East Bay Municipal Utility District
Employees' Retirement System (EBMUDERS)

Actuarial Experience Study

Analysis of Actuarial Experience During the Period July 1, 2020 through June 30, 2024

Segal

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November 13, 2024

Ms. Sophia Skoda
Director of Finance
East Bay Municipal Utility District
375 Eleventh Street
Oakland, CA 94607-4240

Re: Review of Actuarial Assumptions for the June 30, 2024 Actuarial Valuations

Dear Sophia:

We are pleased to submit this report of our review of the actuarial experience for the East Bay Municipal Utility District Employees' Retirement System (EBMUDERS). This study utilizes the census data for the period July 1, 2020 to June 30, 2024 as well as prior periods for some assumptions, examines other relevant inputs, and provides the proposed actuarial assumptions, both economic and demographic, to be used in the June 30, 2024 valuations.

The actuarial calculations were completed under the supervision of Andy Yeung, ASA, MAAA, FCA, Enrolled Actuary and Mehdi Riazi, FSA, 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,

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

Emily Klare, ASA, MAAA, EA
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Section 1: Introduction, Summary, and Recommendations

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

If assumptions are modified, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Taking into account one year's gains or losses without making a change in the assumptions means that year's experience is treated as temporary and that, over the long run, experience will return to what was originally assumed. For example, the actuarial assumptions used in the most recent valuation did not include any possible short-term or long-term impacts on mortality of the covered population that emerged due to COVID-19.[1] Changing assumptions reflects a basic change in thinking about the future and has a much greater effect on the current contribution requirements than recognizing gains or losses as they occur.

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

This study was undertaken in order to review the economic and demographic actuarial assumptions and to compare the actual experience with that expected under the current assumptions during the four-year experience period from July 1, 2020 through June 30, 2024. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27 "Selection of Economic Assumptions for Measuring Pension Obligations" and ASOP No. 35 "Selection of Demographic and Other Non-Economic Assumptions for Measuring Pension Obligations." These Standards of Practice provide guidance for the selection of the various actuarial assumptions utilized in a pension plan actuarial valuation. Based on the study's results and expected future experience, we are recommending various changes in the current actuarial assumptions.

We are recommending changes in the assumptions for merit and promotion salary increases, pre-retirement mortality, post-retirement healthy and disabled life mortality, beneficiary mortality, disability, termination, retirement from active employment, sick leave conversion, percent

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

married/domestic partnership, and form of payment election. We are also recommending a change in the methodology used to calculate the normal cost rate for the 2013 Tier. In addition, we have included the retiree health assumptions we recommend for the Health Insurance Benefit Plan.

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 drives investment returns and active member salary increases.	Maintain the inflation assumption at 2.50% per annum as discussed in *Section 3(A)*.
15	**Cost-of-living adjustments (COLA):** Future increases in the cost of living adjustments for retirees.	Maintain the retiree cost-of-living assumption at 2.75% per annum (based on our recommended inflation assumption of 2.50% plus a margin for adverse deviation of 0.25%) as discussed in *Section 3(A)*.
16	**Investment return:** The estimated average net rate of return on current and future assets of the System 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	**Individual salary increases:** Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components: • Inflationary salary increases • Real "across-the-board" salary increases • Merit and promotion increases • 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 1955/1980 Plan and 2013 Tier members. Future merit and promotion salary increases are higher in several time from hire categories under the proposed assumptions. The recommended total rates of salary increase anticipate higher increases overall than the current assumptions for both 1955/1980 Plan and 2013 Tier members. Maintain the payroll growth assumption (combined inflationary and real "across-the-board" salary increases) at 3.00%.

Pg #	Actuarial Assumption Category	Recommendation
31	**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 and recommended base table*: Pub-2010 General Healthy Retiree Amount-Weighted/Headcount-Weighted[1] Above-Median Mortality Tables with rates increased by 5% for males **Beneficiaries** *Current base table for all beneficiaries:* Pub-2010 Contingent Survivor Amount-Weighted/Headcount-Weighted[1] Above-Median Mortality Tables with rates increased by 5% for males and females *Recommended base table for beneficiaries in pay status at the valuation:* Pub-2010 Contingent Survivor Amount-Weighted/Headcount-Weighted[1] Above-Median Mortality Table with rates increased by 5% for males and females *Recommended base table for beneficiaries not in pay status at the valuation:* For the purposes of the actuarial valuations (for funding and financial reporting), when calculating the liability for the continuance to a beneficiary of a surviving member we recommend that the Healthy Retiree mortality tables be used for beneficiary mortality both before and after the expected death of the member. **Pre-retirement mortality** *Current and recommended base table:* Pub-2010 General Employee Amount-Weighted/Headcount-Weighted[1] Above-Median Mortality Tables **Mortality projection** *Current projection:* All current tables are projected generationally with the two-dimensional mortality improvement scale MP-2020. *Recommended projection:* All recommended tables are projected generationally with the two-dimensional mortality improvement scale MP-2021. This is the most recent projection scale, as an updated projection scale was not published in 2022, 2023, nor 2024.

[1] The above Amount-Weighted tables are recommended for the Pension Plan and the Headcount-Weighted tables are recommended for the Health Plan.

Pg #	Actuarial Assumption Category	Recommendation
42	**Mortality rates - disabled:** The probability of dying at each age for disabled members. Mortality rates are used to anticipate life expectancies.	**Disabled retirees** *Current and recommended base table:* Pub-2010 Non-Safety Disabled Retiree Amount-Weighted/Headcount-Weighted[1] Mortality Tables with rates increased by 5% for males **Mortality projection** *Current projection:* All current tables are projected generationally with the two-dimensional mortality improvement scale MP-2020. *Recommended projection:* All recommended tables are projected generationally with the two-dimensional mortality improvement scale MP-2021. This is the most recent projection scale, as an updated projection scale was not published in 2022, 2023, nor 2024.
46	**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.
48	**Termination rates:** The probability of leaving employment at each age or after a certain number of years of service and receiving either a refund of member contributions or a deferred vested retirement benefit.	Adjust the termination rates to those developed in *Section 4(D)* to reflect a slightly higher incidence of termination overall. This includes introducing separate termination rates for 1955/1980 Plan and 2013 Tier members and switching to use service-based assumptions.
54	**Retirement rates:** The probability of retirement at each age at which participants are 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)* to reflect later retirements. For deferred vested members, maintain the assumed retirement age of 59 for all members.

