Contra Costa County Employees'
Retirement Association

Actuarial Experience Study

Analysis of Actuarial Experience During the Period January 1, 2021 through December 31, 2023

Segal

Segal

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April 30, 2025

Board of Retirement
Contra Costa County Employees' Retirement Association
1200 Concord Avenue, Suite 300
Concord, CA 94520

Re: Review of Actuarial Assumptions for the December 31, 2024 Actuarial Valuation

Dear Members of the Board:

We are pleased to submit this report of our review of the actuarial experience for the Contra Costa County Employees' Retirement Association (CCCERA). This study utilizes the census data for the period January 1, 2021 through December 31, 2023 as well as prior periods for certain assumptions, examines other relevant inputs, and provides the proposed actuarial assumptions, both economic and demographic, to be used in the December 31, 2024 valuation.

The actuarial calculations were completed under the supervision of Andy Yeung, ASA, MAAA, FCA, Enrolled Actuary. 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.

Segal makes no representation or warranty as to the future status of the Plan and does not guarantee any particular result. This document does not constitute legal, tax, accounting or investment advice or create or imply a fiduciary relationship. The Board is encouraged to discuss any issues raised in this report with the Plan's legal, tax and other advisors before taking, or refraining from taking, any action.

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

Sincerely,

Todd Tauzer, FSA, MAAA, FCA, CERA
Senior Vice President and Actuary

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

Eva Yum, FSA, MAAA, EA
Vice President and Actuary

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Section 1: Introduction and Summary

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. 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 January 1, 2021 through December 31, 2023. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27 "Selection of Assumptions for Measuring Pension Obligations". This Standard 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.

We are recommending changes in the assumptions for merit and promotion salary increases, pre-retirement mortality, post-retirement (healthy and disabled) mortality, beneficiary mortality, disability incidence, termination, retirement from active employment, retirement age for deferred vested members, leave cashouts, sick leave conversion, percent of future deferred vested members expected to be covered by a reciprocal system, reciprocal salary increases, percent of members with an eligible survivor, and active death optional form election assumption for members who are assumed to be not married at pre-retirement death.

Section 1: Introduction and Summary

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

Pg #	Actuarial Assumption Category	Recommendation
12	**Inflation:** Future increases in the Consumer Price Index (CPI), which affects investment returns, active member salary increases and retiree COLAs.	Maintain the inflation assumption at 2.50% per annum as discussed in *Section 3(A)*.
15	**Retiree COLA:** Future increases in the cost-of-living adjustments (COLA) for retirees.	**Tiers with a 3% or 4% maximum COLA:** • Maintain the COLA assumption at 2.75% per annum (include inflation assumption of 2.50% plus a margin for adverse deviation of 0.25%) as discussed in *Section 3(A)* **Tiers with a 2% maximum COLA:** Maintain the COLA assumption at 2.00% per annum as discussed in *Section 3(A)*
16	**Investment return:** The estimated average 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 investment return assumption at 6.75% per annum as discussed in *Section 3(B)*.
25	**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: • Inflationary increase • Real "across-the-board" increase • Merit and promotion increase **Payroll growth:** Used to amortize the UAAL in determining the UAAL contribution rate.	Maintain the inflationary salary increase assumption at 2.50% and maintain the real "across-the-board" salary increase assumption at 0.50%. Adjust the merit and promotion rates of salary increase as developed in *Section 3(C)* to reflect past experience. This includes introducing separate rates of merit and promotion salary increases for legacy and PEPRA members. The recommended total rates of salary increase anticipate higher increases overall than the current assumptions for General and Safety members. Maintain the payroll growth assumption (combined inflationary and real "across-the-board" salary increases) at 3.00%.
35	**Administrative Expenses:** Expenses incurred in connection with the plan's operation.	Maintain the administrative expense load assumption to be equal to the actual administrative expenses for the prior year as a percent of actual payroll for the prior year as discussed in *Section 3(D)*.

Pg #	Actuarial Assumption Category	Recommendation
36	**Mortality rates — healthy:** The probability of dying at each age for non-disabled members. Mortality rates are used to anticipate life expectancies.	**Healthy retirees** *Current base table for General members*: Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table *Recommended base table for General members:* Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 5% for females *Current base table for Safety members:* Pub-2010 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and decreased by 5% for females *Recommended base table for Safety members:* Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and decreased by 5% for females **Beneficiaries** *Current base table for beneficiaries in pay status at the valuation:* Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and females *Recommended base table for beneficiaries in pay status at the valuation:* Pub-2016 Contingent Survivor Amount-Weighted Above-Median Mortality Table with rates increased by 5% for males and females *Current base table for beneficiaries not in pay status at the valuation:* Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table *Recommended base table for beneficiaries not in pay status at the valuation:* Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table with rates increased by 5% for females **Pre-retirement mortality** *Current base table for General members:* Pub-2010 General Employee Amount-Weighted Above-Median Mortality Table *Recommended base table for General members:* Pub-2016 General Employee Amount-Weighted Above-Median Mortality Table with rates decreased by 5% for males and females

Pg #	Actuarial Assumption Category	Recommendation
		Current base table for Safety members: Pub-2010 Safety Employee Amount-Weighted Above-Median Mortality Table *Recommended base table for Safety members:* Pub-2016 Safety Employee Amount-Weighted Above-Median Mortality Table **Mortality projection** *Current and recommended projection:* All tables are projected generationally with the two-dimensional mortality improvement scale MP-2021. **Mortality for member contribution rates, optional forms and reserves:** Adjust the mortality rates to those developed in *Section 4(A)* for legacy member contribution rates. A discussion of mortality rates for optional forms and reserves is also provided in *Section 4(A).*
45	**Mortality rates — disabled:** The probability of dying at each age for disabled members. Mortality rates are used to anticipate life expectancies.	**Disabled retirees** *Current base table for General members:* Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with rates increased by 5% for males *Recommended base table for General members:* Pub-2016 Non-Safety Disabled Retiree Amount-Weighted Mortality Table with rates increased by 5% for males and females *Current base table for Safety members:* Pub-2010 Safety Disabled Retiree Amount-Weighted Mortality Table with rates increased by 5% for males *Recommended base table for Safety members:* Pub-2016 Safety Disabled Retiree Amount-Weighted Mortality Table with rates increased by 5% for males and decreased by 5% for females **Mortality projection** *Current and recommended projection:* All tables are projected generationally with the two-dimensional mortality improvement scale MP-2021.
49	**Disability incidence rates:** The probability of becoming disabled at each age.	Adjust the disability rates to those developed in *Section 4(C)* to reflect slightly lower incidence of disability overall for General and Safety members.
56	**Termination rates:** The probability of leaving employment at each service interval.	Adjust the termination rates to those developed in *Section 4(D)* to reflect higher incidence of termination for General members and lower incidence of termination for Safety members.

Section 1: Introduction and Summary

Pg #	Actuarial Assumption Category	Recommendation
61	**Retirement rates:** The probability of retirement at each age a member is eligible to retire. Includes retirement age for deferred vested members.	For active members, adjust the current retirement rates to those developed in *Section 4(E)*. For deferred vested members that work for a reciprocal employer, increase the assumed retirement age from 60 to 61 for General members and maintain the assumption at 53 for Safety members. For deferred vested members that do not work for a reciprocal employer, maintain the assumed retirement age of 60 for General members and reduce the assumption from 51 to 50 for Safety members.
78	**Leave cashouts:** Additional pay elements that are expected to be received during the member's final average earnings period.	Adjust the leave cashouts to those developed in *Section 4(F)*.
81	**Service from unused sick leave:** Additional service that is expected to be received when the member retires due to conversion of unused sick leave.	Adjust the current service from unused sick leave conversion assumptions to those developed in *Section 4(G)*.
82	**Miscellaneous assumptions:** • Reciprocity • Percent with eligible survivor • Eligible survivor age and gender • Future benefit accruals • Unknown data for members • Form of payment • Active death optional form elections	Reduce the current proportion of future inactive members expected to be covered by a reciprocal system from 40% to 20% for General members and reduce the assumption from 70% to 50% for Safety members. In addition, increase the reciprocal salary increase assumption from 3.50% to 3.55% for General members and increase the assumption from 4.00% to 4.10% for Safety members. Increase the current proportion of active and deferred vested members expected to have an eligible survivor at retirement or pre-retirement death from 65% to 70% for males and increase the assumption from 50% to 55% for females. Maintain the eligible survivor age difference assumption that male retirees are three years older than their spouses and that female retirees are two years younger than their spouses. Maintain the assumption that male retirees are assumed to have a female spouse and that female retirees are assumed to have a male spouse. Maintain the current future benefit accrual assumption, adjust the assumption for members with unknown gender, and maintain the form of payment assumptions as outlined in *Section 4(H)*. Introduce a new active death optional form election assumption for members who are assumed to be not married at pre-retirement death.

We have estimated the impact of the recommended assumption changes as if they were applied to the December 31, 2023 actuarial valuation. The table below provides an overview of the impact on key results, while more details, including the contribution impact by cost group, can be found in *Section 5.*

Cost Impact of All Recommended Assumptions Based on December 31, 2023 Actuarial Valuation

Valuation Result	Total Estimated Impact
Actuarial accrued liability	Decrease of $41.3 million
Funded ratio	Increase of 0.30%
Average employer contribution rate	Decrease of 0.54% of payroll
Average member contribution rate	Increase of 0.03% of payroll

There is a decrease in the average employer rate of 0.54% (which includes a decrease in normal cost rate of about 0.30% and a decrease in the UAAL rate of about 0.24%). This decrease is mainly due to demographic assumption changes that reduce cost (such as higher termination rate, lower disability rate and new mortality tables that predict lower life expectancies for payees at advance ages) that is offset somewhat by the increase in the merit and promotion salary increases assumption.

There is an increase in the average member rate mainly due to the increase in the merit and promotion salary increases assumption. We note that the basic contribution rates for legacy members are not impacted by most of the demographic assumptions such as retirement rate, termination rate and disability rate. Therefore, the changes in those assumptions do not have an impact on the basic contribution rates for legacy members. Moreover, the reduction in the employer UAAL rate is also not shared by the members.

Section 2 provides some background on the basic principles and methodology used in the experience study 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*. Lastly, a summary of all the current actuarial assumptions is provided in *Appendix A*, and a summary of all the proposed actuarial assumptions is provided in *Appendix B*.

Section 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 percent of members assumed to go on to work for a reciprocal system, reciprocal salary increases, percentage of members with an eligible spouse or domestic partner, survivor age difference, leave cashouts, conversion of service from unused sick leave and active death optional form election assumption for members who are assumed to be not married at pre-retirement death.

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 accounting for certain 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, which are commonly referred to as merit and promotion increases. Payments to amortize any Unfunded Actuarial Accrued Liability (UAAL) are calculated 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

To determine the probability of an event occurring, we examine the "decrements" and "exposures" of that event. For example, when considering termination from service, we compare the number of employees who actually terminate in a specific service category (the number of

"decrements") with those who could have terminated (the number of "exposures"). If there were 500 active employees in the 3–4 service category at the beginning of the year and 50 of them left during the year, the probability of termination in that service group is 50 ÷ 500, or 10%.

The reliability of the resulting probability depends heavily on both the number of decrements and the number of exposures. For instance, if there are only a few people in a high service category at the beginning of the year (number of exposures), the probability of termination developed for that service category may be less credible, particularly if it does not align with the pattern shown for the other service categories. Similarly, when considering the death decrement, if an age category has a large number of exposures but very few decrements (actual deaths), then the probability developed for that category would still be considered less reliable.

One reason we use several years of experience for such a study is to enhance statistical reliability by increasing the number of exposures and decrements. Another reason for using several years of data is to smooth out any fluctuations that may occur from one year to the next. Nevertheless, we also calculate the rates on a yearly basis to check for any emerging trends in the more recent years.

The setting of the demographic assumptions is provided in *Section 4*.

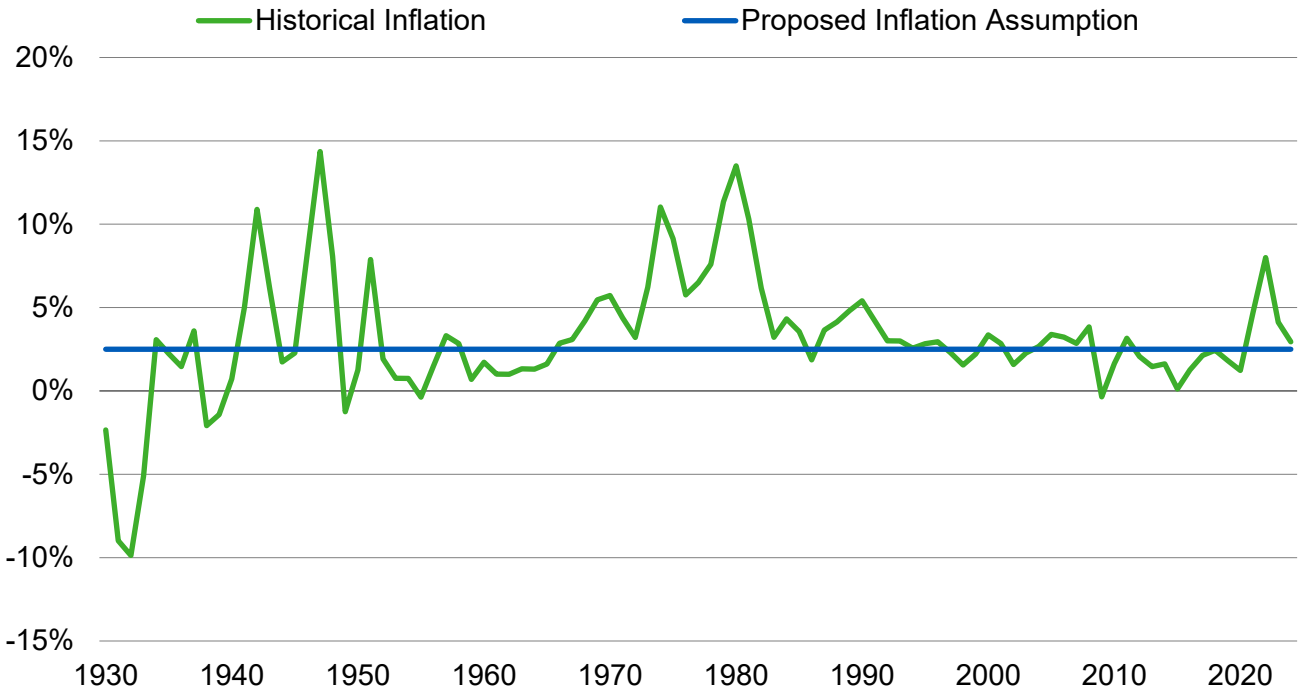
Section 3: Economic Assumptions

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 (CPI) — 1930 to 2024[1]
(U.S. City Average — All Urban Consumers)



There was a spike in inflation that started in the second quarter of 2021 and continued into 2022. The rate of inflation started to decrease after the Federal Reserve began to increase interest rates starting around the second quarter of 2022. The Federal Reserve then changed course and reduced interest rates three times since the third quarter of 2024 in reaction to a continued reduction in inflation. However, they have recently signaled a pause in their adjustment to the interest rates until more economic data becomes available. Based on the most recent inflation data, the change in the CPI from March 2024 to March 2025 was 2.4%.

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

Section 3: Economic Assumptions

Based on information found in the Public Plans Database, which is produced in partnership with the National Association of State Retirement Administrators (NASRA), the median inflation assumption used by 220[1] large public retirement funds in their 2023 fiscal year valuations was 2.50%. In California, CalSTRS and five[2] 1937 Act CERL systems currently use an inflation assumption of 2.75%, the other 15 1937 Act CERL systems use an inflation assumption of 2.50%[3] (including CCCERA) and CalPERS uses an inflation assumption of 2.30%.

CCCERA's investment consultant, Verus, anticipates an annual inflation rate of 2.20% over a 30-year horizon, while the average inflation assumption provided by Verus 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), was 2.47%. 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.[4]

To find a forecast of inflation based on a longer time horizon, we referred to the Social Security Administration's (SSA) 2024 report on the financial status of the Social Security program.[5] The projected average increase in the CPI over the next 75 years under the intermediate cost assumptions used in that report was 2.40%, which the SSA has maintained for several years. The SSA report also includes alternative projections using lower and higher inflation assumptions of 1.80% and 3.00%, respectively.

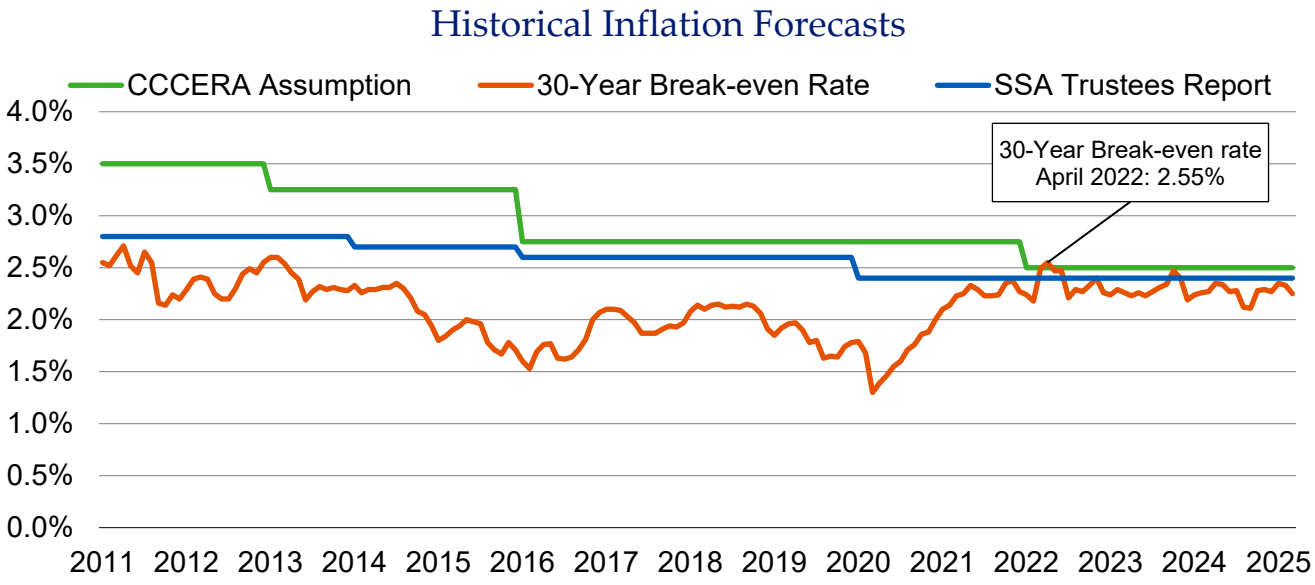
We also compared the yields on the thirty-year inflation indexed U.S. Treasury bonds to comparable traditional U.S. Treasury bonds.[6] This "break-even rate" is commonly regarded as a market-based gauge of future inflation expectations. As of March 2025, the difference in yields is 2.25% which provides a measure of market expectations of inflation. 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 (2.55%). This measure of market expectation for long-term inflation can be quite volatile, which is illustrated in the table on the following page.

[1] Among 228 large public retirement funds, the 2023 fiscal year inflation assumption was not available for 8 of the public retirement funds in the survey data as of April 2025.
[2] We note that none of these five 1937 Act CERL Systems are served by Segal.
[3] Eight of these 1937 Act CERL systems use a 2.50% inflation assumption with a 2.75% COLA assumption.
[4] The time horizon used by the 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 Verus using a 30-year horizon.
[5] Source: "Social Security Administration: The 2024 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds."
[6] Source: Board of Governors of the Federal Reserve System.

Section 3: Economic Assumptions

Observation Month	Difference in Yields	Observation Month	Difference in Yields
February 2022	2.18%	September 2023	2.34%
March 2022	2.49%	October 2023	2.47%
April 2022	2.55%	November 2023	2.40%
May 2022	2.47%	December 2023	2.19%
June 2022	2.47%	January 2024	2.24%
July 2022	2.21%	February 2024	2.26%
August 2022	2.29%	March 2024	2.27%
September 2022	2.27%	April 2024	2.35%
October 2022	2.33%	May 2024	2.34%
November 2022	2.40%	June 2024	2.27%
December 2022	2.26%	July 2024	2.28%
January 2023	2.24%	August 2024	2.12%
February 2023	2.29%	September 2024	2.11%
March 2023	2.26%	October 2024	2.28%
April 2023	2.23%	November 2024	2.29%
May 2023	2.26%	December 2024	2.27%
June 2023	2.23%	January 2025	2.35%
July 2023	2.27%	February 2025	2.33%
August 2023	2.31%	March 2025	2.25%

The following graph shows CCCERA's historical and current proposed inflation assumptions compared to the two other metrics just discussed, going back to 2011. In effect, this compares CCCERA'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 the observed period, CCCERA's assumption has been generally higher, but consistently moving towards these other forecasts and seems to be in a stable place at this point in time.



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 the above metrics, beginning in 2021 we have been 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 maintaining the annual inflation assumption at 2.50%.

Retiree Cost of Living Increases

In our last experience study as of December 31, 2021, the Board adopted the recommended cost-of-living adjustments (COLA) assumption of 2.75% for all retirees in tiers with a maximum COLA of 3% or 4%.[1] The adopted and the recommended COLA assumption was 2.00% for tiers with a maximum COLA of 2%. The assumption of 2.75% included a 0.25% margin above the recommended inflation assumption, to reflect the experience from the December-to-December CPI based on San Francisco-Oakland-Hayward area, which is used by the Board to set COLAs.

The table below shows the changes in the December-to-December CPI based on San Francisco-Oakland-Hayward area (used by the Board to set COLAs) for the most recent five-year, 10-year, 15-year and 20-year periods ending on December 31, 2024.

Period	Change in Dec-to-Dec CPI for San Francisco-Oakland-Hayward Area	Change in Dec-to-Dec CPI for U.S. City Average
5-year period	3.22%	4.20%
10-year period	3.27%	3.00%
15-year period	2.97%	2.56%
20-year period	2.82%	2.56%

With the exception of the most recent five-year period, the December-to-December CPI for the San Francisco-Oakland-Hayward area has historically been higher than the corresponding CPI change for the US City Average (which is a data point considered in setting the recommended inflation assumption). **Therefore, we recommend maintaining the retiree COLA assumption of 2.75%, which includes a 0.25% margin above our recommended inflation assumption for retirees in tiers with a maximum COLA of 3% or 4%. Our recommended COLA assumption for tiers with a maximum 2% remains unchanged at 2.00%.** A summary of the COLA Assumption by maximum COLA (which varies by tier), is shown below:

Maximum COLA	Current Assumption	Proposed Assumption
2.00%	2.00%	2.00%
3.00%	2.75%	2.75%
4.00%	2.75%	2.75%

[1] For current retirees and beneficiaries, we would utilize the accumulated COLA banks to value an annual 3.00% or 4.00% COLA increase to tiers with a maximum COLA of 3% or 4%, respectively, until those banks become depleted.

B. Investment return

The investment return assumption is comprised of two primary components, inflation and real rate of investment return, with adjustments for certain 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.[1] 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 Verus' total or "nominal" 30-year return assumptions for 2025 by their assumed 2.20% inflation rate. The second column of returns (except for certain asset classes as noted in the table) 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 Verus and five other investment advisory firms retained by Segal's public sector clients, as well as Segal's investment advisory division (Segal Marco Advisors). We believe these averages are a reasonable consensus forecast of long-term future market returns in excess of inflation.[2]

[1] However, an argument can also be made that taking on more risk in the portfolio could justify a greater risk margin in the actuarial assumption used, to help manage that risk.

[2] 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 generally shorter than the time horizon encompassed by the actuarial valuation.

CCCERA'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	Verus' Assumed Net Real Rate of Return[1]	Average Assumed Net Real Rate of Return from a Sample of Consultants to Segal's California Public Sector Clients[2]
U.S. Large-Cap Equity	9.00%	4.60%	5.59%
U.S. Small-Cap Equity	2.00%	6.40%	6.45%
International Developed Equity	5.00%	5.90%	6.23%
Global Equity	10.00%	5.20%	6.35%
Emerging Market Equity	2.00%	7.40%	7.89%
Short-term Gov't/Credit	14.00%	2.20%	1.84%
US Treasury	3.50%	2.10%	1.80%
Cash	3.00%	1.70%	0.98%
Private Equity	15.00%	8.70%	9.31%
Private Credit	13.00%	6.60%	6.47%
Real Estate — Debt	3.00%	5.00%	5.00%[3]
Real Estate — Value-add	3.00%	7.90%	7.90%[3]
Real Estate — Opportunistic	4.00%	9.70%	9.70%[3]
Infrastructure	3.00%	7.20%	7.20%[3]
Hedge Funds	6.50%	3.50%	3.50%[3]
Multi-Sector Credit	4.00%	4.50%	4.50%[3]
Total	**100.00%**	**5.50%**	**5.72%**

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 3.7.3.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 believes, based on relevant supporting data, that such superior or inferior returns represent a reasonable expectation over the measurement period."

[1] The rates shown have been estimated by Segal by taking Verus' nominal arithmetic returns and reducing by Verus' assumed 2.20% inflation rate to develop the assumed real rate of return shown. These return assumptions are net of any applicable investment management expenses.

[2] These are based on the projected arithmetic returns provided by Verus and five other investment advisory firms serving Segal's public sector retirement clients in California, as well as Segal's investment advisory division. These return assumptions are net of any applicable investment management expenses.

[3] For these asset classes, Verus' 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 Verus' assumption should more closely reflect the underlying investments made specifically for CCCERA.

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 real rate of returns allows CCCERA'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. We recommend that the 5.72% portfolio **net** real rate of return be used in the determination of CCCERA's investment return assumption, but with some caution. This return is 0.12% higher than the 5.60% **gross** return that was used three years ago in the review of the recommended investment return assumption for the December 31, 2021 valuation. This is before we consider the approximately 0.55% in investment management expense that, as discussed in the next section, will no longer be subtracted from this year's 5.72% net real rate of return.
5. The 0.12% increase in the portfolio real rate of return since 2021 is due to changes in the real rate of return assumptions provided to us by the investment advisory firms (+0.45% under the 2021 asset allocation), changes in CCCERA's target asset allocation (-0.50%) and the interaction effect between these changes (+0.17%). We believe the increase in the real rates of return provided to us by the investment advisory firms may be in part due to the low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate starting in 2022 (even though recently they have started to decrease). Additionally, it is worth noting that the real rates of return provided in these capital market assumptions are generally higher than the ten-year period following the Global Financial Crisis, and so altogether 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 prior experience studies, we adjusted the **gross** real rate of return developed using the target asset allocation by the investment expenses expected to be paid by CCCERA.

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 excluding investment manager fees.

The following table provides these investment expenses in relation to the actuarial value of assets for the six years ending December 31, 2023.

Section 3: Economic Assumptions

Investment Expenses as a Percentage of Actuarial Value of Assets

($ in '000s)

Year Ending December 31	Actuarial Value of Assets[1]	Investment Expenses[2,3]	Investment Expenses as %
2018	$8,195,517	$2,628	0.03%
2019	8,666,778	3,783	0.04%
2020	9,144,580	3,946	0.04%
2021	9,678,508	3,964	0.04%
2022	10,451,125	4,058	0.04%
2023	10,878,818	4,672	0.04%

Investment Expenses Averages and Assumptions

Averaging Period and Assumption	Investment Expenses
Three-year average (2021 – 2023)	0.04%
Six-year average (2018 – 2023)	0.04%
Current assumption (including investment management fees)	**0.60%**
Proposed assumption (excluding investment management fees)	**0.05%**

Based on the above experience, we recommend reducing the investment expense component of the investment return assumption from 0.60% to 0.05%.

Note related to investment expenses paid to active managers – As cited above, under Section 3.7.3.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.

[1] As of beginning of plan year.
[2] Equals the sum of investment consulting fees, custodian fees and other miscellaneous investment expenses. Excludes investment manager fees.
[3] Net of securities lending expenses. Because we do not assume any additional net return for this program, we effectively assume that any securities lending expenses will be offset by related income.

Model change

The 5.72% 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, over long periods of time, to have no surplus or asset shortfall relative to its expected obligations assuming all other actuarial assumptions are met in the future.[1] That is the basis used in Segal's previous experience studies for CCCERA.

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.[2] For any given asset portfolio, the expected geometric average return will be less than the expected arithmetic average return.[3]

Risk adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. CCCERA'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.

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.[4] It also acknowledges that investment results carry significant volatility over time, and yet the proposed assumption is a static number that does not explicitly convey this risk. This practice of a risk adjustment is consistent with our experience that retirement plan fiduciaries would generally prefer that returns exceed the assumed rate more often than not.

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 model used in previous experience studies for CCCERA would look if used in this year's study. Three years ago, the Board adopted an investment return assumption of 6.75%. Under the model used in that experience study, that return implied a risk adjustment of 0.75%, corresponding to a 15-year confidence level of 59%, based on an annual portfolio return standard deviation of 12.50% provided by Verus in 2022.

[1] The mathematical terminology for this is that the mean (or average) surplus or asset shortfall is expected to be zero.
[2] The mathematical terminology for this is that over time the median surplus or asset shortfall is expected to be zero.
[3] 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.
[4] This type of risk adjustment is referred to in the Actuarial Standards of Practice as a "margin for adverse deviation."

If we use the same 59% 15-year confidence level from our last study to set this year's risk adjustment, along with the same methodology, and the current annual portfolio return standard deviation of 10.90% provided by Verus, the corresponding risk adjustment would be 0.66% (the slightly lower standard deviation allows for a slightly lower risk adjustment). 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 6.96%, which is higher than the current assumption of 6.75%. This result would leave room for a potentially larger risk adjustment and confidence level in this year's study based on the previous methodology.

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 increase in the real rates of return provided by the investment consultants may reflect the low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate starting in 2022 (even though recently they have started to decrease), and so could be overly optimistic for use in selecting a long-term investment return assumption. For that reason, for this comparison value we evaluated a net investment return assumption of 6.75% which, together with the other investment return components, would produce a risk adjustment of 0.87% which corresponds to a confidence level of 62% **under the model and expense adjustment used in prior studies**. We believe this increase in confidence level is 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 the expected arithmetic average return. The difference depends on the variability of the portfolio as measured by its standard deviation. The annual portfolio standard deviation provided by Verus is 10.90%, which produces a conversion factor to the expected return of 0.56%. This results in an expected geometric average real return of 5.16% (the expected arithmetic average real return of 5.72% reduced by 0.56%).

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 (or geometric average return) assumption of 7.61%, which is higher than the current assumption of 6.75%. In applying this model to CCCERA for the first time, we again evaluated a net investment return assumption of 6.75% which, together with the other investment return components, would produce a risk adjustment of 0.86% and a corresponding confidence level of 62%.

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 study's model to this year's information.

Section 3: Economic Assumptions

Assumption Component	December 31, 2024 Geometric Model Recommended[1] Value	December 31, 2024 Arithmetic Model For Comparison[2] Only	December 31, 2021 Adopted[2] Value
Inflation	2.50%	2.50%	2.50%
Portfolio expected arithmetic real rate of return	5.72%	5.72%	5.60%
Adjustment to expected geometric real rate of return	(0.56)%	N/A	N/A
Expense adjustment	(0.05)%	(0.60)%[3]	(0.60)%
Risk adjustment	(0.86)%	(0.87)%	(0.75)%
Total	**6.75%**	**6.75%**	**6.75%**
Confidence level	**62%**	**62%**	**59%**

Based on this analysis, we recommend maintaining the investment return assumption at 6.75% per annum.

