirement for deferred vested members covered by a reciprocal retirement system. These assumptions are based on the ultimate 1.30% and 1.75% merit and promotion salary increase assumptions for General and Safety members, respectively, together with the 2.50% inflation and 0.50% real “across the board” salary increase assumptions that are recommended earlier in Section 3 of this report.

Survivor Continuance under the Unmodified Option

In prior valuations, it was assumed that all members would select the unmodified option at retirement. Actual experience for recent new retirees shows that around 90% select the unmodified option. **Therefore, we recommend maintaining the assumption that all members will elect the unmodified option at retirement.**

It was also assumed that 65% of all active and inactive male members and 55% of all active and inactive female members would be married or have an eligible domestic partner entitled to the automatic continuance benefit when they select the unmodified option upon retirement. We reviewed experience for new retirees during the three-year period and determined the actual percentage of these new retirees that had an eligible spouse or eligible domestic partner and selected the unmodified option at the time of retirement. The results of that analysis are shown below.

New Retirees – Actual Percent with Eligible Spouse or Domestic Partner and Selected Unmodified Option

Year Ending June 30	Male	Female
2020	70.0%	52.4%
2021	62.3%	47.8%
2022 ³⁶	57.6%	51.5%
Total	63.2%	50.7%

³⁶ As of May 31, 2022.

According to experience of members who retired during the last three years, about 63.2% of all male members and 50.7% of all female members who selected the unmodified option were married or had a domestic partner at retirement. We recommend maintaining the assumption at 65% for male members and decreasing the assumption to 50% for female members.

Since the present value of the survivor’s automatic continuance benefit is dependent on the survivor’s age and sex, we must also have assumptions for the age and sex of the survivor. Based on the experience for members who retired during the most recent three-year period (results shown in the table below) and studies done for other retirement systems, **we recommend the following:**

1. Since most the survivors are the opposite sex, even with the inclusion of domestic partners, **we will continue to assume that the survivor’s sex is the opposite of the member.**
2. **We recommend the current assumptions for the age of the survivors for all active and inactive members (shown below) be maintained.** These assumptions will continue to be monitored in future experience studies.

Member’s Age as Compared to Spouse’s Age

	Male Retiree	Female Retiree
Current Assumption	3 years older	2 years younger
Actual Experience	2.7 years older	2.0 years younger
Proposed Assumption	3 years older	2 years younger

Chart 3: Retirement Rates
General Tier 1 Members with Less than 30 Years of Service

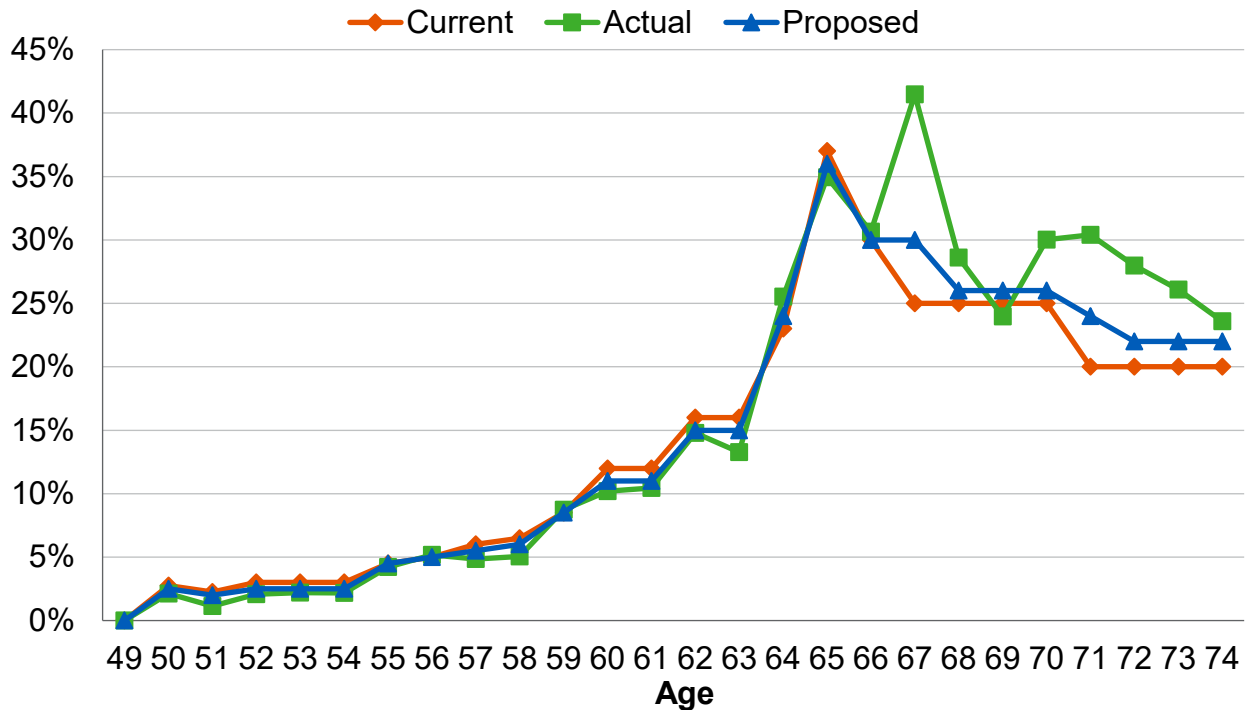


Chart 4: Retirement Rates
General Tier 1 Members with More than 30 Years of Service

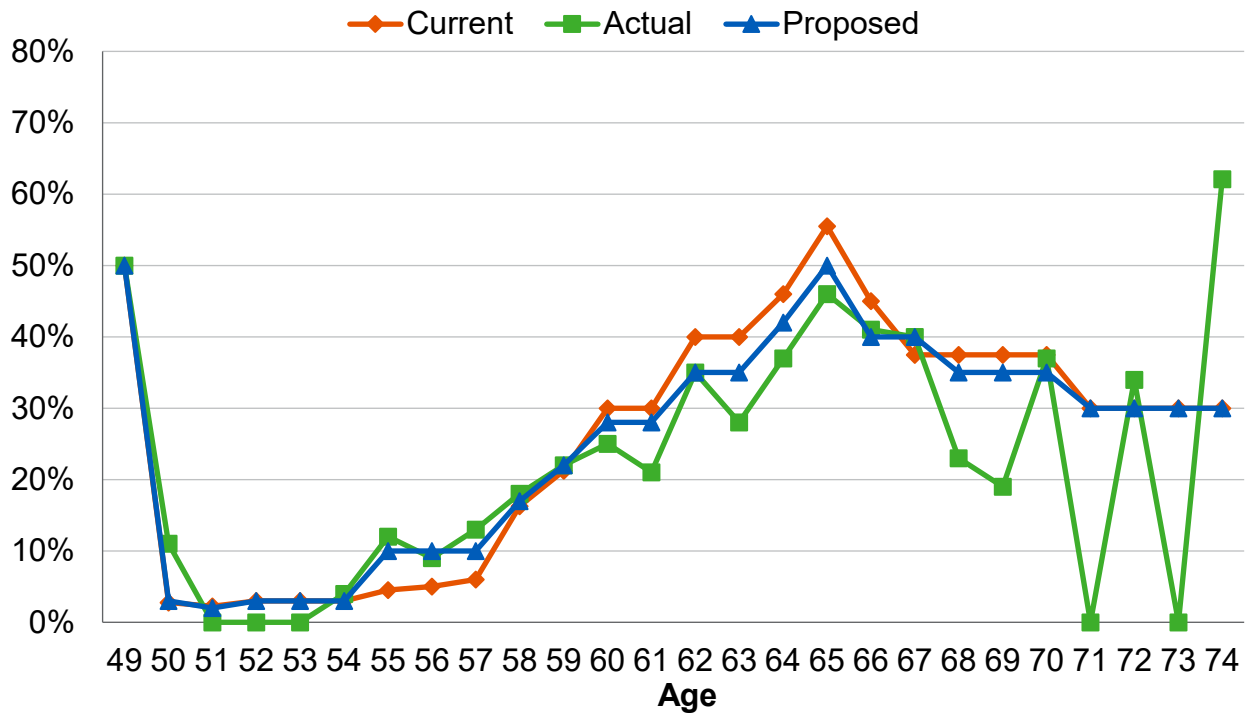


Chart 5: Retirement Rates
Safety Tier 1 Members with Less than 30 Years of Service

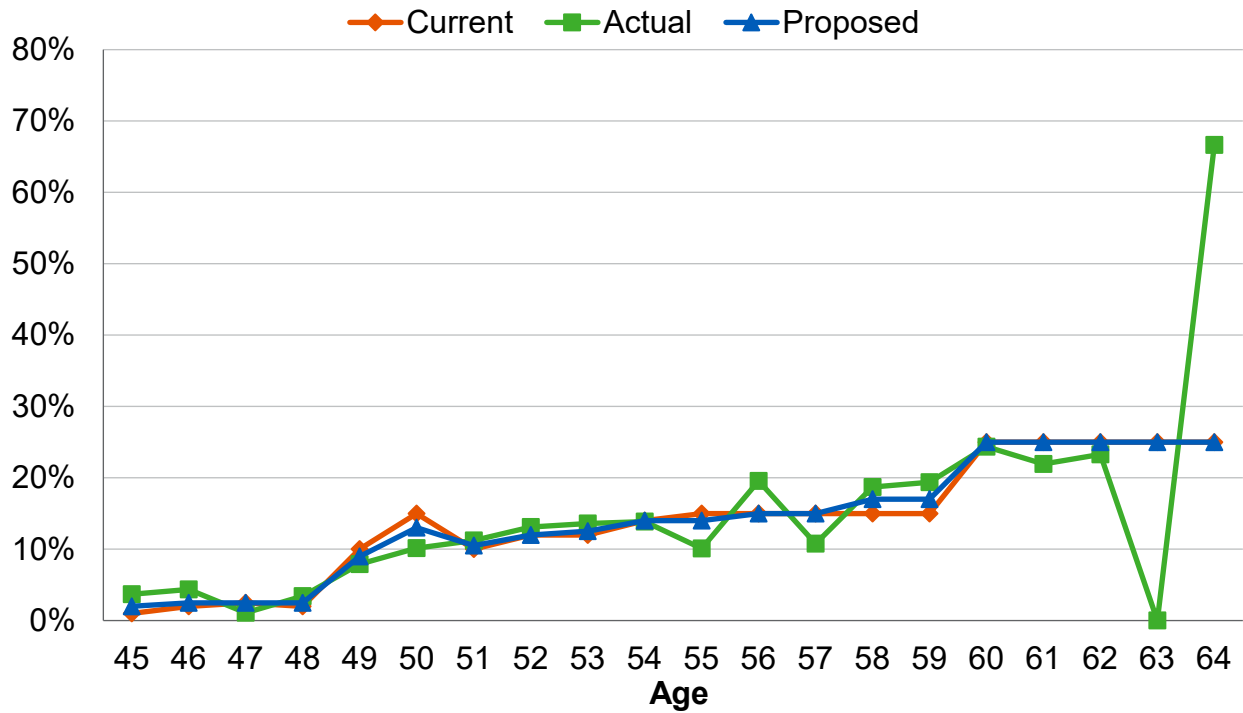


Chart 6: Retirement Rates
Safety Tier 1 Members with More than 30 Years of Service