[1] The above Amount-Weighted tables are recommended for the Pension Plan and the Headcount-Weighted tables are recommended for the Health Plan.

Pg #	Actuarial Assumption Category	Recommendation
61	**Miscellaneous assumption and methodology changes including:** • Reciprocity • Sick leave conversion • Percent married/domestic partnership • Age and gender of spouse/domestic partner • Form of payment • Change in methodology	Maintain the current proportion of future deferred vested members expected to be covered by a reciprocal system at 15%. Increase the sick leave conversion assumption from 0.038 years of additional service credit at retirement for each year of membership to 0.040 years of additional service credit. For active and deferred vested members, maintain the current percent married at retirement assumption at 85% for males and increase from 60% to 65% for females. Maintain the spouse/domestic partner assumptions that male retirees are two years older than their female spouses and that female retirees are three years younger than their male spouses. Change the form of payment assumptions as outlined in *Section 4(F).* Implement a technical change in the calculation of normal cost rate for the 2013 Tier to achieve a more stable future normal cost rate.
66	**Retiree health assumptions including:** • Retiree participation • Spousal coverage • Covered spouse age difference	Maintain the 95% participation assumption for retirees who are eligible for Health Insurance Benefit (HIB). Maintain the 70% assumption for participation in a non-Medicare health plan sponsored by EBMUDERS (for calculating implicit subsidy under accounting valuation). Increase participation assumption for current vested terminated employees from 50% to 65%. Change spousal coverage and covered spouse age difference to those described in *Section 4(G)*.

We have estimated the impact of all the recommended economic and demographic assumptions as if they were applied to the June 30, 2023 actuarial valuation. The first table below shows the changes in the total contribution rates due to the proposed assumption changes separately for the recommended pre-retirement assumptions (including the change in methodology to calculate normal cost rate for the 2013 Tier) and the recommended post-retirement mortality assumptions for the Pension Plan. For the Health Plan, the second table below shows the change in the total contribution rates for all the assumptions combined.

Pension Plan

Estimated Cost Impact of Assumption and Methodology Changes Based on June 30, 2023 Valuation

Assumption	(1) Impact on UAAL ($ thousands)	(2) Impact on Total Normal Cost Rate	(3) Impact on UAAL Rate	(4) Impact on Total Rate (2) + (3)
Increase due to pre-retirement assumption and methodology changes	$2,817	0.25%	(0.04%)	0.21%
Increase due to post-retirement assumption changes	$24,692	0.15%	0.66%	0.81%
Total increase due to all assumption and methodology changes	**$27,509**	**0.40%**	**0.62%**	**1.02%**

Of the various assumption changes, the most significant rate increase is due to the updated post-retirement assumption changes. A breakdown of the changes in the employer and employee contribution rates for each of the 1955/1980 Plan and 2013 Tier is provided in *Section 5*.

Health Plan

Estimated Cost Impact of Assumption Changes Based on June 30, 2023 Valuation

Assumption	(1) Impact on UAAL ($ thousands)	(2) Impact on Total Normal Cost Rate	(3) Impact on UAAL Rate	(4) Impact on Total Rate (2) + (3)
Total increase due to all assumption changes	**$1,603**	**0.00%**	**0.04%**	**0.04%**

A breakdown of the changes in the employer contribution rates for each of the 1955/1980 Plan and 2013 Tier is provided in Section 5.

In total, the changes recommended in this study would increase the contribution rate by 1.06% of total payroll, or $2,780,089 if the changes were applied in the June 30, 2023 valuations.[1]

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

[1] Based on total payroll of $262,272,600 as of June 30, 2023.

Section 2: Background and Methodology

In this report, we analyzed both economic and demographic ("non-economic") assumptions. The primary economic assumptions reviewed are inflation, cost-of-living adjustments, investment return, and salary increases. Demographic assumptions include the probabilities of certain events occurring in the population of members, referred to as "decrements," e.g., termination from service, disability retirement, service retirement, and death before and after retirement. In addition to decrements, other demographic assumptions reviewed in this study include the percentage of members with an eligible spouse or domestic partner, spousal age difference, percent of members assumed to go on to work for a reciprocal system, reciprocal salary increases, form of payment, and unused sick leave conversion. We have also reviewed certain retiree health assumptions for the Health Insurance Benefit Plan.

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.
- **Cost-of-Living Adjustments:** Increases in future benefit payments for retirees. Based on plan provisions, EBMUDERS provides maximum 3% annual increases in the benefits paid to retired employees that is increased to 5% when the System's funded ratio measured on a Projected Benefit Obligation (PBO) basis is more than 85%.[1,2] This assumption is tied to the inflation assumption and the System's funded ratio measured on a PBO basis.
- **Investment return:** Expected long-term rate of return on the System's investments after accounting for certain investment expenses and all administrative 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 assumed to increase each year by the price inflation rate plus any real "across-the-board" pay increases that are assumed.

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

[1] Effective October 1, 2000, when the System is 85% funded on a PBO basis and the cost of living is less than 4%, withdrawals from the accumulated COLA bank are made to allow cost of living increases up to 4%.

[2] We note that as of July 1, 2024, the amounts in the COLA banks range from 0.00% to 12.20%, with about 90% of the retirees and beneficiaries having a COLA bank of 3.3% as of that date. This is a result of most continuing retirees and beneficiaries receiving a COLA increase on July 1, 2024 equal to the 3.0% provision, thereby increasing their 2.6% July 1, 2023 COLA bank by 0.7% to 3.3% as of July 1, 2024.