The table below shows CCCERA'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 December 31	Investment Return[4]	Risk Adjustment	Corresponding Confidence Level
2006 - 2008	7.80%	0.86%	60%
2009 - 2011	7.75%	0.41%	55%
2012 - 2014	7.25%	0.25%	53%
2015 - 2017	7.00%	0.30%	54%
2018 - 2020	7.00%	0.61%	59%
2021 – 2023	6.75%	0.75%	59%
2024 (Recommended)	6.75%	0.86%	62%

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 CCCERA has positioned itself relative to risk over periods of time.[5] The use of a 62% confidence level should be considered in context with other factors, including:

[1] Based on expected geometric average returns.
[2] Based on expected arithmetic average returns.
[3] For purposes of these comparison values, we have assumed the same investment expenses as in the previous study, which included investment management fees.
[4] The investment return assumptions since 2015 are gross of administrative expenses.
[5] 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 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 Verus. 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 "Comparing with other public retirement systems".

Comparison with alternative model used to review investment return assumption

In previous studies, we have consistently reviewed investment return assumptions based on our old model that incorporates expected arithmetic real returns for the different asset classes and for the entire portfolio as one component of that model.[1] The use of "forward looking expected arithmetic returns" is one of the approaches discussed for use in the Selection of 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.[2] 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 CCCERA under the arithmetic approach in the past. 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. For CCCERA, these two changes almost offset each other entirely, which is why, as shown earlier, the same 6.75% assumption has essentially the same confidence level under the two models (comparison values and recommended value).

In the interest of still having an alternative model for comparison, we evaluated the recommended 6.75% assumption based on the expected geometric return for the entire portfolio gross of investment management expenses, but using a fully stochastic approach and a different source for capital market assumptions. Under this alternative model, over a 15-year

[1] 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.

[2] 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.

period, there is a 62% likelihood that future average geometric returns will meet or exceed 6.75%[1] developed using the capital market assumptions compiled by Horizon Actuarial Services based on their most recent survey published in August 2024. This 62% likelihood of achieving a 6.75% return is higher than the corresponding likelihood of 58% (for achieving a 6.75% return) that we observed in this comparison during the assumption review in 2021.

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 6.75% or lower is becoming more common among California public sector retirement systems. Of the twenty 1937 Act CERL systems, one uses a 7.25% investment assumption, six use 7.00%, nine use 6.75% (including CCCERA), three use 6.50%, and one uses 6.25%. Furthermore, CalSTRS currently uses a 7.00% investment return assumption and CalPERS uses a 6.80% investment return assumption.

The following table compares CCCERA's recommended investment return assumption against those of the 221[2] large public retirement funds in their 2023 fiscal year valuations based on information found in the Public Plans Database, which is produced in partnership with NASRA:

CCCERA's Investment Return vs. Public Plans Database[3] Investment Return Assumptions

Assumption	CCCERA	Public Plan Data Low	Public Plan Data Median	Public Plan Data High
Net investment return	6.75%	4.31%	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 three quarters of the systems have reduced their investment return assumption from 2017 to 2023. State systems outside of California tend to change their economic assumptions less frequently and so may lag behind emerging practices in this area.

[1] We performed this stochastic simulation using the capital market assumptions included in the 2024 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 2024 survey that included responses from 26 investment advisors.

[2] Among 228 large public retirement funds, the 2023 fiscal year investment return assumption was not available for 7 of the public retirement funds in the Public Plans Database as of April 2025.

[3] Public Plans Data website – Produced in partnership with the National Association of State Retirement Administrators (NASRA).

C. Salary increases

Salary increases impact plan costs in two ways:

1. Increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and
2. Increasing total active member payroll which in turn generates lower UAAL contribution rates as a percent of payroll.

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 recommend maintaining the annual inflation assumption at 2.50%. 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 0.2% – 0.4% 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 May 2024. In that report, real "across-the-board" pay increases are forecast to be 1.14% 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, the following table compares CCCERA's recent salary experience to the change in CPI over the three-year period ending December 31, 2023 in the following table:

Valuation Date	Actual Average Wage Inflation[1]	Actual December to December Change in CPI[2]
December 31, 2021	3.79%	4.24%
December 31, 2022	4.91%	4.88%
December 31, 2023	4.86%	2.62%
Three-year average	**4.52%**	**3.91%**

Based on the above information, we recommend maintaining the real "across-the-board" salary increase assumption at 0.50%.

[1] 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.

[2] Based on the change in the December CPI index for the San Francisco-Oakland-Hayward Area compared to the prior year.

3. **Merit and promotion increases:** As the name implies, these increases come from an employee's career advancement. This form of pay increase differs from the previous two, since it is specific to the individual. For CCCERA, we continue to recommend service-specific merit and promotion increase assumptions.

   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. 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 decreases of more than 10% during any particular year;
   c. Categorizing these increases into groups by years of service;
   d. Removing the wage inflation component from these increases (assumed to be equal to the increase in the members' average salary during the year, calculated separately for General and Safety members);
   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 total 3.00% assumed inflation and real "across-the-board" increases recommended in this study.

   Merit and promotion increases are measured separately for General and Safety members. Note that beginning with this experience study, we are also recommending separate merit and promotion increase assumptions for Legacy and PEPRA members.

   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 study 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 Legacy members' actual average merit and promotion increases by years of service over the three-year period from January 1, 2021 through December 31, 2023. As mentioned above, we have also included the actual average increases based on the past six years (January 1, 2018 through December 31, 2023) for General Legacy and PEPRA members. These 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 (4.39% on average for the most recent three-year period and 4.43% for the most recent six-year period). The current and proposed assumptions are also shown.

Section 3: Economic Assumptions

General Legacy — Merit and Promotion Salary Increase Rates

Years of Service	Current Assumption	Actual Average (Last 3 Years: Legacy)	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	11.00%	0.35%	3.19%	11.00%
1 – 2	6.50%	1.64%	4.59%	6.50%
2 – 3	4.75%	5.74%	3.52%	4.75%
3 – 4	3.50%	2.27%	2.38%	3.50%
4 – 5	2.50%	4.23%	2.18%	2.50%
5 – 6	2.00%	2.05%	1.58%	2.00%
6 – 7	1.75%	2.44%	1.63%	1.75%
7 – 8	1.65%	2.21%	1.65%	1.65%
8 – 9	1.45%	1.93%	1.70%	1.65%
9 – 10	1.35%	2.69%	2.38%	1.70%
10 – 11	1.30%	2.18%	1.81%	1.70%
11 – 12	1.10%	1.48%	0.87%	1.25%
12 – 13	1.00%	0.95%	0.54%	1.10%
13 – 14	0.90%	1.46%	0.89%	1.20%
14 – 15	0.80%	1.86%	1.68%	1.30%
15 – 16	0.75%	1.73%	1.32%	1.30%
16 – 17	0.70%	1.34%	0.81%	1.00%
17 – 18	0.65%	1.15%	0.71%	0.90%
18 – 19	0.60%	0.80%	0.52%	0.80%
19 – 20	0.55%	1.15%	0.58%	0.75%
20 – 21	0.50%	1.08%	0.81%	0.75%
21 – 22	0.50%	0.41%	0.26%	0.60%
22 – 23	0.50%	0.91%	0.70%	0.60%
23 – 24	0.50%	1.14%	0.85%	0.60%
24 – 25	0.50%	0.56%	0.51%	0.60%
25 and over	0.50%	0.63%	0.43%	0.55%

For General Legacy members with less than eight years of service, we recommend no changes to the current merit and promotion salary increases. This is because at those years of service, there is relatively limited experience available for General Legacy members since most of the members have entered the PEPRA Tiers.

For General Legacy members with more than eight years of service, based on the General Legacy and PEPRA combined experience from the last six years, we recommend increasing the merit and promotion salary increases for all service categories.

Chart 1 on page 33 compares the actual merit and promotion increase experience for General Legacy members with the current and proposed assumptions.

The following table shows similar information for General PEPRA members, with the exception that the actual average merit and promotion increases by years of service over

the three-year period from January 1, 2021 through December 31, 2023 are shown for PEPRA members only.

General PEPRA — Merit and Promotion Salary Increase Rates

Years of Service	Current Assumption	Actual Average (Last 3 Years: PEPRA)[1]	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	11.00%	2.10%	3.19%	9.00%
1 – 2	6.50%	5.48%	4.59%	6.00%
2 – 3	4.75%	4.35%	3.52%	4.50%
3 – 4	3.50%	2.96%	2.38%	3.25%
4 – 5	2.50%	2.68%	2.18%	2.50%
5 – 6	2.00%	1.96%	1.58%	2.00%
6 – 7	1.75%	1.66%	1.63%	1.70%
7 – 8	1.65%	1.54%	1.65%	1.60%
8 – 9	1.45%	1.60%	1.70%	1.65%
9 – 10	1.35%	2.98%	2.38%	1.70%
10 – 11	1.30%	1.45%	1.81%	1.70%
11 – 12	1.10%	0.86%	0.87%	1.25%
12 – 13	1.00%	N/A	0.54%	1.10%
13 – 14	0.90%	N/A	0.89%	1.20%
14 – 15	0.80%	N/A	1.68%	1.30%
15 – 16	0.75%	N/A	1.32%	1.30%
16 – 17	0.70%	N/A	0.81%	1.00%
17 – 18	0.65%	N/A	0.71%	0.90%
18 – 19	0.60%	N/A	0.52%	0.80%
19 – 20	0.55%	N/A	0.58%	0.75%
20 – 21	0.50%	N/A	0.81%	0.75%
21 – 22	0.50%	N/A	0.26%	0.60%
22 – 23	0.50%	N/A	0.70%	0.60%
23 – 24	0.50%	N/A	0.85%	0.60%
24 – 25	0.50%	N/A	0.51%	0.60%
25 and over	0.50%	N/A	0.43%	0.55%

For General PEPRA members with less than eight years of service, based on the General PEPRA experience only from the last three years, we recommend decreasing the merit and promotion salary increases for most service categories. As mentioned earlier, the recommended assumptions for members with more than eight years of service are based on the combined experience for General Legacy and PEPRA members from the last six years.

Chart 2 on page 33 compares the actual merit and promotion increase experience for General PEPRA members with the current and proposed assumptions.

[1] A value of "N/A" represents a service bucket for which there were less than five exposures over the time-period measured.

Section 3: Economic Assumptions

The following table shows the Safety Legacy members' actual average merit and promotion increases by years of service over the three-year period from January 1, 2021 through December 31, 2023. As mentioned above, we have also included the actual average increases based on the past six years (January 1, 2018 through December 31, 2023) for Safety Legacy and PEPRA members. These 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 (4.82% on average for the most recent three-year period and 4.89% for the most recent six-year period). The current and proposed assumptions are also shown.

Safety Legacy — Merit and Promotion Salary Increase Rates

Years of Service	Current Assumption	Actual Average (Last 3 Years: Legacy) [1]	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	12.00%	N/A	2.19%	12.00%
1 – 2	8.50%	N/A	9.13%	8.50%
2 – 3	5.50%	N/A	5.48%	5.50%
3 – 4	5.00%	N/A	5.05%	5.00%
4 – 5	4.00%	N/A	4.44%	4.00%
5 – 6	3.00%	3.84%	3.59%	3.00%
6 – 7	2.25%	4.08%	2.10%	2.25%
7 – 8	1.75%	2.14%	1.39%	1.75%
8 – 9	1.50%	2.65%	2.16%	1.75%
9 – 10	1.45%	2.61%	1.93%	1.75%
10 – 11	1.40%	1.82%	1.85%	1.60%
11 – 12	1.35%	1.19%	1.34%	1.60%
12 – 13	1.30%	1.54%	1.67%	1.60%
13 – 14	1.25%	1.99%	2.18%	1.70%
14 – 15	1.25%	3.41%	2.74%	1.80%
15 – 16	1.25%	2.22%	1.99%	1.80%
16 – 17	1.25%	1.27%	1.30%	1.50%
17 – 18	1.25%	1.72%	1.48%	1.50%
18 – 19	1.25%	1.34%	1.57%	1.50%
19 – 20	1.25%	2.41%	1.98%	1.75%
20 – 21	1.00%	2.69%	2.25%	1.75%
21 – 22	1.00%	1.89%	1.41%	1.40%
22 – 23	1.00%	1.62%	1.58%	1.30%
23 – 24	1.00%	2.60%	2.32%	1.25%
24 – 25	1.00%	1.43%	1.75%	1.15%
25 and over	1.00%	1.55%	1.41%	1.10%

For Safety Legacy members with less than eight years of service, we recommend no changes to the current merit and promotion salary increases. This is because at those

[1] A value of "N/A" represents a service bucket for which there were less than five exposures over the time-period measured.

years of service, there is relatively limited experience available for Safety Legacy members since most of those members have entered the PEPRA tiers.

For Safety Legacy members with more than eight years of service, based on the Safety Legacy and PEPRA combined experience from the last six years, we recommend increasing the merit and promotion salary increases for all service categories.

Chart 3 on page 34 compares the actual merit and promotion increase experience for Safety Legacy members with the current and proposed assumptions.

The following table shows similar information for Safety PEPRA members, with the exception that the actual average merit and promotion increases by years of service over the three-year period from January 1, 2021 through December 31, 2023 are shown for PEPRA only.

Safety PEPRA — Merit and Promotion Salary Increase Rates

Years of Service	Current Assumption	Actual Average (Last 3 Years: PEPRA) [1]	Actual Average (Last 6 Years: Legacy & PEPRA)	Proposed Assumption
Less than 1	12.00%	0.86%	2.19%	10.00%
1 – 2	8.50%	9.07%	9.13%	8.50%
2 – 3	5.50%	5.97%	5.48%	5.50%
3 – 4	5.00%	5.22%	5.05%	5.00%
4 – 5	4.00%	4.67%	4.44%	4.25%
5 – 6	3.00%	3.50%	3.59%	3.25%
6 – 7	2.25%	2.16%	2.10%	2.25%
7 – 8	1.75%	1.25%	1.39%	1.75%
8 – 9	1.50%	1.58%	2.16%	1.75%
9 – 10	1.45%	1.81%	1.93%	1.75%
10 – 11	1.40%	N/A	1.85%	1.60%
11 – 12	1.35%	N/A	1.34%	1.60%
12 – 13	1.30%	N/A	1.67%	1.60%
13 – 14	1.25%	N/A	2.18%	1.70%
14 – 15	1.25%	N/A	2.74%	1.80%
15 – 16	1.25%	N/A	1.99%	1.80%
16 – 17	1.25%	N/A	1.30%	1.50%
17 – 18	1.25%	N/A	1.48%	1.50%
18 – 19	1.25%	N/A	1.57%	1.50%
19 – 20	1.25%	N/A	1.98%	1.75%
20 – 21	1.00%	N/A	2.25%	1.75%
21 – 22	1.00%	N/A	1.41%	1.40%
22 – 23	1.00%	N/A	1.58%	1.30%
23 – 24	1.00%	N/A	2.32%	1.25%
24 – 25	1.00%	N/A	1.75%	1.15%
25 and over	1.00%	N/A	1.41%	1.10%

For Safety PEPRA members with less than eight years of service, based on the Safety PEPRA experience only from the last three years, we recommend the above adjustments to the merit and promotion salary increases. As mentioned earlier, the recommended assumptions for members with more than eight years of service are based on the combined experience for Safety Legacy and PEPRA members from the last six years.

Based on this experience, we are proposing overall increases in the merit and promotion salary increases for General and Safety members. For General PEPRA and Safety PEPRA members, we are proposing an overall decreases in the service categories less than eight.

Chart 4 on page 34 compares the actual merit and promotion increase experience for Safety PEPRA members with the current and proposed assumptions.

[1] A value of "N/A" represents a service bucket for which there were less than five exposures over the time-period measured.

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 included, 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 number of active members will remain about the same, so 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 members' future benefits. Note again that this does not include the assumed merit and promotion increases, because longer service members are assumed to be replaced by new members.

As part of reviewing the current practice, we have summarized in the table below how the number of active members and total payroll has changed over the last six valuations.

Active Members and Total Payroll

Year Ending December 31	Number of Active Members	Total Payroll ($ in '000s)
2018	10,021	$850,522
2019	10,075	891,202
2020	10,099	941,299
2021	10,005	967,867
2022	10,082	1,023,166
2023	10,349	1,101,262
Average Annual Increase	**0.65%**	**5.30%**

The average annual rate of increase in payroll during the above period was 5.30% before accounting for the 0.65% growth in the total active workforce (and 4.63% after netting out the impact due to the growth in the active workforce). The average annual rate of increase in payroll is also affected by the number of PEPRA members who have reached the limit on pensionable compensation imposed by PEPRA. This is because everything else being equal, after those members reach the pensionable compensation limit, their salaries as applied in the computation of the total payroll would only increase by inflation (and no across-the-board salary increase). In the case of CCCERA, the proportion of members who have reached the limit was about 7% as of December 31, 2023.

After considering the above factors and experience, we recommend maintaining the payroll growth assumption at 3.00% annually (consistent with the combined recommended inflation and real "across-the-board" salary increase assumptions).

Section 3: Economic Assumptions

Chart 1: Merit and Promotion Salary Increase Rates

General Legacy Members

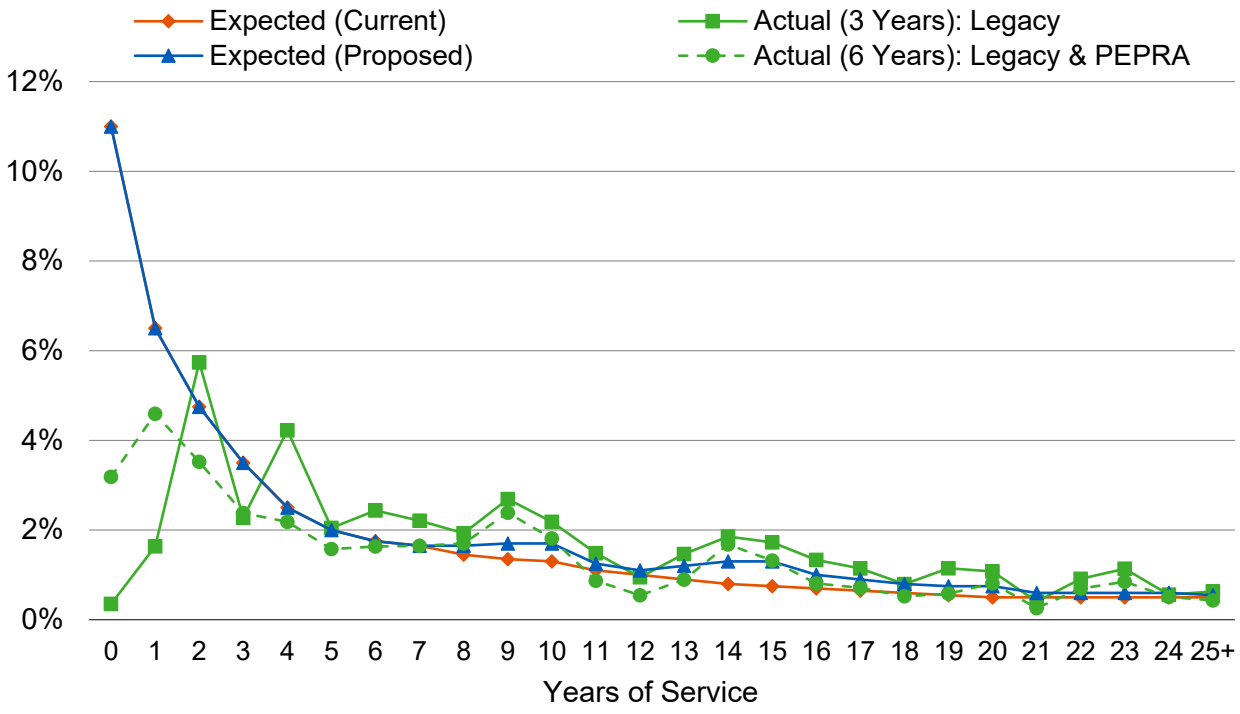


Chart 2: Merit and Promotion Salary Increase Rates

General PEPRA Members

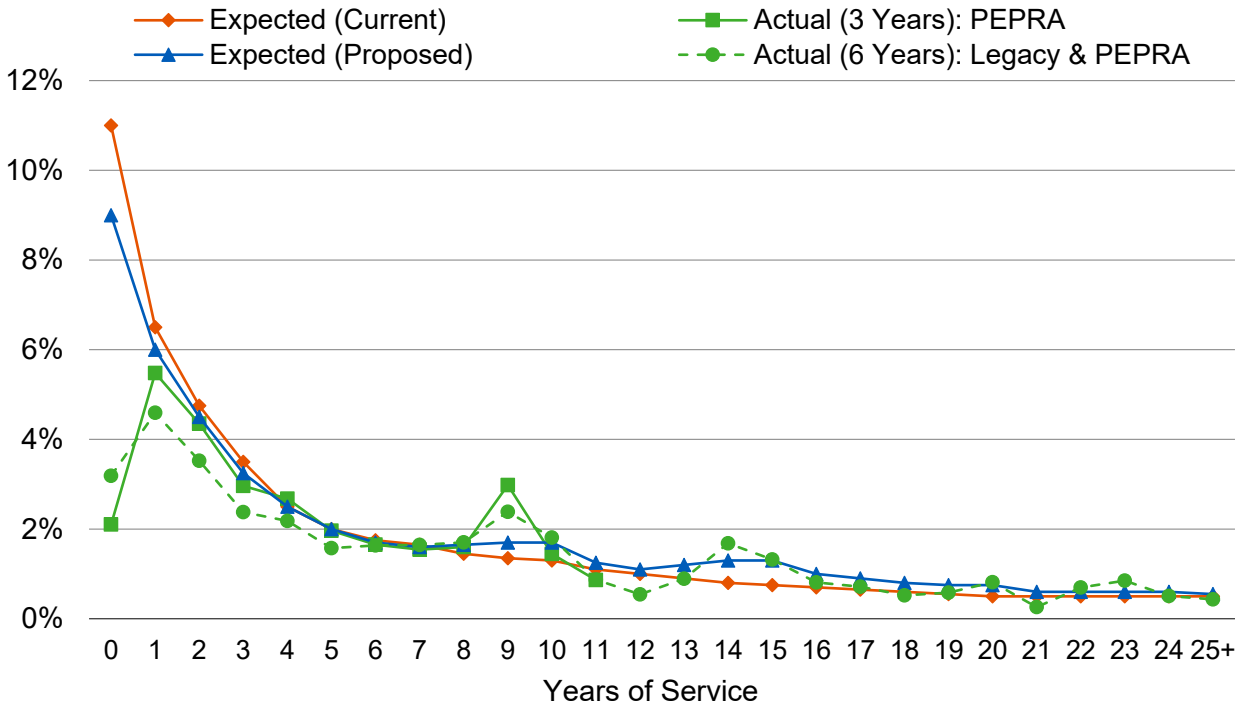


Chart 3: Merit and Promotion Salary Increase Rates

Safety Legacy Members

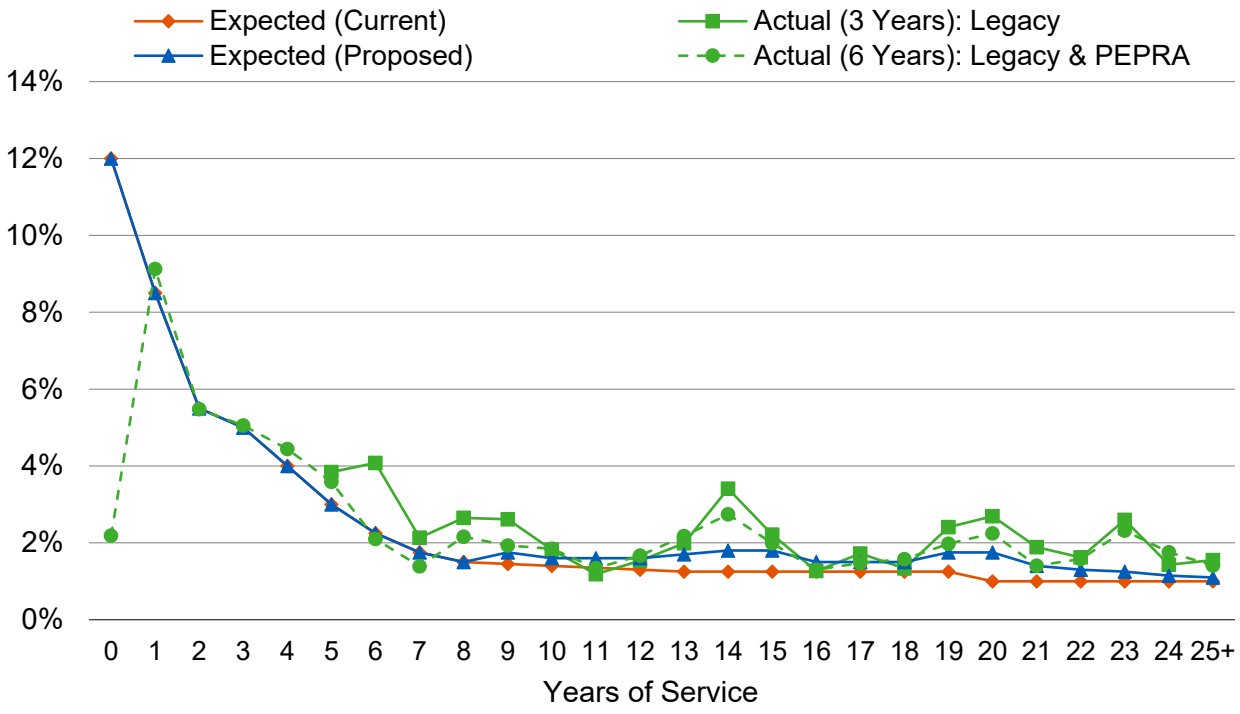
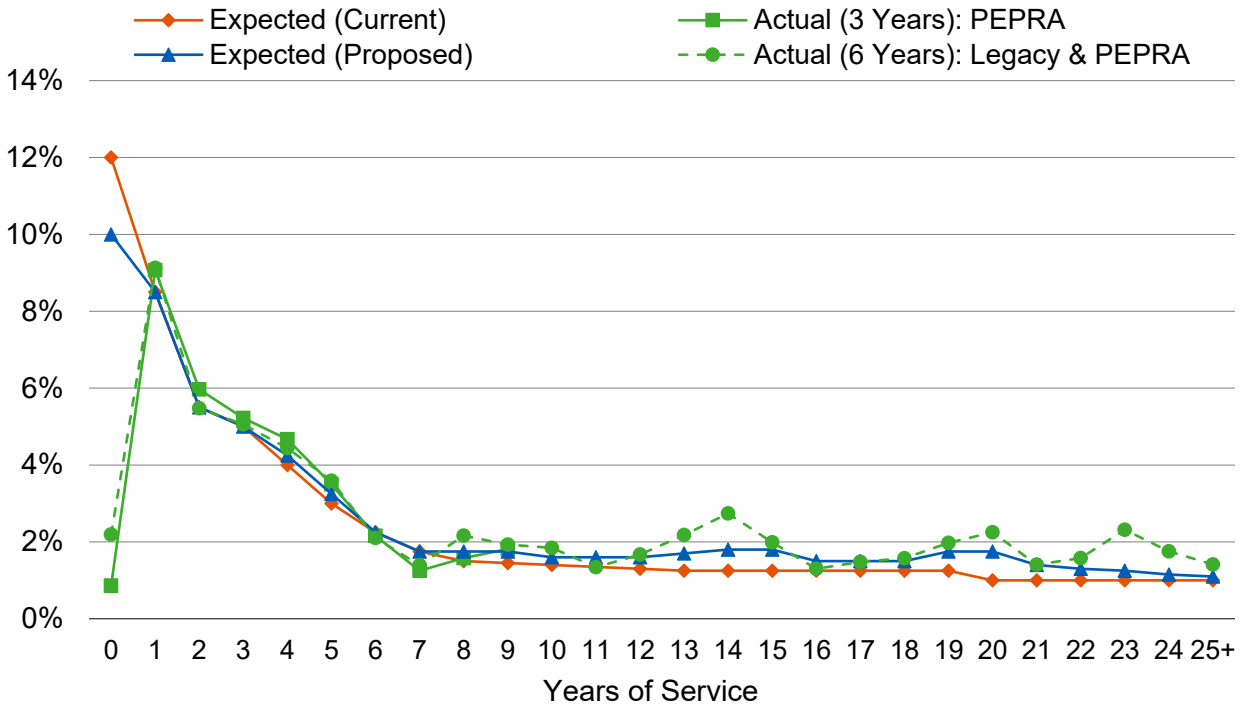


Chart 4: Merit and Promotion Salary Increase Rates

Safety PEPRA Members



D. Administrative expenses

Like benefit payments made to members, expenses incurred in connection with the plan's operation are paid from CCCERA'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.

In order to reflect future administrative expenses in the contribution rates, a load is calculated based on actual administrative expenses as a percentage of payroll. It is allocated between the employer and member based on normal cost (before expenses) for the employer and the member. This assumption is subject to change each year based on actual administrative expenses and payroll.

The following table shows actual administrative expenses as a percent of covered payroll.

Administrative Expenses as a Percentage of Covered Payroll

Year Ending December 31,	Actual Payroll for Year	Actual Administrative Expenses	Total %
2021	$976,332,448	$11,237,383	1.15%
2022	1,023,662,811	11,537,709	1.13%
2023	1,093,972,642	12,839,955	1.17%
Average	**$1,031,322,634**	**$11,871,682**	**1.15%**

The experience shows that actual administrative expenses when expressed as a percent of payroll have been relatively stable during the three-year period shown above. In the prior three-year period, the average was 1.15%.

We recommend maintaining the practice of setting the administrative expense assumption to be equal to the actual administrative expenses for the prior year as a percent of payroll for the prior year.

There will still be actuarial gains and losses associated with this assumption; however, the assumption will be adjusted to the most recent experience in each valuation.

Section 4: Demographic Assumptions

A. 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 (employee) mortality rates project what proportion of members will live to retirement.

In 2019, the Retirement Plans Experience Committee (RPEC) of the SOA published the first family of mortality tables based exclusively on public sector pension plan experience in the United States referred to as the Pub-2010 Public Retirement Plans Mortality Tables (Pub-2010). In January 2025, RPEC released an exposure draft of updated mortality experience for public retirement plans, referred to as the Pub-2016 Public Retirement Plans Mortality Tables (Pub-2016)[1]. The Pub-2016 mortality tables are expected to be formally approved by the SOA later this year. **For this experience study, we are recommending a switch from the Pub-2010 mortality tables to the recently updated Pub-2016 mortality tables for all mortality related assumptions.**

Within the Pub-2010 and Pub-2016 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 and Pub-2016 include mortality rates developed on an "amount-weighted" basis, with higher credibility assigned to experience from annuitants and employees receiving larger benefits and salaries, respectively.

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 and is now the established practice within the actuarial profession.

Periodically[2] RPEC publishes updates to their mortality improvement scales. The two-dimensional mortality improvement scale MP-2021 is the latest improvement scale available as of the date of this report.

We recommend the "amount-weighted" tables from the Pub-2016 family of mortality tables be used (adjusted for CCCERA experience as discussed herein), as well as using the "above-median" tables where applicable.

[1] The Pub-2016 family of mortality tables have been developed without experience from the COVID-19 pandemic.