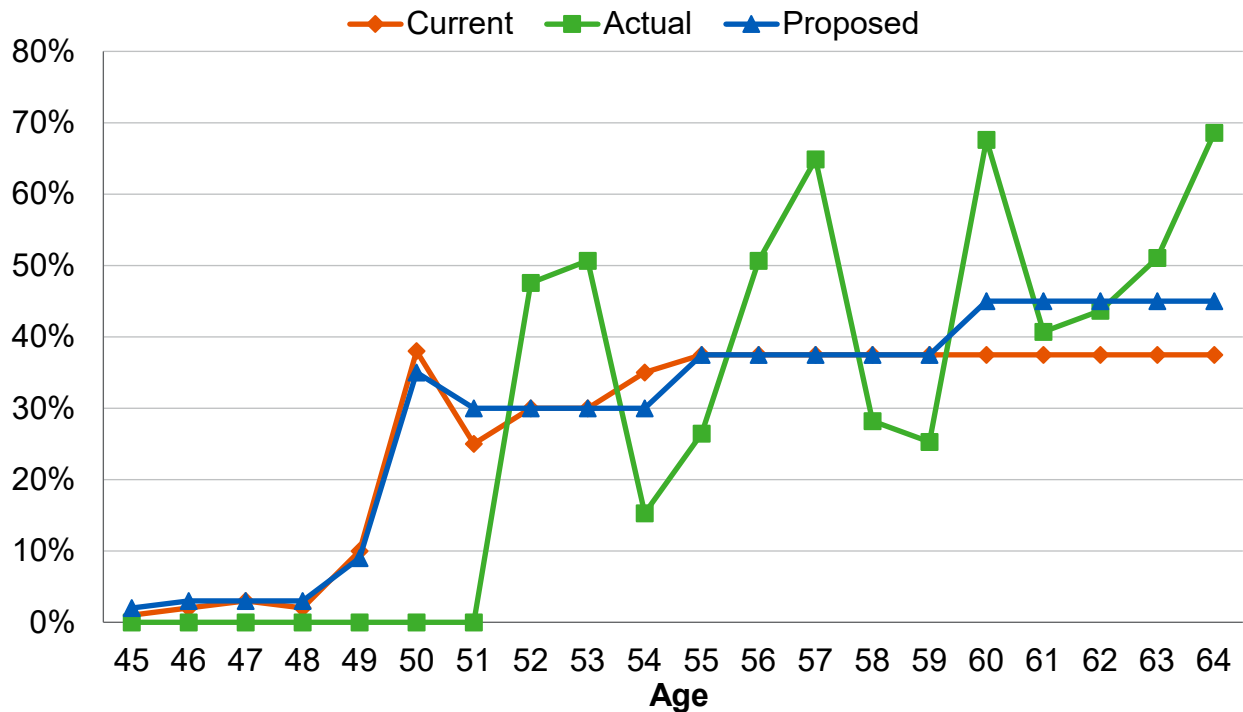


Chart 7: Retirement Rates
General Tier 2 Members

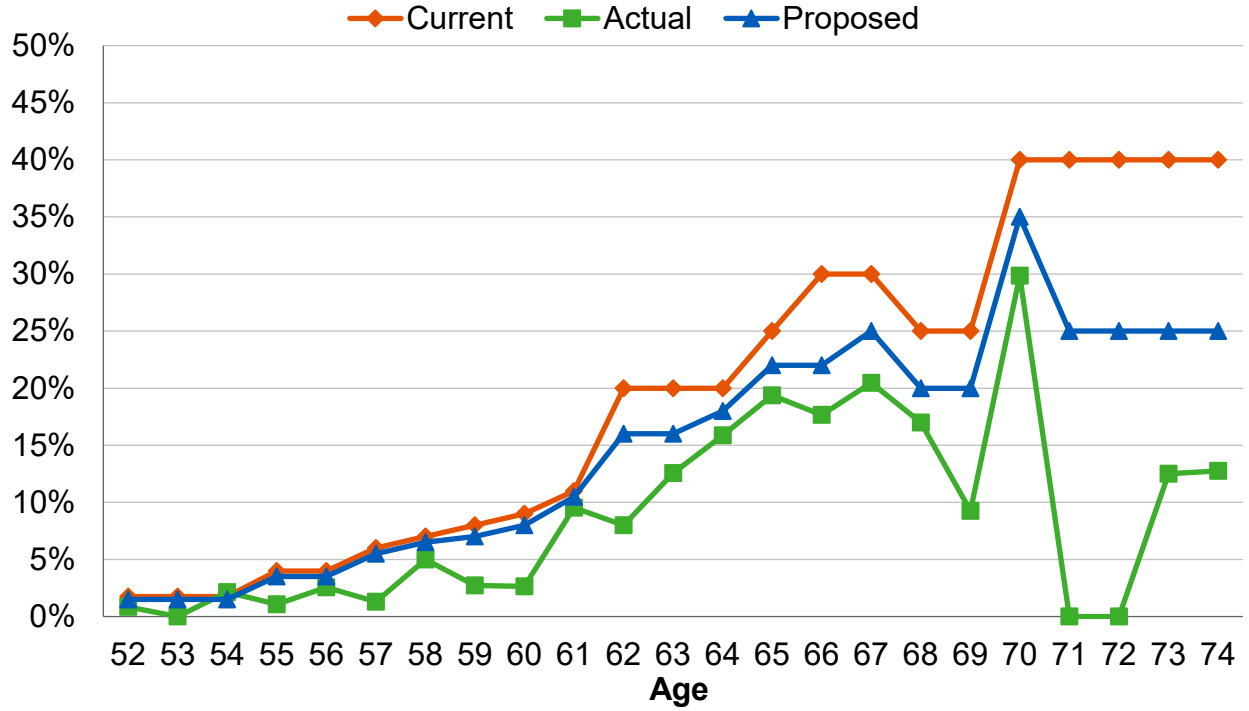
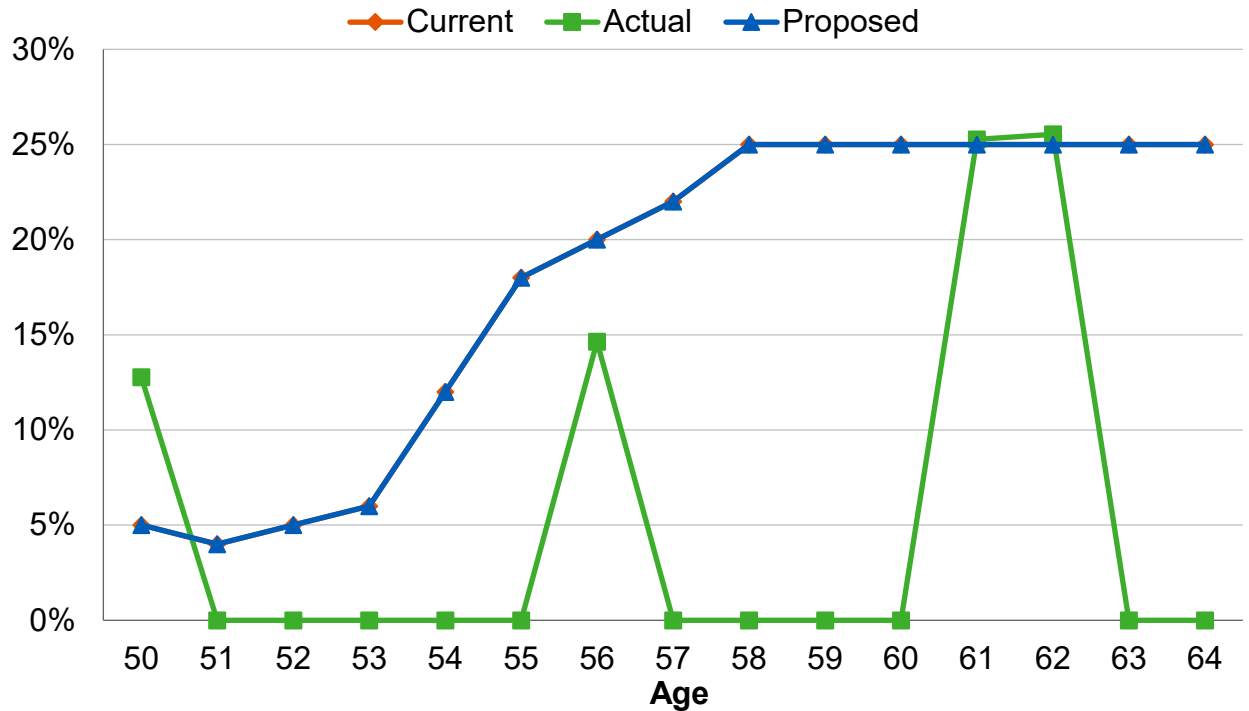


Chart 8: Retirement Rates
Safety Tier 2 Members



B. Mortality Rates - Healthy

The “healthy” mortality rates project the life expectancy of a member who retires from service (i.e., who did not retire on a disability pension). Also, the “healthy” pre-retirement mortality rates project what proportion of members will die before retirement. For General members, the table currently being used for post-service retirement mortality rates is the Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2019. For Safety members, the table currently being used for post-service retirement mortality rates is the Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019. For all beneficiaries, the table currently being used is the Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2019.

The Public Retirement Plans Mortality tables (Pub-2010) were published by the Retirement Plans Experience Committee (RPEC) of the SOA in 2019. For the first time, the published mortality tables are based exclusively on public sector pension plan experience in the United States. Within the Pub-2010 family of mortality tables, there are separate tables by job categories of General, Safety and Teachers. Included with the mortality tables is the analysis prepared by RPEC that continues to observe that benefit amount for healthy retirees and salary for employees are the most significant predictors of mortality differences within the job categories. Therefore, Pub-2010 includes mortality rates developed for annuitants on a “benefit” weighted basis, with higher credibility assigned to experience from annuitants receiving larger benefits. We continue to recommend using the “amount weighted” above-median version of the Pub-2010 mortality tables (adjusted for SBCERA experience as discussed herein).

We also continue to recommend that the mortality improvement scale be applied generationally where each future year has its own mortality table that reflects the forecasted improvements, using the published improvement scales. The “generational” approach is now the established practice within the actuarial profession.

A generational mortality table provides dynamic projections of mortality experience for each cohort of retirees. For example, the mortality rate for someone who is 65 next year will be slightly less than for someone who is 65 this year. In general, using generational mortality anticipates increases in the cost of the Plan over time as participants’ life expectancies are projected to increase.

We understand that RPEC intends to publish annual updates to their mortality improvement scales. Improvement scale MP-2021 is the latest improvement scale available as RPEC decided not to release an updated projection scale in 2022. According to RPEC, they have been relying on the most recent population mortality experience in their model to project future mortality trends. In 2022, if they were to follow their past practice, they would have relied on the newest mortality data available from 2020 to prepare their “MP-2022” mortality improvement scale. However, population data from 2020 was severely affected by the COVID-19 pandemic. They believed it would not be appropriate to incorporate, without adjustment, the substantially higher rates of population mortality experience from 2020 into their graduation and projection

models used to forecast future mortality. As a result, they elected not to release a new mortality improvement scale for 2022. We recommend that the Board adopt the Amount-Weighted Above-Median Pub-2010 mortality tables (adjusted for SBCERA experience as discussed herein), and project the mortality improvement generationally using the MP-2021 mortality improvement scale.

In order to reflect more SBCERA experience in our analysis, we have used experience for a ten-year period by using data from the current (from July 1, 2019 through June 30, 2020 and the last three (from July 1, 2016 through June 30, 2019; from July 1, 2013 to June 30, 2016; and from July 1, 2010 to June 30, 2013) experience study periods in order to analyze this assumption. Based on our analysis of the July 1, 2020 through May 31, 2022 data, we decided to not include it in the mortality analysis, because it appears the data was severely impacted by COVID and showed substantially higher rates of population mortality experience during this two-year period.

Even with the use of ten years of experience, based on standard statistical theory the data is only partially credible especially under the recommended benefit-weighted basis when dispersion of retirees' benefit amounts is taken into account. In 2008 the SOA published an article recommending that mortality assumptions include an adjustment for credibility. Under this approach, the number of deaths needed for full credibility for a headcount-weighted mortality table is just over 1,000, where full credibility means a 90% confidence that the actual experience will be within 5% of the expected value. Therefore, in our recommended assumptions, we have only partially adjusted the Pub-2010 mortality tables to fit SBCERA's experience. In future experience studies, more data will be available which may further increase the credibility of the SBCERA experience.

Post-Retirement Mortality (Service Retirements)

Among all retired members, the actual deaths weighted by benefit amounts under the current assumptions for the ten-year period are shown in the table below. We also show the deaths weighted by benefit amount under the proposed assumptions. We continue to recommend the use of a generational mortality table, which incorporates a more explicit assumption for future mortality improvement. Accordingly, the goal is to start with a mortality table that closely matches the current experience (without a margin for future mortality improvement), and then reflect mortality improvement by projecting lower mortality rates in future years.

The proposed mortality table also reflects current experience to the extent that the experience is credible based on standard statistical theory. For SBCERA, the volume of General member data makes it relatively credible. In contrast, there is much less Safety data, so it is given substantially less credibility. The proposed mortality tables (as shown in the table below) after adjustments for partial credibility have actual to expected ratios of 103% and 105% for General and Safety, respectively. In future years the ratio should remain around 103% and 105% for General and Safety, respectively, as long as actual mortality improves at the same rates as anticipated by the generational mortality tables. The number of actual deaths compared to the number expected under the current and proposed assumptions weighted by benefit amounts for the ten-year period are as follows:

Healthy Retiree Mortality Experience – Benefit Weighted (Dollars in millions)

Gender	General Members			Safety Members		
	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	\$28.64	\$29.17	\$28.59	\$5.81	\$6.29	\$5.79
Female	<u>22.04</u>	<u>22.67</u>	<u>21.96</u>	<u>0.33</u>	<u>0.12</u>	<u>0.31</u>
Total	\$50.69	\$51.84	\$50.55	\$6.14	\$6.41	\$6.11
Actual / Expected	102%		103%³⁷	105%		105%

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased members.
2. Expected amounts under the proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the experience study period.
3. Results may not add due to rounding.

For General members, we recommend updating the post-retirement mortality to follow the Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

For Safety members, we recommend updating the post-retirement mortality to follow the Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Chart 9 that follows later in this section compares the number of actual to expected deaths on a benefit-weighted basis over the ten-year period for the current and proposed assumptions for Service Retirement General members.

Chart 10 compares the number of actual to expected deaths on a benefit-weighted basis over the ten-year period for the current and proposed assumptions for Service Retirement Safety members.

Chart 11 shows the life expectancies (i.e., expected future lifetime) under the current and the proposed tables for General members on a benefit-weighted basis. Life expectancies under the proposed generational mortality rates are based on age as of 2023. In practice, assumed life expectancies will increase as a result of the mortality improvement scale.

Chart 12 shows the life expectancies (i.e., expected future lifetime) under the current and the proposed tables for Safety members on a benefit-weighted basis. Life expectancies under the

³⁷ If we used the benchmark Pub-2010 General table without any adjustment, the proposed actual to expected ratio would be 113%.

proposed generational mortality rates are based on age as of 2023. In practice, assumed life expectancies will increase as a result of the mortality improvement scale.

Beneficiaries Mortality

The Pub-2010 Contingent Survivors Table is developed based only on contingent survivor data after the death of the retirees. This is consistent with the mortality experience that we have available for beneficiaries. The Pub-2010 Contingent Survivor mortality rates are comparable to SBCERA's actual mortality experience for beneficiaries. However, in contrast to service retirees, there is much less beneficiary data, so it is given little credibility when adjusting the base table. As shown in the table below, the proposed mortality tables have an actual to expected ratio of 110%, after adjustments for partial credibility. In future years the ratio should remain around 110% as long as actual mortality improves at the same rates as anticipated by the generational mortality tables. The number of actual deaths compared to the number expected under the current and proposed assumptions weighted by benefit amounts for the ten-year period are as follows:

Beneficiary Mortality Experience – Benefit Weighted (Dollars in millions)

Gender	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	\$1.73	\$1.83	\$1.65
Female	<u>7.86</u>	<u>8.97</u>	<u>8.20</u>
Total	\$9.59	\$10.80	\$9.85
Actual / Expected	113%		110%³⁸

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased beneficiaries.
2. Expected amounts under the proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the experience study period.
3. Results may not add due to rounding.

For all beneficiaries, we recommend updating the beneficiary mortality to follow the Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and 15% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

As noted above, the Contingent Survivor mortality tables are developed based on contingent survivor data only after the death of the retirees (i.e., it does not reflect any contingent survivor data before the death of the retirees). In the last experience study, we recommended that the Board applied the Contingent Survivor mortality tables to predict the mortality rates for the beneficiaries both before and after the death of the retirees. According to analysis provided by

³⁸ If we used the benchmark Pub-2010 Contingent Survivor table without any adjustment, the proposed actual to expected ratio would be 124%.

RPEC, the mortality rates for the beneficiaries could be somewhat overstated before the death of the retirees as the Contingent Survivor mortality tended to be higher than retiree mortality and the difference was statistically significant. Based on this analysis, for the purposes of the actuarial valuations (for funding and financial reporting), when calculating the liability for the continuance to a beneficiary of a surviving member, we recommend that the General Healthy Retiree mortality tables be used for beneficiary mortality both before and after the expected death of the General or Safety member. Upon the actual death of the member (i.e., for all beneficiaries in pay status as of the valuation date), we recommend for the purposes of the actuarial valuations that we use the Contingent Survivor mortality tables as stated above. We note that the use of different mortality tables (before and after the death of the member) has been found by the RPEC to be reasonable.

Pre-Retirement Mortality

For General members, the table currently being used for pre-retirement mortality rates is the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional scale MP 2019. For Safety members, the table currently being used for pre-retirement mortality rates is the Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional scale MP 2019.

When analyzing pre-retirement mortality, there is much less data available, so it is given little credibility when adjusting the base table.

For General members, we recommend updating the pre-retirement mortality to follow the Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

For Safety members, we recommend updating the pre-retirement mortality to follow the Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Based on actual experience of only 4% of pre-retirement deaths were service connected during the three-year experience study period, we also recommend maintaining the current assumption for pre-retirement mortality of 100% non-service connected for both General and Safety members.³⁹

Mortality Table for Member Contributions, Optional Forms of Payment, and Reserves

There are administrative reasons why a generational mortality table is more difficult to implement for determining member contributions for legacy tiers (i.e., Tier 1), optional forms of payment and reserves. For determining member contributions, one emerging practice is to

³⁹ While it is possible that COVID-19 deaths for members in certain industries may be considered service connected, we do not recommend a change in our assumption to reflect this possible short-term increase in service connected deaths.

approximate the use of a generational mortality table by the use of a static table with projection of the mortality improvement from the measurement year over a period that is close to the duration of the benefit payments for active members. We would recommend the use of this approximation for determining member contributions for employees in the Tier 1.

For General members, we recommend that the mortality table used for determining contributions be updated to a blended table based on the Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.

For Safety members, we recommend that the mortality table used for determining contributions be updated to a blended table based on the Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for females, projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2021, weighted 90% male and 10% female.

For optional forms of payment, there are some administrative issues that we may need to resolve with the Association and its vendor maintaining the pension administration software before we would recommend a comparable generational scale to anticipate future mortality improvement. We will provide a recommendation to the Association for use in reflecting mortality improvement for determining optional forms of payment after we have those discussions with the Association and its vendor.