Demographic assumptions

In order to determine the probability of an event occurring, we examine the “decrements” and “exposures” of that event. For example, taking termination from service, we compare the number of employees who actually terminate in a certain service category (i.e., the number of “decrements”) with those who could have terminated (i.e., the number of “exposures”). So if there were 500 active employees with 5 years of service at the beginning of the year and 50 of them left during the year, we would say the probability of termination at 5 years of service is 50 ÷ 500 or 10%.

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

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

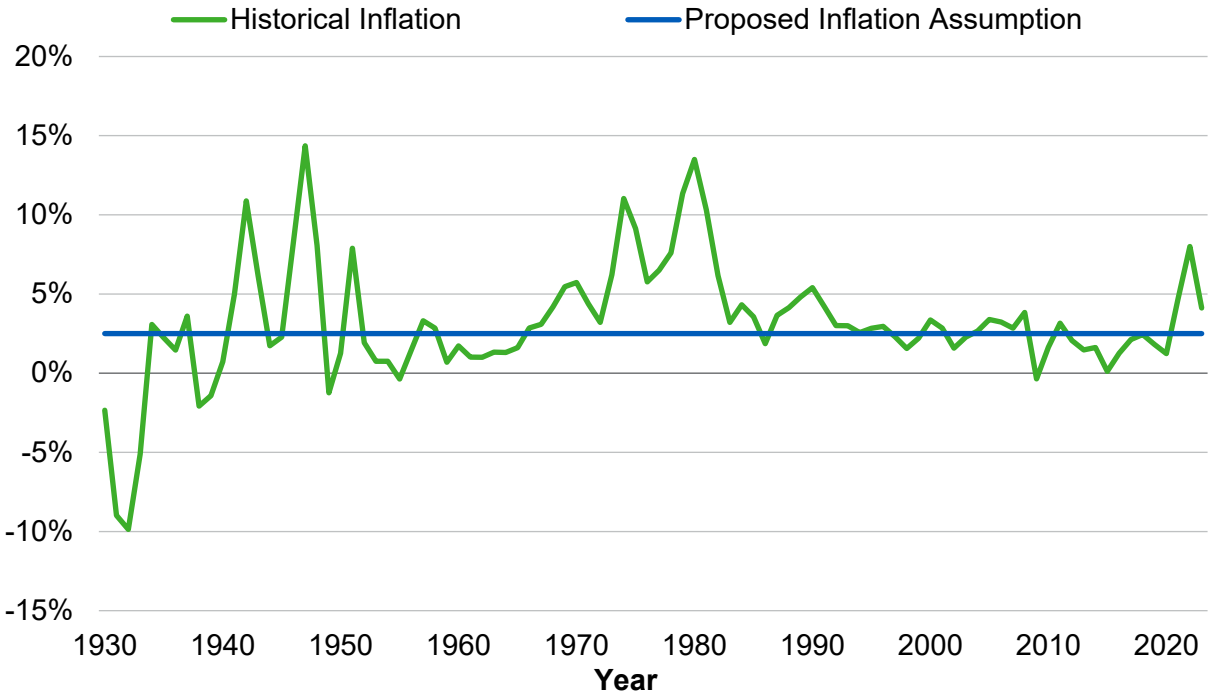
Section 3: Economic Assumptions

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 – 1930 to 2023[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. However, the rate of inflation, while still elevated, has leveled off and started to decline since the Federal Reserve began to increase interest rates starting around the second quarter of 2022. In particular, the change in the CPI from September 2023 to September 2024 was 2.4%.

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

[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).

assumption used by 176 large public retirement funds in their 2023 fiscal year valuations was 2.50%.[1] In California, CalSTRS and five[2] 1937 Act CERL systems currently use an inflation assumption of 2.75%, the other fifteen 1937 Act CERL systems use an inflation assumption of 2.50%[3] (as does EBMUDERS) and CalPERS uses an inflation assumption of 2.30%.

EBMUDERS' investment consultant, Meketa, anticipates an annual inflation rate of 2.80% over a 20-year horizon, while the average inflation assumption provided by Meketa 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 2.50%. 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]

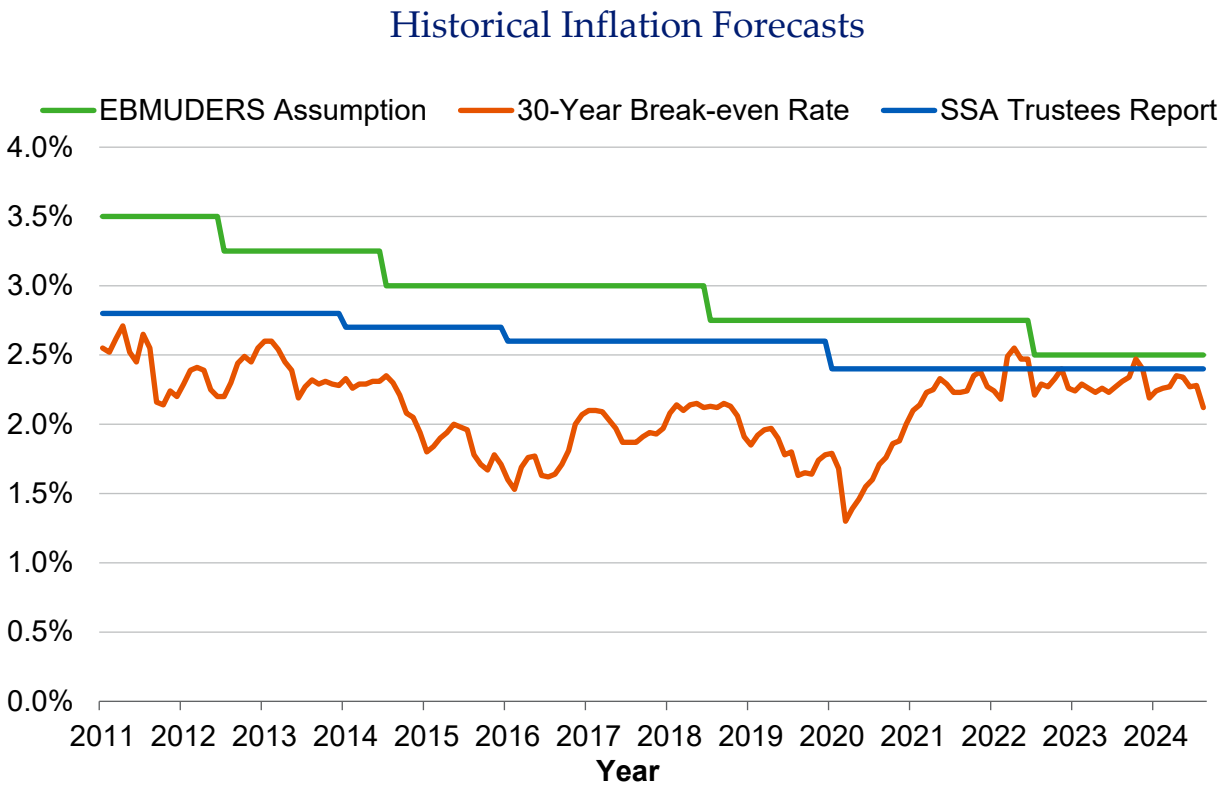
To find a forecast of inflation based on a longer time horizon, we referred to the Social Security Administration's (SSA) 2024 report on the financial status of the Social Security program.[5] The projected average increase in the Consumer Price Index (CPI) over the next 75 years under the intermediate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