[2] We understand that RPEC generally publishes an update to their mortality improvement scale annually based on the newest mortality data available. However, the mortality data observed during 2020 was severely impacted by the COVID-19 pandemic and RPEC elected to not release a new mortality improvement scale for 2022, 2023 and 2024 that would have incorporated the substantially higher rate of mortality experience from 2020. Therefore, the MP-2021 remains the most recent mortality improvement scale published.

Section 4: Demographic Assumptions

We continue to recommend that the MP-2021 mortality improvement scale be used and applied generationally where each future year has its own mortality table that reflects the forecasted improvements.

In order to reflect more CCCERA experience in our analysis of the mortality assumption, we have used experience over a **15-year** period by using data from the current experience study period (from January 1, 2021 through December 31, 2023) and the last four experience study periods (from January 1, 2018 through December 31, 2020; from January 1, 2015 through December 31, 2017; from January 1, 2012 through December 31, 2014; and from January 1, 2009 through December 30, 2011).

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,[1] where full credibility means a 90% confidence that the actual experience will be within 5% of the expected value. For CCCERA, the number of actual deaths differs for each cohort and varies from 0 deaths for Safety active females to 1,371 deaths for General healthy retiree females over the 15-year period studied. In our recommended assumptions, we have adjusted the Pub-2016 mortality tables to fit CCCERA's experience based on the partial credibility for each cohort.

Post-retirement mortality (service retirements)

The current mortality tables used for post-retirement mortality are as follows:

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

The following table shows the observed benefit-weighted deaths for heathy retired members based on the actual experience during the 15-year period. Also shown are the expected benefit-weighted deaths under the current and proposed assumptions. This information is shown separately by gender.

As discussed, 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. As shown in the table below, the proposed mortality tables have an actual to expected ratio of 99% and 106% for General and Safety, respectively, after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

[1] The number of deaths needed for full credibility for an "amount" weighted mortality table is generally higher and based on the dispersion of the benefit amount for a given retiree group.

Healthy Retiree Mortality Experience – Benefit-Weighted

($ in millions)

Gender	General Current Expected Weighted Deaths	General Actual Weighted Deaths	General Proposed Expected Weighted Deaths	Safety Current Expected Weighted Deaths	Safety Actual Weighted Deaths	Safety Proposed Expected Weighted Deaths
Male	$35.63	$34.68	$35.66	$23.62	$24.69	$22.58
Female	36.60	38.64	38.71	1.95	1.27	1.92
Total	$72.23	$73.32	$74.37	$25.57	$25.96	$24.50
Actual / Expected	**102%**		**99%[1]**	**102%**		**106%[2]**

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased members.
2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
3. Results may not add due to rounding.

Based on standard statistical theory, the data used in our analysis is only partially credible under the recommended "amount-weighted" basis when dispersion of retirees' benefit amounts is considered, particularly for the Safety membership groups. Therefore, the proposed mortality tables reflect only a partial adjustment for actual CCCERA experience.

We recommend updating the mortality tables used for post-retirement mortality to the following:

- **General members:** Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Chart 5 on page 43 compares the actual to expected deaths on an amount-weighted basis for General service retirement members over the 15-year period for the current and proposed assumptions.

[1] If we used the benchmark Pub-2016 General Healthy Retiree table without any adjustment, the proposed actual to expected ratio would be 101%.

[2] If we used the benchmark Pub-2016 Safety Healthy Retiree table without any adjustment, the proposed actual to expected ratio would be 110%.

Chart 6 on page 43 compares the actual to expected deaths on an amount-weighted basis for Safety service retirement members over the 15-year period for the current and proposed assumptions.

Chart 7 and Chart 8 on page 44 show the life expectancies (i.e., expected future lifetime) under the current and proposed tables for General service retirement members and Safety service retirement members, respectively, on an amount-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2025. In practice, assumed life expectancies will increase in accordance with the mortality improvement scale.

Beneficiary Mortality

The current mortality tables used for beneficiary mortality are as follows:

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

The Pub-2016 Contingent Survivor mortality tables (as well as the Pub-2010 Contingent Survivor mortality tables) are developed based only on beneficiary data **after** the death of the member. This is consistent with the data that we have available for CCCERA beneficiaries and we have confirmed that the Pub-2016 Contingent Survivor mortality rates are comparable to CCCERA's actual mortality experience for beneficiaries.

Because the Contingent Survivor mortality tables reflect beneficiary mortality experience only **after** the death of the member, in the prior study we recommended the use of two separate mortality tables for beneficiaries, based on the pay status of the beneficiary. In particular, we recommended 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) when calculating the liability for the continuance to a beneficiary of a surviving member. Upon the actual death of the member (i.e., for all beneficiaries in pay status as of the valuation date), we recommended that the Contingent Survivor mortality tables, adjusted for CCCERA experience, be used. 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.

The following table shows the observed benefit-weighted deaths for beneficiaries based on the actual experience during the 15 years studied. Also shown are the expected benefit-weighted deaths under the current and proposed assumptions. This information is shown separately by gender. As shown in the table below, the proposed mortality table has an actual to expected ratio of 104% after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

Beneficiary Mortality Experience – Benefit-Weighted
($ in millions)

Gender	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	$3.52	$4.24	$3.85
Female	20.37	21.57	20.91
Total	**$23.89**	**$25.81**	**$24.76**
Actual / Expected	**108%**		**104%**[1]

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased beneficiaries.
2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
3. Results may not add due to rounding.

The proposed mortality table reflects current experience to the extent that the experience is credible based on standard statistical theory. For CCCERA, there is less data available for beneficiaries than there is for retirees, so it is given relatively less credibility and the proposed tables are only slightly adjusted.

We recommend updating the mortality table used for beneficiary mortality to the following:

- **Not in pay status at the valuation:** Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.
- **In pay status at the valuation:** Pub-2016 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

As noted above, we continued to recommend the use of separate mortality tables for beneficiaries before and after the **actual** death of the member.

[1] If we used the benchmark Pub-2016 Contingent Survivor table without any adjustment, the proposed actual to expected ratio would be 109%.

Pre-retirement mortality

The current mortality tables used for pre-retirement mortality are as follows:

- **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.

The table below shows the observed salary-weighted deaths for active members based on the actual experience during the 15 years studied. Also shown are the expected salary-weighted deaths under the current and proposed assumptions. This information is shown separately by gender. As shown in the table below, the proposed mortality tables have an actual to expected ratio of 88% and 86% for General and Safety, respectively, after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

Pre-Retirement Mortality Experience – Salary-Weighted

($ in millions)

Gender	General Current Expected Weighted Deaths	General Actual Weighted Deaths	General Proposed Expected Weighted Deaths	Safety Current Expected Weighted Deaths	Safety Actual Weighted Deaths	Safety Proposed Expected Weighted Deaths
Male	$4.41	$3.84	$4.37	$1.54	$1.52	$1.58
Female	5.56	5.13	5.77	0.18	0.00	0.19
Total	**$9.97**	**$8.97**	**$10.14**	**$1.72**	**$1.52**	**$1.77**
Actual / Expected	**90%**		**88%[1]**	**88%**		**86%**

Notes:

1. Experience shown above is weighted by annual salary for deceased members.
2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
3. Results may not add due to rounding.

The proposed mortality tables reflect current experience to the extent that the experience is credible based on standard statistical theory. For many plans, there is generally less mortality experience available for actives, so it is given little credibility and the proposed tables are only slightly adjusted.

[1] If we used the benchmark Pub-2016 General Employee table without any adjustment, the proposed actual to expected ratio would be 84%.

We recommend updating the mortality tables used for pre-retirement mortality to the following:

- **General members:** Pub-2016 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2016 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.

Currently, our assumption is that all General and Safety member pre-retirement deaths are non-service connected. Based on the actual experience during the last three years of 32 total deaths, four were due to service-connected causes. **We recommend maintaining the current assumption that all pre-retirement deaths are non-service-connected deaths.** We will continue to monitor this assumption.

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 the legacy tiers (i.e., non-PEPRA), optional forms of payment and reserves. For determining member contributions, one emerging practice is to 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 legacy members. We recommend the use of this approximation for determining member contributions for employees in the legacy tiers.

We recommend updating the mortality tables used for determining contributions to the following:

- **General members:** Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.
- **Safety members:** Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 85% male and 15% female.

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

Chart 5: Post-Retirement Benefit-Weighted Deaths ($ in millions)

General Service Retired Members (January 1, 2009 through December 31, 2023)

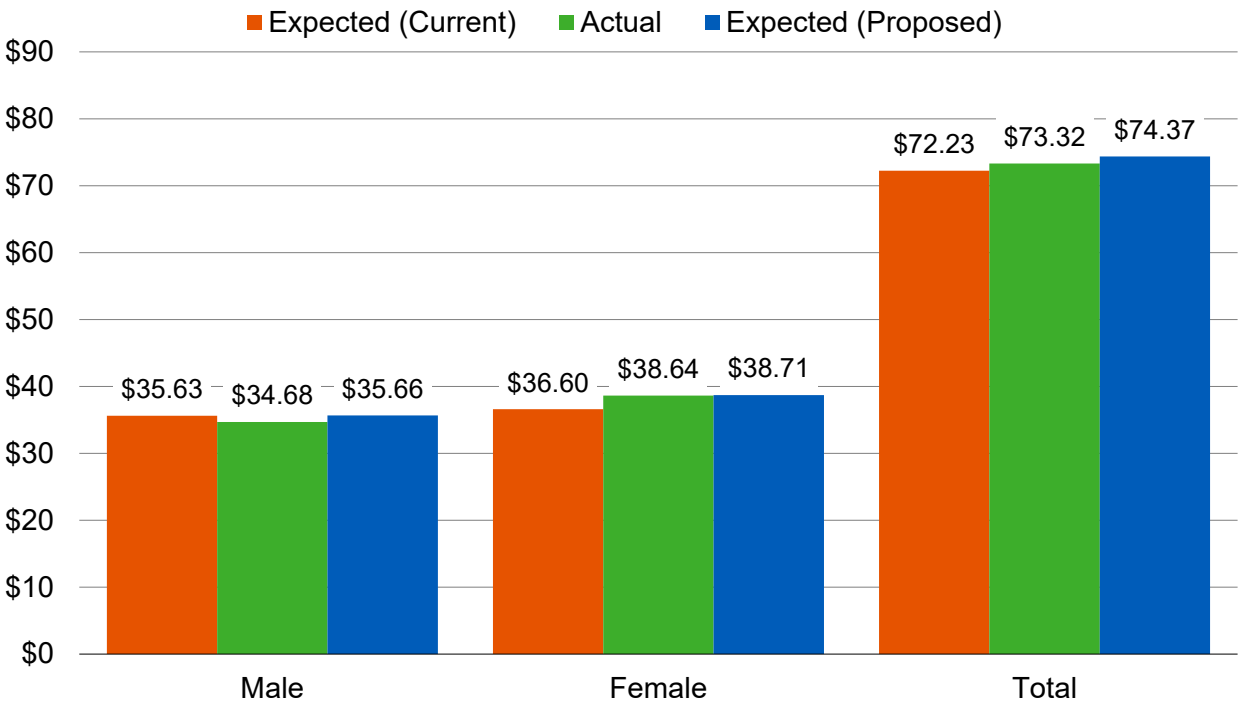


Chart 6: Post-Retirement Benefit-Weighted Deaths ($ in millions)

Safety Service Retired Members (January 1, 2009 through December 31, 2023)

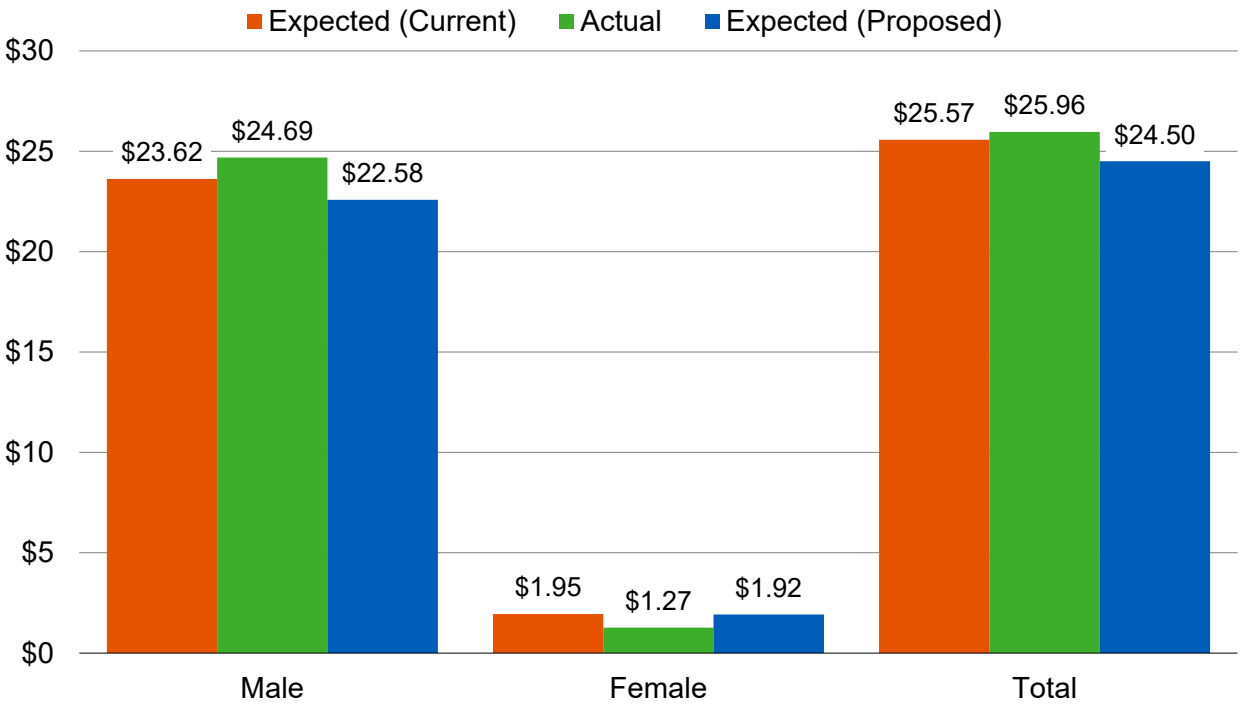


Chart 7: Benefit-Weighted Life Expectancies for Age in 2025

General Service Retired Members

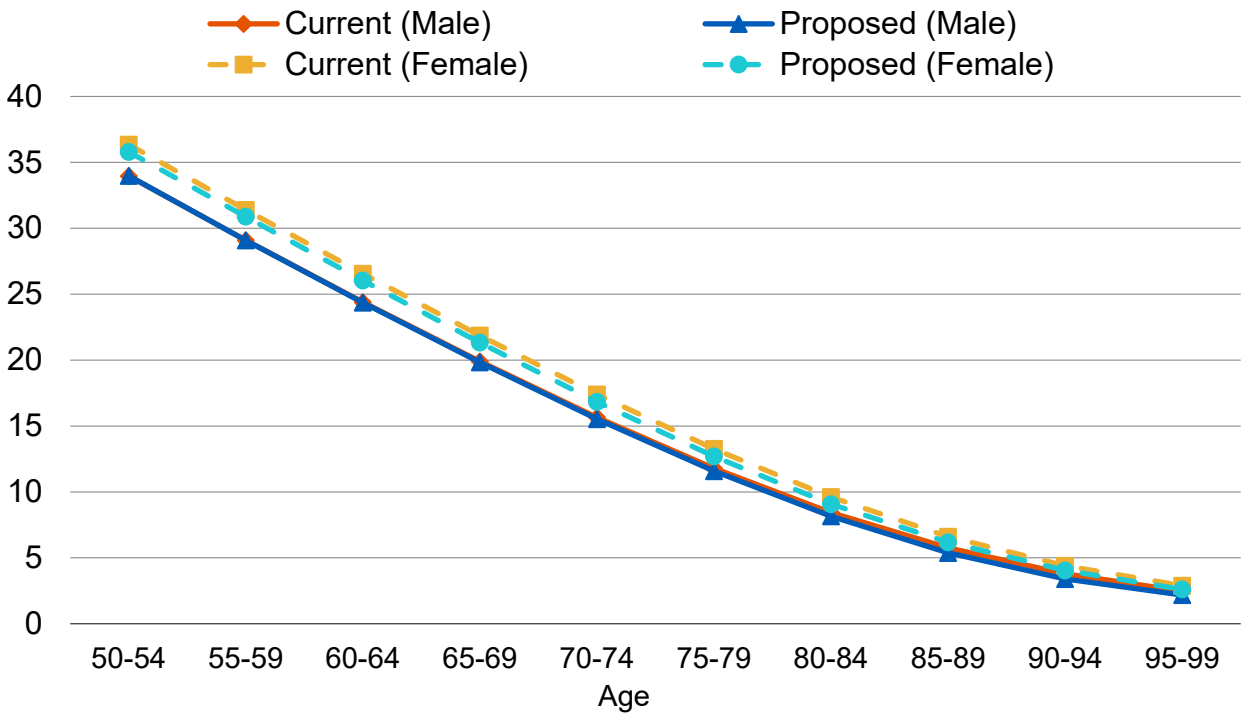
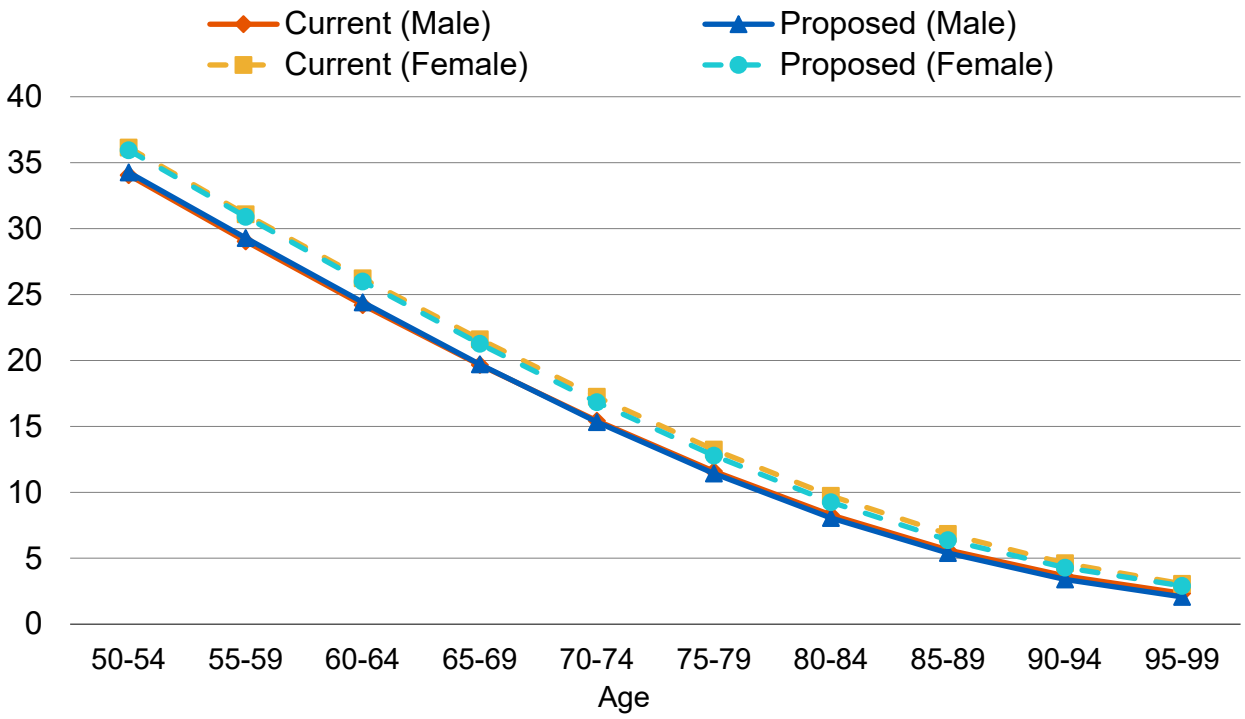


Chart 8: Benefit-Weighted Life Expectancies for Age in 2025

Safety Service Retired Members



B. Mortality rates — disabled

Since mortality rates for disabled members can vary from those of healthy members, a different mortality assumption is often used.

The current mortality tables used for disabled mortality are as follows:

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

The following table shows the observed benefit-weighted deaths for disability retired members based on the actual experience during the 15 years studied. Also shown are the expected benefit-weighted deaths under the current and proposed assumptions. This information is shown separately by gender.

The proposed mortality tables have an actual to expected ratio of 107% and 101% for General and Safety, respectively, after adjustments for partial credibility. In future years the ratios should remain around these levels as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

Disabled Retiree Mortality Experience – Benefit-Weighted

($ in millions)

Gender	General Current Expected Weighted Deaths	General Actual Weighted Deaths	General Proposed Expected Weighted Deaths	Safety Current Expected Weighted Deaths	Safety Actual Weighted Deaths	Safety Proposed Expected Weighted Deaths
Male	$2.96	$2.85	$2.55	$9.13	$9.46	$9.13
Female	4.55	4.50	4.30	0.47	0.30	0.49
Total	**$7.51**	**$7.35**	**$6.85**	**$9.60**	**$9.76**	**$9.62**
Actual / Expected	**98%**		**107%[1]**	**102%**		**101%[2]**

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased members.
2. Expected amounts under the current and proposed generational mortality table are based on mortality rates from the base year projected with mortality improvements to the year the death occurred (or was expected to occur).
3. Results may not add due to rounding.

[1] If we used the benchmark Pub-2016 Non-Safety Disabled Retiree table without any adjustment, the proposed actual to expected ratio would be 113%.

[2] If we used the benchmark Pub-2016 Safety Disabled Retiree table without any adjustment, the proposed actual to expected ratio would remain at 106%.

Section 4: Demographic Assumptions

Similar to mortality rates for service retirees, the proposed mortality tables reflect current experience to the extent that the experience is credible based on standard statistical theory. For CCCERA, there is much less data available for disabled retirees, so it is given little credibility and the proposed tables are only slightly adjusted.

We recommend updating the mortality tables used for disabled mortality to the following:

- **General members:** Pub-2016 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members:** Pub-2016 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Chart 9 on page 47 compares the actual to expected deaths on an amount-weighted basis for General disabled retirement members over the 15-year period for the current and proposed assumptions.

Chart 10 on page 47 compares the actual to expected deaths on an amount-weighted basis for Safety disabled retirement members over the 15-year period for the current and proposed assumptions.

Chart 11 and Chart 12 on page 48 show the life expectancies (i.e., expected future lifetime) under the current and proposed tables for General disabled retirement members and Safety disabled retirement members, respectively, on an amount-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2025. In practice, assumed life expectancies will increase in accordance with the mortality improvement scale.

Chart 9: Post-Retirement Benefit-Weighted Deaths ($ in millions)

General Disabled Members (January 1, 2009 through December 31, 2023)

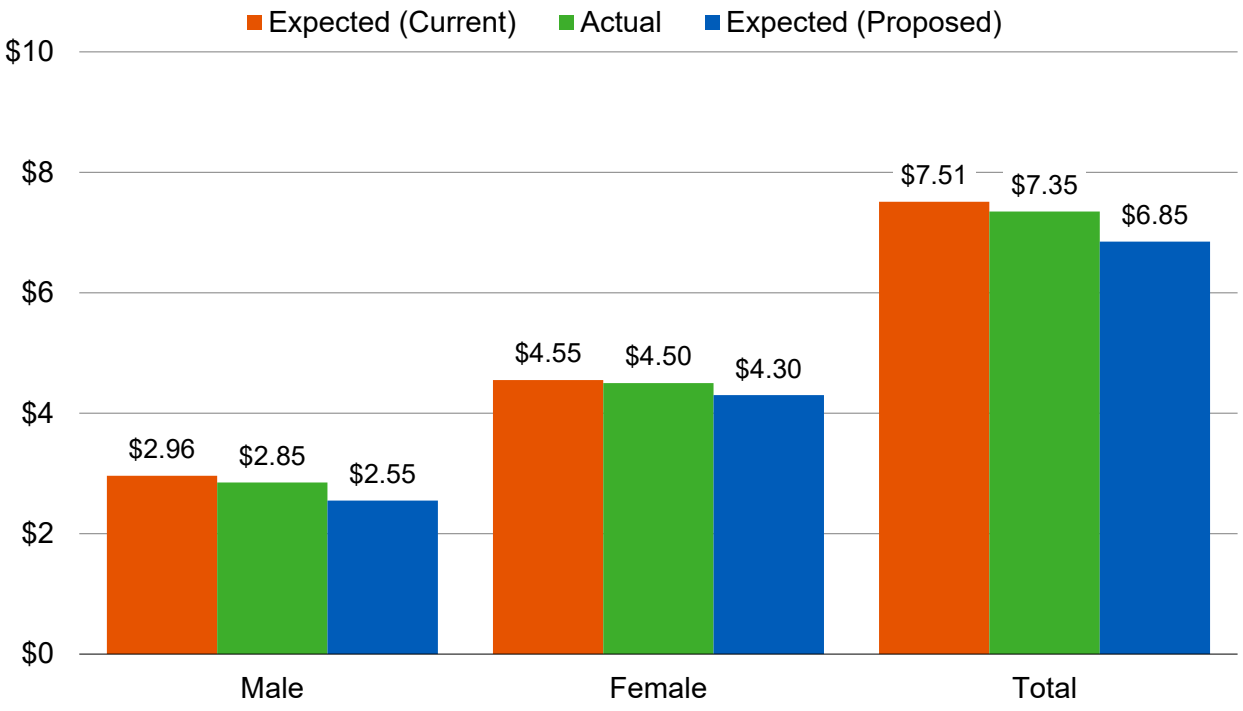


Chart 10: Post-Retirement Benefit-Weighted Deaths ($ in millions)

Safety Disabled Members (January 1, 2009 through December 31, 2023)

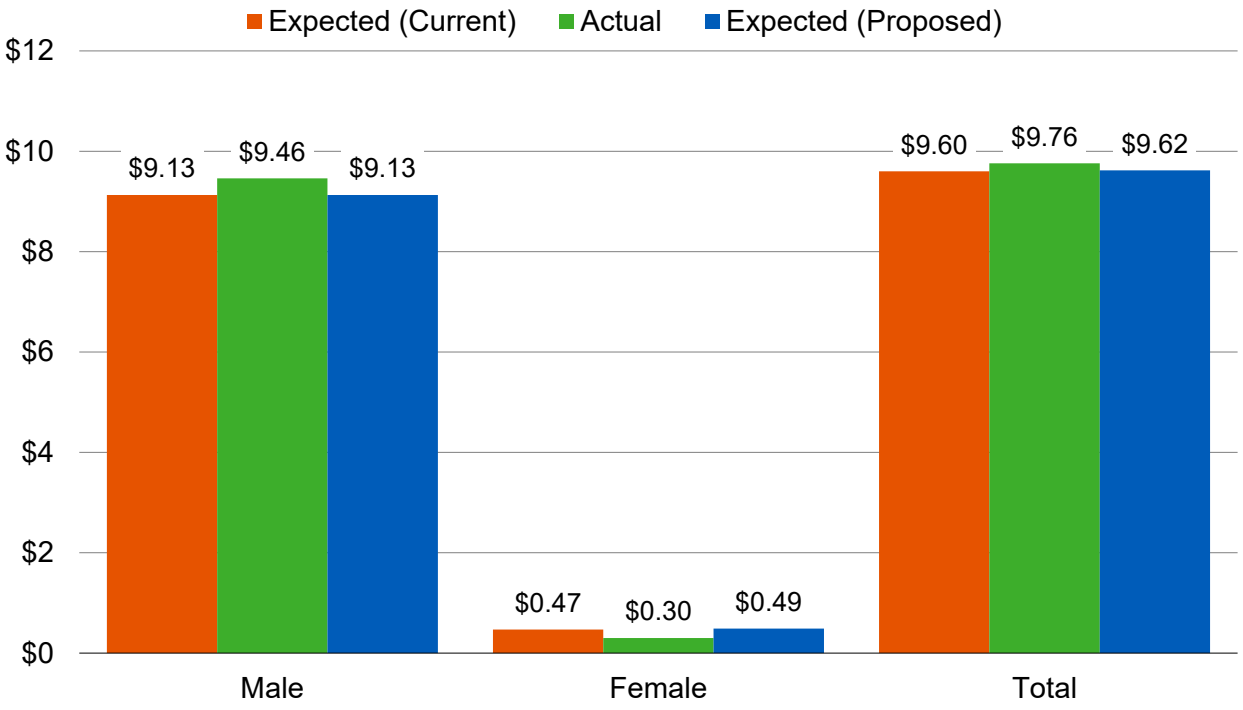


Chart 11: Benefit-Weighted Life Expectancies for Age in 2025

General Disabled Members

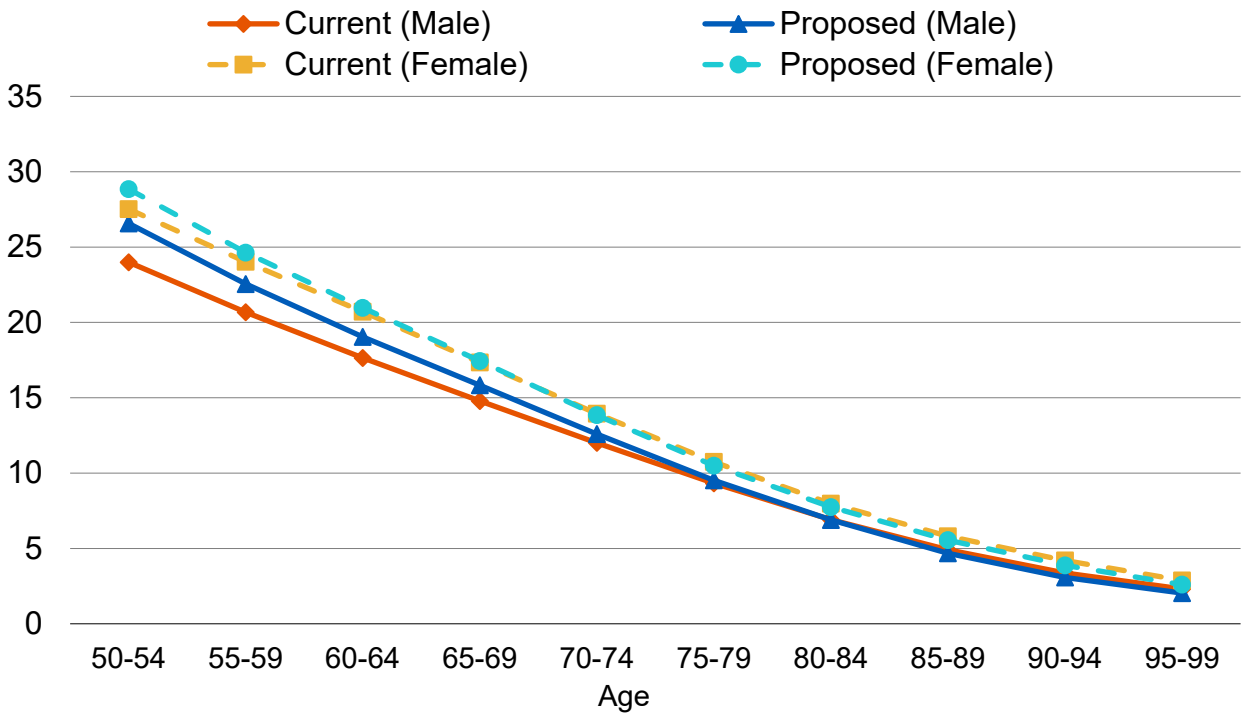
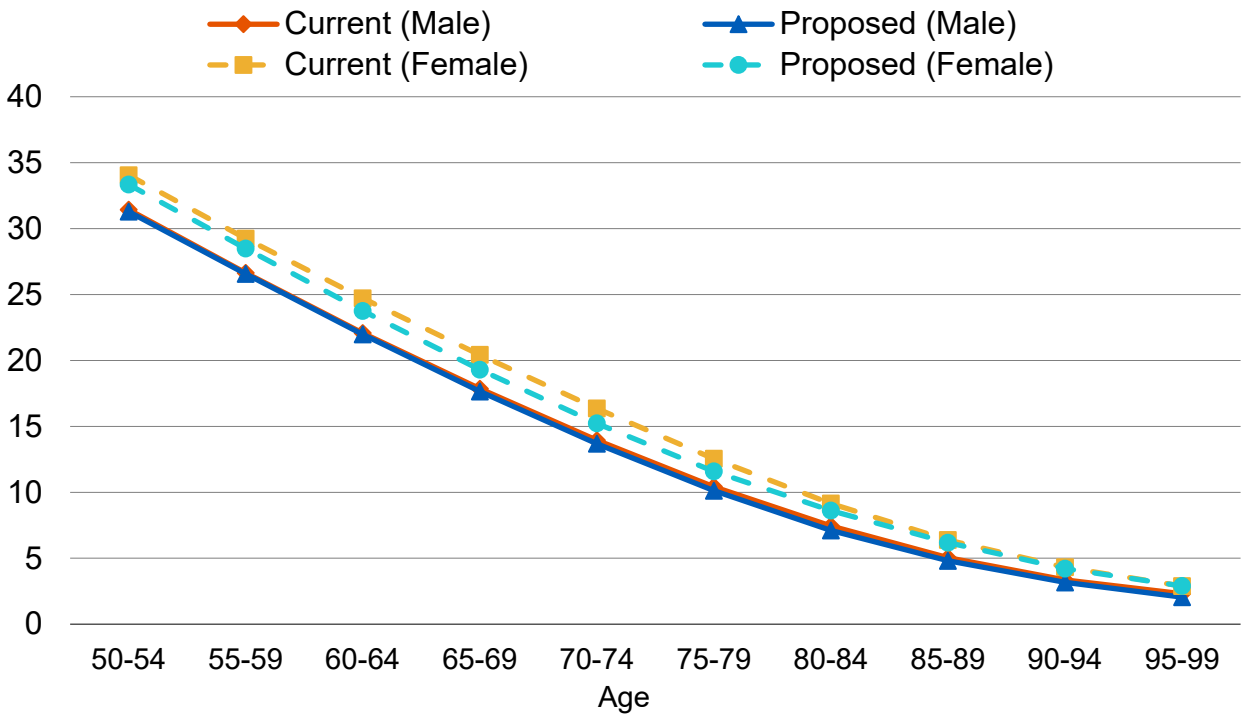


Chart 12: Benefit-Weighted Life Expectancies for Age in 2025

Safety Disabled Members



C. Disability incidence rates

When a member becomes disabled, he or she may be entitled to at least a 40% or 50% of pay pension depending on tier (service-connected disability), or a pension that depends upon the member's years of service (non-service-connected disability).