Chart 9: Post-Retirement Benefit-Weighted Deaths (In Millions)
 Service Retirement General Members (July 1, 2010 through June 30, 2020)

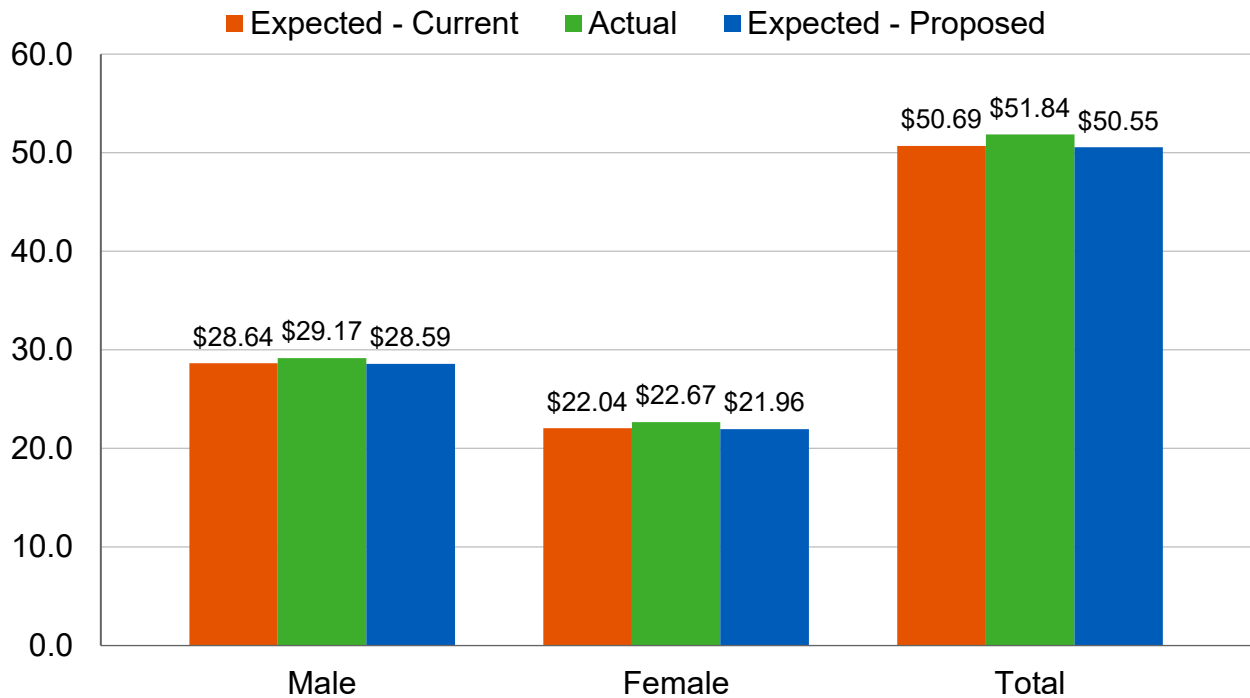


Chart 10: Post-Retirement Benefit-Weighted Deaths (In Millions)
 Service Retirement Safety Members (July 1, 2010 through June 30, 2020)

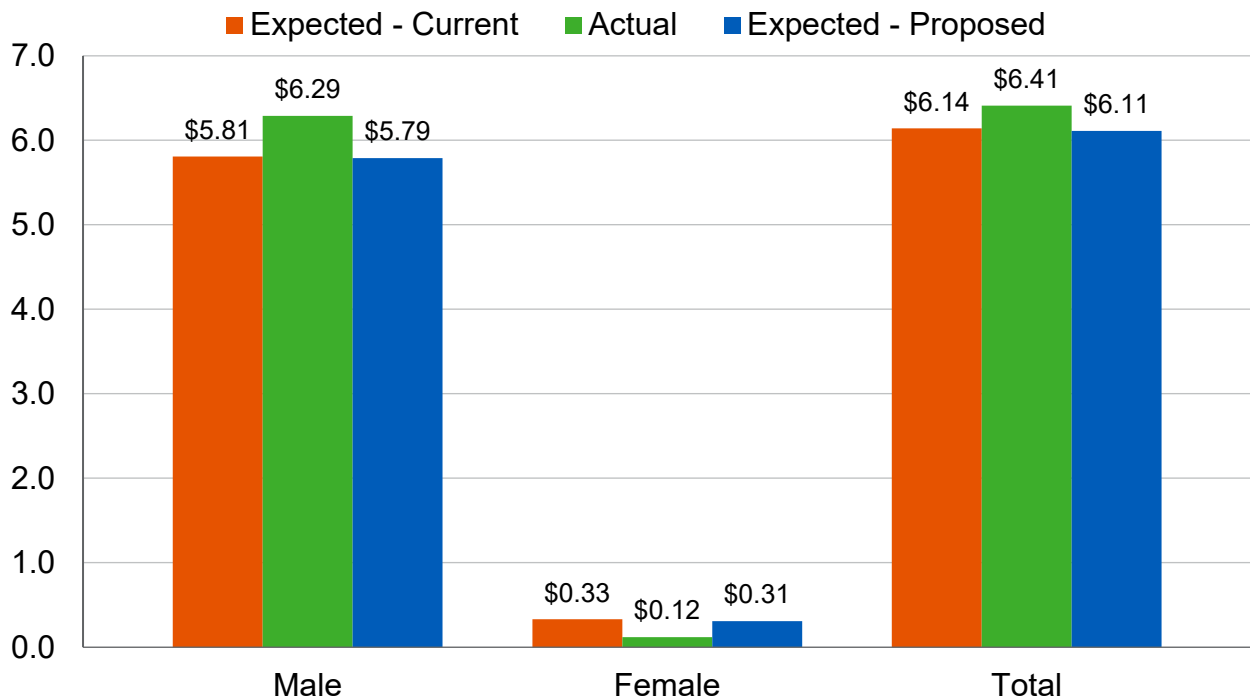


Chart 11: Benefit-Weighted Life Expectancies
Service Retirement General Members

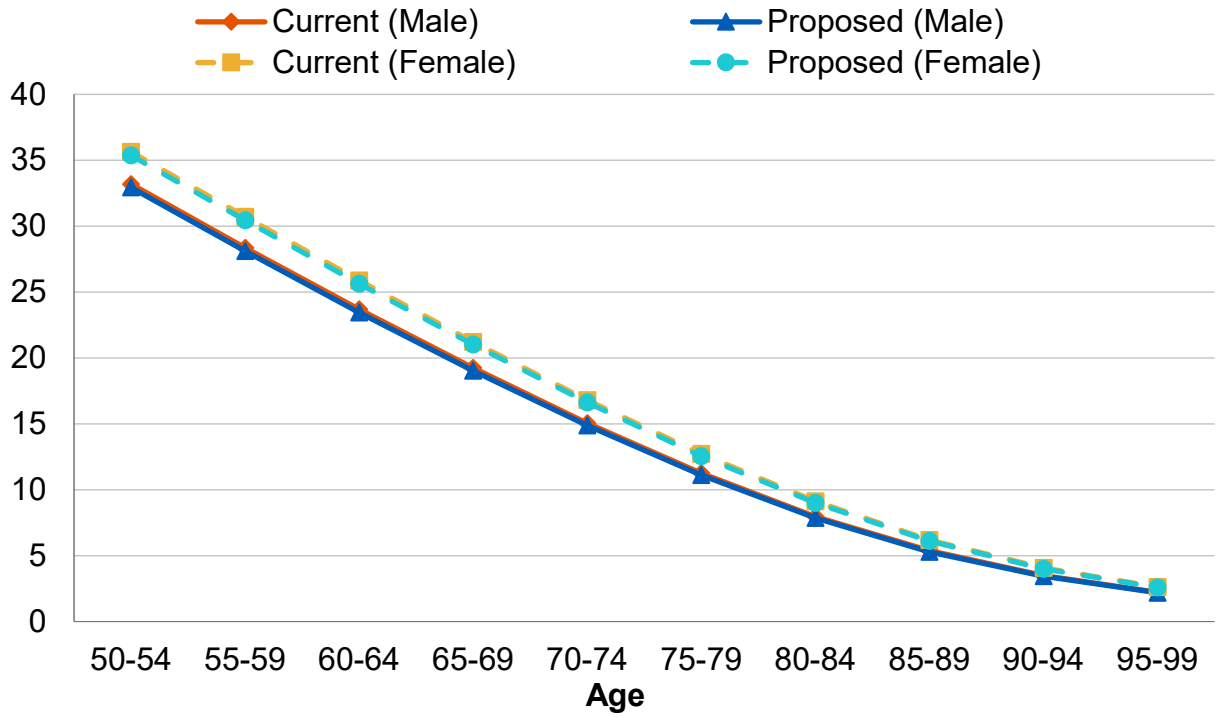
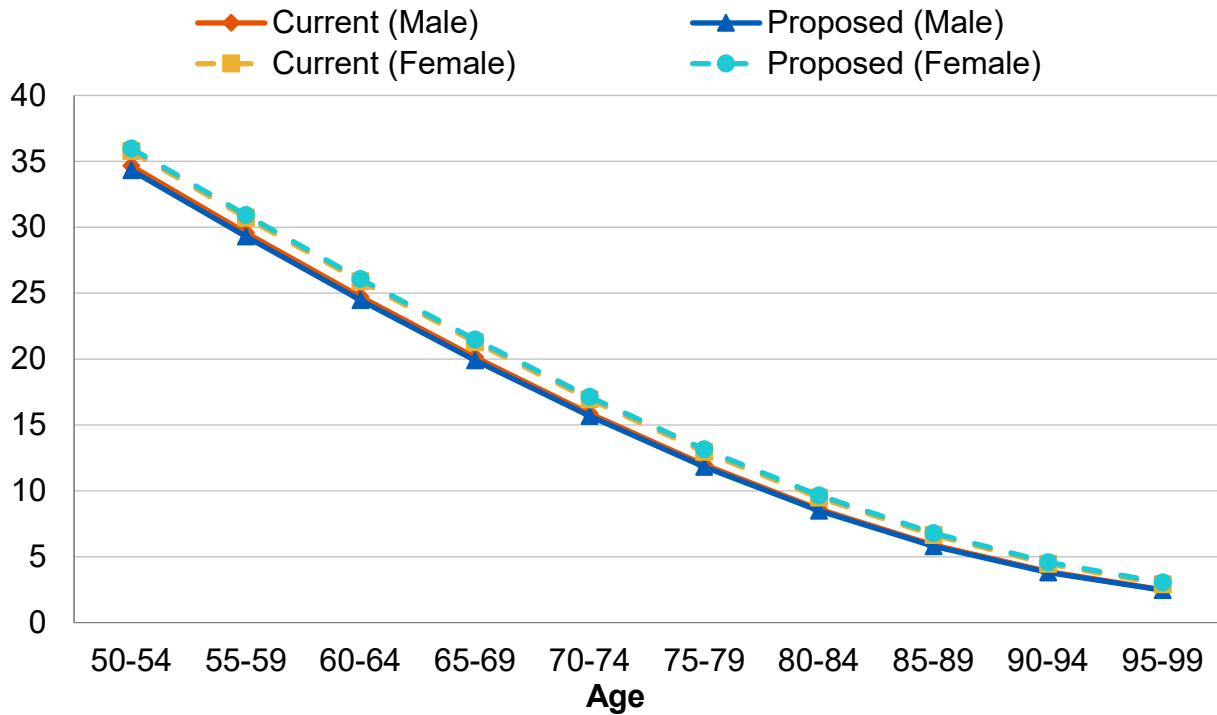


Chart 12: Benefit-Weighted Life Expectancies
Service Retirement Safety Members



C. Mortality Rates - Disabled

Since mortality rates for disabled members can vary from those of healthy members, a different mortality assumption is often used. For General members the table currently being used is the Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) projected generationally with the two-dimensional mortality improvement scale MP-2019. For Safety members, the table currently being used is the Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) projected generationally with the two-dimensional mortality improvement scale MP-2019.

Similar to mortality rates for service retirees, the proposed mortality table reflects current experience to the extent that the experience is credible based on standard statistical theory. For SBCERA, there is far less data for disabled retirees, so it is given little credibility, even using experience for a ten-year period. As shown in the table below, the proposed mortality tables have actual to expected ratios of 100% and 91% for General and Safety respectively, after adjustments for partial credibility. In future years the ratio should remain around 100% and 91% for General and Safety, respectively, as long as actual mortality improves at the same rates as anticipated by the generational mortality tables. The number of actual deaths compared to the number expected under the current and proposed assumptions weighted by benefit amounts for the ten-year period are as follows:

Disabled Retiree Mortality Experience – Benefit Weighted (Dollars in millions)

Gender	General Members			Safety Members		
	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	\$3.05	\$3.25	\$3.04	\$4.79	\$4.29	\$4.79
Female	<u>3.30</u>	<u>2.93</u>	<u>3.12</u>	<u>0.34</u>	<u>0.39</u>	<u>0.34</u>
Total	\$6.34	\$6.18	\$6.16	\$5.14	\$4.68	\$5.12
Actual / Expected	97%		100%⁴⁰	91%		91%

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased members.
2. Expected amounts under the proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the experience study period.
3. Results may not add due to rounding.

For General disabled members, we recommend updating the disabled mortality to follow the Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

⁴⁰ If we use the benchmark Pub-2010 Non-Safety Disabled table without any adjustment, the proposed actual to expected ratio would be 98%.

For Safety disabled members, we recommend updating the disabled mortality to follow the Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Chart 13 compares the number of actual to expected deaths on a benefit-weighted basis over the ten-year period for the current and proposed assumptions for disabled General members.

Chart 14 compares the number of actual to expected deaths on a benefit-weighted basis over the ten-year period for the current and proposed assumptions for disabled Safety members.

Chart 15 shows the life expectancies (i.e., expected future lifetime) under the current and the proposed tables for disabled General members on a benefit-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2023. In practice, life expectancies will be assumed to increase as a result of the mortality improvement scale.

Chart 16 shows the life expectancies (i.e., expected future lifetime) under the current and the proposed tables for disabled Safety members on a benefit-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2023. In practice, life expectancies will be assumed to increase as a result of the mortality improvement scale.