We also compared the yields on the thirty-year inflation indexed U.S. Treasury bonds to comparable traditional U.S. Treasury bonds.[6] This "break-even rate" is commonly regarded as a market-based gauge of future inflation expectations. As of August 2024, the difference in yields is about 2.12% 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. This measure of market expectation for long-term inflation can be quite volatile, which is illustrated in the table below.

[1] Among 228 large public retirement funds, the 2023 fiscal year inflation assumption was not available for 52 of the public retirement funds in the survey data as of September 2024.
[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 six investment consultants included in our review, with the exception of one investment consultant that uses a 1-year horizon, generally ranges from 20 years to 30 years, with Meketa using a 20-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.

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

The following graph shows EBMUDERS' historical and current proposed inflation assumptions compared to the two other metrics just discussed, going back to 2011. In effect, this compares EBMUDERS' 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, EBMUDERS' assumption has been 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

The annual cost of living increase in the benefit paid to retired members and beneficiaries is dependent on inflation. Up to a 3% annual adjustment will be made and that adjustment is increased to 5% when the Retirement Board determines that the System is more than 85% funded on a Projected Benefit Obligation (PBO) basis using market value of assets. Effective October 1, 2000, when the System is 85% funded on a PBO basis and the cost of living is less than 4%, withdrawals from the accumulated COLA bank are made to allow cost of living increases up to 4%. (As we noted in the footnote at the bottom of *Section 2*, about 90% of retirees and beneficiaries had a 3.3% COLA bank as of July 1, 2024, due to the 0.7% increase to their 2.6% July 1, 2023 COLA bank after they received a July 1, 2024 COLA equal to the 3% provision.)

In our last economic assumptions study dated November 8, 2022, the Board adopted the continued use of a 2.75% COLA assumption which included a 0.25% margin above the 2.50% inflation assumption.[1]

In the table below, we continue to observe that the changes in the annual CPI based on the San Francisco-Oakland-Hayward area used by the Board to set COLAs have exceeded those of the changes in the annual CPI for the U.S. City Average during the most recent 10-year, 15-year and 20-year periods. While there has been a reversal to this trend in the most recent five-year period, we note that the average change in annual CPI for the San Francisco-Oakland-Hayward area is still higher than the 3% maximum COLA.

	Change in Annual CPI for San Francisco-Oakland-Hayward Area	Change in Annual CPI for U.S. City Average
5-year period	3.49%	3.94%
10-year period	3.30%	2.72%
15-year period	2.84%	2.34%
20-year period	2.77%	2.55%

We recommend maintaining the current assumptions to value the post-retirement COLA benefit at 2.75% per year which includes a 0.25% margin above our recommended inflation assumption.

As of the date of the most recent valuation as of June 30, 2023, the Pension Plan's PBO funded ratio was 75.0% while the combined Pension and Health Insurance Benefit Plans' PBO funded ratio was 73.6%. We will continue to monitor the PBO funded ratio and the inflation environment

[1] We will continue to assume in the valuation that retired members and beneficiaries with a COLA bank on the date of the valuation will continue to receive the maximum COLA until the balances in their COLA banks are used up.

and to report back to the Board if we believe an additional margin should be included to anticipate payment of COLA in excess of what we assume in the valuation.

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 System'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 Meketa's total or "nominal" 2024 return assumptions by their assumed 2.80% inflation rate. The second column of returns 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 Meketa and five other investment advisory firms retained by Segal's public sector clients, as well as Segal's investment advisory division. We believe these averages are a reasonable consensus forecast of long-term future market returns in excess of inflation.[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 shorter than the time horizon encompassed by the actuarial valuation.

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

Asset Class	Percentage of Portfolio	Meketa's 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]
Domestic Large Cap Equity	32.55%	7.15%	5.80%
Domestic Small Cap Equity	2.45%	7.15%	6.59%
Developed Int'l Large Cap Equity	18.00%	7.47%	6.44%
Emerging Market Equity	7.00%	8.11%	8.32%
Core Bonds	20.00%	2.08%	2.27%
High Yield Bonds	7.50%	4.61%	4.62%
Bank Loans	5.00%	4.30%	4.43%
Real Estate	2.50%	4.82%	4.54%
Private Debt	5.00%	7.53%	6.63%
Total	**100.00%**	**5.89%**	**5.26%**

Generally, the above are representative of "indexed" returns for securities that are publicly traded, returns net of fees for securities that are non-publicly traded and do not include any additional returns ("alpha") from active management. Consideration of returns without alpha is consistent with the Actuarial Standard of Practice No. 27, Section 3.8.3.d,[3] 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 Meketa's nominal arithmetic returns and reducing by Meketa's assumed 2.80% 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 Meketa 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] The relevant section under the most recently revised ASOP No. 27 is Section 3.7.3.d and will be effective January 1, 2025.