The following tables show the observed disability incidence rates based on actual experience over the past three years. Given the overall low level of disability incidence, we have also included and considered the actual experience over the past **twelve** years. Also shown are the current assumed rates and the rates we propose. Please note that we have combined service-connected and non-service-connected disability incidence in the tables below.

General Tier 1 and Tier 4 — Disability Incidence Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (12 Years)	Proposed Rate
20 – 24	0.01%	0.00%	0.00%	0.00%
25 – 29	0.02%	0.00%	0.00%	0.00%
30 – 34	0.05%	0.00%	0.00%	0.03%
35 – 39	0.10%	0.00%	0.00%	0.06%
40 – 44	0.30%	0.00%	0.10%	0.20%
45 – 49	0.40%	0.32%	0.40%	0.40%
50 – 54	0.60%	0.00%	0.59%	0.60%
55 – 59	0.60%	0.00%	0.14%	0.60%
60 – 64	0.60%	0.56%	0.37%	0.60%
65 – 69	0.60%	0.00%	1.20%	0.60%
70 and over	0.60%	0.00%	3.64%	0.60%
Actual / Expected (12 Years)	**0.74**			**0.78**

Due to limited recent experience (there were only 2 actual disabilities for General Tier 1 and Tier 4 members in the last 3 years), we have relied primarily upon the actual experience over the past 12 years to recommend decreases in the disability incidence rate assumption for General Tier 1 and Tier 4 members.

Chart 13 on page 53 compares the number of actual disabilities for General Tier 1 and Tier 4 members over the past three years to the current and proposed assumptions.

Chart 14 on page 53 compares the actual disability incidence experience for General Tier 1 and Tier 4 members with the current and proposed assumptions.

General Tier 3 and Tier 5 — Disability Incidence Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (12 Years)	Proposed Rate
20 – 24	0.01%	0.00%	0.00%	0.00%
25 – 29	0.02%	0.00%	0.00%	0.00%
30 – 34	0.04%	0.00%	0.00%	0.02%
35 – 39	0.06%	0.00%	0.01%	0.04%
40 – 44	0.08%	0.06%	0.06%	0.07%
45 – 49	0.10%	0.00%	0.08%	0.09%
50 – 54	0.14%	0.14%	0.10%	0.14%
55 – 59	0.18%	0.03%	0.10%	0.14%
60 – 64	0.18%	0.09%	0.17%	0.14%
65 – 69	0.18%	0.10%	0.03%	0.14%
70 and over	0.18%	0.00%	0.12%	0.14%
Actual / Expected (12 Years)	**0.64**			**0.78**

Based on the recent experience, along with the actual experience over the past 12 years, we recommend decreases in the disability incidence rate assumption for General Tier 3 and Tier 5 members.

Chart 15 on page 54 compares the number of actual disabilities for General Tier 3 and Tier 5 members over the past three years to the current and proposed assumptions.

Chart 16 on page 54 compares the actual disability incidence experience for General Tier 3 and Tier 5 members with the current and proposed assumptions.

Safety — Disability Incidence Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (12 Years)	Proposed Rate
20 – 24	0.10%	0.00%	0.00%	0.10%
25 – 29	0.20%	0.00%	0.00%	0.10%
30 – 34	0.40%	0.48%	0.35%	0.40%
35 – 39	0.50%	0.63%	0.54%	0.55%
40 – 44	0.60%	1.20%	0.68%	0.65%
45 – 49	1.20%	0.70%	0.96%	1.10%
50 – 54	4.00%	2.03%	3.71%	3.75%
55 – 59	4.00%	3.33%	3.60%	3.75%
60 – 64	4.50%	3.26%	3.85%	4.25%
65 – 69	4.50%	10.00%	5.71%	5.00%
70 and over	4.50%	0.00%	12.50%	5.00%
Actual / Expected (12 Years)	**0.91**			**0.95**

Based on the recent experience, along with the actual experience over the past 12 years, we recommend an overall decrease in the disability incidence rate assumption for Safety members.

Chart 17 on page 55 compares the number of actual disabilities for Safety members over the past three years to the current and proposed assumptions.

Chart 18 on page 55 compares the actual disability incidence experience for Safety members with the current and proposed assumptions.

Service-connected vs. non-service-connected disability

The following table shows the observed percentage of new disabled members that received a service-connected disability based on the actual experience over the past three years as well as the actual experience over the past 12 years. Also shown are the current and proposed assumptions.

Disabled Members Receiving a Service-Connected Disability

Line Description	General Tier 1 and Tier 4	General Tier 3 and Tier 5	Safety
Current assumption	65%	25%	100%
Actual percentage (3 Years)	100%[1]	27%	98%
Actual percentage (12 Years)	68%	22%	96%
Proposed assumption	**70%**	**25%**	**100%**

[1] There were only 2 actual disabilities for General Tier 1 and Tier 4 members during the past three years.

Section 4: Demographic Assumptions

Based on the recent experience, along with the actual experience over the past 12 years, we recommend increasing the assumption for future disabled General Tier 1 and Tier 4 members receiving a service-connected disability to 70%. We recommend maintaining the assumptions for General Tier 3 and Tier 5 members at 25% and for Safety members at 100%. The remaining percentages are assumed to be non-service-connected disabilities (30% for General Tier 1 and Tier 4 members, 75% for General Tier 3 and Tier 5 members, and 0% for Safety members).

Chart 13: Actual Number of Disability Retirements Compared to Expected

General Tier 1 and Tier 4 Members

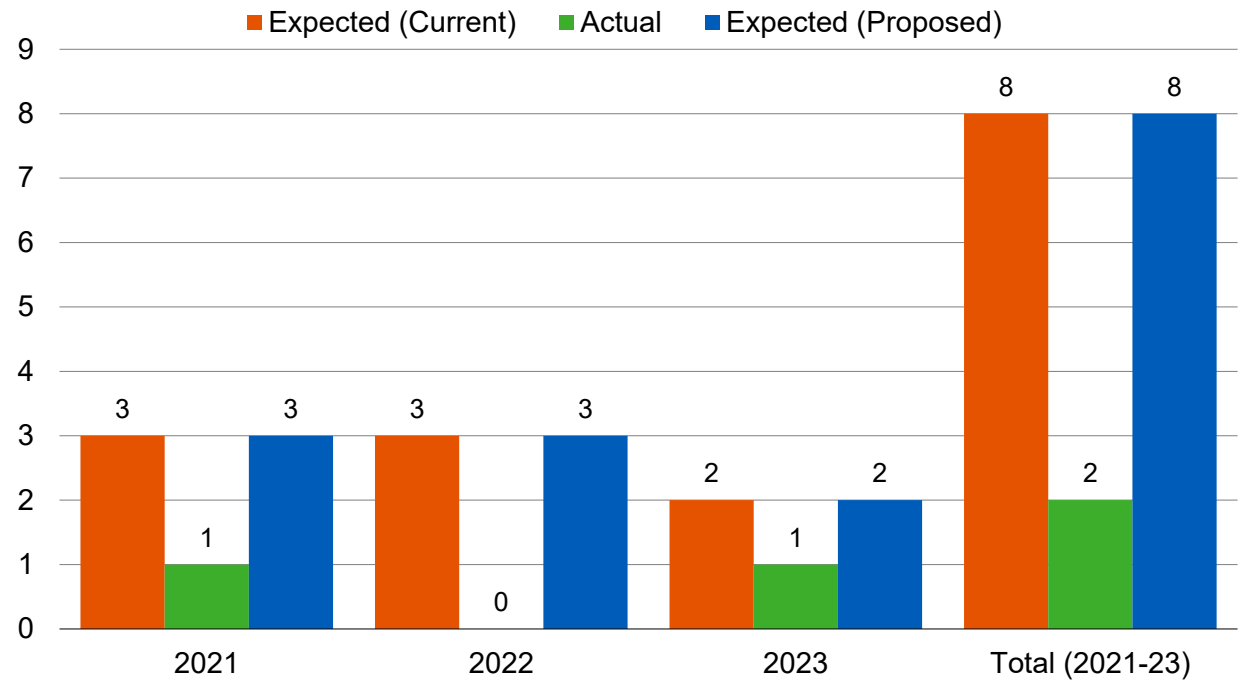


Chart 14: Disability Incidence Rates

General Tier 1 and Tier 4 Members

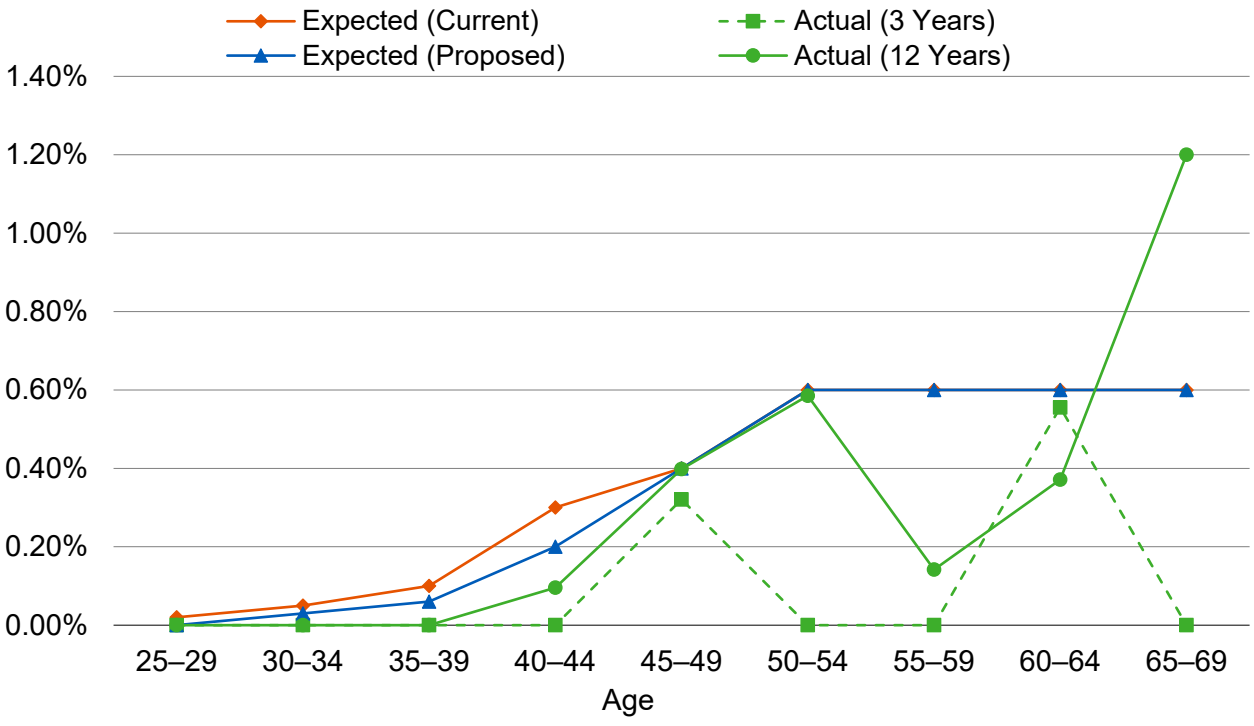


Chart 15: Actual Number of Disability Retirements Compared to Expected

General Tier 3 and Tier 5 Members

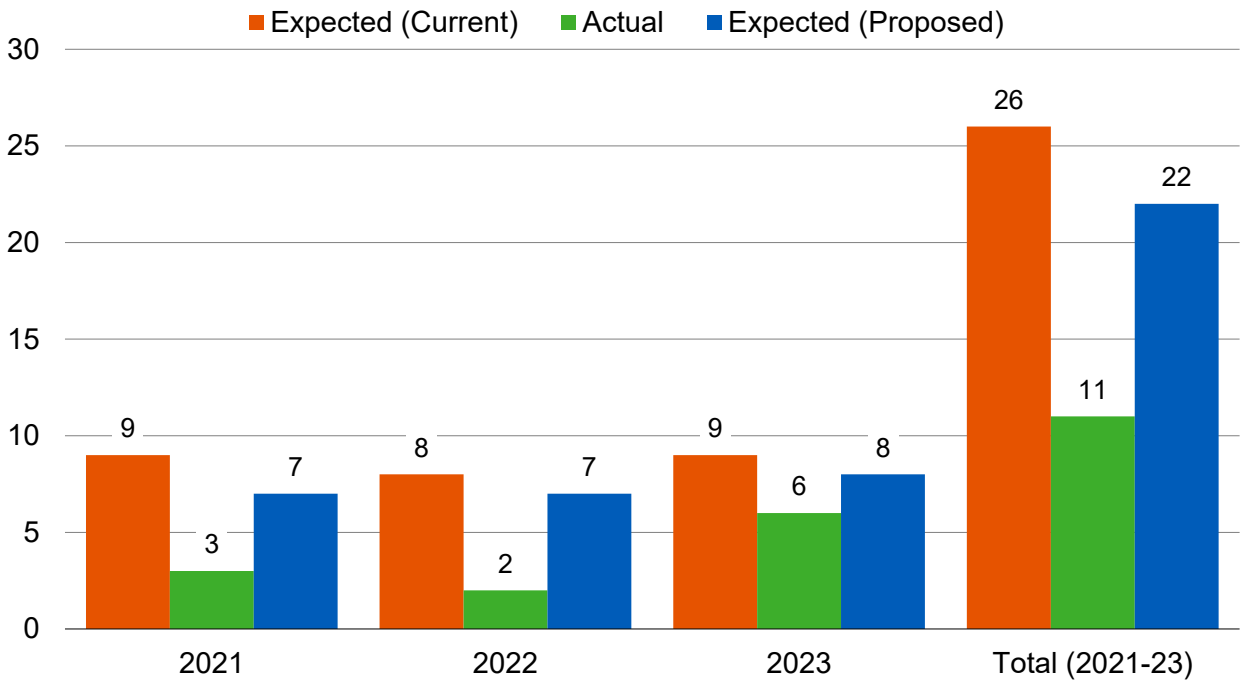


Chart 16: Disability Incidence Rates

General Tier 3 and Tier 5 Members

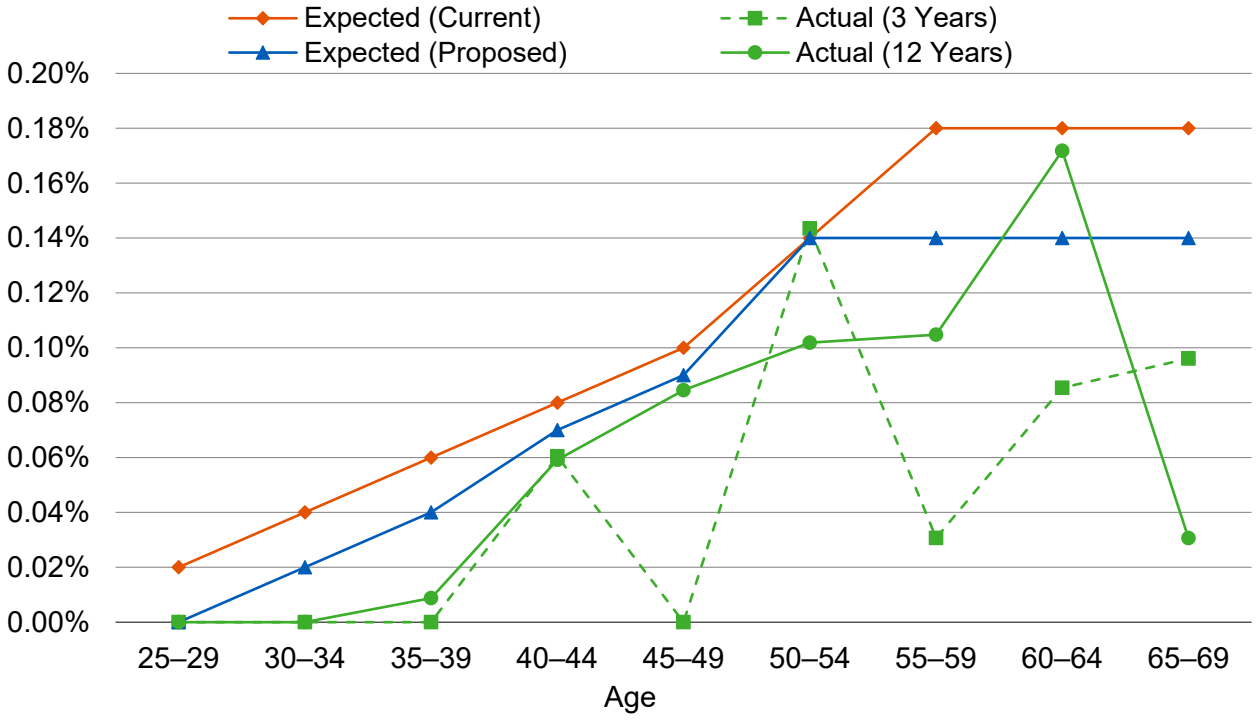


Chart 17: Actual Number of Disability Retirements Compared to Expected

Safety Members

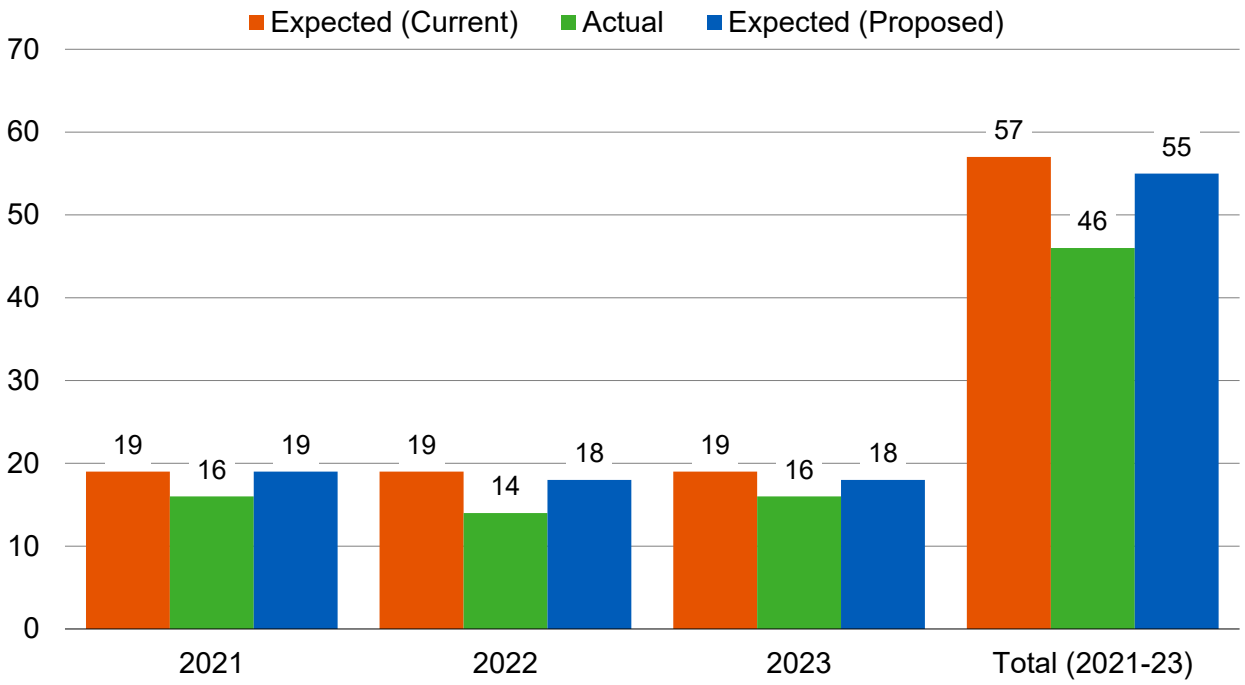
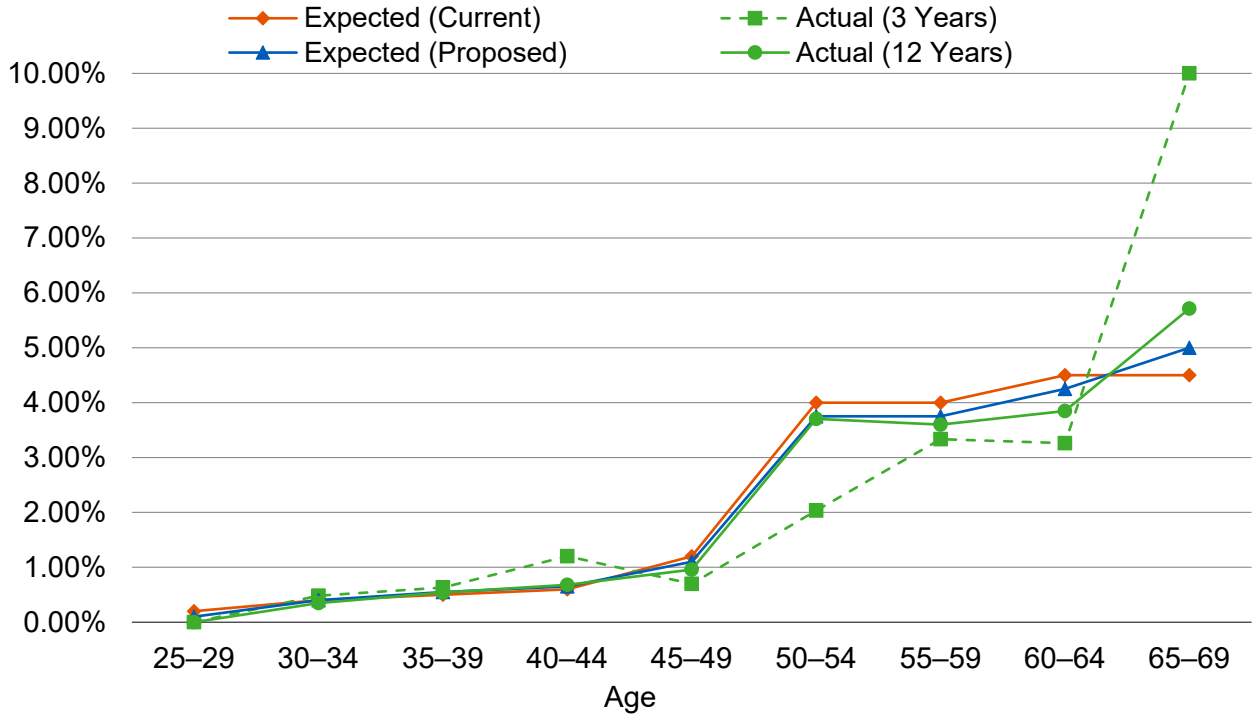


Chart 18: Disability Incidence Rates

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 incidence of termination assumed, combined with an assumption that a member will choose between a refund of member contributions and a deferred vested benefit based on which option is more valuable, measured by its present value at the date of the member's termination. Furthermore, the termination rates are based as a function of the member's years of service and are applied until the member is first assumed to retire. That is, we assume that members eligible to retire at termination will retire in accordance with the retirement rate assumptions rather than terminate and defer their benefit. **With this study, we continue to recommend that this same assumption structure be used.**

We have also reviewed the actual experience for Legacy and PEPRA members separately. **Based on our review, we continue to propose that one set of termination rates be used for all General members and one set of termination rates be used for all Safety members.**

The following tables show the observed[1] termination rates based on the actual experience over the past three years. To increase the credibility of the data, particularly for Safety members, we have also included and considered the actual experience over the past **six** years. Also shown are the current assumed rates and the rates we propose.

[1] We have excluded any members that were eligible for retirement.

Section 4: Demographic Assumptions

General — Termination Rates

Years of Service	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
Less than 1	14.00%	15.70%	14.94%	14.50%
1 – 2	9.50%	12.19%	10.92%	10.50%
2 – 3	9.00%	11.68%	9.97%	9.50%
3 – 4	6.25%	8.54%	7.13%	7.00%
4 – 5	6.25%	6.91%	6.60%	6.50%
5 – 6	5.00%	7.40%	6.28%	6.00%
6 – 7	4.50%	6.99%	5.93%	5.50%
7 – 8	4.00%	5.80%	4.61%	5.00%
8 – 9	3.75%	6.94%	5.51%	5.00%
9 –10	3.75%	3.94%	3.97%	4.00%
10 – 11	3.50%	5.91%	5.12%	4.00%
11 – 12	3.25%	4.64%	4.45%	4.00%
12 – 13	2.75%	4.61%	3.32%	3.00%
13 – 14	2.50%	2.97%	2.06%	2.50%
14 – 15	2.50%	2.98%	2.77%	2.50%
15 – 16	2.25%	3.49%	3.05%	2.50%
16 – 17	2.25%	4.69%	3.56%	2.50%
17 – 18	2.00%	1.66%	1.31%	1.75%
18 – 19	2.00%	1.65%	1.66%	1.75%
19 – 20	1.50%	2.59%	2.03%	1.50%
20 and over	1.50%	1.80%	2.09%	1.50%
Actual / Expected (6 Years)	**1.14**			**1.04**

Based on this experience, we recommend increasing the termination rates at most years of service for General members.

It is important to note that not every years of service category has enough exposures and/or decrements such that the results for that category are statistically credible even when looking at six years' worth of experience. This is mainly the case for the higher service categories, since most members in those categories are eligible to retire and therefore have been excluded from our review of termination experience.

Chart 19 on page 59 compares the number of actual to expected terminations for General members over the past three years for the current and proposed assumptions.

Chart 20 on page 59 compares the actual terminations experience for General members with the current and proposed assumptions.

Safety — Termination Rates

Years of Service	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
Less than 1	11.00%	6.49%	7.87%	9.00%
1 – 2	9.00%	5.46%	5.46%	7.00%
2 – 3	7.00%	5.06%	5.83%	6.00%
3 – 4	5.00%	4.52%	3.78%	5.00%
4 – 5	4.00%	3.20%	1.91%	3.50%
5 – 6	3.50%	3.66%	3.54%	3.50%
6 – 7	3.00%	2.44%	1.69%	3.00%
7 – 8	2.50%	4.50%	3.17%	2.50%
8 – 9	2.50%	1.05%	0.68%	2.25%
9 –10	2.00%	1.20%	1.05%	2.00%
10 – 11	2.00%	1.72%	1.50%	2.00%
11 – 12	2.00%	2.38%	0.75%	2.00%
12 – 13	2.00%	2.04%	2.30%	2.00%
13 – 14	1.80%	2.29%	1.55%	1.80%
14 – 15	1.60%	0.62%	0.38%	1.50%
15 – 16	1.50%	0.70%	0.36%	1.40%
16 – 17	1.40%	0.96%	1.15%	1.30%
17 – 18	1.30%	2.38%	0.84%	1.20%
18 – 19	1.20%	1.02%	0.42%	1.10%
19 – 20	1.00%	0.91%	1.12%	1.00%
20 or more	0.50%	0.00%	0.00%	0.25%
Actual / Expected (6 Years)	**0.70**			**0.78**

Based on this experience, we recommend decreasing the termination rates at most years of service for Safety members.

For Safety members it is especially important to note that due to the overall low level of termination, many of the years of service category do not have enough decrements to be statistically credible. Therefore, while we are recommending decreases based on the actual rates we have seen over the past six years, we have not decreased the rates (after considering credibility) by as much as the actual rates may seem to imply.

Chart 21 on page 60 compares the number of actual to expected terminations for Safety members over the past three years for the current and proposed assumptions.

Chart 22 on page 60 compares the actual withdrawal experience for Safety members under the current and proposed assumptions.