Chart 13: Post-Retirement Benefit-Weighted Deaths (In Millions)
 Disabled General Members (July 1, 2010 through June 30, 2020)

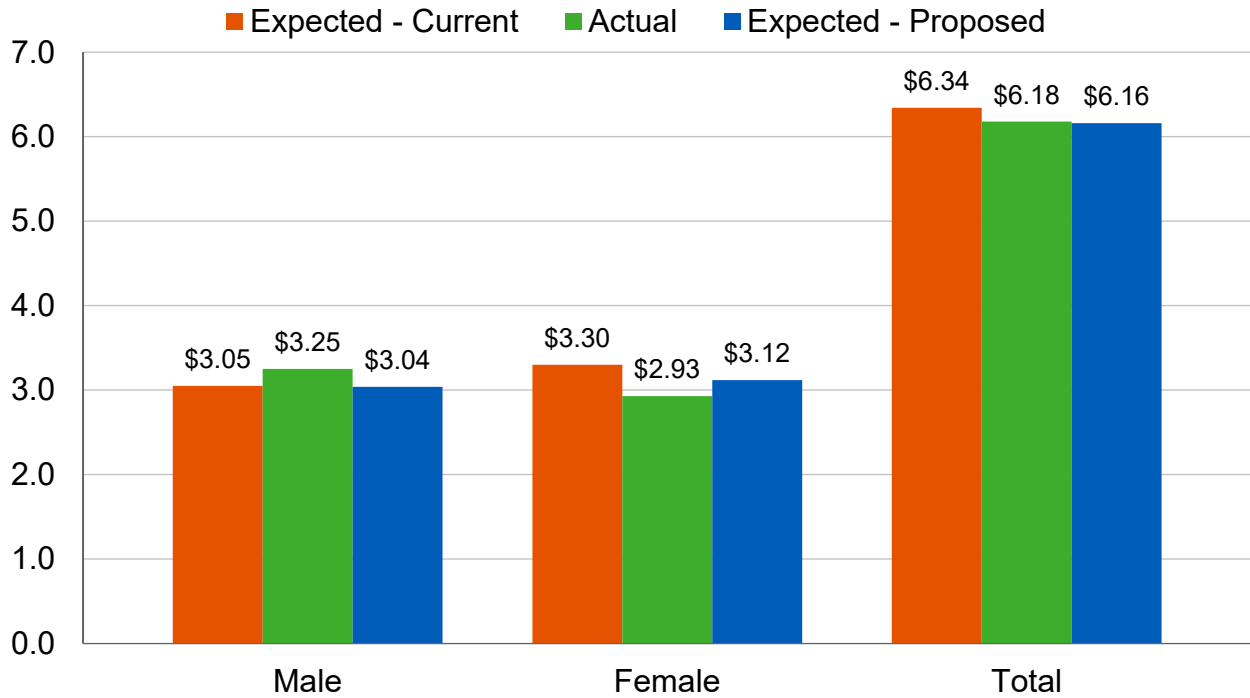


Chart 14: Post-Retirement Benefit-Weighted Deaths (In Millions)
 Disabled Safety Members (July 1, 2010 through June 30, 2020)

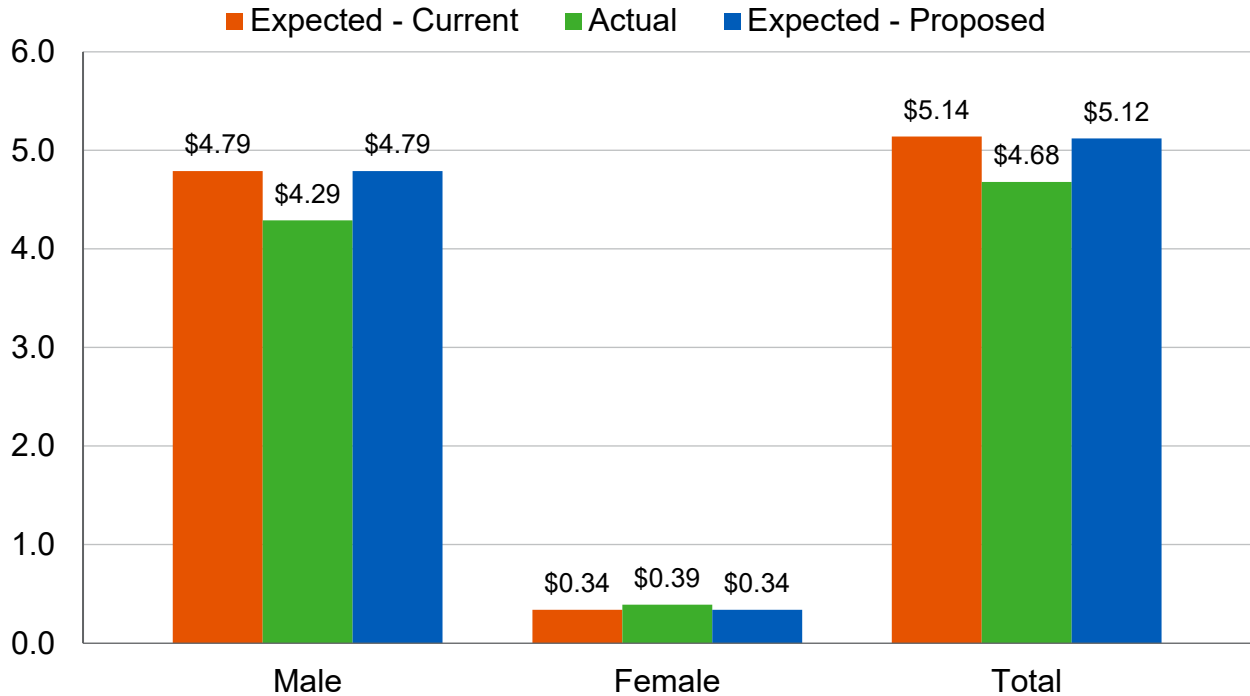


Chart 15: Benefit-Weighted Life Expectancies
Disabled General Members

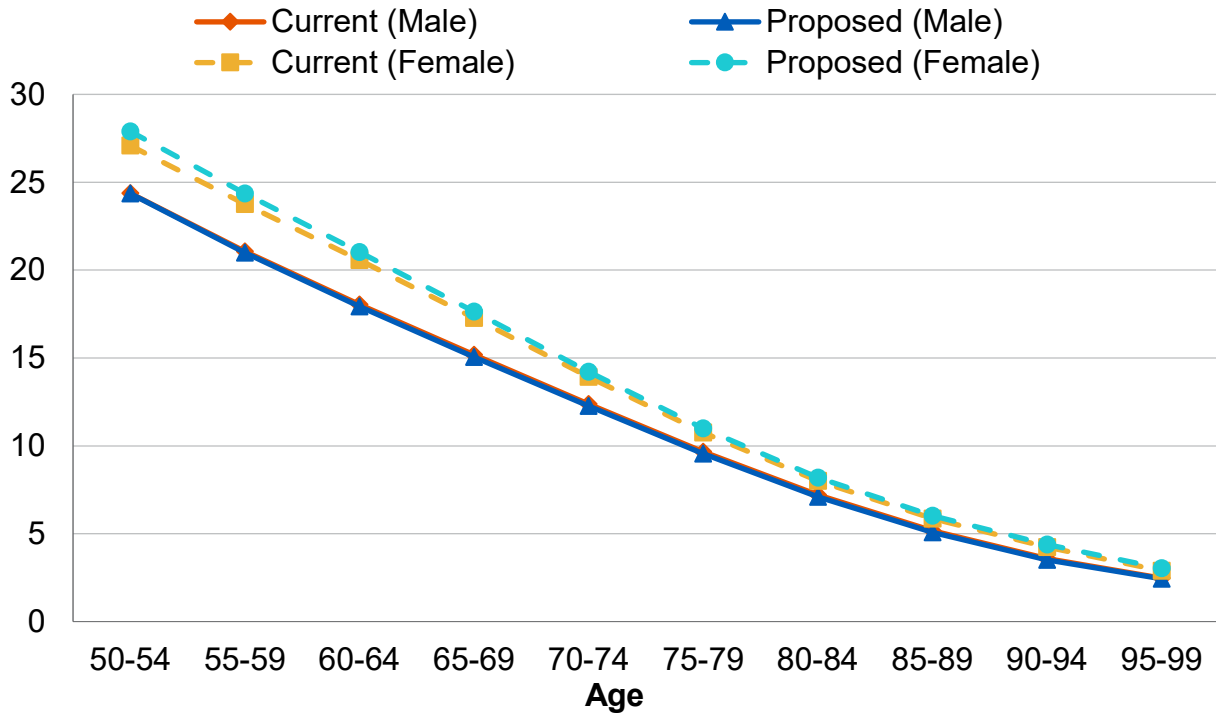
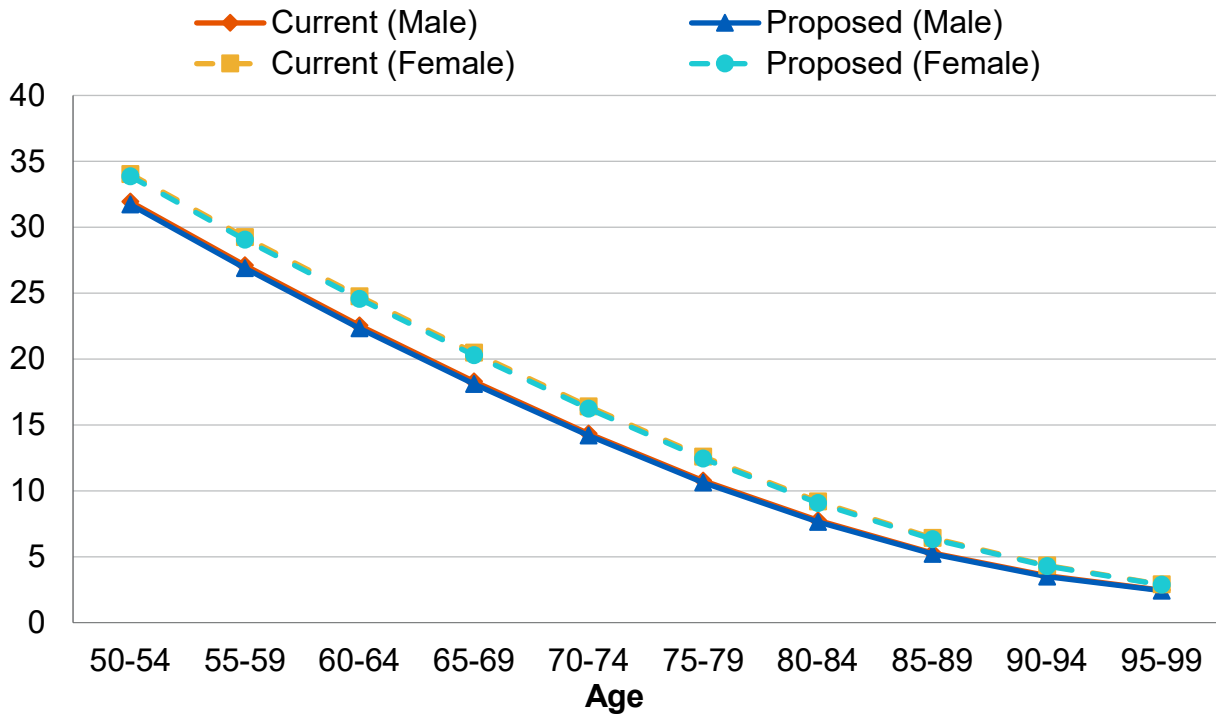


Chart 16: Benefit-Weighted Life Expectancies
Disabled Safety Members



D. Termination Rates

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current assumptions there is an overall assumed incidence of total termination based on the plan membership, and years of service, combined with an assumption as to whether the terminated vested member will choose a deferred vested benefit or a refund of contributions. The latter assumption is also based on plan membership and years of service, as well as whether the member elected refundable contributions. With this study, we continue to recommend that this same assumption structure be used.

The termination experience over the last six years for General and Safety members is shown by years of service in the following tables. We have included six years of experience, rather than only the three years of the current experience period, in order to improve the credibility of SBCERA's termination experience. Please note that we have excluded any members that were eligible for retirement. We also show the current and proposed assumptions.

Rates of Termination – General *Rates (%)*

Years of Service	Current Rate	Actual Rate (6 years)	Proposed Rate
Less than 1	15.00	15.96	15.00
1 – 2	11.00	12.22	12.00
2 – 3	10.00	11.20	11.00
3 – 4	8.00	9.19	9.00
4 – 5	7.00	7.92	7.50
5 – 6	6.50	8.43	7.00
6 – 7	6.00	7.51	6.50
7 – 8	4.75	6.19	5.50
8 – 9	4.50	4.83	5.00
9 – 10	4.50	5.42	5.00
10 – 11	4.50	5.75	5.00
11 – 12	4.50	5.52	5.00
12 – 13	4.25	5.22	4.50
13 – 14	4.25	6.24	4.50
14 – 15	4.00	4.80	4.25
15 – 16	3.75	4.07	4.00
16 – 17	3.50	4.14	3.75
17 – 18	3.25	3.59	3.50
18 – 19	3.00	3.26	3.25
19 – 20	3.00	3.52	3.25
20 & Over	3.00	5.18	3.25

Rates of Termination – Safety

Rates (%)

Years of Service	Current Rate	Actual Rate (6 years)	Proposed Rate
Less than 1	7.00	9.51	8.00
1 – 2	6.50	10.43	7.50
2 – 3	5.50	7.23	6.50
3 – 4	5.00	7.81	6.00
4 – 5	4.50	6.30	5.00
5 – 6	3.00	6.35	4.00
6 – 7	2.50	4.12	3.00
7 – 8	2.00	2.03	2.00
8 – 9	1.80	3.79	1.90
9 – 10	1.60	3.48	1.80
10 – 11	1.40	2.04	1.60
11 – 12	1.30	1.94	1.40
12 – 13	1.20	0.91	1.20
13 – 14	1.10	1.50	1.20
14 – 15	1.10	1.50	1.20
15 – 16	1.10	1.21	1.10
16 – 17	1.10	2.82	1.10
17 – 18	1.10	0.82	1.10
18 – 19	1.10	0.55	1.10
19 – 20	1.10	1.09	1.10
20 & Over	1.10	100.00	1.10

It is important to note that not every service category has enough exposures and/or decrements such that the results in that category are statistically credible. This is mainly the case at the highest service categories since most members in those categories are eligible to retire and so have been excluded from our review of this experience. It is also the case in the tables that follow due to the even more limited experience regarding actual terminations.

Based upon the recent experience, we recommend increasing the termination rates for most service categories for both General and Safety members.

We also continue to recommend that termination rates are zero at any age where members are assumed to retire. In other words, at those ages, members will either retire in accordance with the retirement rate assumptions or continue working, rather than terminate and defer their benefit.

Chart 17 compares actual to expected terminations over the past six years for both the current and proposed assumptions.

Chart 18 shows the actual termination rates over the past six years compared to the current and proposed assumptions for General members.

Chart 19 shows the same information as Chart 18, but for Safety members.

The next two tables show the refund election experience over the last six years for General and Safety members. We have utilized the Refundable Code provided by SBCERA indicating whether the member has elected refundable or non-refundable contributions as of the valuation date. Please note that this refundable code may change year by year depending on the member's election for that year.

Rates of Electing a Refund of Contributions upon Termination – General

Rates (%)

Years of Service ⁴¹	Current Rate if Elected Refundable Contribution	Actual Rate if Elected Refundable Contribution	Proposed Rate if Elected Refundable Contribution	Current Rate if Elected Non-refundable Contribution	Actual Rate if Elected Non-refundable Contribution	Proposed Rate if Elected Non-refundable Contribution
5 – 6	40.00	31.40	35.00	20.00	0.00	17.50
6 – 7	40.00	33.46	35.00	20.00	14.29	17.50
7 – 8	40.00	27.42	35.00	20.00	0.00	17.50
8 – 9	40.00	25.79	35.00	20.00	0.00	17.50
9 – 10	40.00	33.33	35.00	20.00	0.00	17.50
10 – 11	35.00	29.03	30.00	17.50	0.00	15.00
11 – 12	35.00	25.33	30.00	17.50	0.00	15.00
12 – 13	35.00	28.33	30.00	17.50	0.00	15.00
13 – 14	35.00	26.72	30.00	17.50	0.00	15.00
14 – 15	35.00	19.57	30.00	17.50	N/A	15.00
15 – 16	20.00	11.76	15.00	10.00	0.00	7.50
16 – 17	20.00	6.45	15.00	10.00	0.00	7.50
17 – 18	20.00	25.49	15.00	10.00	0.00	7.50
18 – 19	20.00	11.36	15.00	10.00	0.00	7.50
19 – 20	20.00	13.64	15.00	10.00	N/A	7.50
20 & Over	20.00	13.22	15.00	10.00	0.00	7.50

⁴¹ All members with less than 5 years of service are assumed to elect a refund of contributions

Rates of Electing a Refund of Contributions upon Termination – Safety

Rates (%)

Years of Service ⁴²	Current Rate if Elected Refundable Contribution	Actual Rate if Elected Refundable Contribution	Proposed Rate if Elected Refundable Contribution	Current Rate if Elected Non-refundable Contribution	Actual Rate if Elected Non-refundable Contribution	Proposed Rate if Elected Non-refundable Contribution
5 – 6	20.00	8.82	15.00	10.00	N/A	7.50
6 – 7	20.00	12.50	15.00	10.00	0.00	7.50
7 – 8	20.00	0.00	15.00	10.00	N/A	7.50
8 – 9	20.00	27.27	15.00	10.00	0.00	7.50
9 – 10	20.00	9.09	15.00	10.00	0.00	7.50
10 – 11	20.00	10.00	15.00	10.00	N/A	7.50
11 – 12	20.00	9.09	10.00	10.00	N/A	5.00
12 – 13	15.00	40.00	10.00	7.50	N/A	5.00
13 – 14	15.00	0.00	10.00	7.50	0.00	5.00
14 – 15	15.00	0.00	10.00	7.50	N/A	5.00
15 – 16	15.00	20.00	10.00	7.50	0.00	5.00
16 – 17	10.00	0.00	5.00	5.00	0.00	2.50
17 – 18	10.00	0.00	5.00	5.00	N/A	2.50
18 – 19	5.00	0.00	5.00	2.50	N/A	2.50
19 – 20	5.00	0.00	5.00	2.50	0.00	2.50
20 & Over	0.00	0.00	0.00	0.00	N/A	0.00

For both General and Safety members, the overall actual rates for electing a refund of contributions are generally lower than the current assumptions for the past six years. Therefore, **for both General and Safety members, we recommend decreasing the rates of electing a refund of contributions at most service groups between 5 and 20 years of service, as shown above.** The rates for those members that have elected non-refundable contributions are generally half the rates for members that elected refundable contributions.