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 EBMUDERS' investment return assumption to reflect a broader range of capital market information and should help reduce year to year volatility in the investment return assumption.
4. Therefore, we recommend that the 5.26% portfolio net real rate of return be used in the determination of EBMUDERS' investment return assumption, but with some caution. This return is 0.55% higher than the 4.71% gross return that was used two years ago in the review of the recommended investment return assumption for the June 30, 2022 valuation.
5. The 0.55% increase in the portfolio net real rate of return since 2022 is due to changes in the real rate of return assumptions provided to us by the investment advisory firms (+0.43% under the 2021 asset allocation), changes in the EBMUDERS' target asset allocation (-0.07%) and the interaction effect between these changes (+0.19%). 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 very low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate during 2022, and so should be used with caution in selecting a long-term investment return assumption.

System 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. Current practice for EBMUDERS also adjusts for expected administrative expenses. In prior experience studies, we have adjusted the gross real rate of return developed using the target asset allocation by the administrative and investment expenses expected to be paid by EBMUDERS.

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 but excluding investment manager fees.

The following table provides these investment and administrative expenses in relation to the actuarial value of assets for the four years ending June 30, 2024.

Investment and Administrative Expenses as a Percentage of Actuarial Value of Assets

Year Ending June 30	Actuarial Value of Assets[1]	Investment Expenses[2,3]	Administrative Expenses	Investment Expenses	Administrative Expenses	Total Expenses
2021	$1,914,278,306	$508,000	$1,922,000	0.03%	0.10%	0.13%
2022	2,097,712,454	123,000	1,921,000	0.01%	0.09%	0.10%
2023	2,216,123,725	220,000	2,273,000	0.01%	0.10%	0.11%
2024	2,314,460,062	202,000	2,506,000	0.01%	0.11%	0.12%

Investment and Administrative Expenses Averages and Assumptions

Averaging Period and Assumption	Investment	Administrative	Total
Four-year average (2021 – 2024)	0.02%	0.10%	0.12%
Current assumption (including investment management fees)	**0.16%**	**0.09%**	**0.25%**
Proposed assumption (excluding investment management fees)	**0.05%**	**0.10%**	**0.15%**

Based on the above experience, we recommend reducing the investment and administrative expense component of the investment return assumption from 0.25% to 0.15%.

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

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

Model change

The 5.26% 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

[1] As of beginning of plan year. In our prior analyses, we had used average market value of assets weighted by cash flow.
[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.

the discount rate in a funding valuation is expected on average to have no surplus or asset shortfall relative to its expected obligations assuming all other actuarial assumptions are met in the future.[1] That is the basis used in Segal's previous experience studies for EBMUDERS.

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. EBMUDERS' 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] This 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 earlier model would look if used in this year's study. Two years ago, the Board adopted an investment return assumption of 6.75%. Under the model used in that economic assumptions study, that return implied a risk adjustment of 0.21%, corresponding to a 15-year confidence level of 53%, based on an annual portfolio return standard deviation of 12.50% provided by Meketa in 2022.

If we use the same 53% 15-year confidence level from our last study to set this year's risk adjustment and the current annual portfolio return standard deviation of 12.90% provided by Meketa, the corresponding risk adjustment would be 0.22% (the slightly higher standard deviation allows for a slightly higher 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

[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."

assumption of 7.29%, which is higher than the current assumption of 6.75%. This result leaves room for a potentially larger risk adjustment and confidence level in this year's study.

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 very low returns earned in the 2021-2022 plan year, as well as the increase in the federal funds rate during 2022, and so could be overly optimistic for use in selecting a long-term investment return assumption. For that reason, for this comparison value we evaluated an investment return assumption of 6.75% which, together with the other investment return components, would produce a risk adjustment of 0.76% which corresponds to a confidence level of 59% 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. While the expected geometric average return of a portfolio will be less than the expected arithmetic average return, the magnitude of this difference depends on the variability of the portfolio, as measured by its standard deviation. The annual portfolio standard deviation provided by Meketa is 12.90%, which produces a conversion factor to the expected return of 0.78%. This results in an expected geometric average real return of 4.48% (the expected arithmetic average real return of 5.26% reduced by 0.78%).

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 6.83%, which is higher than the current assumption of 6.75%. In applying this model to EBMUDERS 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 0.08%, which reflects a confidence level of 51%.

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.

Assumption Component	June 30, 2024 Recommended Value	June 30, 2024 Comparison Values	June 30, 2022 Adopted Value
Inflation	2.50%	2.50%	2.50%
Portfolio expected arithmetic real rate of return	5.26%	5.26%	4.71%
Adjustment to expected geometric real rate of return	(0.78)%	N/A	N/A
Expense adjustment	(0.15)%	(0.25)%	(0.25)%
Risk adjustment	(0.08)%	(0.76)%	(0.21)%
Total	**6.75%**	**6.75%**	**6.75%**
Confidence level	**51%**	**59%**	**53%**

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

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

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

Years Ending June 30	Investment Return	Risk Adjustment	Corresponding Confidence Level
2012	7.75%	0.10%	51%
2014	7.50%	0.09%	51%
2016	7.25%	0.44%	55%
2018	7.00%	0.12%	51%
2020	7.00%	0.05%	51%
2022	6.75%	0.21%	53%
2024 (Comparison)	6.75%	0.76%	59%
2024 (Recommended)	6.75%	0.08%	51%

As we have discussed in prior experience and economic assumption studies, the risk adjustment model and associated confidence level is most useful as a means for comparing how EBMUDERS has positioned itself relative to risk over periods of time.[1] The use of either a 51% or 59% confidence level should be considered in context with other factors, including:

- As noted above, the confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparisons. This is particularly true when comparing confidence levels developed using different models, as we are doing in this transitional year from one model to another.