Chart 19: Actual Number of Terminations Compared to Expected

General Members

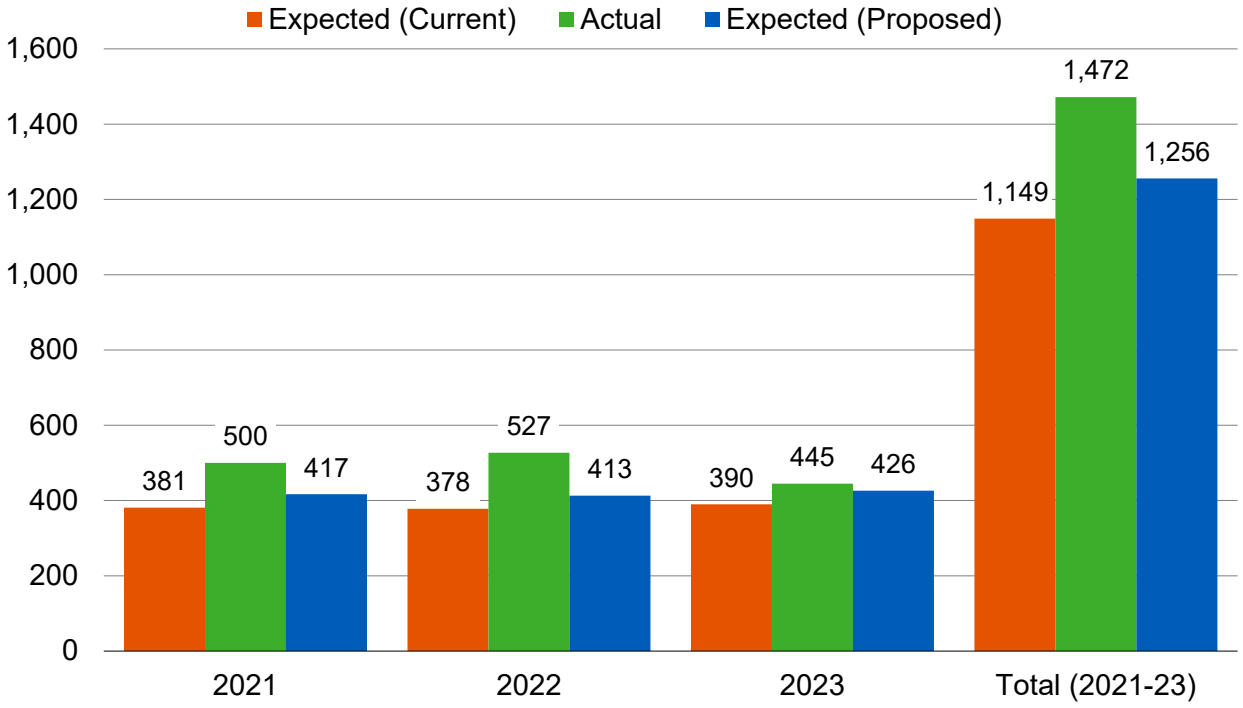


Chart 20: Terminations Rates

General Members

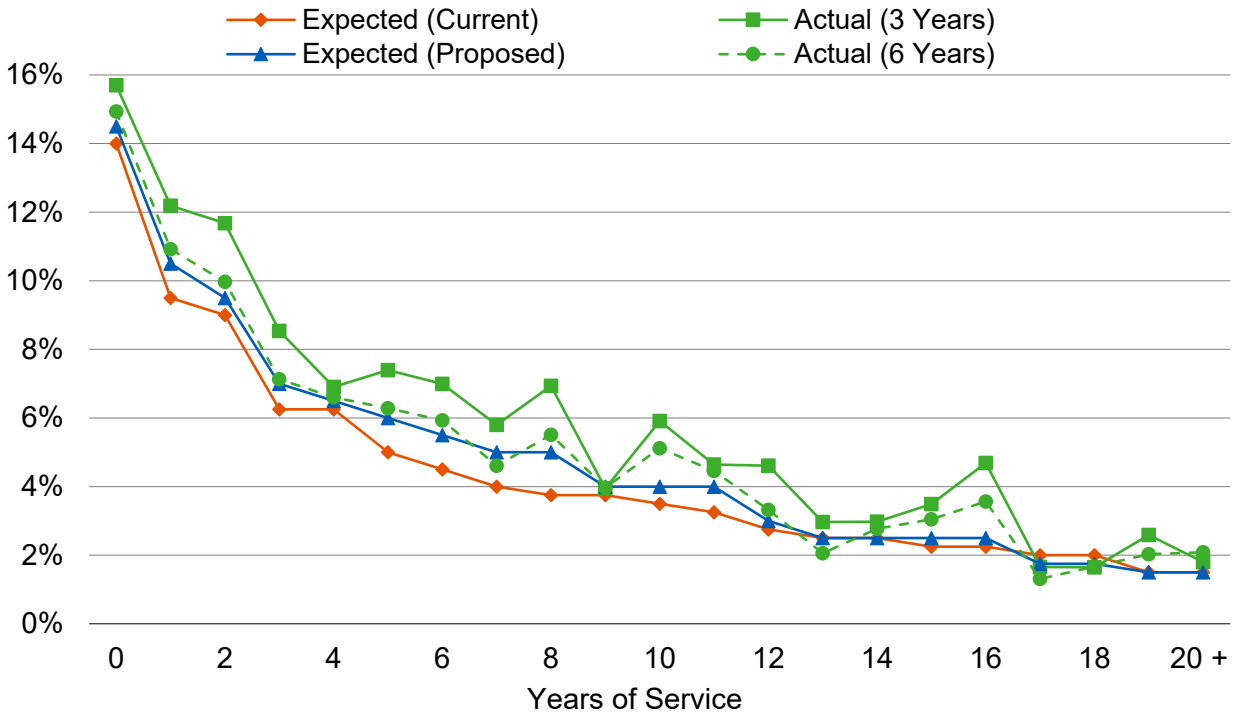


Chart 21: Actual Number of Terminations Compared to Expected

Safety Members

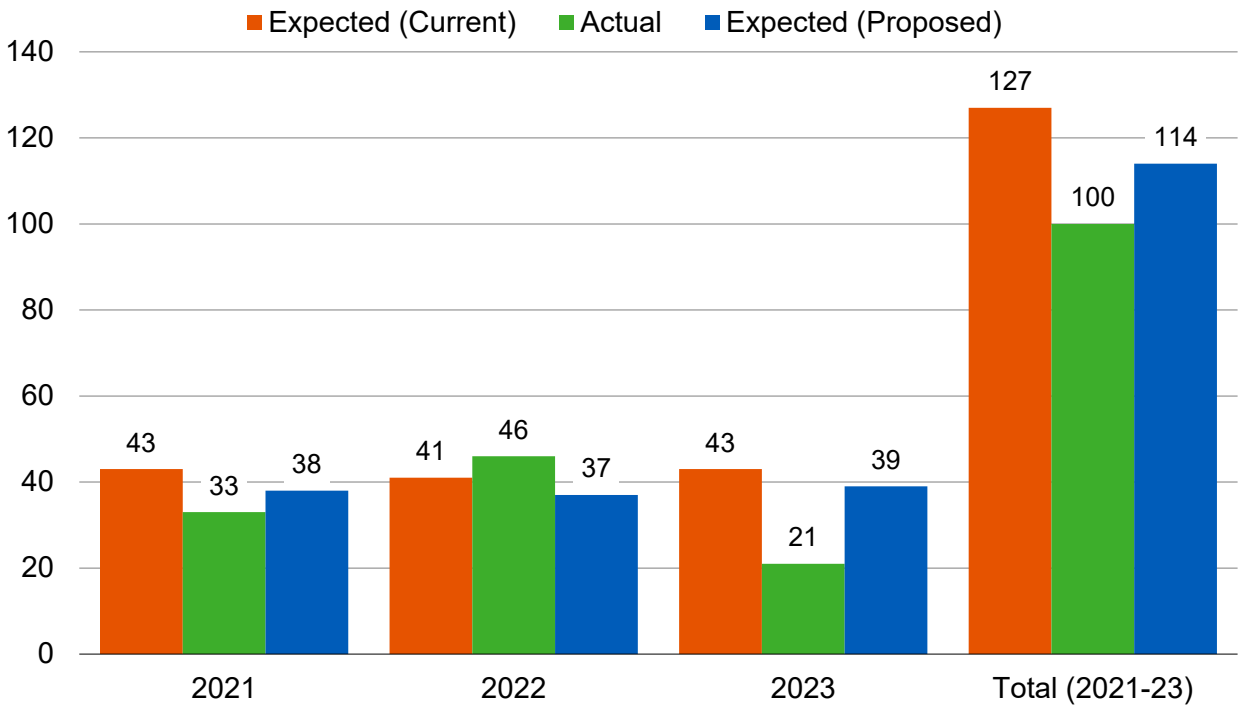
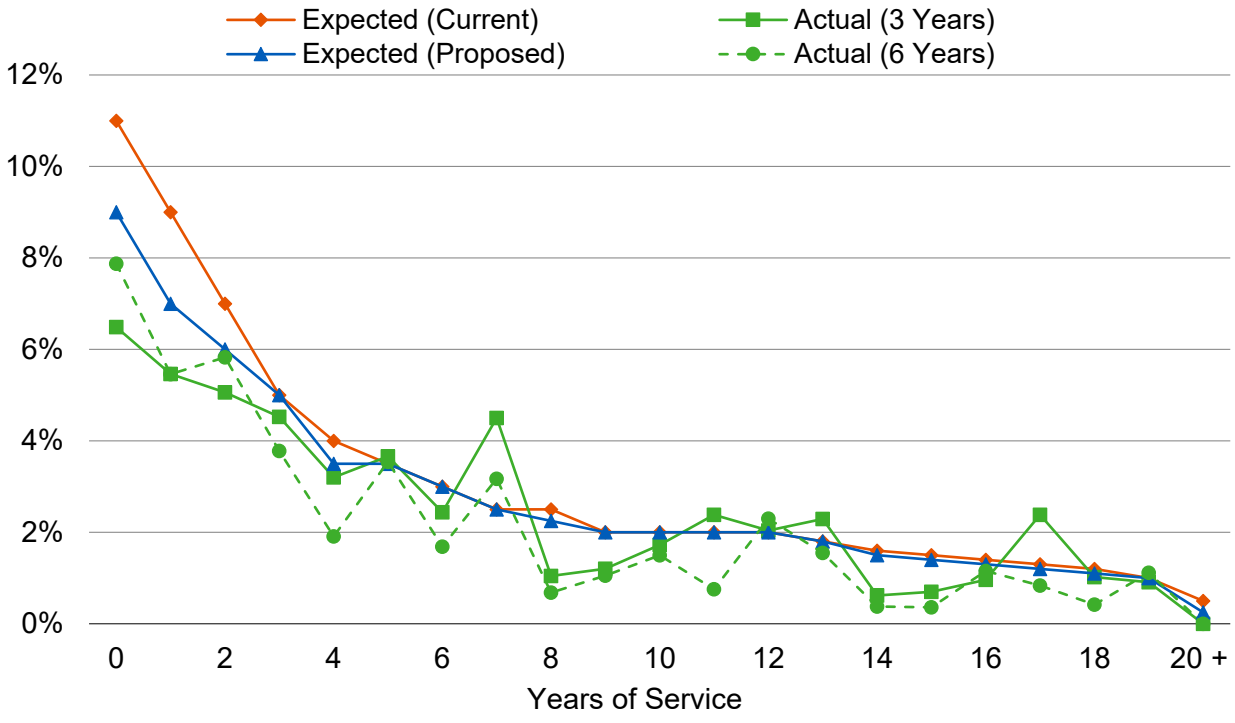


Chart 22: Termination Rates

Safety Members



E. 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.

Continuing the practice adopted in the last experience study, the recommended retirement rates for General Tier 1 Enhanced, General Tier 3 Enhanced and Safety Tier A Enhanced apply different sets of age-based retirement assumptions for members with less than 30 years of service and for members with more than 30 years of service. **For the first time in this experience study, we recommend retirement rates for General Tier 4 and Tier 5 also be applied using different sets of age-based retirement assumptions for members with less than 30 years of service and for members with more than 30 years of service so that they would follow the retirement rate structure for the General Legacy members.** For all other tiers, we continue to recommend retirement rates as a function of age only due to the limited experience available.

On January 1, 2013, PEPRA formulas were implemented for new General and Safety tiers. These new tiers are referred to as Tier 4 and Tier 5 for General, and Tier D and Tier E for Safety. With this study, we are introducing service-based retirement rates for the General Tier 4 and Tier 5 members as well as adjusting the current assumptions based on actual experience. However, there is still relatively limited experience available for these tiers, so there continues to be some smoothing of the proposed rates at most ages. This assumption will continue to be monitored in future experience studies, including whether service-based retirement rates should also be implemented for Safety Tier D and Tier E.

The following tables shows the observed service retirement rates based on the actual experience over the past three years. To increase the credibility of the data, we have also included and considered the actual experience over the past **six** years. Also shown are the current assumed rates and the rates we propose.

Section 4: Demographic Assumptions

General Tier 1 Enhanced — Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
50	4.00%	11.90%	8.33%	4.00%	10.00%	N/A	0.00%	8.00%
51	4.00%	6.67%	3.41%	4.00%	10.00%	0.00%	25.00%	10.00%
52	4.00%	2.50%	5.15%	4.00%	10.00%	0.00%	16.67%	10.00%
53	4.00%	4.65%	2.91%	4.00%	10.00%	0.00%	0.00%	10.00%
54	10.00%	2.50%	4.08%	8.00%	16.00%	25.00%	7.69%	16.00%
55	15.00%	9.76%	12.22%	12.00%	24.00%	46.15%	39.13%	30.00%
56	15.00%	5.13%	8.43%	12.00%	24.00%	25.00%	14.29%	24.00%
57	15.00%	12.82%	12.66%	14.00%	24.00%	11.11%	16.67%	22.00%
58	15.00%	15.15%	9.23%	15.00%	22.00%	44.44%	26.32%	22.00%
59	18.00%	9.68%	14.04%	18.00%	22.00%	22.22%	20.00%	22.00%
60	20.00%	22.22%	22.22%	20.00%	20.00%	30.00%	19.05%	20.00%
61	20.00%	22.22%	15.22%	20.00%	20.00%	50.00%	26.09%	20.00%
62	25.00%	15.79%	22.00%	22.00%	30.00%	0.00%	17.65%	25.00%
63	25.00%	15.38%	23.68%	22.00%	30.00%	33.33%	40.00%	30.00%
64	25.00%	7.14%	17.86%	22.00%	30.00%	11.11%	9.09%	30.00%
65	35.00%	26.32%	24.14%	30.00%	35.00%	14.29%	23.08%	30.00%
66	40.00%	50.00%	47.62%	40.00%	40.00%	100.00%	37.50%	30.00%
67	40.00%	60.00%	36.36%	40.00%	40.00%	N/A	16.67%	30.00%
68	40.00%	75.00%	55.56%	40.00%	40.00%	0.00%	0.00%	30.00%
69	40.00%	0.00%	16.67%	40.00%	40.00%	20.00%	16.67%	30.00%
70	40.00%	100.00%	66.67%	40.00%	40.00%	0.00%	0.00%	30.00%
71	35.00%	0.00%	0.00%	35.00%	35.00%	50.00%	50.00%	35.00%
72	35.00%	50.00%	25.00%	35.00%	35.00%	100.00%	100.00%	35.00%
73	35.00%	50.00%	33.33%	35.00%	35.00%	N/A	N/A	35.00%
74	35.00%	50.00%	50.00%	35.00%	35.00%	N/A	N/A	35.00%
75+	100.00%	0.00%	33.33%	100.00%	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	**0.84**			**0.91**	**0.84**			**0.89**

Based on this experience, we recommend decreasing the retirement rates overall for General Tier 1 Enhanced members with less than 30 years of service and with 30 or more years of service.

Chart 23 on page 70 compares the number of actual to expected retirements for General Tier 1 Enhanced members over the past three years for the current and proposed assumptions.

Chart 29 and Chart 30 on page 73 compare the actual retirement experience with the current and proposed assumptions for General Tier 1 Enhanced members with less than 30 years of service and with 30 or more years of service, respectively.

Section 4: Demographic Assumptions

General Tier 3 Enhanced — Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
49	0.00%	N/A	N/A	0.00%	25.00%	N/A	100.00%	25.00%
50	4.00%	4.10%	3.58%	4.00%	10.00%	0.00%	0.00%	10.00%
51	3.00%	2.41%	2.27%	3.00%	5.00%	0.00%	0.00%	5.00%
52	3.00%	4.72%	4.02%	3.25%	5.00%	7.14%	8.00%	5.00%
53	4.00%	3.45%	2.83%	3.50%	5.00%	4.76%	5.71%	5.00%
54	6.00%	5.77%	4.47%	5.75%	11.00%	10.34%	11.54%	11.00%
55	8.00%	6.38%	8.23%	8.00%	15.00%	8.57%	13.24%	15.00%
56	8.00%	8.64%	8.03%	8.00%	10.00%	13.16%	13.41%	10.00%
57	8.00%	7.89%	6.72%	8.00%	10.00%	6.82%	8.14%	10.00%
58	9.00%	8.43%	7.99%	8.50%	15.00%	11.76%	16.49%	15.00%
59	10.00%	13.92%	11.34%	10.00%	15.00%	27.87%	26.60%	20.00%
60	12.00%	6.94%	9.15%	11.00%	15.00%	11.11%	16.00%	15.00%
61	16.00%	13.50%	13.05%	16.00%	20.00%	21.43%	15.58%	18.00%
62	20.00%	21.79%	18.89%	20.00%	25.00%	33.33%	25.00%	25.00%
63	20.00%	21.20%	17.30%	20.00%	25.00%	23.33%	14.93%	25.00%
64	25.00%	15.34%	20.06%	20.00%	28.00%	25.00%	23.44%	25.00%
65	30.00%	27.85%	26.47%	30.00%	32.00%	39.39%	37.04%	32.00%
66	32.00%	35.21%	35.47%	32.00%	32.00%	33.33%	28.13%	32.00%
67	30.00%	38.04%	33.85%	32.00%	30.00%	20.00%	35.29%	30.00%
68	30.00%	25.00%	29.05%	30.00%	30.00%	41.67%	35.71%	30.00%
69	30.00%	38.00%	36.04%	30.00%	30.00%	0.00%	25.00%	30.00%
70	35.00%	35.42%	36.28%	35.00%	35.00%	60.00%	50.00%	30.00%
71	35.00%	36.67%	22.54%	30.00%	35.00%	50.00%	25.00%	30.00%
72	35.00%	24.00%	25.86%	30.00%	35.00%	0.00%	0.00%	30.00%
73	35.00%	13.04%	15.79%	30.00%	35.00%	0.00%	0.00%	30.00%
74	35.00%	23.81%	18.75%	30.00%	35.00%	0.00%	0.00%	30.00%
75+	100.00%	30.30%	25.71%	100.00%	100.00%	25.00%	33.33%	100.00%
Actual / Expected (6 Years)	**0.88**			**0.91**	**0.99**			**0.99**

Based on this experience, we recommend decreasing the retirement rates overall for General Tier 3 Enhanced members with less than 30 years of service and minor adjustments to the General Tier 3 Enhanced members with 30 or more years of service.

Chart 24 on page 70 compares the number of actual to expected retirements for General Tier 3 Enhanced members over the past three years for the current and proposed assumptions.

Chart 31 and Chart 32 on page 74 compare the actual retirement experience with the current and proposed assumptions for General Tier 3 Enhanced members with less than 30 years of service and with 30 or more years of service, respectively.

Section 4: Demographic Assumptions

General Tier 1 Non-Enhanced — Retirement Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
50	3.00%	N/A	0.00%	3.00%
51	3.00%	N/A	0.00%	3.00%
52	3.00%	0.00%	0.00%	3.00%
53	3.00%	0.00%	0.00%	3.00%
54	3.00%	0.00%	0.00%	3.00%
55	10.00%	N/A	N/A	10.00%
56	10.00%	N/A	N/A	10.00%
57	10.00%	N/A	N/A	10.00%
58	10.00%	N/A	0.00%	10.00%
59	10.00%	100.00%	66.67%	10.00%
60	25.00%	N/A	0.00%	25.00%
61	15.00%	0.00%	0.00%	15.00%
62	40.00%	100.00%	100.00%	40.00%
63	35.00%	0.00%	0.00%	35.00%
64	30.00%	N/A	N/A	30.00%
65	40.00%	N/A	N/A	40.00%
66	35.00%	N/A	N/A	35.00%
67	35.00%	N/A	N/A	35.00%
68	35.00%	N/A	N/A	35.00%
69	35.00%	N/A	N/A	35.00%
70	40.00%	N/A	N/A	35.00%
71	40.00%	N/A	N/A	35.00%
72	40.00%	N/A	N/A	35.00%
73	50.00%	N/A	N/A	35.00%
74	50.00%	N/A	N/A	35.00%
75+	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	**1.62**			**1.62**

The General Tier 1 Non-Enhanced formula covers a very small group of members, with only two actual retirements observed in the past three years (and only six actual retirements observed in the past 12 years). **Due to the size of this tier, we have only recommended decreasing some of the retirement rates in the later ages to be consistent with similar changes we are recommending for other General members.**

Section 4: Demographic Assumptions

General Tier 4 and Tier 5 — Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
52	2.00%	3.15%	2.78%	2.00%	2.00%	N/A	N/A	2.00%
53	3.00%	0.00%	0.82%	2.00%	3.00%	N/A	N/A	3.00%
54	3.00%	1.01%	1.60%	2.00%	3.00%	N/A	N/A	3.00%
55	4.00%	0.00%	0.00%	2.00%	4.00%	N/A	N/A	4.00%
56	5.00%	1.20%	0.93%	3.00%	5.00%	N/A	N/A	5.00%
57	6.00%	7.21%	7.97%	6.00%	6.00%	N/A	N/A	6.00%
58	6.00%	5.08%	4.96%	6.00%	6.00%	N/A	N/A	6.00%
59	8.00%	3.88%	3.15%	6.00%	8.00%	N/A	N/A	8.00%
60	8.00%	4.49%	4.59%	7.00%	8.00%	N/A	N/A	8.00%
61	12.00%	7.69%	9.91%	10.00%	12.00%	N/A	N/A	12.00%
62	15.00%	3.80%	3.85%	12.00%	15.00%	N/A	N/A	15.00%
63	17.00%	10.47%	10.91%	14.00%	17.00%	N/A	N/A	17.00%
64	20.00%	11.11%	13.33%	16.00%	20.00%	N/A	N/A	20.00%
65	25.00%	15.19%	17.53%	20.00%	25.00%	N/A	N/A	25.00%
66	25.00%	28.30%	26.76%	25.00%	25.00%	N/A	N/A	25.00%
67	25.00%	22.73%	22.64%	25.00%	25.00%	N/A	N/A	25.00%
68	25.00%	21.43%	17.65%	25.00%	25.00%	N/A	N/A	25.00%
69	25.00%	3.85%	7.14%	25.00%	25.00%	N/A	N/A	25.00%
70	35.00%	10.00%	7.69%	25.00%	35.00%	N/A	N/A	30.00%
71	35.00%	16.67%	23.08%	30.00%	35.00%	N/A	N/A	30.00%
72	35.00%	14.29%	18.18%	30.00%	35.00%	N/A	N/A	30.00%
73	35.00%	0.00%	0.00%	30.00%	35.00%	N/A	N/A	30.00%
74	35.00%	20.00%	11.11%	30.00%	35.00%	N/A	N/A	30.00%
75+	100.00%	33.33%	23.08%	100.00%	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	**0.59**			**0.68**	**N/A**			**N/A**

Based on this experience, we recommend decreasing the retirement rates overall for General Tier 4 and Tier 5 members with less than 30 years of service. While there were no actual retirements during this period for General Tier 4 and Tier 5 members with 30 or more years of service, we recommend decreasing the rates for ages 70 to 74 to be consistent with similar recommendations in the other tiers.

Chart 25 on page 71 compares the number of actual to expected retirements for General Tier 4 and Tier 5 members over the past three years for the current and proposed assumptions.

Chart 33 and Chart 34 on page 75 compare the actual retirement experience with the current and proposed assumptions for General Tier 4 and Tier 5 members with less than 30 years of service and with 30 or more years of service, respectively.

Section 4: Demographic Assumptions

Safety Tier A Enhanced — Retirement Rates by Years of Service (YOS)

Age	<30 YOS Current Rate	<30 YOS Actual Rate (3 Years)	<30 YOS Actual Rate (6 Years)	<30 YOS Proposed Rate	30+ YOS Current Rate	30+ YOS Actual Rate (3 Years)	30+ YOS Actual Rate (6 Years)	30+ YOS Proposed Rate
43	0.00%	15.79%	15.79%	5.00%	0.00%	N/A	N/A	0.00%
44	0.00%	15.38%	11.11%	5.00%	0.00%	N/A	N/A	0.00%
45	7.00%	0.00%	0.00%	5.00%	7.00%	N/A	N/A	0.00%
46	5.00%	4.08%	7.69%	5.00%	5.00%	N/A	N/A	0.00%
47	7.00%	3.57%	3.88%	5.00%	7.00%	N/A	N/A	0.00%
48	10.00%	9.59%	10.29%	10.00%	30.00%	N/A	N/A	30.00%
49	22.00%	18.92%	19.48%	20.00%	30.00%	N/A	N/A	30.00%
50	22.00%	17.39%	20.66%	22.00%	30.00%	0.00%	0.00%	30.00%
51	22.00%	11.65%	16.10%	20.00%	22.00%	0.00%	0.00%	20.00%
52	16.00%	13.19%	15.61%	16.00%	20.00%	25.00%	16.67%	20.00%
53	16.00%	13.85%	14.07%	16.00%	22.00%	0.00%	25.00%	20.00%
54	16.00%	20.00%	17.82%	16.00%	24.00%	25.00%	33.33%	24.00%
55	16.00%	17.14%	7.89%	16.00%	30.00%	33.33%	30.00%	30.00%
56	18.00%	16.67%	21.31%	18.00%	30.00%	42.86%	40.00%	30.00%
57	18.00%	27.27%	18.33%	18.00%	30.00%	0.00%	0.00%	30.00%
58	20.00%	9.52%	11.90%	18.00%	35.00%	20.00%	28.57%	30.00%
59	20.00%	11.76%	11.11%	18.00%	35.00%	33.33%	40.00%	35.00%
60	20.00%	11.11%	7.14%	18.00%	35.00%	50.00%	33.33%	35.00%
61	20.00%	0.00%	14.81%	20.00%	35.00%	N/A	50.00%	35.00%
62	20.00%	30.77%	23.81%	20.00%	35.00%	0.00%	0.00%	35.00%
63	25.00%	0.00%	14.29%	20.00%	35.00%	0.00%	0.00%	35.00%
64	35.00%	33.33%	33.33%	35.00%	35.00%	50.00%	50.00%	35.00%
65	100.00%	0.00%	0.00%	35.00%	100.00%	50.00%	66.67%	100.00%
66	100.00%	40.00%	18.18%	50.00%	100.00%	100.00%	100.00%	100.00%
67	100.00%	50.00%	33.33%	50.00%	100.00%	N/A	100.00%	100.00%
68	100.00%	50.00%	40.00%	50.00%	100.00%	N/A	N/A	100.00%
69	100.00%	0.00%	0.00%	50.00%	100.00%	N/A	N/A	100.00%
70+	100.00%	100.00%	100.00%	100.00%	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	**0.81**			**0.89**	**0.91**			**0.93**

Based on this experience, we recommend decreasing the retirement rates overall for Safety Tier A Enhanced members with less than 30 years of service and with 30 or more years of service.

Chart 26 on page 71 compares the number of actual to expected retirements for Safety Tier A Enhanced members over the past three years for the current and proposed assumptions.

Chart 35 and Chart 36 on page 76 compares the actual retirement experience with the current and proposed assumptions for Safety Tier A Enhanced members with less than 30 years of service and with 30 or more years of service, respectively.

Safety Tier C Enhanced — Retirement Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
45	2.00%	0.00%	0.00%	2.00%
46	1.00%	0.00%	0.00%	1.00%
47	4.00%	0.00%	0.00%	4.00%
48	4.00%	N/A	0.00%	4.00%
49	12.00%	100.00%	66.67%	20.00%
50	20.00%	0.00%	20.00%	20.00%
51	18.00%	0.00%	14.29%	12.00%
52	15.00%	0.00%	0.00%	12.00%
53	15.00%	0.00%	0.00%	12.00%
54	18.00%	0.00%	20.00%	18.00%
55	18.00%	0.00%	0.00%	18.00%
56	15.00%	0.00%	0.00%	15.00%
57	15.00%	0.00%	0.00%	15.00%
58	25.00%	0.00%	0.00%	15.00%
59	25.00%	50.00%	50.00%	25.00%
60	25.00%	0.00%	0.00%	25.00%
61	25.00%	N/A	100.00%	25.00%
62	25.00%	N/A	N/A	25.00%
63	30.00%	N/A	N/A	30.00%
64	35.00%	N/A	N/A	35.00%
65+	100.00%	100.00%	100.00%	100.00%
Actual / Expected (6 Years)	**0.87**			**0.94**

The Safety Tier C Enhanced formula covers a relatively small group of members, with only four actual retirements observed in the past three years (and only eight actual retirements observed in the past 12 years). **Due to the size of this tier, we have only recommended moderate changes to some of the retirement rates, for an overall decrease in retirement rates.**

Chart 27 on page 72 compares the number of actual to expected retirements for Safety Tier C members over the past three years for the current and proposed assumptions.

Chart 37 on page 77 compares the actual retirement experience with the current and proposed assumptions for Safety Tier C members.

Safety Tier A Non-Enhanced, Tier D and Tier E — Retirement Rates

Age	Current Rate	Actual Rate (3 Years)	Actual Rate (6 Years)	Proposed Rate
50	5.00%	0.00%	0.00%	5.00%
51	4.00%	0.00%	0.00%	4.00%
52	4.00%	0.00%	0.00%	4.00%
53	5.00%	12.50%	7.69%	6.00%
54	6.00%	11.11%	10.00%	8.00%
55	15.00%	28.57%	37.50%	20.00%
56	15.00%	40.00%	28.57%	20.00%
57	15.00%	25.00%	16.67%	15.00%
58	15.00%	16.67%	10.00%	15.00%
59	20.00%	25.00%	28.57%	22.00%
60	20.00%	40.00%	33.33%	25.00%
61	20.00%	33.33%	25.00%	25.00%
62	20.00%	66.67%	50.00%	35.00%
63	20.00%	50.00%	50.00%	40.00%
64	25.00%	100.00%	100.00%	40.00%
65+	100.00%	N/A	N/A	100.00%
Actual / Expected (6 Years)	**1.47**			**1.19**

The Safety Tier A Non-Enhanced formula covers a relatively small group of members, with only three actual retirements observed in the past three years (and only seven actual retirements observed in the past 12 years). **We continue to recommend applying the same retirement rates to the Safety Tier A Non-Enhanced members that are used for the Safety Tier D and Tier E members.**

Based on the above experience, we recommend increasing the retirement rates overall for Safety Tier A Non-Enhanced, Tier D and Tier E members.

Chart 28 on page 72 compares the number of actual to expected retirements for Safety Tier A Non-Enhanced, Tier D and Tier E members over the past three years for the current and proposed assumptions.

Chart 38 on page 77 compares the actual retirement experience with the current and proposed assumptions for Safety Tier A Non-Enhanced, Tier D and Tier E members.

Deferred vested members

In the last experience study, separate deferred vested retirement ages were introduced for reciprocal and non-reciprocal members.

The following tables show the observed deferred vested retirement age based on the actual experience over the past **six** 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

Line Description	Reciprocal Members	Non-Reciprocal Members
Current assumption	60.0	60.0
Actual average age (3 Years)	61.8	60.8
Actual average age (6 Years)	61.1	60.2
Proposed assumption	**61.0**	**60.0**

Based on this experience, we recommend increasing the deferred vested retirement age assumption for General members with reciprocity from age 60 to age 61 and maintaining the assumption for General members without reciprocity at age 60.

Safety Members' Deferred Vested Retirement Age

Line Description	Reciprocal Members	Non-Reciprocal Members
Current assumption	53.0	51.0
Actual average age (3 Years)	52.3	50.3
Actual average age (6 Years)	52.3	51.3
Proposed assumption	**53.0**	**50.0**

Based on this experience, we recommend maintaining the deferred vested retirement age assumption for Safety members with reciprocity at age 53 and decreasing the assumption for Safety members without reciprocity from age 51 to age 50.