Chart 20 shows the actual rates of electing a refund of contributions compared to the current and proposed assumptions for General members who elected refundable contributions.

Chart 21 shows the actual rates of electing a refund of contributions compared to the current and proposed assumptions for General members who elected non-refundable contributions.

Chart 22 shows the same information as Chart 20, but for Safety members.

Chart 23 shows the same information as Chart 21, but for Safety members.

⁴² All members with less than 5 years of service are assumed to elect a refund of contributions

Chart 17: Actual Number of Terminations
Compared to Expected

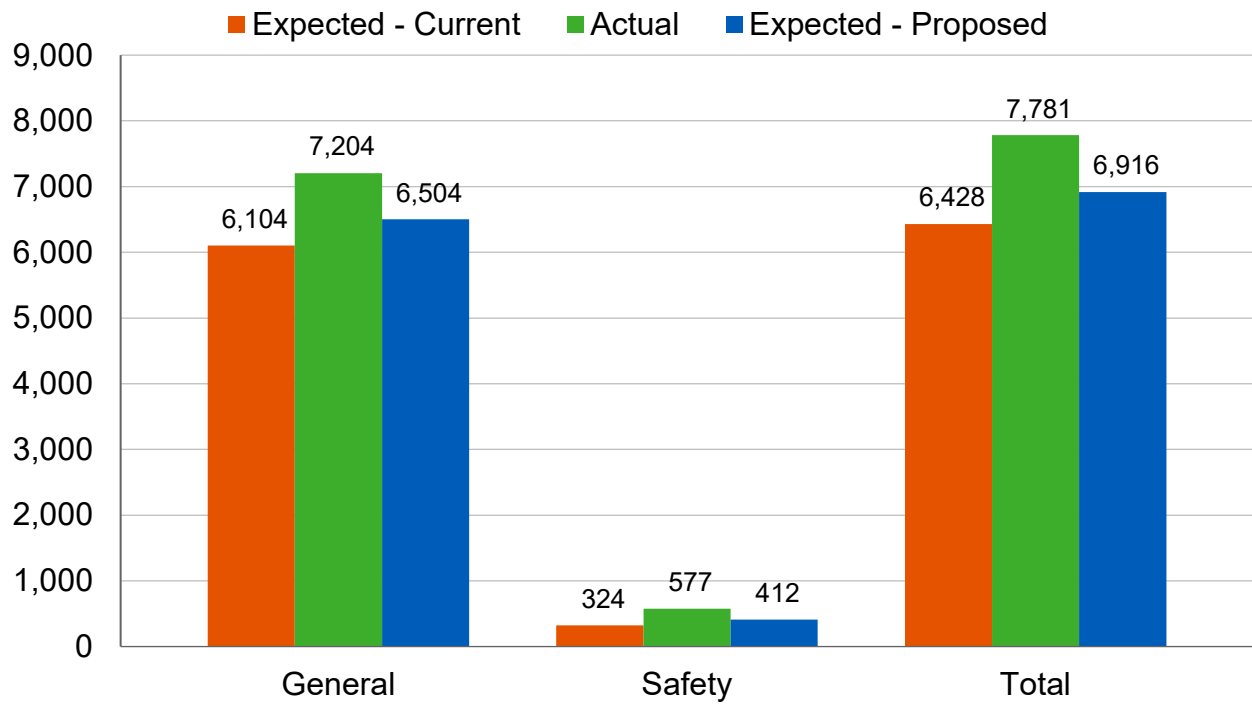


Chart 18: Termination Rates – General Members

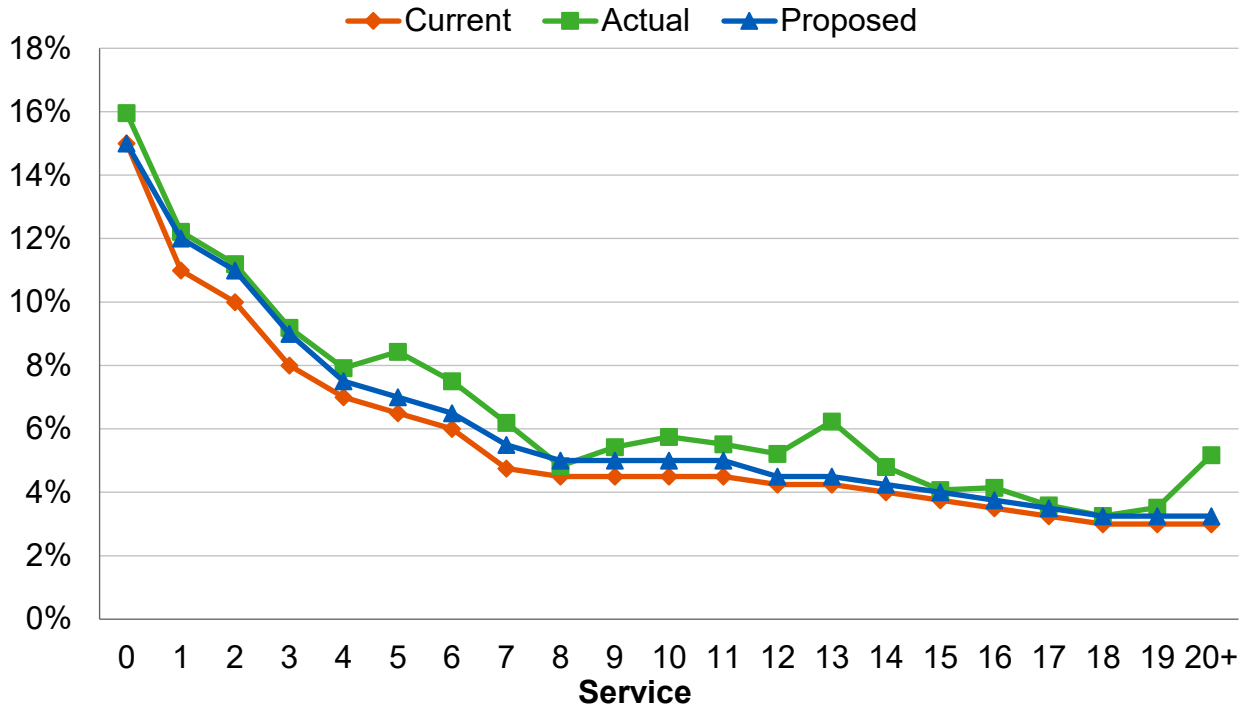


Chart 19: Termination Rates – Safety Members

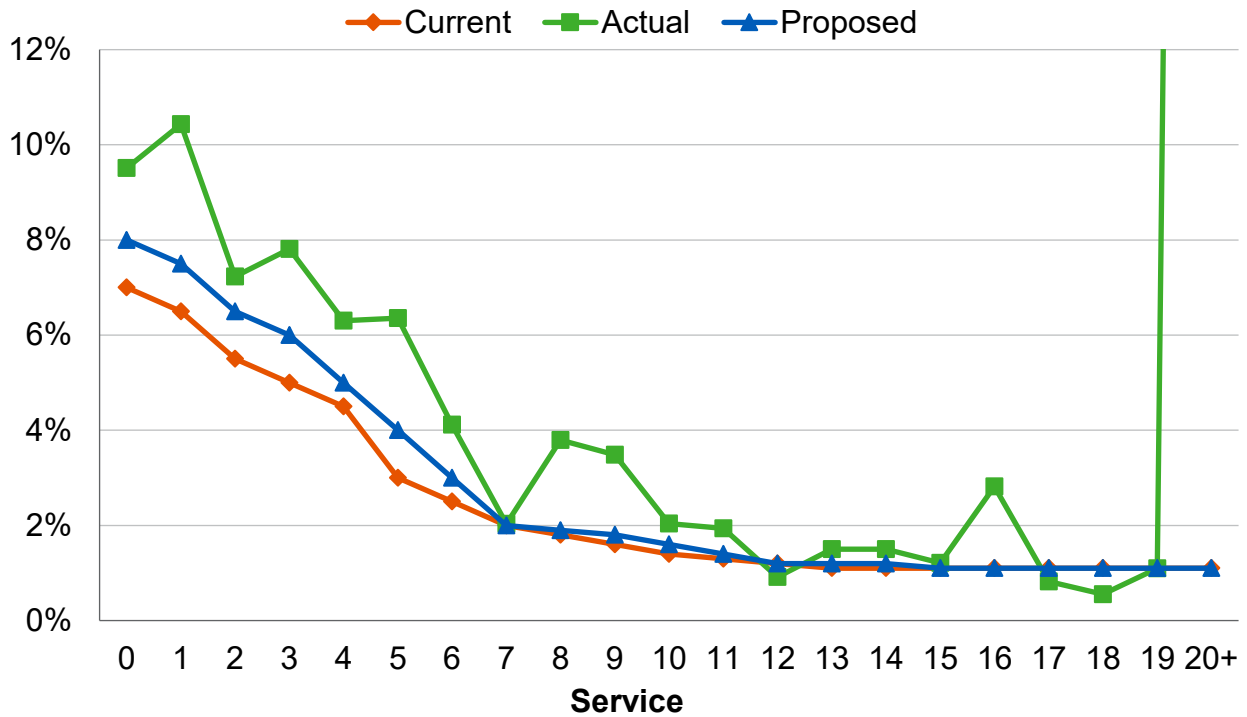


Chart 20: Rates of Electing a Refund – General Members Elected Refundable Contributions

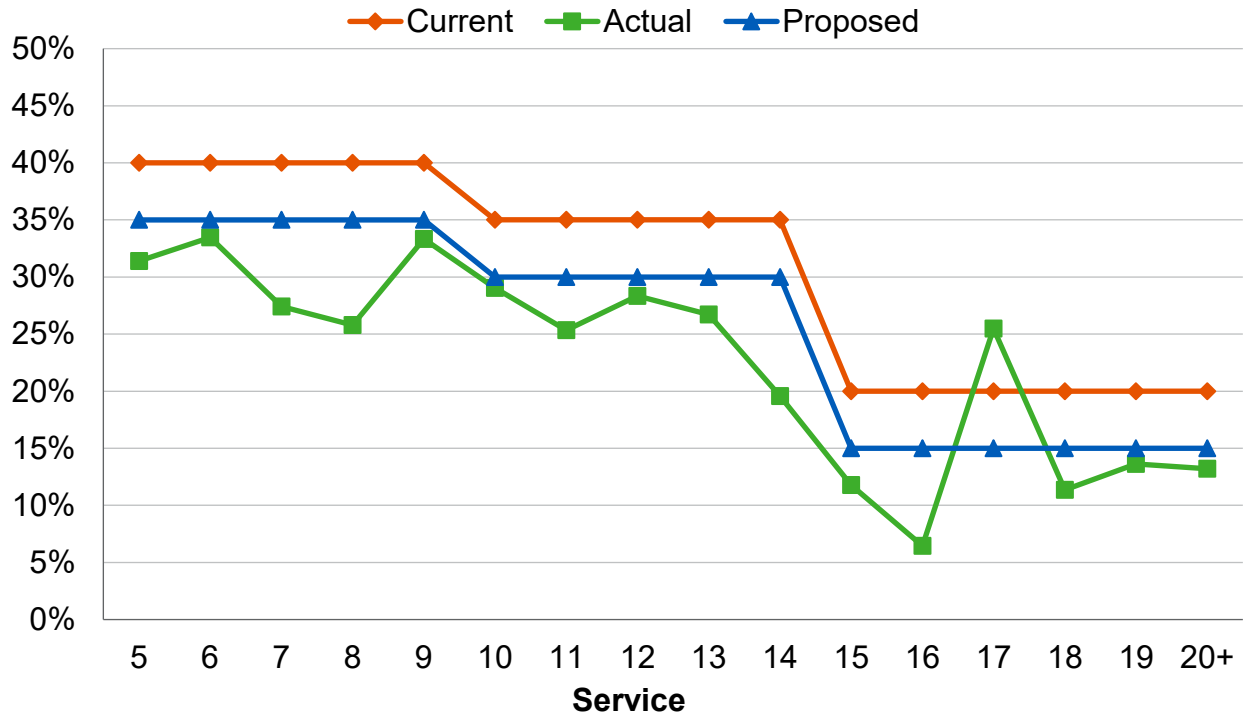


Chart 21: Rates of Electing a Refund – General Members Elected Non-Refundable Contributions

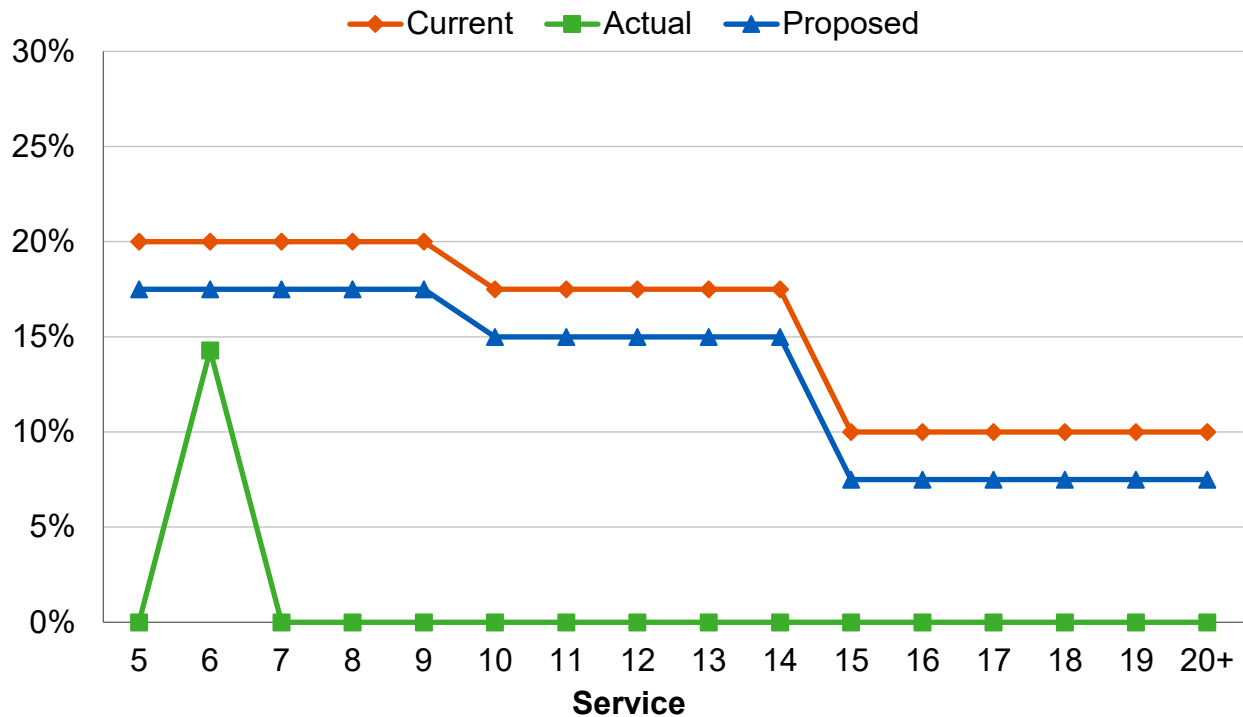


Chart 22: Rates of Electing a Refund – Safety Members Elected Refundable Contributions