[1] 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."

- The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by Meketa. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a "soft" number.
- We have not taken into account any additional returns ("alpha") that might be earned on active management. This means that if active management generates enough alpha to cover its related expenses, this would increase returns. This aspect of Segal's model is further evaluated below.
- As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the later section on "Comparison with Other Public Retirement Systems."

Comparison with alternative model used to review investment return assumption

In previous studies, we have consistently reviewed investment return assumptions based on our prior 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 Economic Assumptions for measuring Pension Obligations under Actuarial Standards of Practice (ASOP) No. 27.

Besides using forward looking expected arithmetic returns, ASOP No. 27 also discusses setting investment return assumptions using an alternative "forward looking expected geometric returns" approach, which is the model we have used in this study.[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 EBMUDERS under the arithmetic approach. This is because under the model used by those retirement systems and by Segal in this report, the investment return assumption is **not** reduced to anticipate future investment management expenses. However, for EBMUDERS, these two changes do not completely offset each other because the future investment management expenses are relatively low, while the standard deviation used to convert from an expected arithmetic return to a median geometric return is relatively high. That is why, as shown earlier, the same 6.75% assumption does not have 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 period, there is a 56% likelihood that future average geometric returns will meet or exceed

[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.

6.75%[1] developed using the capital market assumptions compiled by Horizon Actuarial Services based their most recent survey published in August 2024. This 56% likelihood of achieving a 6.75% return is higher than the corresponding likelihood of 43%[2] (for achieving a 6.75% return) that we observed in this comparison during the economic assumptions review in 2022.

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, six use a 7.00% investment return assumption, nine use 6.75%, three use 6.50%, and one uses 6.25%. The remaining 1937 Act CERL system currently uses a 7.25% investment return assumption. Furthermore, CalSTRS currently uses a 7.00% investment return assumption and CalPERS uses a 6.80% investment return assumption, while the San Jose and San Diego City retirement systems use investment return assumptions of 6.625% and 6.50%, respectively.

The following table compares EBMUDERS' recommended net investment return assumption against those of the 207 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:[3]

EBMUDERS' Investment Return vs. Public Plans Database[4] Investment Return Assumptions

Assumption	EBMUDERS	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 half 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] The lower likelihood reflects the lower expected capital market return assumptions, etc., published by Horizon Actuarial Services in their 2022 survey.

[3] Among 228 large public retirement funds, the 2023 fiscal year investment return assumption was not available for 21 of the public retirement funds in the Public Plans Database as of September 2024.

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

C. Salary increase

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.

These two impacts are discussed separately below.

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 0.0% – 0.3% 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, recent salary experience with public systems in California as well as anecdotal discussions with plans and plan sponsors indicate lower future real wage growth expectations for public sector employees. We note that for EBMUDERS' active members, the actual average inflation plus "across-the-board" increase (i.e., wage inflation) over the four-year period ending June 30, 2024 was 4.47%, which is higher than the change in CPI of 4.02% during that same period.

Valuation Date	Actual Average Increase[1]	Actual Change in CPI[2]
June 30, 2021	0.50%	3.15%
June 30, 2022	8.67%	6.80%
June 30, 2023	5.18%	2.88%
June 30, 2024	3.53%	3.24%
Four-year average	**4.47%**	**4.02%**

Based on all of the above information, we recommend maintaining the real "across-the-board" salary increase assumption at 0.50%. This means that the combined inflation and "across-the-board" salary increase assumption will remain at 3.00%.

3. **Merit and promotion increases:** As the name implies, these increases come from an employee's career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For EBMUDERS, there are years from hire 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 a decrease during any particular year;
   c. Categorizing these increases according to member demographics;
   d. Removing the wage inflation component from these increases (assumed to be equal to the increase in the members' average salary during the year);
   e. Averaging these annual increases over the experience period; and
   f. Modifying current assumptions to reflect some portion of these measured increases reflective of their "credibility."

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

   Note that beginning with this experience study, we are recommending separate merit and promotion increase assumptions for 1955/1980 Plan and 2013 Tier members.

   Due to the high variability of the actual salary increases, we have also analyzed this assumption using data for the past eight 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 1955/1980 Plan members' actual average merit and promotion increases by time from hire over the four-year period from July 1, 2020 through June 30, 2024. Due to the limited experience for 1955/1980 Plan members in the earlier

[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 June CPI for the San Francisco-Oakland-Hayward Area compared to the prior June CPI. (Note that for determining the annual retiree COLA increases, EBMUDERS uses the change in the annual average CPI for the San Francisco-Oakland-Hayward Area.)

time from hire categories, we are also showing the actual average increase for 1955/1980 Plan and 2013 Tier members combined over the current and prior four-year periods combined (for eight total years of experience). The current and proposed assumptions are also shown. The actual increases were reduced by the actual average inflation plus "across-the-board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year during the experience period (4.47% on average for the most recent four-year period and 4.16% on average for the most recent eight-year period).