Chart 23: Actual Number of Retirements Compared to Expected

General Tier 1 Enhanced Members

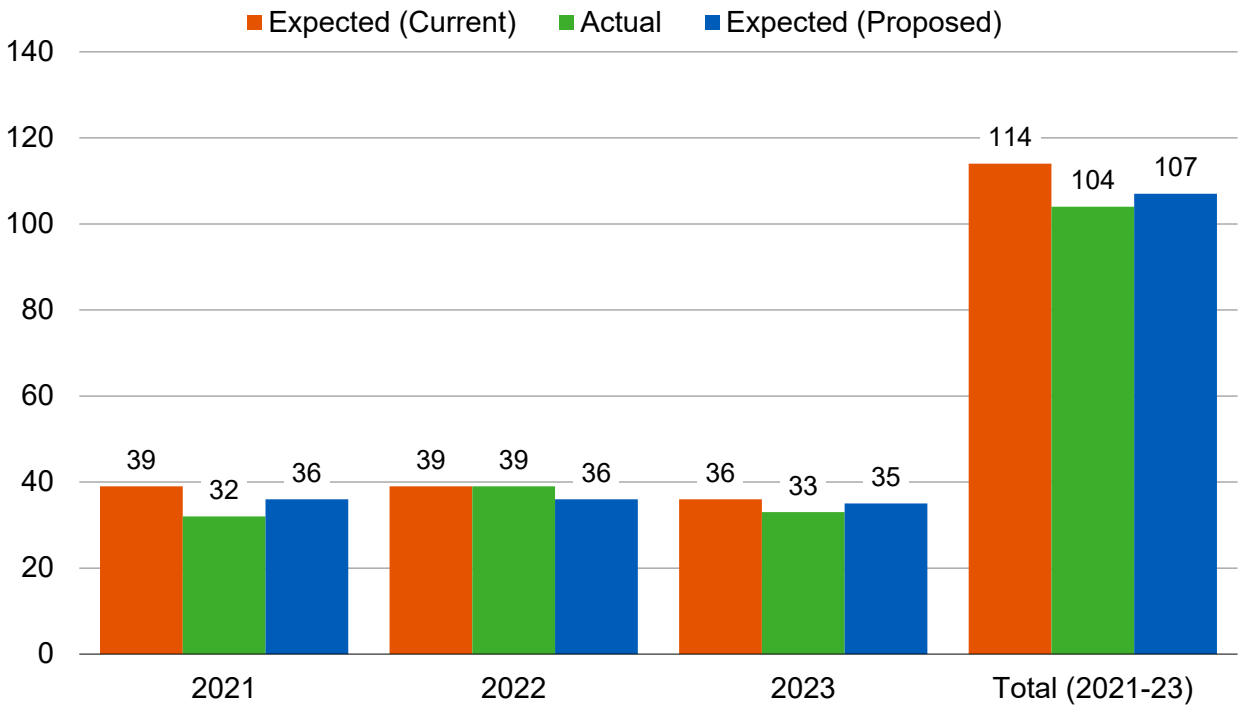


Chart 24: Actual Number of Retirements Compared to Expected

General Tier 3 Enhanced Members

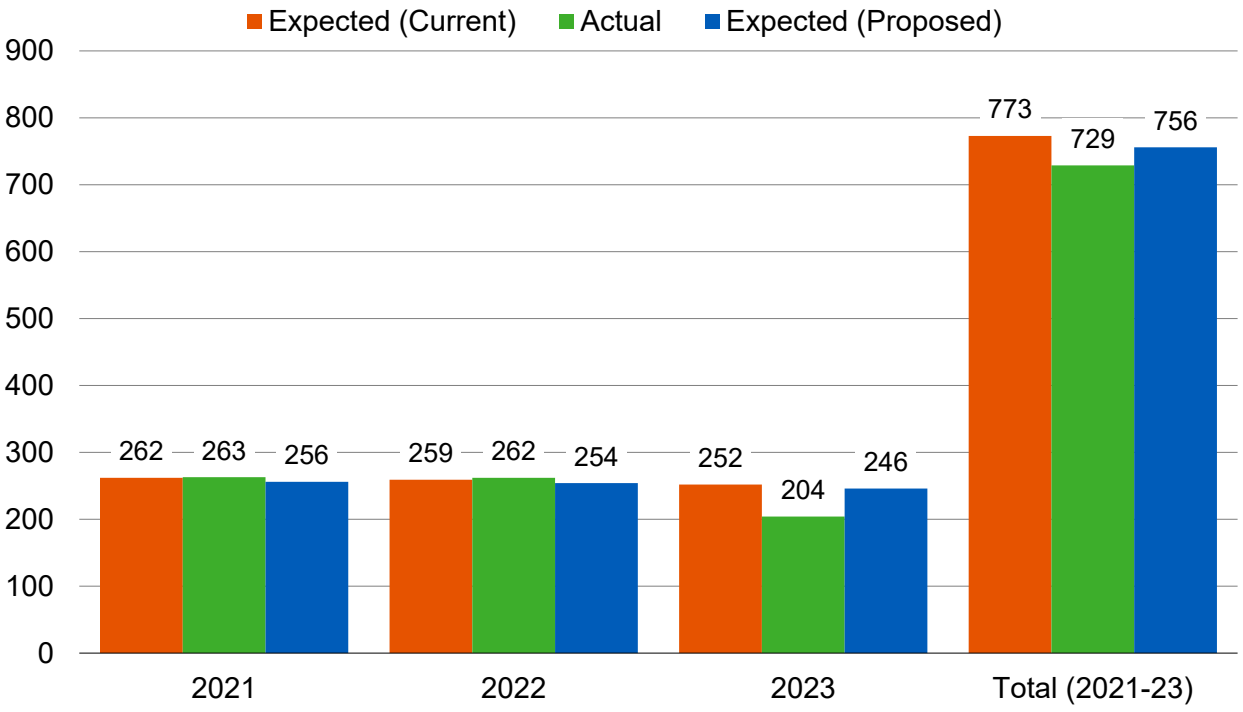


Chart 25: Actual Number of Retirements Compared to Expected

General Tier 4 and Tier 5 Members

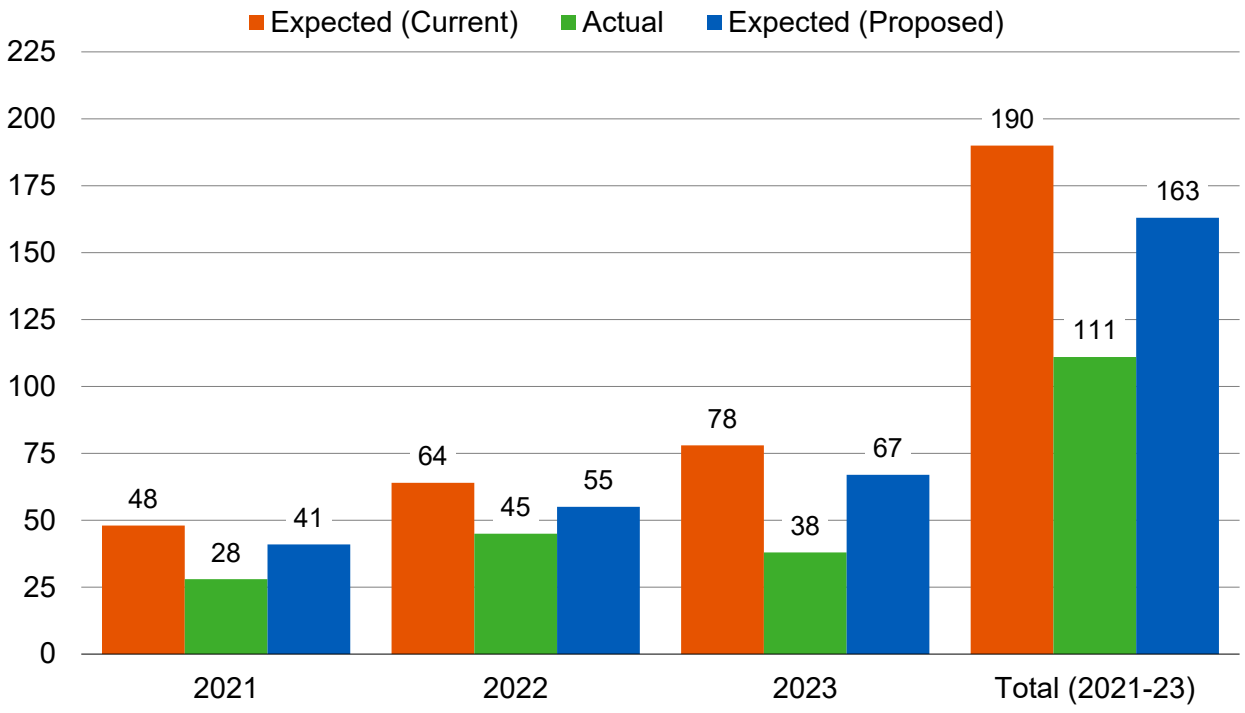


Chart 26: Actual Number of Retirements Compared to Expected

Safety Tier A Enhanced Members

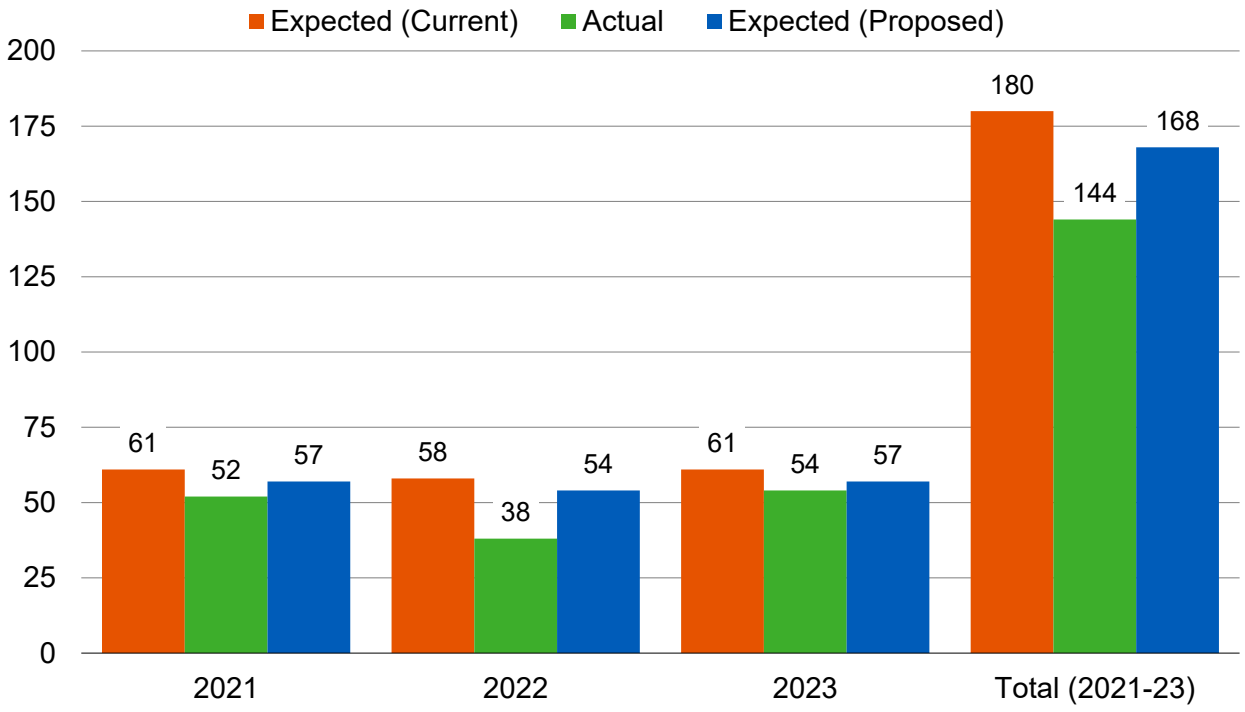


Chart 27: Actual Number of Retirements Compared to Expected
Safety Tier C Enhanced Members

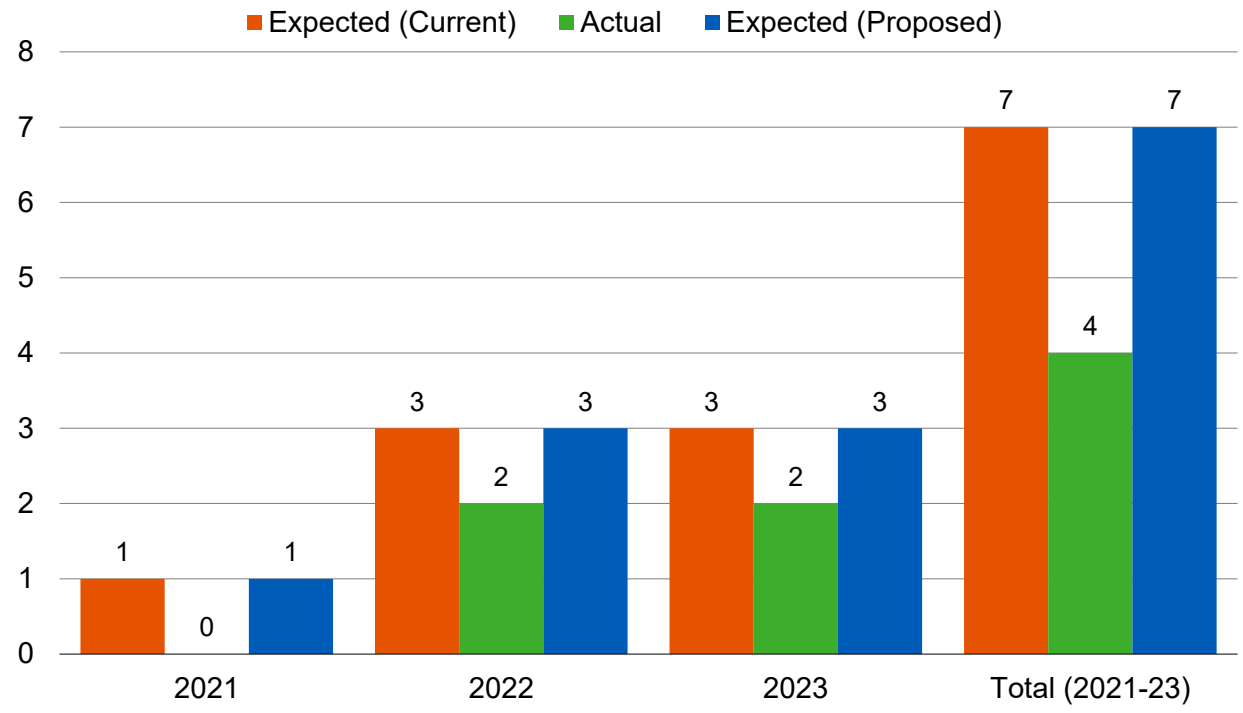


Chart 28: Actual Number of Retirements Compared to Expected
Safety Tier A Non-Enhanced, Tier D and Tier E Members