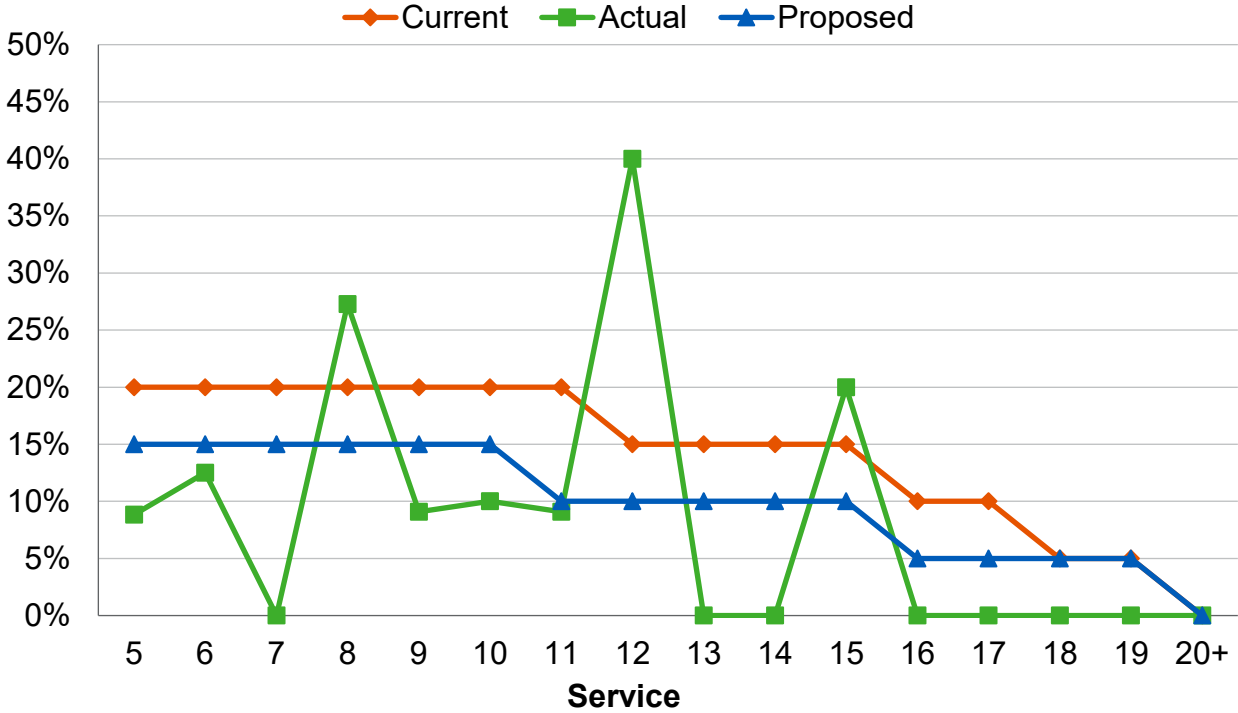
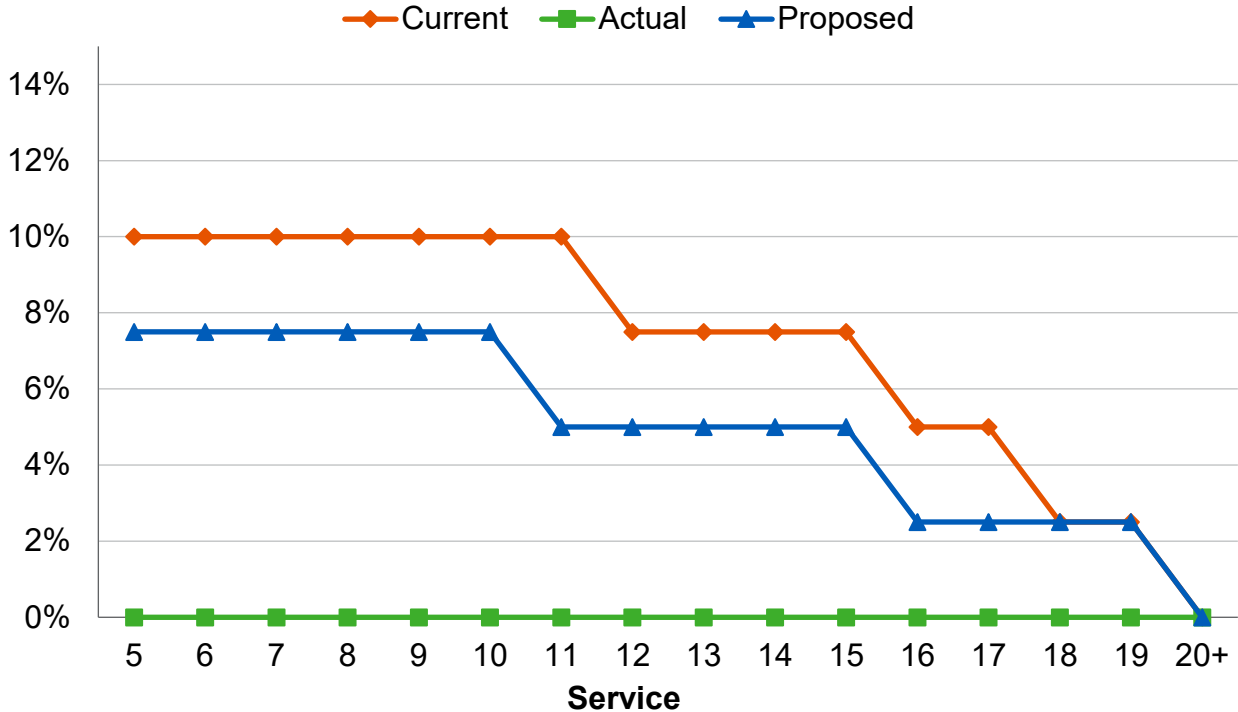


Chart 23: Rates of Electing a Refund – Safety Members Elected Non-Refundable Contributions



E. Disability Incidence Rates

When a member becomes disabled, he or she may be entitled to at least a 50% of pay pension (service connected disability), or a pension that depends upon the member’s years of service (non-service connected disability).

The following summarizes the actual incidence of combined service and non-service connected disabilities over the past three years compared to the current and proposed assumptions for both service connected and non-service connected disability incidence:

Disability Incidence Rates (%)

Age	General			Safety		
	Current Rate	Actual Rate	Proposed Rate	Current Rate	Actual Rate	Proposed Rate
20 – 24	0.02	0.00	0.02	0.20	0.00	0.15
25 – 29	0.02	0.08	0.03	0.25	0.22	0.25
30 – 34	0.04	0.03	0.04	0.40	0.23	0.35
35 – 39	0.07	0.16	0.08	0.60	0.95	0.70
40 – 44	0.10	0.08	0.10	0.70	0.86	0.80
45 – 49	0.20	0.14	0.20	1.20	0.97	1.20
50 – 54	0.30	0.17	0.25	3.00	4.00	3.50
55 – 59	0.40	0.25	0.35	6.50	8.19	7.00
60 – 64	0.70	0.38	0.60	7.50	5.77	7.00
65 – 69	1.00	0.82	1.00	7.50	31.91	12.50
70 – 74	1.20	0.00	1.00	0.00	0.00	0.00

Based on this experience, we recommend slightly decreasing the disability incidence rate assumption for General members and slightly increasing the disability incidence for Safety members.

Chart 24 compares the actual number of non-service connected and service connected disabilities over the past three years to that expected under both the current and proposed assumptions.

Chart 25 shows actual disability incidence rates, compared to the assumed and proposed rates for General members.

Chart 26 graphs the same information as Chart 25, but for Safety members.

The following table shows the observed percentage of members that received a service versus non-service connected disability based on the actual experience over the past three years. Also shown are the current assumed percentages and the percentages we propose.

Service vs. Non-Service Connected Disability

Service Connected %	General	Safety
Current Assumption	55%	100%
Actual Experience	71%	99%
Proposed Assumption	60%	100%

Based on this experience, we recommend increasing the current assumption that General disabilities will be service connected disabilities from 55% to 60%. We also recommend maintaining the current assumption that 100% of Safety disabilities will be service connected disabilities.

In prior valuations, it was assumed that 45% of future General service connected disabled retirees would be eligible for the Supplemental Disability benefit and 70% of future General non-service connected disabled retirees would be eligible for the Supplemental Disability benefit. Based on the last three years of experience, about 35% of General service connected disabled retirees (46% in the last study) and 89% of General non-service connected disabled retirees (69% in the last study) received this benefit. **We recommend decreasing the assumption to 40% for General service connected disabled retirees and increasing the assumption to 75% for General non-service connected disabled retirees.**

Chart 24: Actual Number of Service and Non-service Disability Retirements Compared to Expected