1955/1980 Plan—Merit and Promotion Salary Increase Rates (%)

Time from Hire (Years)	Current Assumption	Actual Average Increase (Last 4 Years, 1955/1980 Plan)	Actual Average Increase (Last 8 Years, 2013 Tier and 1955/1980 Plan)	Proposed Assumption
Less than 1	6.25	1.81	6.62	6.25
1 – 2	6.00	4.50	6.47	6.00
2 – 3	5.00	3.67	5.69	5.00
3 – 4	3.75	1.98	4.48	3.75
4 – 5	2.50	1.48	2.99	2.50
5 – 6	1.50	1.05	1.94	1.50
6 – 7	1.25	1.73	1.42	1.25
7 – 8	1.25	1.86	1.60	1.25
8 – 9	1.00	1.33	1.38	1.25
9 – 10	1.00	1.79	1.66	1.25
10 – 11	0.75	0.99	1.22	1.00
11 – 12	0.75	1.20	1.21	1.00
12 – 13	0.75	0.91	0.94	0.75
13 – 14	0.75	1.02	1.17	0.75
14 – 15	0.75	0.82	0.84	0.75
15 and over	0.75	0.75	0.85	0.75

We are not recommending changes to the merit and promotional salary increases for 1955/1980 Plan members for time from hire of less than seven years. This is because at those durations relatively limited experience is available for 1955/1980 Plan members, because most of the members within seven years of hire are 2013 Tier members.

The following table shows the 2013 Tier members' actual average merit and promotion increases by time from hire over the four-year period from July 1, 2020 through June 30, 2024. Due to the limited experience for 2013 Tier members in the later time from hire categories, we are also showing the actual average increases for 1955/1980 Plan and 2013 Tier members combined over the current and prior four-year periods combined (for eight total years of experience). The current and proposed assumptions are also shown. The actual increases were reduced by the actual average inflation plus "across-the-board" increase (i.e., wage inflation, estimated as the increase in average salaries) for each year during the experience period (4.47% on average for the most recent four-year period and 4.16% on average for the most recent eight-year period).

2013 Tier—Merit and Promotion Salary Increase Rates (%)

Time from Hire (Years)	Current Assumption	Actual Average Increase (Last 4 Years, 2013 Tier)	Actual Average Increase (Last 8 Years, 2013 Tier and 1955/1980 Plan)	Proposed Assumption
Less than 1	6.25	6.81	6.62	6.50
1 – 2	6.00	6.38	6.47	6.25
2 – 3	5.00	5.51	5.69	5.25
3 – 4	3.75	4.55	4.48	4.25
4 – 5	2.50	3.00	2.99	2.75
5 – 6	1.50	2.09	1.94	1.75
6 – 7	1.25	1.24	1.42	1.25
7 – 8	1.25	1.17	1.60	1.25
8 – 9	1.00	1.29	1.38	1.25
9 – 10	1.00	0.00[1]	1.66	1.25
10 – 11	0.75	0.00	1.22	1.00
11 – 12	0.75	0.00	1.21	1.00
12 – 13	0.75	0.00	0.94	0.75
13 – 14	0.75	0.00	1.17	0.75
14 – 15	0.75	0.00	0.84	0.75
15 and over	0.75	0.00	0.85	0.75

We are recommending setting the merit and promotional salary increases for 2013 Tier members for time from hire of at least seven years equal to the recommended increases for 1955/1980 Plan members. This is because at those durations relatively limited experience is available for 2013 Tier members, because most of the members hired at least seven years ago are 1955/1980 Plan members.

Based on this experience, we are proposing increases in the merit and promotion salary increases for 1955/1980 Plan members in some time from hire categories with seven or more years. We are also proposing increases in the merit and promotion salary increases for 2013 Tier members in most time from hire categories.

Chart 1 and Chart 2 that follow later in the section compare the actual merit and promotion increase experience with the current and proposed assumptions for 1955/1980 Plan and 2013 Tier members, respectively.

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.

[1] Four full years of experience are not available starting with this time from hire category.

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 shorter service members.

As part of reviewing the current practice, we have gone back to the prior valuations and summarized in the table below how the number of active members and their total payrolls have changed during the June 30, 2016 through June 30, 2023 valuations.

Active Members and Total Payroll

Year Ending June 30	Number of Active Members	Total Payroll[1] ($ in '000s)
2016	1,789	$180,027
2017	1,802	180,971
2018	1,828	199,928
2019	1,847	209,964
2020	1,903	222,232
2021	1,896	222,530
2022	1,895	241,693
2023	1,955	262,268
Average Compounded Annual Rate of Increase	**1.28%**	**5.52%**

As can be observed from the above table, the average annual rate of increase in the payroll during the above period was 5.52% before accounting for the 1.28% average growth in the active workforce (and 4.19% after netting out the impact due to the growth in the active workforce).

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

[1] Reflects the annualized monthly rate of pay for each member.