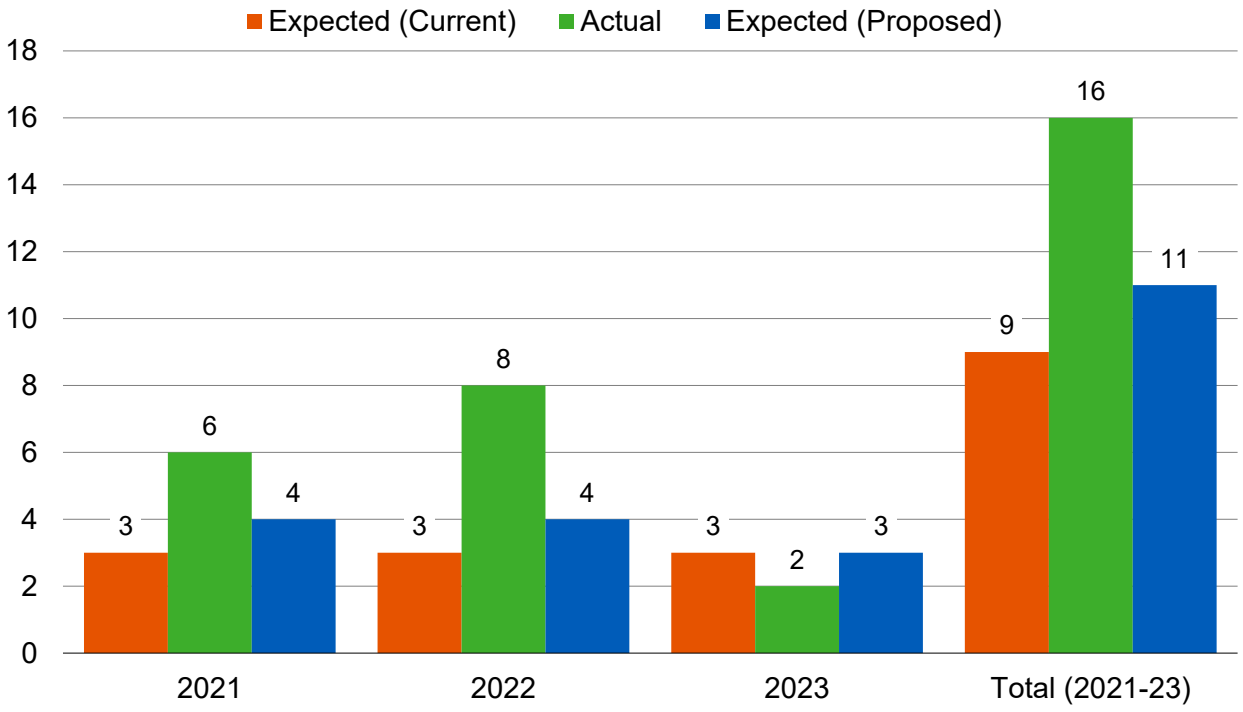


Chart 29: Retirement Rates

General Tier 1 Enhanced Members with less than 30 Years of Service

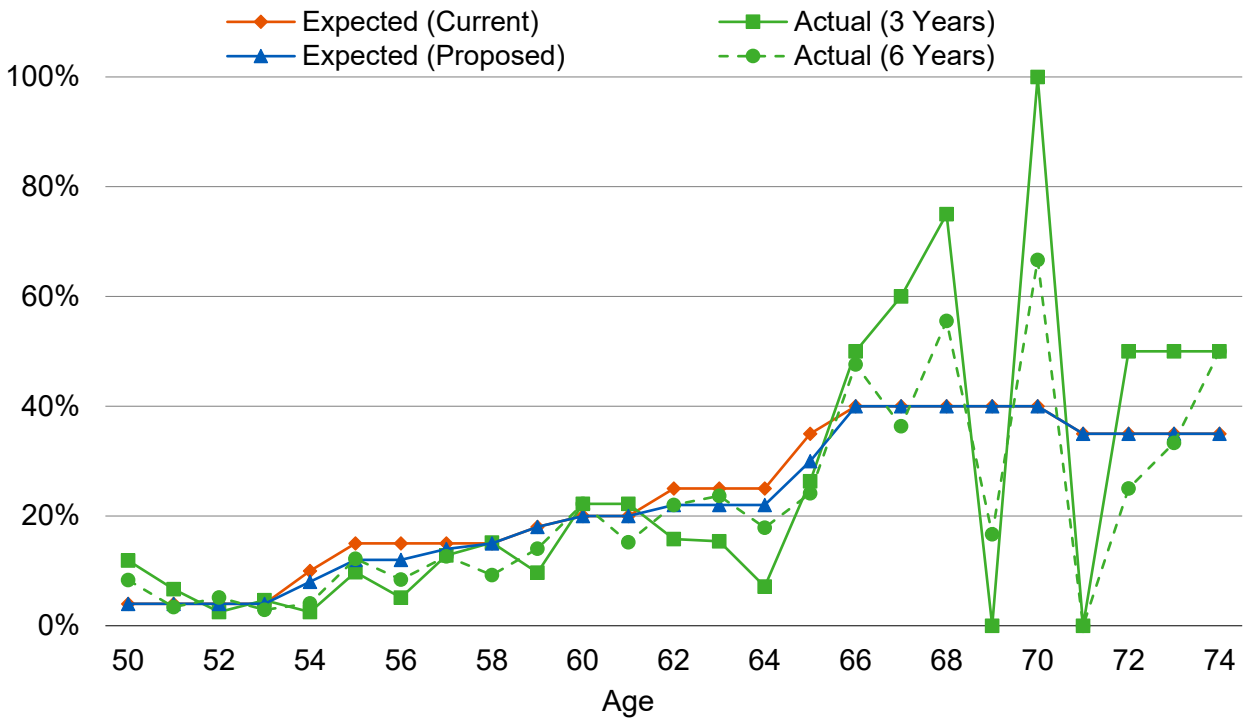


Chart 30: Retirement Rates

General Tier 1 Enhanced Members with 30 or more Years of Service

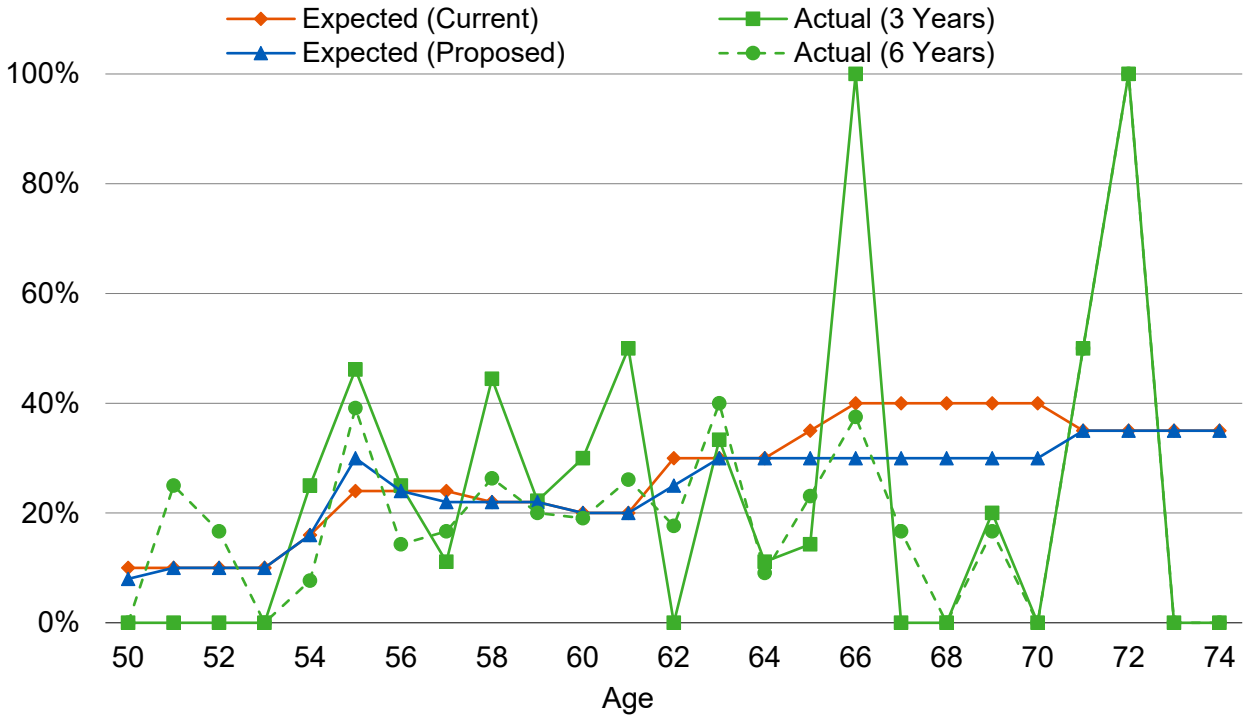


Chart 31: Retirement Rates

General Tier 3 Enhanced Members with less than 30 Years of Service

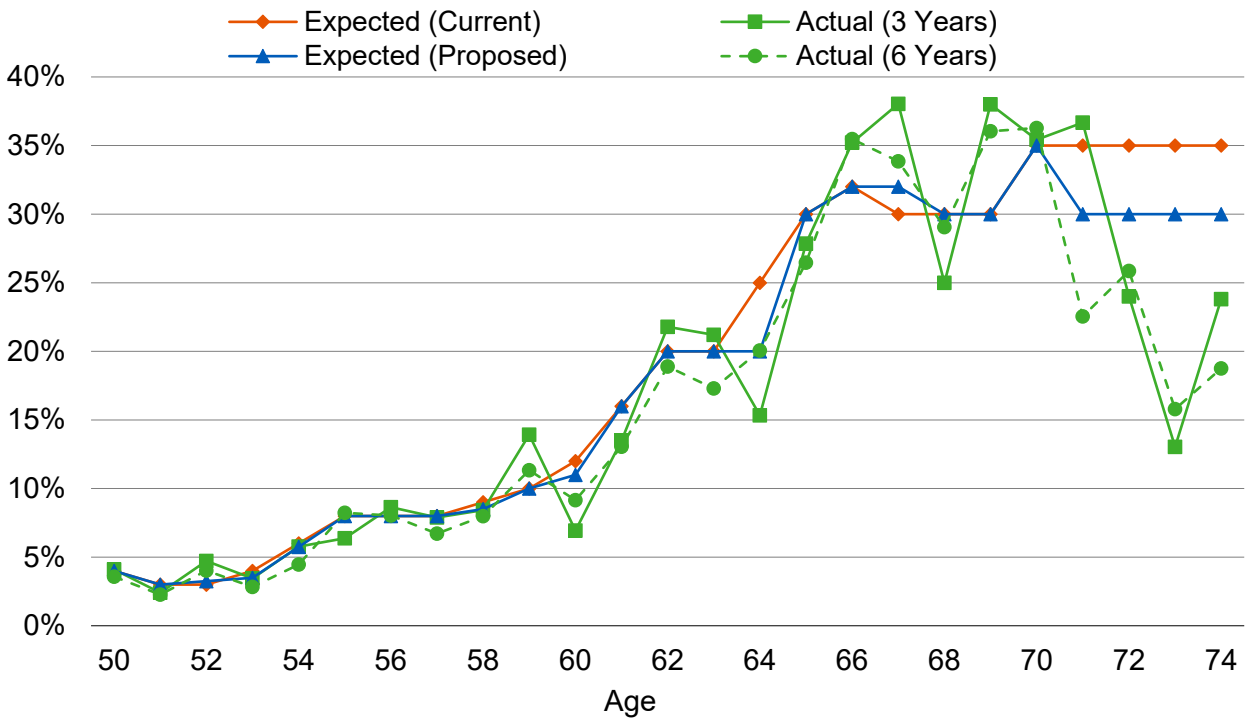


Chart 32: Retirement Rates

General Tier 3 Enhanced Members with 30 or more Years of Service

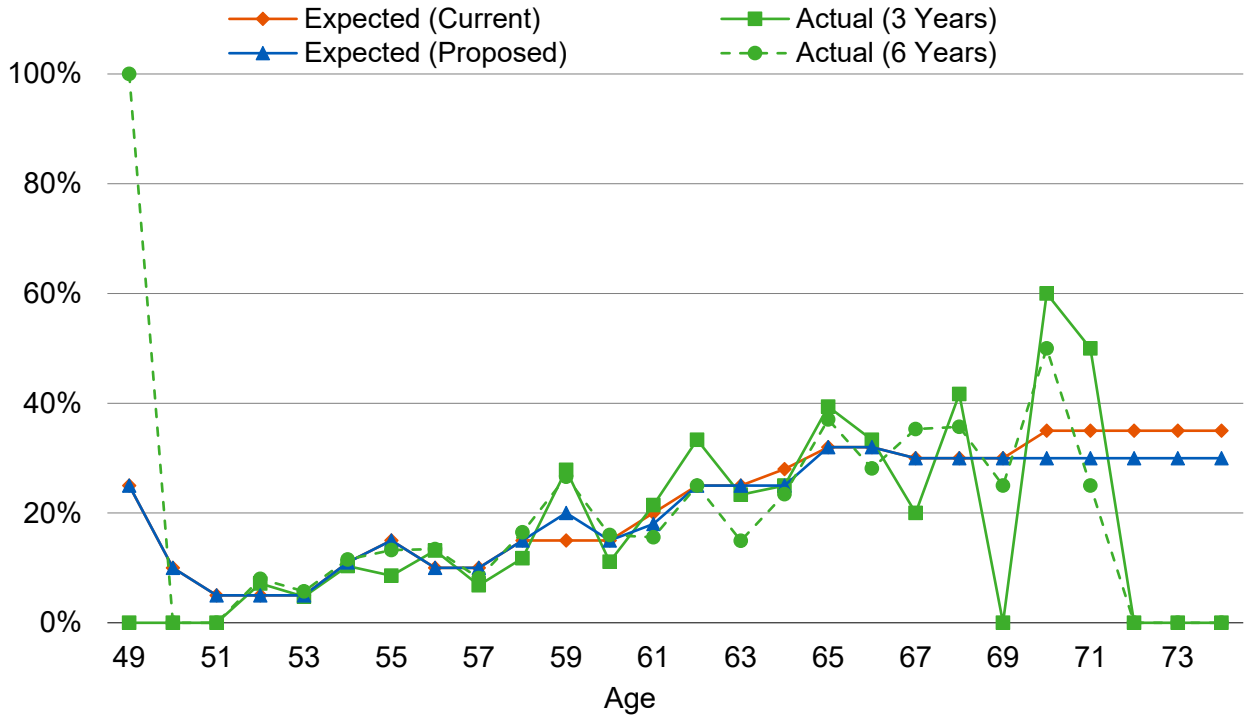


Chart 33: Retirement Rates

General Tier 4 and Tier 5 Members with less than 30 Years of Service

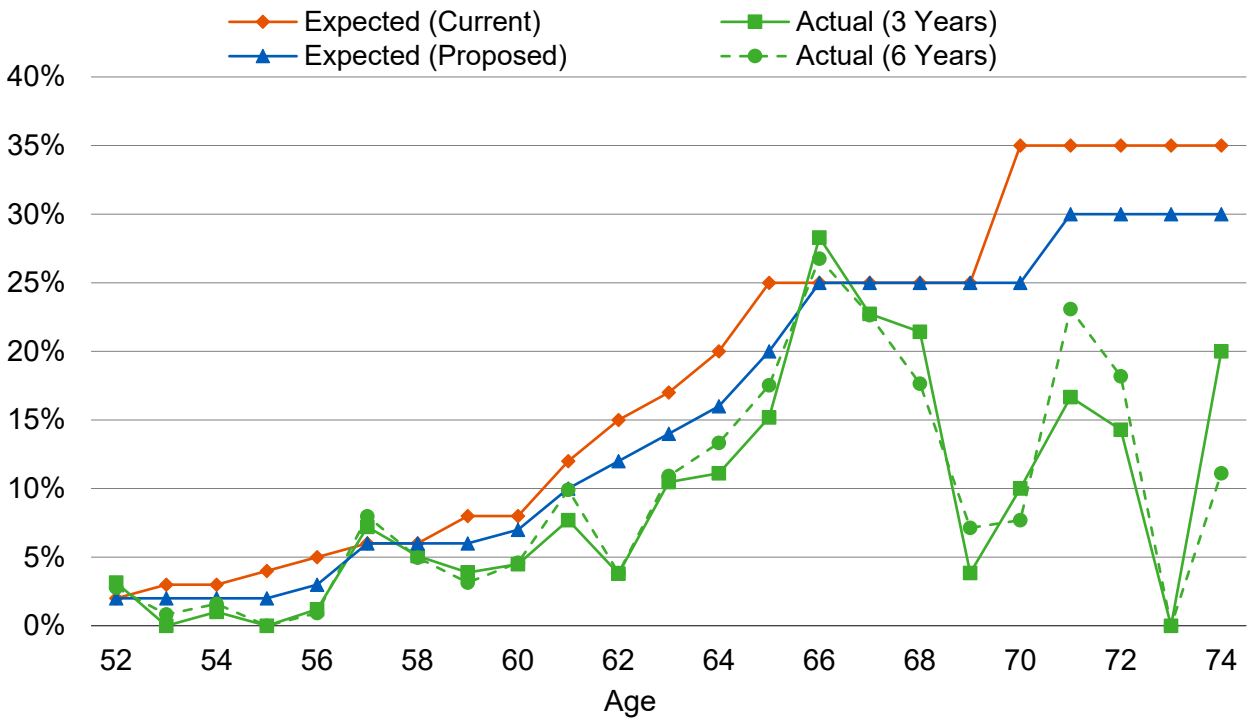


Chart 34: Retirement Rates

General Tier 4 and Tier 5 Members with 30 or more Years of Service

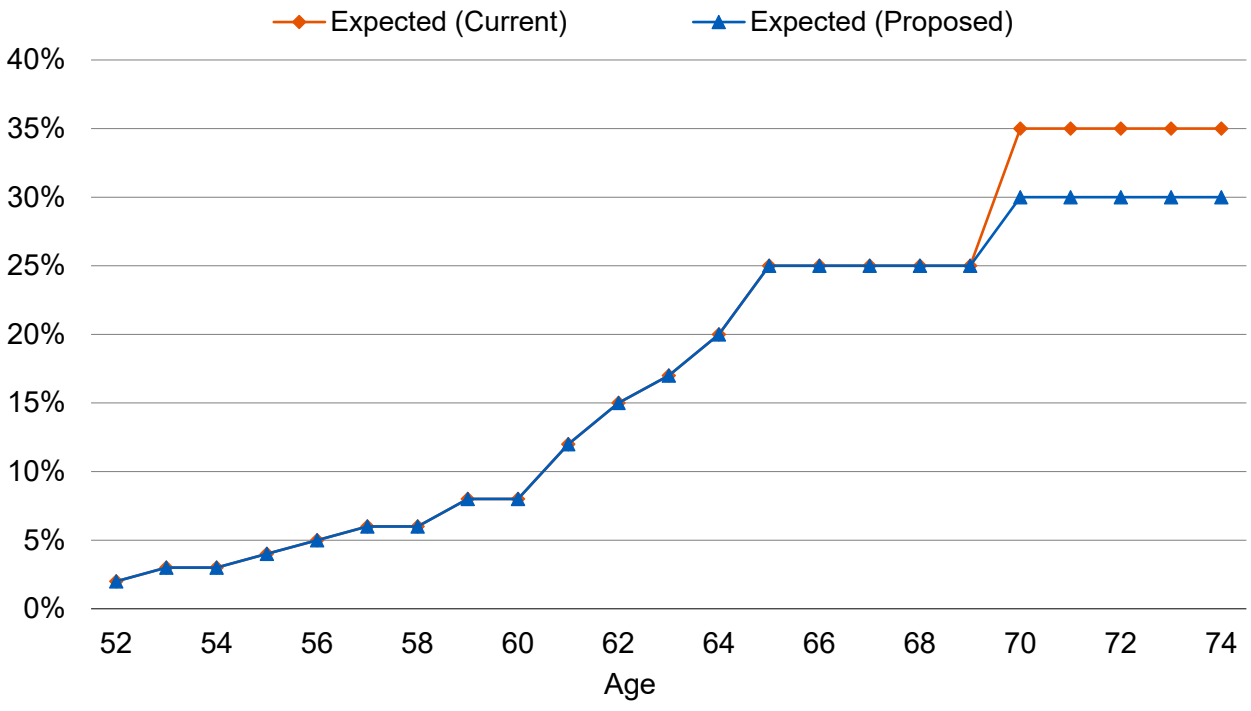


Chart 35: Retirement Rates

Safety Tier A Enhanced Members with less than 30 Years of Service

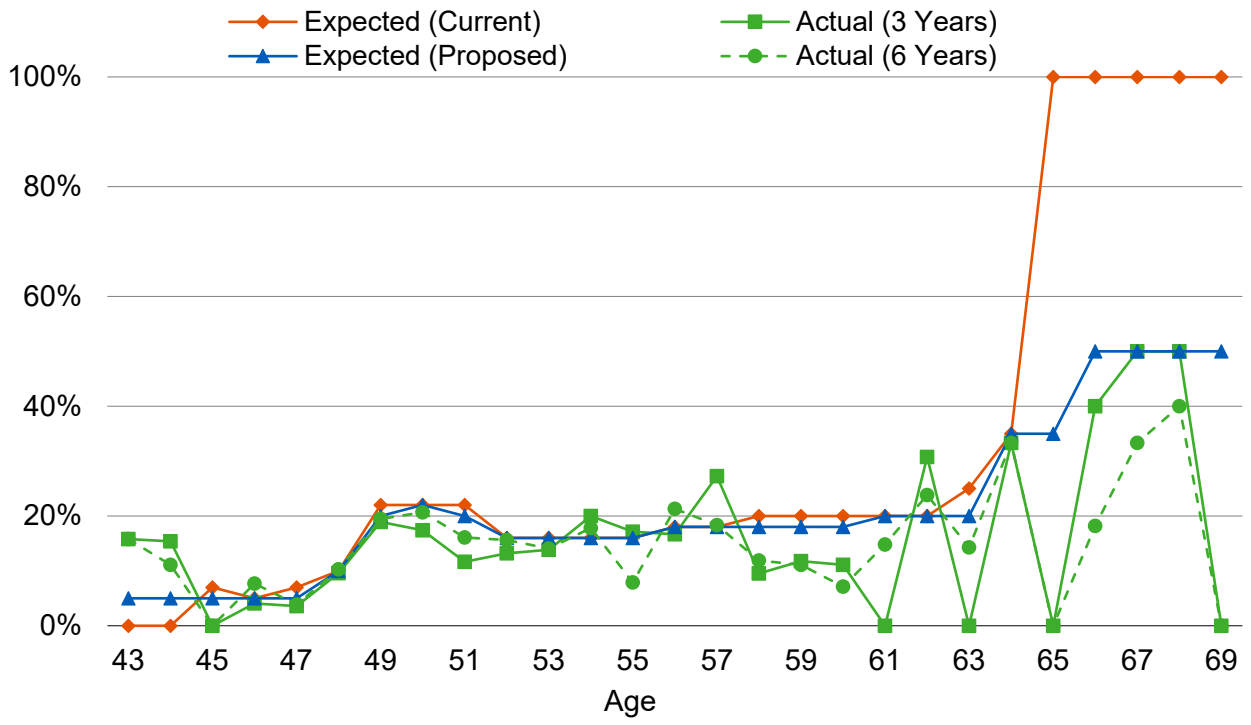


Chart 36: Retirement Rates

Safety Tier A Enhanced Members with 30 or more Years of Service

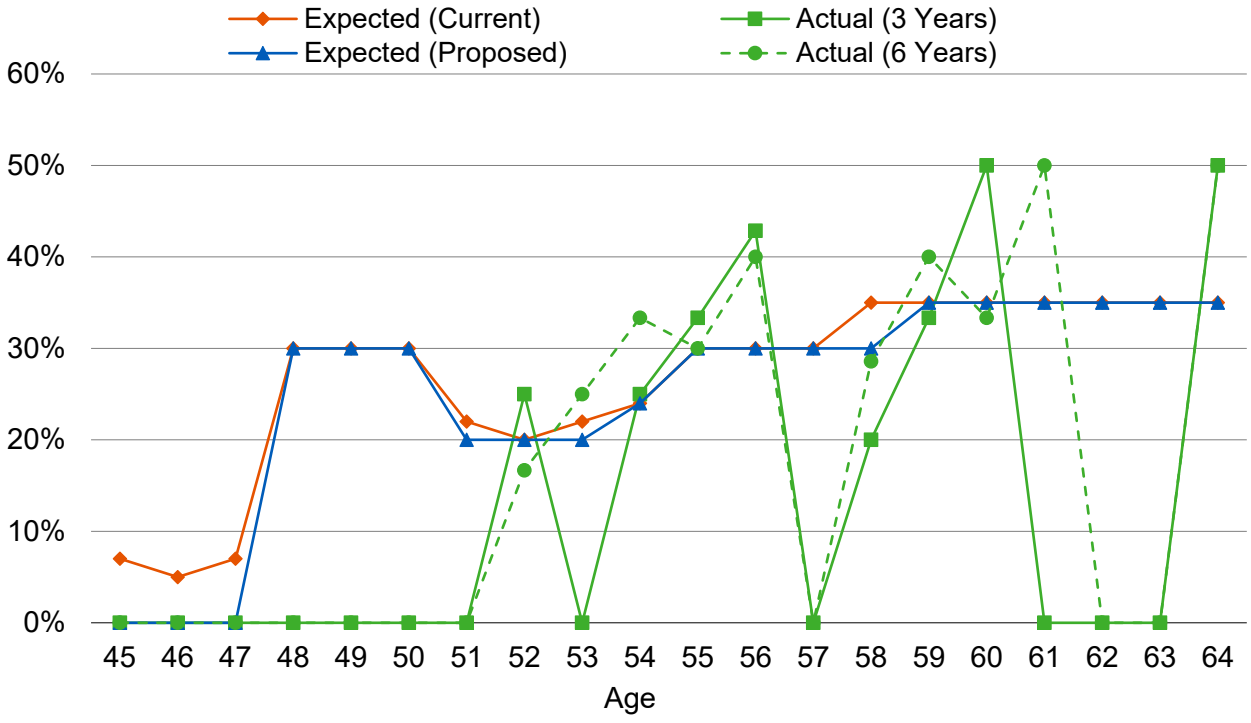


Chart 37: Retirement Rates

Safety Tier C Enhanced Members

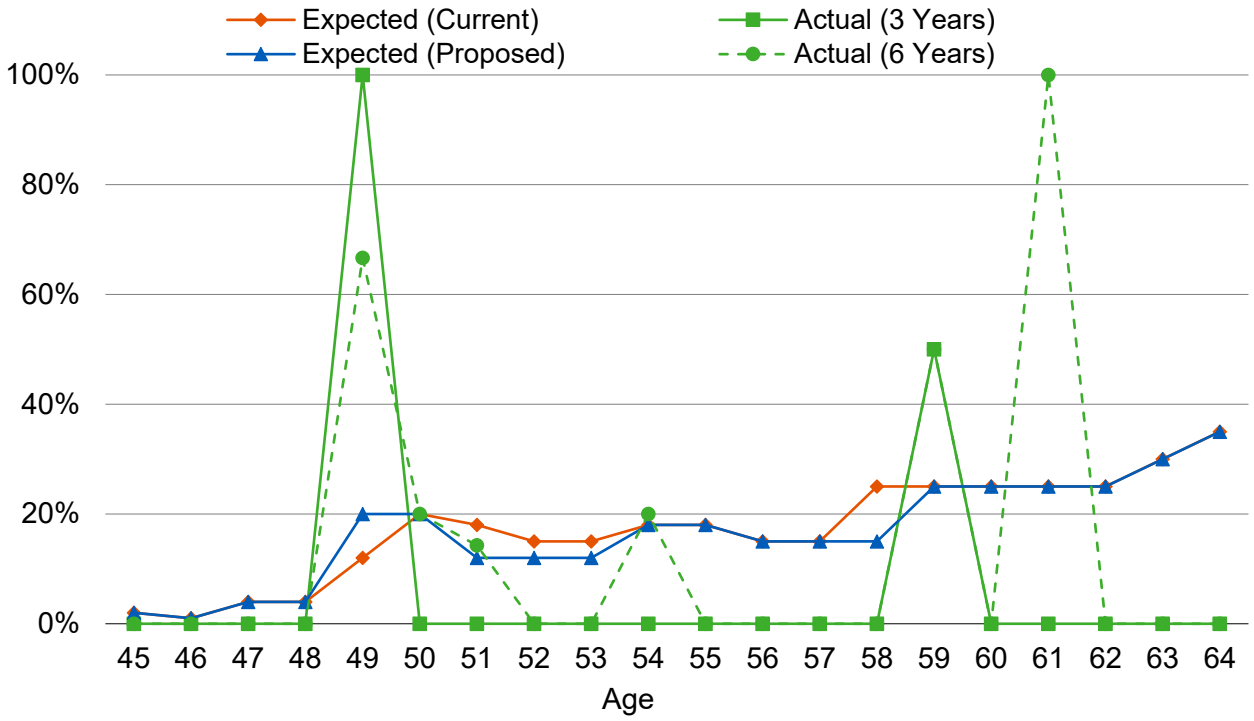
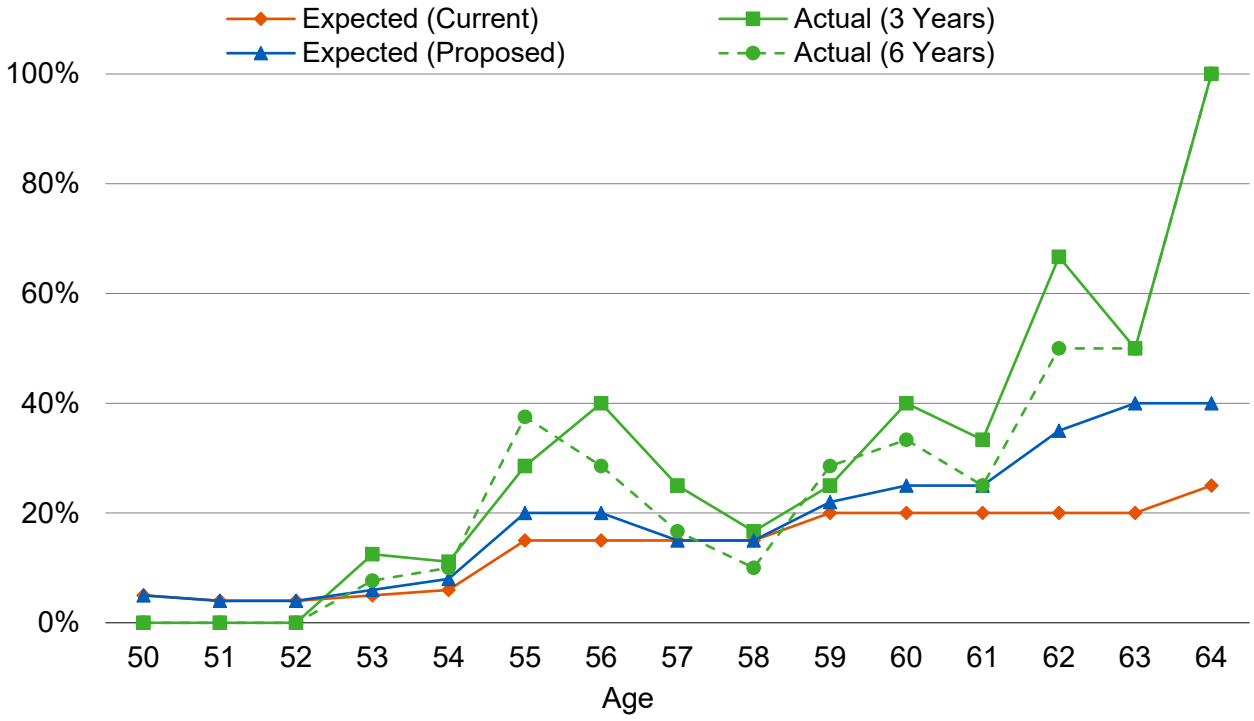


Chart 38: Retirement Rates

Safety Tier A Non-Enhanced, Tier D and Tier E Members



F. Leave cashouts

In 1998, the Board of Retirement, in the course of actions related to the Paulson Settlement, determined that several additional pay elements should be included as Earnable Compensation. For purposes of the actuarial valuation, these additional pay elements fall into two categories:

- **Ongoing Pay Elements:** Those that are expected to be received relatively uniformly over a member's employment years.
- **Leave Cashout Elements:** Those that are expected to be received mostly 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. The second category requires a separate actuarial assumption to anticipate its impact on a member's retirement benefit. Note that members in the PEPRA tiers do not have a leave cashout assumption, because leave cashout elements are not included in pensionable compensation under the PEPRA formulas.

AB 197 required CCCERA to implement a policy where certain terminal pay elements are no longer included in the determination of compensation for retirement purposes. This applies to all legacy tiers. In addition, the Board decided to discontinue "straddling" where employees could time their leave cashouts so that two leave cashouts would occur during their 12-month final average earnings period. The Board decided that only one such payment should be included on a prospective basis.

On July 30, 2020, the California Supreme Court issued a decision in the case of Alameda County Deputy Sheriffs' Association et al. v. Alameda County Employees' Retirement Association (ACERA) and Board of Retirement of ACERA. In particular, the decision requires pension systems like CCCERA to exclude certain pay items from a legacy member's compensation earnable. Our understanding is that the Alameda decision in 2020 does not affect the CCCERA leave cashout policy.

The cost of this pay element is recognized in the valuation as an employer and member cost in both the basic and COLA components.

The following tables show the estimated leave cashouts for non-PEPRA members as a percentage of current pay based on actual experience over the past three years. The leave cashouts shown are only those that occur during the member's final average earnings period.

The results are summarized by cost group followed by a key showing the employers in each cost group. Also shown are the current rate assumed and the rates we propose.

It is not always clear from the member data how much **additional** leave is cashed out in the years right before retirement (i.e., Leave Cashout Elements) as compared to what is cashed out in earlier years of service (i.e., Ongoing Pay Elements). Our recommended leave cashout assumptions are set based on what is reported during the final average earnings period, which implicitly assumes no leave cashouts prior to that period were included in the Ongoing Pay Elements.

Section 4: Demographic Assumptions

Average Leave Cashout as a % of Final Average Pay by General Cost Groups

Year	Cost Group #1	Cost Group #2 Tier 2	Cost Group #2 Tier 3	Cost Group #3	Cost Group #4	Cost Group #5	Cost Group #6[1]
2021	1.62%	0.62%	0.80%	5.52%	2.43%	0.00%	0.00%
2022	2.21%	0.98%	0.95%	5.85%	2.15%	0.00%	0.00%
2023	1.64%	0.71%	1.00%	5.77%	2.83%	1.90%	0.00%
Current Study Average[2]	**1.85%**	**0.79%**	**0.91%**	**5.70%**	**2.53%**	**0.53%**	**0.00%**
Prior Study Average[2]	0.95%	0.59%	0.75%	6.58%	2.88%	0.51%	0.00%
Retiring Member Count	98	598	926	35	17	12	1
Current Assumption	1.00%	0.50%	0.75%	5.25%	1.00%	1.00%	0.00%
Proposed Assumption	**1.25%**	**0.60%**	**0.75%**	**5.50%**	**1.75%**	**0.75%**	**0.00%**

Average Leave Cashout as a % of Final Average Pay by Safety Cost Groups

Year	Cost Group #7	Cost Group #8	Cost Group #9	Cost Group #10	Cost Group #11	Cost Group #12[3]
2021	0.39%	0.00%	0.00%	0.00%	3.70%	1.41%
2022	0.40%	0.00%	0.00%	0.00%	2.98%	3.56%
2023	0.10%	0.00%	0.00%	0.00%	3.36%	0.00%
Current Study Average[2]	**0.30%**	**0.00%**	**0.00%**	**0.00%**	**3.30%**	**2.26%**
Prior Study Average[2]	0.41%	0.12%	0.00%	0.00%	3.73%	1.31%
Retiring Member Count	173	24	11	8	34	4
Current Assumption	0.50%	0.25%	0.00%	0.25%	3.00%	1.75%
Proposed Assumption	**0.50%**	**0.20%**	**0.00%**	**0.00%**	**3.00%**	**1.75%**

Based on this experience, we recommend decreasing the leave cashout assumption for some Cost Groups while increasing the leave cashout assumption for other Cost Groups.

[1] CCCERA has previously confirmed that legacy members in this Cost Group are not eligible to apply cashouts in their Final Average Pay.

[2] The average rates shown are weighted-averages based on the final average pay before leave cashouts for each year within the three-year period.

[3] The annexation of Rodeo-Hercules Fire Protection District (RHFPD, Cost Group #12) to Contra Costa County Fire Protection District (CCCFPD, Cost Group #8) is pending final approval by LAFCO and is expected to be effective around July 1, 2025. It is our understanding that the employees of RHFPD will be governed by the CCCFPD employment rules after July 1, 2025. The leave cashout information for Cost Groups #8 and #12 as shown in the table above was developed based on the actual experience during the experience study period and reflects the current respective cashout policies for each Cost Group. After the annexation becomes effective and members from Cost Group #12 are transferred to Cost Group #8, we will apply the Cost Group #8 leave cashout assumption to all members under Cost Group #8.

Section 4: Demographic Assumptions

General Cost Groups and Employers

Cost Group	Employer Name	Benefit Structure
1	County General	Tier 1 Enhanced/PEPRA Tier 4
	Local Agency Formation Commission	Tier 1 Enhanced/PEPRA Tier 4
	Contra Costa Mosquito and Vector Control District	Tier 1 Enhanced/PEPRA Tier 4
	Bethel Island Municipal District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
	First 5-Children & Families Commission	Tier 1 Enhanced/PEPRA Tier 4
	Contra Costa County Employees' Retirement Association	Tier 1 Enhanced/PEPRA Tier 4
	Superior Court	Tier 1 Enhanced/PEPRA Tier 4
	Moraga-Orinda Fire District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
	Rodeo-Hercules Fire Protection District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
	San Ramon Valley Fire District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
2	County General	Tier 3 Enhanced/PEPRA Tier 5
	In-Home Supportive Services Authority	Tier 3 Enhanced/PEPRA Tier 5
	Contra Costa Mosquito and Vector Control District	Tier 3 Enhanced/PEPRA Tier 5
	Superior Court	Tier 3 Enhanced/PEPRA Tier 5
3	Central Contra Costa Sanitary District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
4	Contra Costa Housing Authority	Tier 1 Enhanced/PEPRA Tier 4
5	Contra Costa County Fire Protection District (Non-Integrated)	Tier 1 Enhanced/PEPRA Tier 4
6	Rodeo Sanitary District	Tier 1 Non-Enhanced/PEPRA Tier 4
	Byron Brentwood Cemetery	Tier 1 Non-Enhanced/PEPRA Tier 4

Safety Cost Groups and Employers

Cost Group	Employer Name	Benefit Structure
7	County Safety	Tier A Enhanced/PEPRA Tier D
8	Contra Costa County Fire Protection District	Tier A Enhanced/PEPRA Tier D/E
9	County Safety[1]	Tier C Enhanced/PEPRA Tier E
10	Moraga-Orinda Fire District	Tier A Enhanced/PEPRA Tier D
11	San Ramon Valley Fire District	Tier A Enhanced/PEPRA Tier D
12	Rodeo-Hercules Fire Protection District	Tier A Non-Enhanced/PEPRA Tier D

[1] Members hired on or after January 1, 2007.

G. Service from unused sick leave

At retirement, members can convert their unused sick leave to increase the service credit used in the calculation of their retirement benefit. The actuarial valuation anticipates this additional benefit using an assumption to estimate the proportional increase in service that will occur due to unused sick leave conversions.

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.

The following table shows the estimated sick leave converted to service credit as a percentage of total service credit (before including the sick leave converted to service credit) at retirement separately for General and Safety members as well as non-disabled and disabled members, based on the actual experience over the past three years. Also shown are the current assumed rates and the rates we propose.

Sick Leave Converted to Service Credit as Percentage of Total Service (Before Including the Sick Leave to be Converted)

Year	Service Retiree General	Service Retiree Safety	Disabled Retiree General	Disabled Retiree Safety
2021	1.04%	1.91%	0.00%	0.90%
2022	1.08%	1.69%	1.14%	0.57%
2023	0.98%	1.37%	0.00%	0.24%
Current Study Average[1]	**1.04%**	**1.66%**	**0.14%**	**0.61%**
Prior Study Average[1]	0.82%	1.41%	0.11%	0.37%
Current Assumption	1.00%	1.70%	0.06%	1.00%
Proposed Assumption	**1.00%**	**1.70%**	**0.08%**	**0.90%**

Based on this experience, we recommend maintaining the sick leave conversion assumption for all service retirees while increasing the sick leave conversion assumption for General disabled retirees and decreasing the assumption for Safety disabled retirees.

[1] The average rates shown are weighted-averages based on the total service for each year within the three-year period.

H. Miscellaneous assumptions

Reciprocity

Under the current assumptions, a percentage of future inactive members are assumed to work under a reciprocal retirement system. The following table shows the observed reciprocity percent based on the actual experience of all inactive members as of December 31, 2023. Unlike other assumptions, we do not review just new deferred vested members during the three-year period because there is typically a lag between a member's date of termination and the time that it is known if they have reciprocity with a reciprocal retirement system. Also shown are the current and proposed assumptions.

Percent of Inactive Members Covered under Reciprocal System

Line Description	General	Safety
Current assumption	40%	70%
Actual percent	16%	46%
Proposed assumption	**20%**	**50%**

We recommend decreasing the reciprocal assumption to 20% for General members and decreasing the assumption to 50% for Safety members. For this study, we have modified the approach of evaluating the reciprocity assumptions to align with how this assumption is applied in the valuation. In particular, we have included both the deferred vested members and the deferred non-vested members when developing the reciprocity percentage. This is the main reason why the proposed assumptions decreased significantly from the current assumptions.

In addition, we recommend 3.55% and 4.10% annual salary increase assumptions for General and Safety members, respectively, be utilized to anticipate salary increases from the date of termination from CCCERA to the expected date of retirement for deferred vested members covered by a reciprocal retirement system. These assumptions are based on the ultimate 0.55% and 1.10% merit and promotion salary increase assumptions for General and Safety members, respectively, together with the 2.50% inflation and 0.50% "across-the-board" salary increase assumptions that are recommended in *Section 3* of this report.

Percent with eligible survivor

The value of a member's retirement, disability, or death benefit depends on the percentage of members who are assumed to have an eligible spouse or domestic partner.

The following table shows the observed percentage of new retirees, weighted by benefit amounts, who were reported with an eligible spouse or domestic partner at the time of retirement based on the actual experience over the past three years. Also shown are the current and proposed assumptions. This information is shown separately by the member's gender.

New Retirees with Eligible Spouse or Domestic Partner who Selected the Unmodified Option (Weighted by Benefit Amount)

Line Description	Male Member	Female Member
Current assumption	65%	50%
Actual percent	70%	53%
Proposed assumption	**70%**	**55%**

Based on this experience, we recommend increasing the percent with eligible survivor assumption for male members to 70% and increasing the assumption for female members to 55%.

Eligible survivor age and gender

Since the present value of the survivor's automatic continuance benefit is dependent on the survivor's age and gender, we must also have assumptions for these demographics of the survivor. Based on the actual experience for members who retired during the past three years (results shown in the table below) and studies done for other retirement systems, **we recommend the following:**

1. **We recommend maintaining the survivor gender assumption that male members have a female survivor, and female members have a male survivor.** We note that this assumption is consistent with the actual data for most members as of December 31, 2023, even with the inclusion of domestic partners.
2. **We recommend maintaining 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.** These assumptions will continue to be monitored in future experience studies.

Member's Age as Compared to Survivor's Age

Line Description	Male Retiree	Female Retiree
Current assumption	3 years older	2 years younger
Actual experience	3.0 years older	2.7 years younger[1]
Proposed assumption	**3 years older**	**2 years younger**

Active death optional form election

Active members could elect an Optional Settlement 2 (or Optional Settlement 4 for more than one beneficiary) allowance in advance to provide a continuance of 100% (with actuarial adjustment) to the member's spouse, domestic partner or other beneficiaries upon the member's active death.

[1] Actual nine-year experience is 2.4 years younger. We have taken this longer term experience into consideration when setting our proposed assumption.

Currently, we assume that only members who are married or have a domestic partner would make this advance election to provide a continuance of 100% to their spouse/domestic partner upon the member's active death. (This means that a continuance of 100% is not assumed in the valuation for members who are not expected to be married or have domestic partnership.)

For this experience study, we requested and CCCERA provided us a file with the relationship information for members who have made the advance optional form election for active death.[1] Out of about 5,312 active members who had made such election,[2] 2,413 members (somewhat less than 50%) had named a spouse/domestic partner as the beneficiaries. Based on the recommended assumption that 70% of all male members and 55% of all female members would be expected to be married at retirement or active death**, we recommend that we continue to apply the same assumption to anticipate the proportion of active members who would be married and expected to elect an Optional Settlement 2 to cover their spouse/domestic partner at pre-retirement death.**

For the remaining 2,899 active members who had made the advance Optional Settlement 2 election and named a beneficiary who is not the member's spouse/domestic partner, the following table shows the observed percentages of the various type of beneficiaries that are covered under the advance optional form election. Also shown are the percentages we proposed and the assumption for age differences.

Optional Settlement 2 Election for Active Death

Beneficiary Type[3]	Observed Percentage	Proposed Percentage Assumption	Proposed Age Difference with Active Member
Child	30%	**30%**	**30 years younger**
Parent	32%	**30%**	**30 years older**
Sibling and other	38%	**40%**	**Same age**

For active members who are assumed to be non-married at pre-retirement death, we recommend applying an assumption that those members would have made an advance Optional Settlement 2 election and cover a beneficiary as shown in the table above.

Future benefit accruals

Benefits are based on the years of service and compensation earned by the member. In order to project benefits and determine the liabilities, an assumption about the amount of service earned by members each year is necessary.

We recommend maintaining the current assumption that full-time employees accrue 1.0 year of service annually, while part-time employees earn service proportionate to their part-time percentage each year.

[1] Similar information for members who actually died is not readily available.
[2] The file provided by CCCERA also includes about 5,676 active members who did not make the advance optional form election. For purposes of valuing the pre-retirement death benefit, we will assume that all active members would have made the advance optional form election and the beneficiaries covered would be similar to that described in this section.
[3] We made the simplifying assumption that the beneficiary is of the opposite sex of the member.

Unknown data for members

When various elements of valuation data are not available, an assumption must be made in order to project benefits and determine liabilities.

The following table shows the gender of active members based on actual experience as of December 31, 2023. Also shown are the current and proposed assumptions for members with unknown gender.[1] This information is shown separately for active General and Safety members.

General Member — Assumption for Unknown Gender

Line Description	Male Member	Female Member
Current assumption	100%	0%
Actual percent as of December 31, 2023	29%	71%
Proposed assumption	**0%**	**100%**

Safety Member — Assumption for Unknown Gender

Line Description	Male Member	Female Member
Current assumption	100%	0%
Actual percent as of December 31, 2023	85%	15%
Proposed assumption	**100%**	**0%**

Based on this experience, we recommend updating the assumption for members with unknown gender to assume General members are female and Safety members are male. We would continue to monitor this experience and if more members fall into this category, we may recommend a change in method in the next experience study.

Form of payment

Under the plan provisions, an eligible survivor of a deceased member who has elected the unmodified option is eligible to receive a benefit continuance upon the member's death.

In prior valuations, it was assumed that all active and inactive members would select the unmodified option at retirement. Actual experience for recent new retirees shows that 93% select the unmodified option. **Therefore, we recommend maintaining the assumption that all members will elect the unmodified option at retirement.**

[1] Note that as of December 31, 2023, there were only 8 records who were reported with an unknown gender.