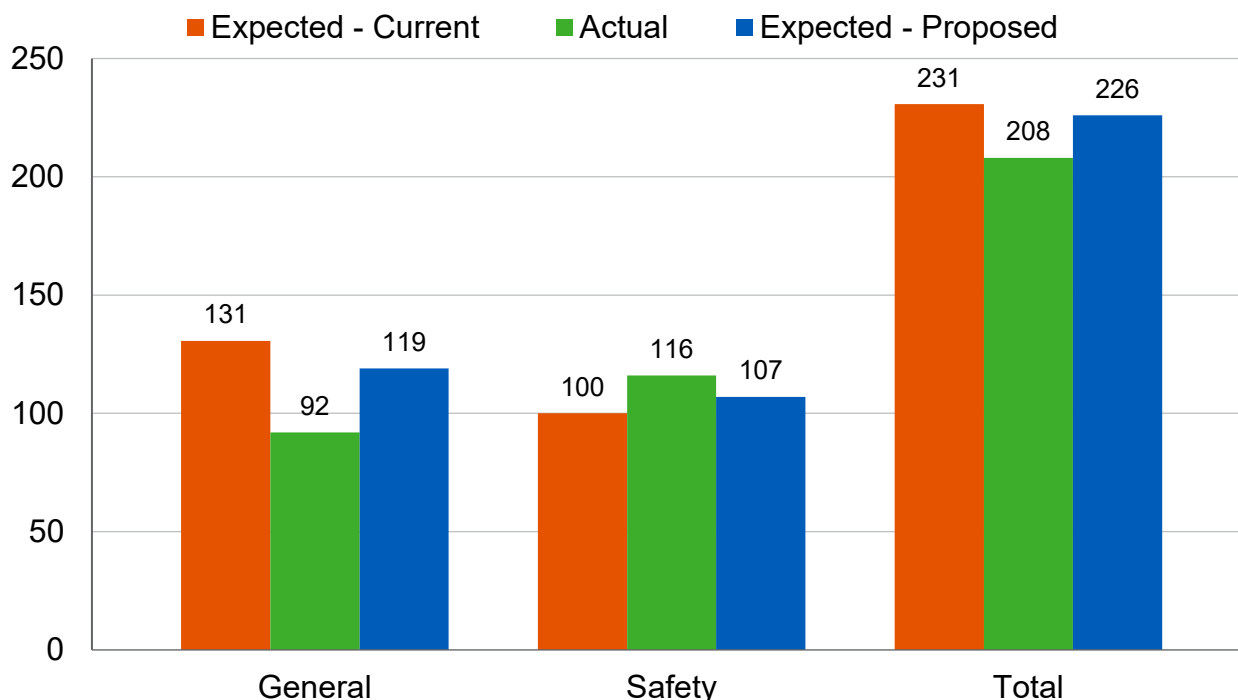


Chart 25: Disability Incidence Rates
General Members

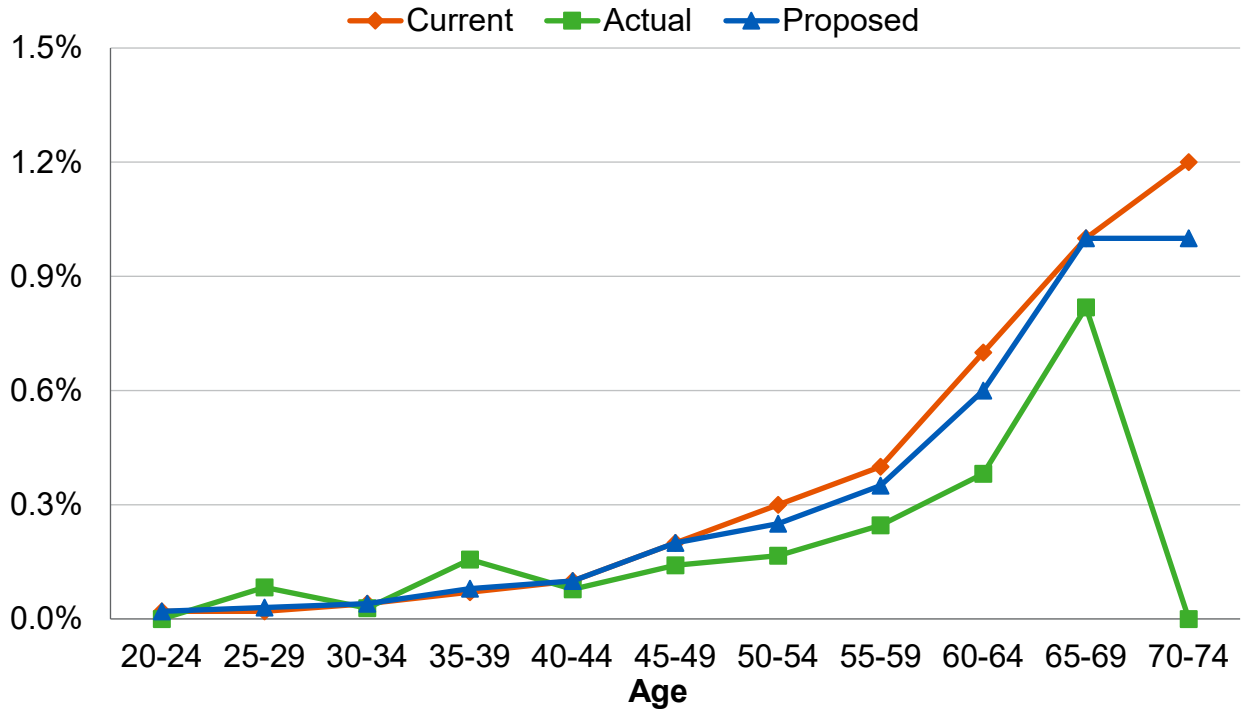
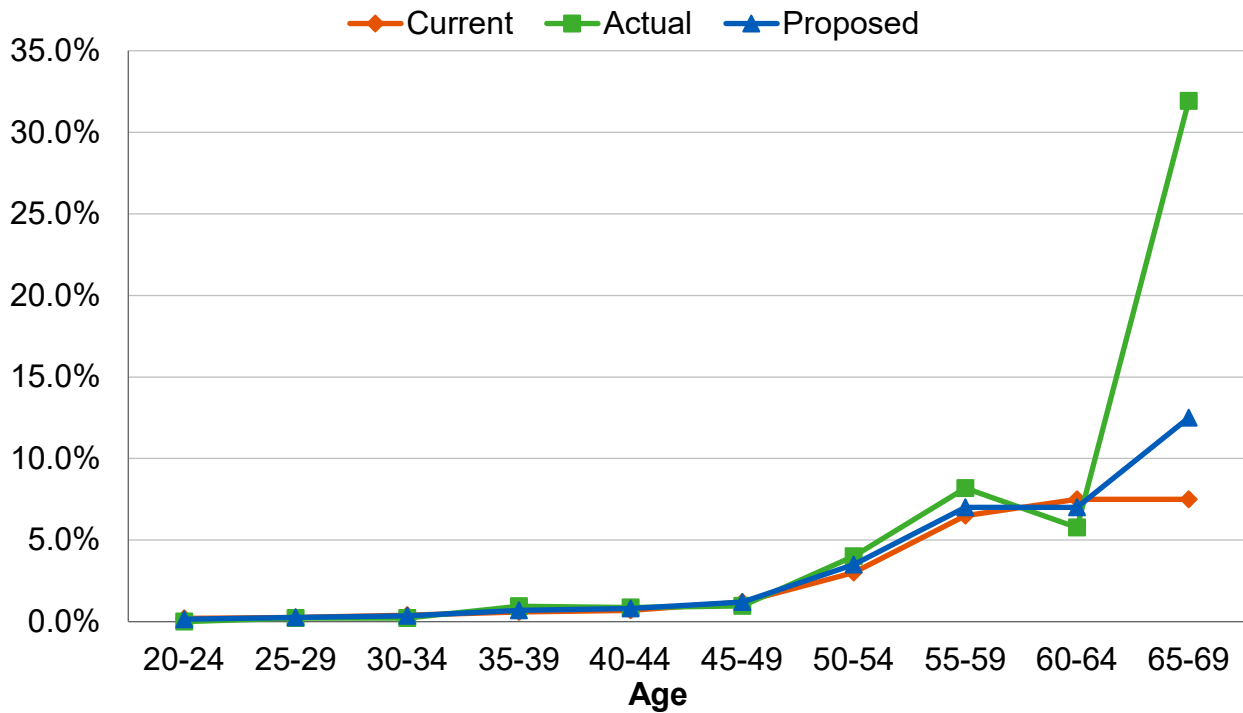


Chart 26: Disability Incidence Rates
Safety Members



F. Leave Cashouts

Certain SBCERA Tier 1 members are eligible for leave cashouts on an annual basis. These cashouts are included as part of a member's Earnable Compensation at retirement. There are two categories within which these leave cashouts may fall:

- Ongoing Pay Elements – Those that are expected to be received relatively uniformly over a member's employment years; and
- Terminal Pay Elements – Those that are expected to be received only during the member's final average earnings pay period.

The first category is recognized in the actuarial calculations by virtue of being included in the current pay of active members. Any year to year fluctuation in the amount of leave cashouts would be incorporated in the salary scale assumptions discussed in the prior section of this report. The second category requires a separate actuarial assumption to anticipate its impact on a member's retirement benefit. Note that the leave cashout assumptions are not applied to Tier 2 members.

In the last experience study, SBCERA provided us information for the first time on the actual amount of cashouts during the ten years prior to retirement for each of the members who retired during the three-year period from July 1, 2016 through June 30, 2019. We studied the impact of including these cashouts by comparing the average cashouts in the year prior to retirement (which are used in the benefit calculation) to the average cashouts made in the year prior to that (which were already reflected in the actuarial valuation).⁴³ The difference between them was the basis for our actuarial assumption for the "terminal pay element" described above. As a result, the Board adopted cashout load assumption to 1.0% and 2.0% for General Tier 1 and Safety Tier 1, respectively.

Based on the data in the most recent three year study period from July 1, 2019 through May 31, 2022, we observed the following:

For General Tier 1 members two years out from retirement, the average cashout represented about 0.94% of salary. In the final year before retirement, the average cashout was about 1.62% of salary. This resulted in an observed terminal pay cashout rate of 0.68% of salary.

For Safety Tier 1 members two years out from retirement, the average cashout represented about 3.19% of salary. In the final year before retirement, the average cashout was about 4.52% of salary. This resulted in an observed terminal pay cashout rate of 1.29% of salary.

⁴³ Note that we could have included years further out from retirement; however, that experience may not reflect current MOUs.

The following tables show the actual cashouts that are expected to be received only during the member's final average earnings pay period for General and Safety Tier 1 members compared to the current and proposed assumptions.

Year of Retirement	General New Retirees (%)			Safety New Retirees (%)		
	Current Assumption	Actual Rate	Proposed Assumption	Current Assumption	Actual Rate	Proposed Assumption
July 1, 2019 to May 31, 2022	1.00	0.68	0.75	2.00	1.29	1.75

Based on the above experience, we recommend decreasing the cashout load assumption to 0.75% for General Tier 1 and 1.75% for Safety Tier 1.

G. Survivor Assumptions for Survivor Benefit Valuation

Additional assumptions concerning the probability of being married or having eligible children upon pre-retirement death are needed for the Survivor Benefit Valuation. The current assumptions are based on the 2019 U.S. Census data.⁴⁴ We have proposed changes to these assumptions that reflect the 2021 U.S. Census data. The proposed assumptions are shown at the end of Appendix B. Overall, the proposed assumptions reflect slight decreases in the percent of members with survivors.

⁴⁴ The 2021 U.S. Census data is utilized because certain data points are unavailable in the 2022 U.S. Census data.

5. Cost Impact

We have estimated the impact of all the recommended demographic and economic assumptions as if they were applied to the June 30, 2022 actuarial valuation. The table below shows the changes in the employer and member contribution rates due to the proposed assumption changes separately for the recommended economic assumption changes including the recommended merit and promotion salary increases (as recommended in Section 3 of this report) and the recommended demographic assumption changes (as recommended in Section 4 of this report).

The results include the change in the administrative expense load from 0.85% to 0.90% of payroll. The cost associated with the administrative expense load has continued to be allocated to both the employer and the member based on the components of the total contribution rate (before administrative expenses) for the employer and the member.⁴⁵

Cost Impact of the Recommended Assumptions Based on June 30, 2022 Actuarial Valuation

Assumption	Impact on Average Employer Contribution Rates
Decrease due to changes in economic assumptions	(0.33%)
Decrease due to changes in demographic assumptions	(0.28%)
Total decrease in average employer rate	(0.61%)
Total estimated decrease in annual dollar amount (\$000s)⁴⁶	\$(14,393)

Assumption	Impact on Weighted Average Member Contribution Rates
Decrease due to changes in economic assumptions	(0.21%)
Decrease due to changes in demographic assumptions	(0.21%)
Total decrease in average member rate	(0.42%)
Total estimated decrease in annual dollar amount (\$000s)³¹	\$(8,416)

Assumption	Impact on UAAL (\$000s)
Decrease due to changes in economic assumptions	\$(90,390)
Decrease due to changes in demographic assumptions	(27,459)
Total decrease in UAAL (\$000s)	\$(117,849)

⁴⁵ The actual allocation of contribution rates for administrative expenses will be determined in each actuarial valuation to reflect the relative proportions of employer and member contributions.

⁴⁶ Based on June 30, 2022 projected annual payroll as determined under each set of assumptions.

**Impact on
Funded Percentage**

Change in Funded Percentage	84.8% to 85.5%
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Of the various recommended assumption changes, the most significant cost impact is from the change in inflation.

We have also analyzed in the tables below the average employer and member contribution rate impacts for each cost group due to the recommended assumption changes as if they were applied to the June 30, 2022 actuarial valuation.

Employer Contribution Rate Increases/(Decreases)
(% of Payroll)

	Normal Cost	UAAL	Total	Annual Amount ⁴⁷ (\$000s)
County General Tier 1	(0.61%)	(0.36%)	(0.97%)	\$(6,078)
County General Tier 2	(0.36%)	(0.36%)	(0.72%)	(6,127)
Safety Tier 1	(0.32%)	0.57%	0.25%	288
Safety Tier 2	(0.45%)	0.57%	0.12%	(296)
Superior Court Tier 1	(0.61%)	(0.41%)	(1.02%)	(481)
Superior Court Tier 2	(0.36%)	(0.41%)	(0.77%)	(364)
SCAQMD Tier 1	(0.91%)	(0.08%)	(0.99%)	(490)
SCAQMD Tier 2	(0.40%)	(0.08%)	(0.48%)	(366)
Other General Tier 1	(0.52%)	(0.21%)	(0.73%)	(249)
Other General Tier 2	(0.37%)	(0.21%)	(0.58%)	(230)
All Categories Combined	(0.45%)	(0.16%)	(0.61%)	\$(14,393)

⁴⁷ Based on June 30, 2022 projected annual payroll as determined under each set of assumptions.

Average Member Contribution Rate Increases/(Decreases)
(% of Payroll)

	Total	Annual Amount ⁴⁸ (\$000s)
County General Tier 1	(0.57%)	\$(3,517)
County General Tier 2	(0.36%)	(2,860)
Safety Tier 1	(0.24%)	(451)
Safety Tier 2	(0.45%)	(663)
Superior Court Tier 1	(0.49%)	(228)
Superior Court Tier 2	(0.36%)	(160)
SCAQMD Tier 1	(0.11%)	(59)
SCAQMD Tier 2	(0.40%)	(186)
Other General Tier 1	(0.57%)	(181)
Other General Tier 2	(0.37%)	(111)
All Categories Combined	(0.42%)	\$(8,416)

⁴⁸ Based on June 30, 2022 projected annual payroll as determined under each set of assumptions.

Appendix A: Current Actuarial Assumptions

Economic Assumptions

Net Investment Return:	7.25%, net of investment expenses
Administrative Expenses:	0.85% of payroll allocated to both the employer and member based on the components of the total contribution rate (before expenses) for the employer and member.
Employee Contribution Crediting Rate:	2.75% (Actual rate is based on six-month Treasury rate).
Consumer Price Index:	Increase of 2.75% per year; retiree COLA increases due to CPI are limited to maximum of 2.00% per year.
Payroll Growth:	Inflation of 2.75% per year plus “across the board” real salary increases of 0.50% per year.
Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 2.75% per year from the valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 2.75% per year from the valuation date.

Salary Increases:

The annual rate of compensation increase includes:

- Inflation at 2.75%, plus
- “Across the board” salary increases of 0.50% per year, plus
- The following merit and promotion increases:

Years of Service	Rate (%)	
	General	Safety
Less than 1	9.50	9.00
1 – 2	7.00	5.50
2 – 3	4.75	4.00
3 – 4	4.25	3.80
4 – 5	4.00	3.70
5 – 6	3.50	3.60
6 – 7	3.25	3.50
7 – 8	3.00	3.25
8 – 9	2.50	3.00
9 – 10	2.00	2.75
10 – 11	1.75	2.25
11 – 12	1.50	2.00
12 – 13	1.45	1.90
13 – 14	1.40	1.85
14 – 15	1.35	1.80
15 – 16	1.30	1.75
16 – 17	1.30	1.70
17 – 18	1.30	1.65
18 – 19	1.30	1.60
19 – 20	1.30	1.55
20 & Over	1.30	1.50

Demographic Assumptions

Post-Retirement Mortality Rates:

Healthy

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10%, projected generationally with the two-dimensional mortality improvement scale MP-2019.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.

Disabled

- **General Members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.
- **Safety Members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.

Beneficiary

- **All Beneficiaries:** Pub-2010 General Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10%, projected generationally with the two-dimensional mortality improvement scale MP-2019.

The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Pre-Retirement Mortality Rates:

- **General Members:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.
- **Safety Members:** Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2019.

Age	Rate (%)			
	General		Safety	
	Male	Female	Male	Female
25	0.02	0.01	0.03	0.02
30	0.03	0.01	0.04	0.02
35	0.04	0.02	0.04	0.03
40	0.06	0.03	0.05	0.04
45	0.09	0.05	0.07	0.06
50	0.13	0.08	0.10	0.08
55	0.19	0.11	0.15	0.11
60	0.28	0.17	0.23	0.14
65	0.41	0.27	0.35	0.20
70	0.61	0.44	0.66	0.39

All pre-retirement deaths are assumed to be non-service connected. Note that generational projections beyond the base year (2010) are not reflected in the above mortality rates.

Mortality Rates for Member Contributions:

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10%, projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 30% male and 70% female.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2019, weighted 90% male and 10% female.

Disability Incidence Rates:

Age	Rate (%)	
	General	Safety
20	0.02	0.20
25	0.02	0.23
30	0.03	0.34
35	0.06	0.52
40	0.09	0.66
45	0.16	1.00
50	0.26	2.28
55	0.36	5.10
60	0.58	7.10
65	0.88	7.50
70	1.12	0.00

55% of General disabilities are assumed to be service connected (duty) disabilities and the other 45% are assumed to be non-service connected (ordinary) disabilities.
100% of Safety disabilities are assumed to be service connected (duty) disabilities.

Termination Rates:

Years of Service	Rate (%)	
	General	Safety
Less than 1	15.00	7.00
1 – 2	11.00	6.50
2 – 3	10.00	5.50
3 – 4	8.00	5.00
4 – 5	7.00	4.50
5 – 6	6.50	3.00
6 – 7	6.00	2.50
7 – 8	4.75	2.00
8 – 9	4.50	1.80
9 – 10	4.50	1.60
10 – 11	4.50	1.40
11 – 12	4.50	1.30
12 – 13	4.25	1.20
13 – 14	4.25	1.10
14 – 15	4.00	1.10
15 – 16	3.75	1.10
16 – 17	3.50	1.10
17 – 18	3.25	1.10
18 – 19	3.00	1.10
19 – 20	3.00	1.10
20 & Over	3.00	1.10

Refer to the next table that contains rates for electing a refund of contributions upon termination. No termination is assumed after a member is first assumed to retire.