Section 5: Cost Impact

We have estimated the impact of all the recommended demographic and economic assumptions as if they were applied to the December 31, 2023 actuarial valuation. The table below shows the changes in the employer and member contribution rates due to the proposed assumption changes separately for the economic assumption changes (as recommended in *Section 3* of this report, which include the recommended merit and promotion salary increases) and the demographic assumption changes (as recommended in *Section 4* of this report).

Cost Impact of the Recommended Assumptions Based on December 31, 2023 Actuarial Valuation

Assumption	Impact on Average Employer Contribution Rates	Impact on Average Member Contribution Rates
Changes in demographic assumptions	-0.86%	-0.10%
Changes in economic assumptions	0.32%	0.13%
Total change in average rate	**-0.54%**	**0.03%**
Estimated increase in annual amount ($ in '000s)[1]	**-$6,362**	**$269**

Assumption	Impact on UAAL ($million)	Impact on Funded Ratio (VVA[2] Basis)
Changes in demographic assumptions	-$81.8	0.60%
Changes in economic assumptions	40.5	-0.30%
Total change	**-$41.3**	**0.30%**

Note: Results may not add due to rounding.

The tables below show 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 December 31, 2023 actuarial valuation.

[1] Based on December 31, 2023 projected compensation as determined under the proposed assumptions.
[2] Valuation value of assets.

Section 5: Cost Impact

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

Cost Group	Normal Cost	UAAL	Total	Annual Amount[1] ($ in '000s)
General				
Cost Group #1 – County and Small Districts (Tiers 1 and 4)	-0.36%	-0.31%	-0.67%	-$155
Cost Group #2 – County and Small Districts (Tiers 3 and 5)	-0.41%	-0.31%	-0.72%	-6,041
Cost Group #3 – Central Contra Costa Sanitary District	-0.37%	-0.24%	-0.61%	-256
Cost Group #4 – Contra Costa Housing Authority	-0.39%	-0.45%	-0.84%	-57
Cost Group #5 – Contra Costa County Fire Protection District	-0.16%	-0.37%	-0.53%	-49
Cost Group #6 – Small Districts (Non-Enhanced Tiers 1 and 4)	-0.26%	-0.02%	-0.28%	-4
Safety				
Cost Group #7 – County (Tiers A and D)	-0.06%	0.15%	0.09%	$42
Cost Group #8 – Contra Costa Fire Protection District	0.18%	-0.27%	-0.09%	-64
Cost Group #9 – County (Tiers C and E)	0.06%	0.15%	0.21%	157
Cost Group #10 – Moraga-Orinda Fire District	0.04%	-0.35%	-0.31%	-28
Cost Group #11 – San Ramon Valley Fire District	0.20%	0.03%	0.23%	59
Cost Group #12 – Rodeo-Hercules Fire Protection District	0.36%	0.85%	1.21%	36
Total Plan	**-0.30%**	**-0.24%**	**-0.54%**	**-$6,362**

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

Cost Group	Rate	Annual Amount[1] ($ in '000s)
General		
Cost Group #1 – County and Small Districts (Tiers 1 and 4)	0.00%	$0
Cost Group #2 – County and Small Districts (Tiers 3 and 5)	-0.06%	-503
Cost Group #3 – Central Contra Costa Sanitary District	0.05%	21
Cost Group #4 – Contra Costa Housing Authority	-0.03%	-2
Cost Group #5 – Contra Costa County Fire Protection District	0.02%	2
Cost Group #6 – Small Districts (Non-Enhanced Tiers 1 and 4)	0.02%	0
Safety		
Cost Group #7 – County (Tiers A and D)	0.44%	$204
Cost Group #8 – Contra Costa Fire Protection District	0.39%	275
Cost Group #9 – County (Tiers C and E)	0.17%	127
Cost Group #10 – Moraga-Orinda Fire District	0.42%	38
Cost Group #11 – San Ramon Valley Fire District	0.38%	97
Cost Group #12 – Rodeo-Hercules Fire Protection District	0.35%	10
Total Plan	**0.03%**	**$269**

Note: Results may not add due to rounding.

[1] Based on December 31, 2023 projected compensation as determined under the proposed assumptions.

Section 5: Cost Impact

There is a decrease in the average employer rate of 0.54% (which includes a decrease in normal cost rate of about 0.30% and a decrease in the UAAL rate of about 0.24%). This decrease is mainly due to demographic assumption changes that reduce cost (such as higher termination rate, lower disability rate and new mortality tables that predict lower life expectancies for payees at advance ages) that is offset somewhat by the increase in the merit and promotion salary increases assumption.

There is an increase in the average member rate mainly due to the increase in the merit and promotion salary increases assumption. We note that the basic contribution rates for legacy members are not impacted by most of the demographic assumptions such as retirement rate, termination rate and disability rate. Therefore, the changes in those assumptions do not have an impact on the basic contribution rates for legacy members. Moreover, the reduction in the employer UAAL rate is also not shared by the members.

Appendix A: Current Actuarial Assumptions

Economic assumptions

Net investment return

6.75%, net of investment expenses.

Administrative expenses

Actual administrative expenses as a percentage of payroll are allocated between the employer and member based on normal cost (before expenses) for the employer and member. This assumption is subject to change each year based on the actual administrative expenses as a percent of actual covered payroll during the calendar year ending on the valuation date.

The administrative expense load was 1.17% of payroll based on the December 31, 2023 actuarial valuation.

Inflation rate

Increase of 2.50% per year.

Cost-of-Living Adjustment (COLA)

Increases of 2.75% per year.

- The actual COLA granted by CCCERA on April 1, 2024 has been reflected for non-active members in the December 31, 2023 valuation.
- For members that have COLA banks, the COLA banks are reflected in projected future COLAs.
- Benefits are subject to a maximum COLA per year, which varies based on the member's tier and retirement type, as shown in the table below.

General Membership Tier	Safety Membership Tier	Maximum COLA Per Year	COLA Valued (Before Application of COLA Banks)
Tier 1, Tier 3 (non-disability), Tier 4, and Tier 5 (non-disability)	Tier A and Tier D	3.00%	2.75%
Tier 2, Tier 3 (disability), and Tier 5 (disability)	N/A	4.00%	2.75%
Tier 4 and Tier 5 members covered under certain MOUs	Tier C and Tier E	2.00%	2.00%

Appendix A: Current Actuarial Assumptions

Member contribution crediting rate

6.75%, compounded semi-annually.

Payroll growth

Inflation of 2.50% per year plus “across-the-board” salary increase of 0.50% per year.

Increase 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.

Appendix A: Current Actuarial Assumptions

Salary increases

The annual rate of compensation increase includes:

- Inflation at 2.50%, plus
- "Across-the-board" salary increase of 0.50% per year, plus
- Merit and promotion increase based on years of service:

Merit and Promotion Increases (%)

Years of Service	General	Safety
Less than 1	11.00	12.00
1 – 2	6.50	8.50
2 – 3	4.75	5.50
3 – 4	3.50	5.00
4 – 5	2.50	4.00
5 – 6	2.00	3.00
6 – 7	1.75	2.25
7 – 8	1.65	1.75
8 – 9	1.45	1.50
9 – 10	1.35	1.45
10 – 11	1.30	1.40
11 – 12	1.10	1.35
12 – 13	1.00	1.30
13 – 14	0.90	1.25
14 – 15	0.80	1.25
15 – 16	0.75	1.25
16 – 17	0.70	1.25
17 – 18	0.65	1.25
18 – 19	0.60	1.25
19 – 20	0.55	1.25
20 and over	0.50	1.00

Appendix A: Current Actuarial Assumptions

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), 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) increased by 5% for males and 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) increased by 5% for males and unadjusted 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) increased by 5% for males and unadjusted for 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), 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) increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Appendix A: Current Actuarial Assumptions

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.

Pre-Retirement Mortality Rates (%) — Before Generational Projection from 2010

Age	General Male	General Female	Safety Male	Safety 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

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

Mortality rates for member contributions

The following mortality rates are used in calculating the member basic contribution rates for General Tier 1 and Tier 3, as well as Safety Tier A and Tier C.

- **General Members**
  - Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females), projected 30 years 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) increased by 5% for males and decreased by 5% for females, projected 30 years with the two-dimensional mortality improvement scale MP-2021, weighted 85% male and 15% female.

Appendix A: Current Actuarial Assumptions

Disability

Disability Incidence Rates (%)

Age	General Tier 1 and Tier 4	General Tier 3 and Tier 5	Safety
20	0.01	0.01	0.06
25	0.02	0.02	0.16
30	0.04	0.03	0.32
35	0.08	0.05	0.46
40	0.22	0.07	0.56
45	0.36	0.09	0.96
50	0.52	0.12	2.88
55	0.60	0.16	4.00
60	0.60	0.18	4.30
65	0.60	0.18	4.50
70	0.60	0.18	4.50

Assumed Percentage of Future Disability Type

Membership Tier	Service-Connected Disabilities	Non-Service-Connected Disabilities
General Tier 1 and Tier 4	65%	35%
General Tier 3 and Tier 5	25%	75%
Safety	100%	0%

Appendix A: Current Actuarial Assumptions

Termination

Termination Rates (%)

Years of Service	General	Safety
Less than 1	14.00	11.00
1 – 2	9.50	9.00
2 – 3	9.00	7.00
3 – 4	6.25	5.00
4 – 5	6.25	4.00
5 – 6	5.00	3.50
6 – 7	4.50	3.00
7 – 8	4.00	2.50
8 – 9	3.75	2.50
9 – 10	3.75	2.00
10 – 11	3.50	2.00
11 – 12	3.25	2.00
12 – 13	2.75	2.00
13 – 14	2.50	1.80
14 – 15	2.50	1.60
15 – 16	2.25	1.50
16 – 17	2.25	1.40
17 – 18	2.00	1.30
18 – 19	2.00	1.20
19 – 20	1.50	1.00
20 and over	1.50	0.50

The member is assumed to receive the greater of a refund of member contributions or the present value of a deferred retirement benefit.

No termination is assumed after a member is first assumed to retire.

Appendix A: Current Actuarial Assumptions

Retirement rates

Retirement Rates (%) — General

Age	Tier 1 Enhanced: <30 Years of Service	Tier 1 Enhanced: 30+ Years of Service	Tier 3 Enhanced: <30 Years of Service	Tier 3 Enhanced: 30+ Years of Service	Tier 1 Non-Enhanced	Tier 4 and Tier 5
49	0.00	0.00	0.00	25.00	0.00	0.00
50	4.00	10.00	4.00	10.00	3.00	0.00
51	4.00	10.00	3.00	5.00	3.00	0.00
52	4.00	10.00	3.00	5.00	3.00	2.00
53	4.00	10.00	4.00	5.00	3.00	3.00
54	10.00	16.00	6.00	11.00	3.00	3.00
55	15.00	24.00	8.00	15.00	10.00	4.00
56	15.00	24.00	8.00	10.00	10.00	5.00
57	15.00	24.00	8.00	10.00	10.00	6.00
58	15.00	22.00	9.00	15.00	10.00	6.00
59	18.00	22.00	10.00	15.00	10.00	8.00
60	20.00	20.00	12.00	15.00	25.00	8.00
61	20.00	20.00	16.00	20.00	15.00	12.00
62	25.00	30.00	20.00	25.00	40.00	15.00
63	25.00	30.00	20.00	25.00	35.00	17.00
64	25.00	30.00	25.00	28.00	30.00	20.00
65	35.00	35.00	30.00	32.00	40.00	25.00
66	40.00	40.00	32.00	32.00	35.00	25.00
67	40.00	40.00	30.00	30.00	35.00	25.00
68	40.00	40.00	30.00	30.00	35.00	25.00
69	40.00	40.00	30.00	30.00	35.00	25.00
70	40.00	40.00	35.00	35.00	40.00	35.00
71	35.00	35.00	35.00	35.00	40.00	35.00
72	35.00	35.00	35.00	35.00	40.00	35.00
73	35.00	35.00	35.00	35.00	50.00	35.00
74	35.00	35.00	35.00	35.00	50.00	35.00
75+	100.00	100.00	100.00	100.00	100.00	100.00

Appendix A: Current Actuarial Assumptions

Retirement Rates (%) — Safety

Age	Tier A Enhanced: <30 Years of Service	Tier A Enhanced: 30+ Years of Service	Tier C Enhanced	Tier A Non-Enhanced and Tier D and Tier E
45	7.00	7.00	2.00	0.00
46	5.00	5.00	1.00	0.00
47	7.00	7.00	4.00	0.00
48	10.00	30.00	4.00	0.00
49	22.00	30.00	12.00	0.00
50	22.00	30.00	20.00	5.00
51	22.00	22.00	18.00	4.00
52	16.00	20.00	15.00	4.00
53	16.00	22.00	15.00	5.00
54	16.00	24.00	18.00	6.00
55	16.00	30.00	18.00	15.00
56	18.00	30.00	15.00	15.00
57	18.00	30.00	15.00	15.00
58	20.00	35.00	25.00	15.00
59	20.00	35.00	25.00	20.00
60	20.00	35.00	25.00	20.00
61	20.00	35.00	25.00	20.00
62	20.00	35.00	25.00	20.00
63	25.00	35.00	30.00	20.00
64	35.00	35.00	35.00	25.00
65+	100.00	100.00	100.00	100.00

Appendix A: Current Actuarial Assumptions

Inactive members

Current and Future Inactive Member Assumptions

Category	% of Future[1] Inactive Members	Annual Salary Increases from Separation Date	Retirement Age
General with reciprocity	40%	3.50%	60
General without reciprocity	60%	N/A	60
Safety with reciprocity	70%	4.00%	53
Safety without reciprocity	30%	N/A	51

Inactive member benefit

- Inactive members without reciprocity who terminate with less than five years of service and are not vested are assumed to receive an immediate refund of their member contributions.
- All other inactive members are assumed to receive the greater of an immediate refund of their member contributions or the present value of a deferred retirement benefit.

Future benefit accruals

1.0 year of service per year for full-time employees. Continuation of current partial service accrual for part-time employees.

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 CCCERA as of the valuation date.

Form of payment

- All active and inactive members are assumed to elect the unmodified option at retirement.
- There is no explicit assumption for children's benefits.

[1] CCCERA provides the reciprocity status for current inactive members in the valuation census data.

Appendix A: Current Actuarial Assumptions

Survivor assumptions

Current Active and Inactive Member Eligible Survivor Assumptions

Member Gender	% with Eligible Survivor at Retirement or Pre-Retirement Death	Eligible Survivor Age	Eligible Survivor Gender
Male member	65%	3 years younger than member	Female
Female member	50%	2 years older than member	Male

Offsets by other plans of the employer for disability benefits

The Plan requires members who retire because of disability from General Tier 3 and General Tier 5 to offset the Plan's disability benefits with other Plans of the employer. We have not assumed any offsets in this valuation.

Leave cashout

General Tier 1, Tier 2 and Tier 3 & Safety Tier A and Tier C

Leave Cashout as Percentage of Final Average Pay

Cost Group	Leave Cashout
Cost Group 1	1.00%
Cost Group 2	0.50% for Tier 2 0.75% for Tier 3
Cost Group 3	5.25%
Cost Group 4	1.00%
Cost Group 5	1.00%
Cost Group 6	0.00%
Cost Group 7	0.50%
Cost Group 8	0.25%
Cost Group 9	0.00%
Cost Group 10	0.25%
Cost Group 11	3.00%
Cost Group 12	1.75%
Withdrawn Employers	0.00%

General Tier 4 and Tier 5 & Safety Tier D and Tier E

None.

Service from accumulated sick leave

Additional Service Converted from Accumulated Sick Leave

Retirement Type and Membership Group	Converted Sick Leave as % of Service at Retirement
Service Retirements	
General	1.00%
Safety	1.70%
Disability Retirements	
General	0.06%
Safety	1.00%

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.

Appendix B: Proposed Actuarial Assumptions

Economic assumptions

Net investment return

6.75%, net of investment expenses.

Administrative expenses

Actual administrative expenses as a percentage of payroll are allocated between the employer and member based on normal cost (before expenses) for the employer and member. This assumption is subject to change each year based on the actual administrative expenses as a percent of actual covered payroll during the calendar year ending on the valuation date.

The administrative expense load was 1.17% of payroll based on the December 31, 2023 actuarial valuation.

Inflation rate

Increase of 2.50% per year.

Cost-of-Living Adjustment (COLA)

Increases of 2.75% per year.

- The actual COLA granted by CCCERA on April 1, 2024 has been reflected for non-active members in the December 31, 2023 valuation.
- For members that have COLA banks, the COLA banks are reflected in projected future COLAs.
- Benefits are subject to a maximum COLA per year, which varies based on the member's tier and retirement type, as shown in the table below.

General Membership Tier	Safety Membership Tier	Maximum COLA Per Year	COLA Valued (Before Application of COLA Banks)
Tier 1, Tier 3 (non-disability), Tier 4, and Tier 5 (non-disability)	Tier A and Tier D	3.00%	2.75%
Tier 2, Tier 3 (disability), and Tier 5 (disability)	N/A	4.00%	2.75%
Tier 4 and Tier 5 members covered under certain MOUs	Tier C and Tier E	2.00%	2.00%

Appendix B: Proposed Actuarial Assumptions

Member contribution crediting rate

6.75%, compounded semi-annually.

Payroll growth

Inflation of 2.50% per year plus “across-the-board” salary increase of 0.50% per year.

Increase 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.

Appendix B: Proposed Actuarial Assumptions

Salary increases

The annual rate of compensation increase includes:

- Inflation at 2.50%, plus
- "Across-the-board" salary increase of 0.50% per year, plus
- Merit and promotion increase based on years of service:

Merit and Promotion Increases (%)

Years of Service	General Legacy	General PEPRA	Safety Legacy	Safety PEPRA
Less than 1	11.00%	9.00%	12.00%	10.00%
1 – 2	6.50%	6.00%	8.50%	8.50%
2 – 3	4.75%	4.50%	5.50%	5.50%
3 – 4	3.50%	3.25%	5.00%	5.00%
4 – 5	2.50%	2.50%	4.00%	4.25%
5 – 6	2.00%	2.00%	3.00%	3.25%
6 – 7	1.75%	1.70%	2.25%	2.25%
7 – 8	1.65%	1.60%	1.75%	1.75%
8 – 9	1.65%	1.65%	1.75%	1.75%
9 – 10	1.70%	1.70%	1.75%	1.75%
10 – 11	1.70%	1.70%	1.60%	1.60%
11 – 12	1.25%	1.25%	1.60%	1.60%
12 – 13	1.10%	1.10%	1.60%	1.60%
13 – 14	1.20%	1.20%	1.70%	1.70%
14 – 15	1.30%	1.30%	1.80%	1.80%
15 – 16	1.30%	1.30%	1.80%	1.80%
16 – 17	1.00%	1.00%	1.50%	1.50%
17 – 18	0.90%	0.90%	1.50%	1.50%
18 – 19	0.80%	0.80%	1.50%	1.50%
19 – 20	0.75%	0.75%	1.75%	1.75%
20 – 21	0.75%	0.75%	1.75%	1.75%
21 – 22	0.60%	0.60%	1.40%	1.40%
22 – 23	0.60%	0.60%	1.30%	1.30%
23 – 24	0.60%	0.60%	1.25%	1.25%
23 – 25	0.60%	0.60%	1.15%	1.15%
20 and over	0.55%	0.55%	1.10%	1.10%

Appendix B: Proposed Actuarial Assumptions

Demographic assumptions

Post-retirement mortality rates

Healthy

- **General members**
  - Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.
- **Safety members**
  - Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.

Disabled

- **General members**
  - Pub-2016 Non-Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP 2021.
- **Safety members**
  - Pub-2016 Safety Disabled Retiree Amount-Weighted Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.

Beneficiary

- **Beneficiaries not currently in pay status**
  - Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected generationally with the two-dimensional mortality improvement scale MP 2021.
- **Beneficiaries in pay status**
  - Pub-2016 Contingent Survivor Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.

Appendix B: Proposed Actuarial Assumptions

Pre-retirement mortality rates

- **General members**
  - Pub-2016 General Employee Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates decreased by 5% for males and females, projected generationally with the two-dimensional mortality improvement scale MP-2021.
- **Safety members**
  - Pub-2016 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.

Pre-Retirement Mortality Rates (%) — Before Generational Projection from 2016

Age	General Male	General Female	Safety Male	Safety Female
20	0.02%	0.01%	0.02%	0.01%
25	0.03%	0.01%	0.03%	0.01%
30	0.03%	0.01%	0.04%	0.02%
35	0.04%	0.02%	0.04%	0.03%
40	0.05%	0.04%	0.05%	0.04%
45	0.08%	0.05%	0.07%	0.06%
50	0.12%	0.08%	0.10%	0.09%
55	0.18%	0.12%	0.16%	0.13%
60	0.28%	0.18%	0.27%	0.20%
65	0.42%	0.28%	0.45%	0.32%
70	0.65%	0.43%	0.84%	0.50%

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

Mortality rates for member contributions

The following mortality rates are used in calculating the member basic contribution rates for General Tier 1, Tier 2 and Tier 3, as well as Safety Tier A and Tier C.

- **General Members**
  - Pub-2016 General Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 30% male and 70% female.
- **Safety Members**
  - Pub-2016 Safety Healthy Retiree Amount-Weighted Above-Median Mortality Table (separate tables for males and females) with rates increased by 5% for males and decreased by 5% for females, projected 30 years (from 2016) with the two-dimensional mortality improvement scale MP-2021, weighted 85% male and 15% female.

Appendix B: Proposed Actuarial Assumptions

Disability

Disability Incidence Rates (%)

Age	General Tier 1 and Tier 4	General Tier 3 and Tier 5	Safety
22	0.00%	0.00%	0.10%
27	0.00%	0.00%	0.10%
32	0.03%	0.02%	0.40%
37	0.06%	0.04%	0.55%
42	0.20%	0.07%	0.65%
47	0.40%	0.09%	1.10%
52	0.60%	0.14%	3.75%
57	0.60%	0.14%	3.75%
62	0.60%	0.14%	4.25%
67	0.60%	0.14%	5.00%
70 and over	0.60%	0.14%	5.00%

Assumed Percentage of Future Disability Type

Membership Tier	Service-Connected Disabilities	Non-Service-Connected Disabilities
General Tier 1 and Tier 4	70%	30%
General Tier 3 and Tier 5	25%	75%
Safety	100%	0%

Appendix B: Proposed Actuarial Assumptions

Termination

Termination Rates (%)

Years of Service	General	Safety
Less than 1	14.50%	9.00%
1 – 2	10.50%	7.00%
2 – 3	9.50%	6.00%
3 – 4	7.00%	5.00%
4 – 5	6.50%	3.50%
5 – 6	6.00%	3.50%
6 – 7	5.50%	3.00%
7 – 8	5.00%	2.50%
8 – 9	5.00%	2.25%
9 – 10	4.00%	2.00%
10 – 11	4.00%	2.00%
11 – 12	4.00%	2.00%
12 – 13	3.00%	2.00%
13 – 14	2.50%	1.80%
14 – 15	2.50%	1.50%
15 – 16	2.50%	1.40%
16 – 17	2.50%	1.30%
17 – 18	1.75%	1.20%
18 – 19	1.75%	1.10%
19 – 20	1.50%	1.00%
20 and over	1.50%	0.25%

The member is assumed to receive the greater of a refund of member contributions or the present value of a deferred retirement benefit.

No termination is assumed after a member is first assumed to retire.

Appendix B: Proposed Actuarial Assumptions

Retirement rates

Retirement Rates (%) — General (Legacy)

Age	Tier 1 Enhanced: <30 Years of Service	Tier 1 Enhanced: 30+ Years of Service	Tier 3 Enhanced: <30 Years of Service	Tier 3 Enhanced: 30+ Years of Service	Tier 1 Non-Enhanced
49	0.00%	0.00%	0.00%	25.00%	0.00%
50	4.00%	8.00%	4.00%	10.00%	3.00%
51	4.00%	10.00%	3.00%	5.00%	3.00%
52	4.00%	10.00%	3.25%	5.00%	3.00%
53	4.00%	10.00%	3.50%	5.00%	3.00%
54	8.00%	16.00%	5.75%	11.00%	3.00%
55	12.00%	30.00%	8.00%	15.00%	10.00%
56	12.00%	24.00%	8.00%	10.00%	10.00%
57	14.00%	22.00%	8.00%	10.00%	10.00%
58	15.00%	22.00%	8.50%	15.00%	10.00%
59	18.00%	22.00%	10.00%	20.00%	10.00%
60	20.00%	20.00%	11.00%	15.00%	25.00%
61	20.00%	20.00%	16.00%	18.00%	15.00%
62	22.00%	25.00%	20.00%	25.00%	40.00%
63	22.00%	30.00%	20.00%	25.00%	35.00%
64	22.00%	30.00%	20.00%	25.00%	30.00%
65	30.00%	30.00%	30.00%	32.00%	40.00%
66	40.00%	30.00%	32.00%	32.00%	35.00%
67	40.00%	30.00%	32.00%	30.00%	35.00%
68	40.00%	30.00%	30.00%	30.00%	35.00%
69	40.00%	30.00%	30.00%	30.00%	35.00%
70	40.00%	30.00%	35.00%	30.00%	35.00%
71	35.00%	35.00%	30.00%	30.00%	35.00%
72	35.00%	35.00%	30.00%	30.00%	35.00%
73	35.00%	35.00%	30.00%	30.00%	35.00%
74	35.00%	35.00%	30.00%	30.00%	35.00%
75+	100.00%	100.00%	100.00%	100.00%	100.00%

Appendix B: Proposed Actuarial Assumptions

Retirement Rates (%) — General (PEPRA)

Age	Tier 4 and Tier 5 <30 Years of Service	Tier 4 and Tier 5 30+ Years of Service
52	2.00%	2.00%
53	2.00%	3.00%
54	2.00%	3.00%
55	2.00%	4.00%
56	3.00%	5.00%
57	6.00%	6.00%
58	6.00%	6.00%
59	6.00%	8.00%
60	7.00%	8.00%
61	10.00%	12.00%
62	12.00%	15.00%
63	14.00%	17.00%
64	16.00%	20.00%
65	20.00%	25.00%
66	25.00%	25.00%
67	25.00%	25.00%
68	25.00%	25.00%
69	25.00%	25.00%
70	25.00%	30.00%
71	30.00%	30.00%
72	30.00%	30.00%
73	30.00%	30.00%
74	30.00%	30.00%
75+	100.00%	100.00%

Appendix B: Proposed Actuarial Assumptions

Retirement Rates (%) — Safety

Age	Tier A Enhanced: <30 Years of Service	Tier A Enhanced: 30+ Years of Service	Tier C Enhanced	Tier A Non-Enhanced and Tier D and Tier E
43	5.00%	0.00%	0.00%	0.00%
44	5.00%	0.00%	0.00%	0.00%
45	5.00%	0.00%	2.00%	0.00%
46	5.00%	0.00%	1.00%	0.00%
47	5.00%	0.00%	4.00%	0.00%
48	10.00%	30.00%	4.00%	0.00%
49	20.00%	30.00%	20.00%	0.00%
50	22.00%	30.00%	20.00%	5.00%
51	20.00%	20.00%	12.00%	4.00%
52	16.00%	20.00%	12.00%	4.00%
53	16.00%	20.00%	12.00%	6.00%
54	16.00%	24.00%	18.00%	8.00%
55	16.00%	30.00%	18.00%	20.00%
56	18.00%	30.00%	15.00%	20.00%
57	18.00%	30.00%	15.00%	15.00%
58	18.00%	30.00%	15.00%	15.00%
59	18.00%	35.00%	25.00%	22.00%
60	18.00%	35.00%	25.00%	25.00%
61	20.00%	35.00%	25.00%	25.00%
62	20.00%	35.00%	25.00%	35.00%
63	20.00%	35.00%	30.00%	40.00%
64	35.00%	35.00%	35.00%	40.00%
65	35.00%	100.00%	100.00%	100.00%
66	50.00%	100.00%	100.00%	100.00%
67	50.00%	100.00%	100.00%	100.00%
68	50.00%	100.00%	100.00%	100.00%
69	50.00%	100.00%	100.00%	100.00%
70+	100.00%	100.00%	100.00%	100.00%

Appendix B: Proposed Actuarial Assumptions

Inactive members

Current and Future Inactive Member Assumptions

Category	% of Future[1] Inactive Members	Annual Salary Increases from Separation Date	Retirement Age
General with reciprocity	20%	3.55%	61
General without reciprocity	80%	N/A	60
Safety with reciprocity	50%	4.10%	53
Safety without reciprocity	50%	N/A	50

Inactive member benefit

Inactive members are assumed to receive the greater of an immediate refund of their member contributions or the present value of a deferred retirement benefit.

Future benefit accruals

1.0 year of service per year for full-time employees. Continuation of current partial service accrual for part-time employees.

Unknown data for members

- Same as those exhibited by members with similar known characteristics.
- If not specified, General members are assumed to be female and Safety members are assumed to be male.

Definition of active members

All active members of CCCERA as of the valuation date.

Form of payment

- All active and inactive members are assumed to elect the unmodified option at retirement.
- There is no explicit assumption for children's benefits.

[1] CCCERA provides the reciprocity status for current inactive members in the valuation census data.

Appendix B: Proposed Actuarial Assumptions

Survivor assumptions

Current Active and Inactive Member Eligible Survivor Assumptions

Member Gender	% with Eligible Survivor at Retirement or Pre-Retirement Death	Eligible Survivor Age	Eligible Survivor Gender
Male member	70%	3 years younger than member	Female
Female member	55%	2 years older than member	Male

Active death optional form election

All active members with five or more years of service are assumed to elect the optional settlement 2 allowance that leaves a 100% continuance to their beneficiary upon the member's non-service connected pre-retirement death. For those who are assumed to be not married at pre-retirement death:

Active Death Optional Form Election Assumptions

Beneficiary Type	Percentage %	Age Difference with Active Member
Child	30%	30 years younger
Parent	30%	30 years older
Sibling and other	40%	Same age

Offsets by other plans of the employer for disability benefits

The Plan requires members who retire because of disability from General Tier 3 and General Tier 5 to offset the Plan's disability benefits with other Plans of the employer. We have not assumed any offsets in this valuation.

Leave cashout

General Tier 1, Tier 2 and Tier 3 & Safety Tier A and Tier C

Leave Cashout as Percentage of Final Average Pay

Cost Group	Leave Cashout
Cost Group 1	1.25%
Cost Group 2	0.60% for Tier 2 0.75% for Tier 3
Cost Group 3	5.50%
Cost Group 4	1.75%
Cost Group 5	0.75%
Cost Group 6	0.00%

Cost Group 7	0.50%
Cost Group 8	0.20%
Cost Group 9	0.00%
Cost Group 10	0.00%
Cost Group 11	3.00%
Cost Group 12	1.75%
Withdrawn Employers	0.00%

General Tier 4 and Tier 5 & Safety Tier D and Tier E

None.

Service from accumulated sick leave

Additional Service Converted from Accumulated Sick Leave

Retirement Type and Membership Group	Converted Sick Leave as % of Service at Retirement
Service Retirements	
General	1.00%
Safety	1.70%
Disability Retirements	
General	0.08%
Safety	0.90%

Pursuant to Section 31641.01, the cost of this benefit for the non-PEPRA tiers will be charged only to employers and will not affect member contribution rates.

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