**Termination Rates
(continued):**

Rate (%) of Electing a Refund of Contributions upon Termination

Years of Service	General		Safety	
	Rate if Elected Refundable Contribution	Rate if Elected Non-Refundable Contribution	Rate if Elected Refundable Contribution	Rate if Elected Non-Refundable Contribution
Less than 5	100.00	100.00	100.00	100.00
5 – 6	40.00	20.00	20.00	10.00
6 – 7	40.00	20.00	20.00	10.00
7 – 8	40.00	20.00	20.00	10.00
8 – 9	40.00	20.00	20.00	10.00
9 – 10	40.00	20.00	20.00	10.00
10 – 11	35.00	17.50	20.00	10.00
11 – 12	35.00	17.50	20.00	10.00
12 – 13	35.00	17.50	15.00	7.50
13 – 14	35.00	17.50	15.00	7.50
14 – 15	35.00	17.50	15.00	7.50
15 – 16	20.00	10.00	15.00	7.50
16 – 17	20.00	10.00	10.00	5.00
17 – 18	20.00	10.00	10.00	5.00
18 – 19	20.00	10.00	5.00	2.50
19 – 20	20.00	10.00	5.00	2.50
20 & Over	20.00	10.00	0.00	0.00

Retirement Rates:

Age	General Tier 1			Safety Tier 1		
	<30 Years of Service	>30 Years of Service	General Tier 2	<30 Years of Service	>30 Years of Service	Safety Tier 2
45	0.00	0.00	0.00	1.00	1.00	0.00
46	0.00	0.00	0.00	2.00	2.00	0.00
47	0.00	0.00	0.00	2.50	2.50	0.00
48	0.00	0.00	0.00	2.00	2.00	0.00
49	0.00	50.00	0.00	10.00	10.00	0.00
50	2.75	2.75	0.00	15.00	37.50	5.00
51	2.25	2.25	0.00	10.00	25.00	4.00
52	3.00	3.00	1.75	12.00	30.00	5.00
53	3.00	3.00	1.75	12.00	30.00	6.00
54	3.00	3.00	1.75	14.00	35.00	12.00
55	4.50	4.50	4.00	15.00	37.50	18.00
56	5.00	5.00	4.00	15.00	37.50	20.00
57	6.00	6.00	6.00	15.00	37.50	22.00
58	6.50	16.25	7.00	15.00	37.50	25.00
59	8.50	21.25	8.00	15.00	37.50	25.00
60	12.00	30.00	9.00	25.00	37.50	25.00
61	12.00	30.00	11.00	25.00	37.50	25.00
62	16.00	40.00	20.00	25.00	37.50	25.00
63	16.00	40.00	20.00	25.00	37.50	25.00
64	23.00	46.00	20.00	25.00	37.50	25.00
65	37.00	55.50	25.00	100.00	100.00	100.00
66	30.00	45.00	30.00	100.00	100.00	100.00
67	25.00	37.50	30.00	100.00	100.00	100.00
68	25.00	37.50	25.00	100.00	100.00	100.00
69	25.00	37.50	25.00	100.00	100.00	100.00
70	25.00	37.50	40.00	100.00	100.00	100.00
71	20.00	30.00	40.00	100.00	100.00	100.00
72	20.00	30.00	40.00	100.00	100.00	100.00
73	20.00	30.00	40.00	100.00	100.00	100.00
74	20.00	30.00	40.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:	<p>For current and future deferred vested members, retirement age assumptions are as follows:</p> <p style="padding-left: 40px;">General Age: 59 Safety Age: 53</p> <p>40% of future General and 65% of future Safety deferred vested members are assumed to continue to work for a reciprocal employer. For reciprocals, 4.55% and 4.75% compensation increases are assumed per annum for General and Safety, respectively.</p>
Future Benefit Accruals:	1.0 year of service per year of employment.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Definition of Active Members:	All active members of SBCERA as of the valuation date.
Data Adjustment:	Data as of May 31 has been adjusted to June 30 by adding one month of age and, for active members, one month or two biweekly periods of service.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement.
Percent Married:	For all active and inactive members, 65% of male members and 55% of female members are assumed to be married at pre-retirement death or retirement.
Age and Gender of Spouse:	For all active and inactive members, male members are assumed to have a female spouse who is 3 years younger than the member and female members are assumed to have a male spouse who is 2 years older than the member.
Supplemental Disability Benefit:	45% of future General service connected (duty) disabled retirees are assumed to be eligible for this benefit; 70% of future General non-service connected (ordinary) disabled retirees are assumed to be eligible for this benefit.
Leave Cashouts:	<p>Additional compensation amounts are expected to be received during a member's final average earnings period. The percentages are as follows:</p> <ul style="list-style-type: none"> • General Tier 1: 1.00% • Safety Tier 1: 2.00% • Tier 2: None

Survivor Assumptions for Survivor Benefit Valuation

Member's Age at Death	Percent Married	Not Married No Child	Not Married One Child	Not Married 2+ Child	Married No Child	Married One Child	Married 2+ Child	Child 1 Age	Child 2 Age
Under 25	19%	71%	6%	4%	9%	6%	4%	3	1
25-34	55%	33%	5%	7%	19%	13%	23%	6	4
35-44	76%	15%	4%	5%	15%	16%	45%	10	8
45-54	74%	20%	3%	2%	37%	18%	20%	14	12
55-59	70%	28%	1%	0%	63%	5%	3%	18	16
60-64	70%	28%	1%	0%	63%	5%	3%	21	19
65-74	68%	31%	0%	0%	67%	1%	1%	N/A	N/A
75+	47%	54%	0%	0%	46%	0%	0%	N/A	N/A
Total	64%	30%	3%	3%	40%	9%	15%	N/A	N/A

Note 1: Derived from 2019 U.S. Census data.

Note 2: Child payments are assumed to end when the child reaches age 22.

Note 3: Widows or widowers are assumed to start payment at age 62 (or later if they are caring for an eligible child).

Appendix B: Proposed Actuarial Assumptions

Economic Assumptions

Net Investment Return:	7.25%, net of investment expenses
Administrative Expenses:	0.90% of payroll allocated to both the employer and member based on the components of the total contribution rate (before expenses) for the employer and member.
Employee Contribution Crediting Rate:	2.50% (Actual rate is based on six-month Treasury rate).
Consumer Price Index:	Increase of 2.50% per year; retiree COLA increases due to CPI are limited to maximum of 2.00% per year.
Payroll Growth:	Inflation of 2.50% per year plus “across the board” real salary increases of 0.50% per year.
Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit:	Increase of 2.50% per year from the valuation date.
Increase in Section 7522.10 Compensation Limit:	Increase of 2.50% per year from the valuation date.

Salary Increases:

The annual rate of compensation increase includes:

- Inflation at 2.50%, plus
- “Across the board” salary increases of 0.50% per year, plus
- The following merit and promotion increases:

Years of Service	Rate (%)	
	General	Safety
Less than 1	5.00	7.00
1 – 2	6.50	4.75
2 – 3	4.75	3.75
3 – 4	4.25	3.75
4 – 5	4.00	3.75
5 – 6	3.50	3.75
6 – 7	3.25	3.75
7 – 8	3.25	3.75
8 – 9	3.00	3.50
9 – 10	2.50	3.25
10 – 11	2.00	2.50
11 – 12	1.75	2.00
12 – 13	1.50	1.90
13 – 14	1.40	1.85
14 – 15	1.35	1.80
15 – 16	1.30	1.75
16 – 17	1.30	1.75
17 – 18	1.30	1.75
18 – 19	1.30	1.75
19 – 20	1.30	1.75
20 & Over	1.30	1.75

Demographic Assumptions

Post-Retirement Mortality Rates:

Healthy

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Disabled

- **General Members:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety Members:** Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Beneficiary

- **Beneficiaries not currently in Pay Status:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Beneficiaries in Pay Status:** Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and 15% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

The Pub-2010 mortality tables and adjustments as shown above reasonably reflect the mortality experience as of the measurement date. These mortality tables were adjusted to future years using the generational projection to reflect future mortality improvement between the measurement date and those years.

Pre-Retirement Mortality Rates:

- **General Members:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety Members:** Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2021.

Age	Rate (%)			
	General		Safety	
	Male	Female	Male	Female
20	0.04	0.01	0.04	0.02
25	0.02	0.01	0.03	0.02
30	0.03	0.01	0.04	0.02
35	0.04	0.02	0.04	0.03
40	0.06	0.03	0.05	0.04
45	0.09	0.05	0.07	0.06
50	0.13	0.08	0.10	0.08
55	0.19	0.11	0.15	0.11
60	0.28	0.17	0.23	0.14
65	0.41	0.27	0.35	0.20
70	0.61	0.44	0.66	0.39

Note that generational projections beyond the base year (2010) are not reflected in the above mortality rates.

All pre-retirement deaths are assumed to be non-service connected.

Mortality Rates for Member Contributions:

- **General Members:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 10% for males and females, projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.
- **Safety Members:** Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for females, projected 30 years (from 2010) with the two-dimensional mortality improvement scale MP-2021, weighted 90% male and 10% female.

Disability Incidence Rates:

Age	Rate (%)	
	General	Safety
20	0.03	0.15
25	0.03	0.21
30	0.04	0.31
35	0.06	0.56
40	0.09	0.76
45	0.16	1.04
50	0.23	2.58
55	0.31	5.60
60	0.50	7.00
65	0.84	10.30
70	1.00	0.00

60% of General disabilities are assumed to be service connected (duty) disabilities and the other 40% are assumed to be non-service connected (ordinary) disabilities.
100% of Safety disabilities are assumed to be service connected (duty) disabilities.

Termination Rates:

Years of Service	Rate (%)	
	General	Safety
Less than 1	15.00	8.00
1 – 2	12.00	7.50
2 – 3	11.00	6.50
3 – 4	9.00	6.00
4 – 5	7.50	5.00
5 – 6	7.00	4.00
6 – 7	6.50	3.00
7 – 8	5.50	2.00
8 – 9	5.00	1.90
9 – 10	5.00	1.80
10 – 11	5.00	1.60
11 – 12	5.00	1.40
12 – 13	4.50	1.20
13 – 14	4.50	1.20
14 – 15	4.25	1.20
15 – 16	4.00	1.10
16 – 17	3.75	1.10
17 – 18	3.50	1.10
18 – 19	3.25	1.10
19 – 20	3.25	1.10
20 & Over	3.25	1.10

Refer to the next table that contains rates for electing a refund of contributions upon termination. No termination is assumed after a member is first assumed to retire.

**Termination Rates
(continued):**

Years of Service	Rate (%) of Electing a Refund of Contributions upon Termination			
	General		Safety	
	Rate if Elected Refundable Contribution	Rate if Elected Non-Refundable Contribution	Rate if Elected Refundable Contribution	Rate if Elected Non-Refundable Contribution
Less than 5	100.00	100.00	100.00	100.00
5 – 6	35.00	17.50	15.00	7.50
6 – 7	35.00	17.50	15.00	7.50
7 – 8	35.00	17.50	15.00	7.50
8 – 9	35.00	17.50	15.00	7.50
9 – 10	35.00	17.50	15.00	7.50
10 – 11	30.00	15.00	15.00	7.50
11 – 12	30.00	15.00	10.00	5.00
12 – 13	30.00	15.00	10.00	5.00
13 – 14	30.00	15.00	10.00	5.00
14 – 15	30.00	15.00	10.00	5.00
15 – 16	15.00	7.50	10.00	5.00
16 – 17	15.00	7.50	5.00	2.50
17 – 18	15.00	7.50	5.00	2.50
18 – 19	15.00	7.50	5.00	2.50
19 – 20	15.00	7.50	5.00	2.50
20 & Over	15.00	7.50	0.00	0.00

Retirement Rates:

Age	General Tier 1			Safety Tier 1		
	<30 Years of Service	>30 Years of Service	General Tier 2	<30 Years of Service	>30 Years of Service	Safety Tier 2
45	0.00	0.00	0.00	2.00	2.00	0.00
46	0.00	0.00	0.00	2.50	2.50	0.00
47	0.00	0.00	0.00	2.50	2.50	0.00
48	0.00	0.00	0.00	2.50	2.50	0.00
49	0.00	50.00	0.00	9.00	9.00	0.00
50	2.50	2.50	0.00	13.00	35.00	5.00
51	2.00	2.00	0.00	10.50	30.00	4.00
52	2.50	2.50	1.50	12.00	30.00	5.00
53	2.50	2.50	1.50	12.50	30.00	6.00
54	2.50	2.50	1.50	14.00	30.00	12.00
55	4.50	10.00	3.50	14.00	37.50	18.00
56	5.00	10.00	3.50	15.00	37.50	20.00
57	5.50	10.00	5.50	15.00	37.50	22.00
58	6.00	17.00	6.50	17.00	37.50	25.00
59	8.50	21.50	7.00	17.00	37.50	25.00
60	11.00	27.50	8.00	25.00	45.00	25.00
61	11.00	27.50	10.50	25.00	45.00	25.00
62	15.00	35.00	16.00	25.00	45.00	25.00
63	15.00	35.00	16.00	25.00	45.00	25.00
64	24.00	42.00	18.00	25.00	45.00	25.00
65	36.00	50.00	22.00	100.00	100.00	100.00
66	30.00	40.00	22.00	100.00	100.00	100.00
67	30.00	40.00	25.00	100.00	100.00	100.00
68	26.00	35.00	20.00	100.00	100.00	100.00
69	26.00	35.00	20.00	100.00	100.00	100.00
70	26.00	35.00	35.00	100.00	100.00	100.00
71	24.00	30.00	25.00	100.00	100.00	100.00
72	22.00	30.00	25.00	100.00	100.00	100.00
73	22.00	30.00	25.00	100.00	100.00	100.00
74	22.00	30.00	25.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00	100.00	100.00

Retirement Age and Benefit for Deferred Vested Members:	<p>For current and future deferred vested members, retirement age assumptions are as follows:</p> <p><u>General Retirement Age</u> Reciprocal members: 59 Other members: 59</p> <p><u>Safety Retirement Age</u> Reciprocal members: 53 Other members: 52</p> <p>We assume that 40% of future General and 65% of future Safety deferred vested members will continue to work for a reciprocal employer. For reciprocal members, we assume 4.30% and 4.75% compensation increases per annum for General and Safety members, respectively.</p>
Future Benefit Accruals:	1.0 year of service per year of employment.
Unknown Data for Members:	Same as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Definition of Active Members:	All active members of SBCERA as of the valuation date.
Data Adjustment:	Data as of May 31 has been adjusted to June 30 by adding one month of age and, for active members, one month or two biweekly periods of service.
Form of Payment:	All active and inactive members are assumed to elect the unmodified option at retirement.
Percent Married:	For all active and inactive members, 65% of male members and 50% of female members are assumed to be married at pre-retirement death or retirement.
Age and Gender of Spouse:	For all active and inactive members, male members are assumed to have a female spouse who is 3 years younger than the member and female members are assumed to have a male spouse who is 2 years older than the member.
Supplemental Disability Benefit:	40% of future General service connected (duty) disabled retirees are assumed to be eligible for this benefit; 75% of future General non-service connected (ordinary) disabled retirees are assumed to be eligible for this benefit.
Leave Cashouts:	<p>Additional compensation amounts are expected to be received during a member's final average earnings period. The percentages are as follows:</p> <ul style="list-style-type: none"> • General Tier 1: 0.75% • Safety Tier 1: 1.75% • Tier 2: None

Survivor Assumptions for Survivor Benefit Valuation

Member's Age at Death	Percent Married	Not Married No Child	Not Married One Child	Not Married 2+ Child	Married No Child	Married One Child	Married 2+ Child	Child 1 Age	Child 2 Age
Under 25	17%	73%	7%	3%	9%	5%	3%	3	1
25-34	52%	35%	5%	8%	19%	13%	20%	6	4
35-44	75%	14%	5%	5%	15%	17%	44%	10	8
45-54	75%	21%	3%	2%	37%	18%	19%	14	12
55-59	69%	30%	1%	0%	61%	5%	3%	18	16
60-64	69%	30%	1%	0%	61%	5%	3%	21	19
65-74	68%	31%	0%	0%	67%	1%	1%	N/A	N/A
75+	49%	52%	0%	0%	48%	0%	0%	N/A	N/A
Total	64%	30%	3%	3%	40%	9%	15%	N/A	N/A

Note 1: Derived from 2021 U.S. Census data.

Note 2: Child payments are assumed to end when the child reaches age 22.

Note 3: Widows or widowers are assumed to start payment at age 62 (or later if they are caring for an eligible child).