Chart 1: Merit and Promotion Salary Increase Rates
1955/1980 Plan Members

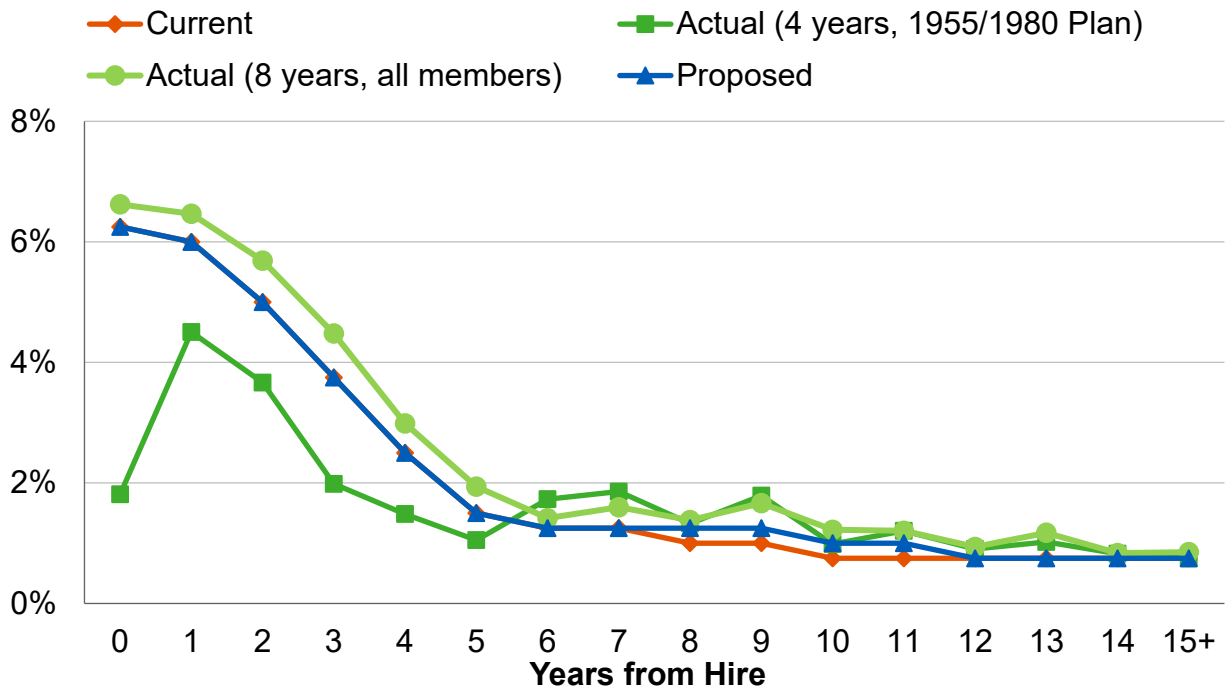
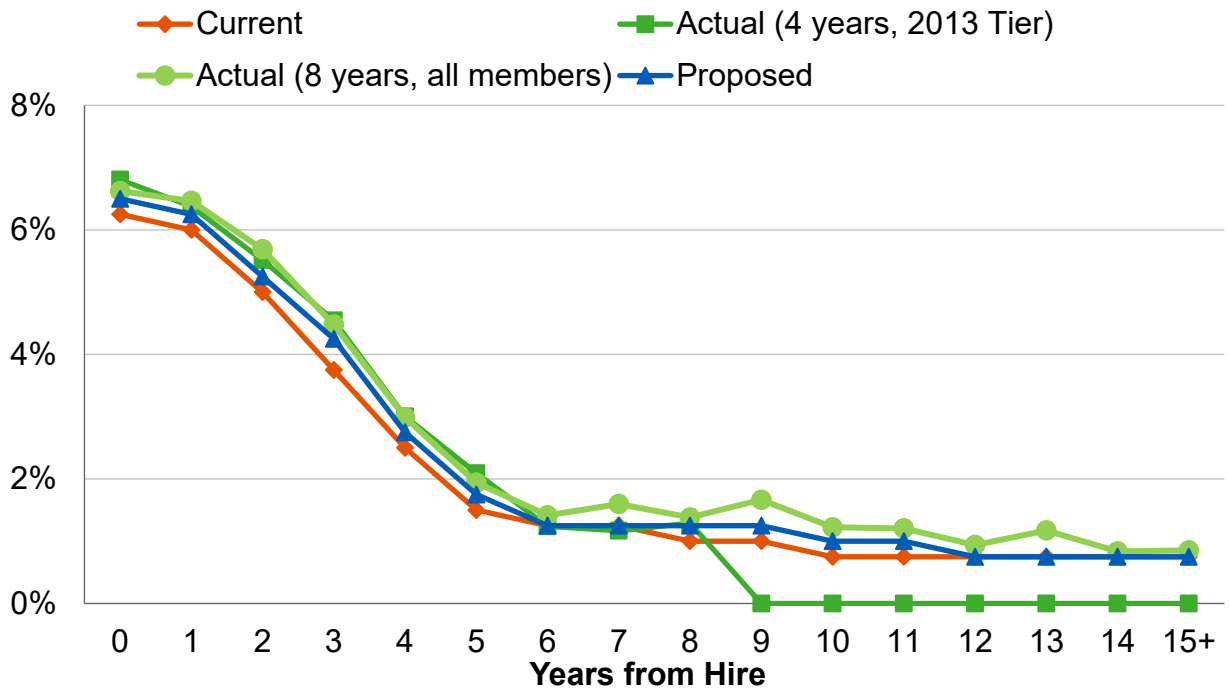


Chart 2: Merit and Promotion Salary Increase Rates
2013 Tier Members



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 die before retirement.

The Public Retirement Plans Mortality tables (Pub-2010) were published by the Retirement Plans Experience Committee (RPEC) of the SOA in 2019. These were the first published mortality tables based exclusively on public sector pension plan experience in the United States. Within the Pub-2010 family of mortality tables, there are separate tables by job categories of General, Safety and Teachers. Included with the mortality tables is the analysis prepared by RPEC that continues to observe that benefit amount for healthy retirees and salary for employees are the most significant predictors of mortality differences within the job categories. Therefore, Pub-2010 includes mortality rates developed 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[1] 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.

For the Pension Plan, we continue to recommend using the "amount-weighted" above-median version of the Pub-2010 mortality tables (adjusted for EBMUDERS experience as discussed herein).

For the Health Insurance Benefit Plan, we continue to recommend using the "headcount-weighted" above-median version of the Pub-2010 mortality tables (adjusted for EBMUDERS experience consistent with that for the Pension Plan).

We also continue to recommend that the mortality improvement scale be applied generationally where each future year has its own mortality table that reflects the forecasted improvements. Furthermore, we recommend that the mortality improvement scale be updated from MP-2020 to MP-2021.

[1] 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 has elected to not release a new mortality improvement scale for 2022, 2023 and 2024. Therefore, the MP-2021 remains the most recent mortality improvement scale published.

In order to reflect more EBMUDERS experience in our analysis of the mortality assumption, we have used experience over a sixteen-year period by using data from the current experience study period (from July 1, 2020 through June 30, 2024 and the last three experience study periods (from July 1, 2016 through June 30, 2020; from July 1, 2012 through June 30, 2016; and from July 1, 2008 through June 30, 2012).

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. In our recommended assumptions, we have adjusted the Pub-2010 mortality tables to fit EBMUDERS' experience based on the partial credibility for the given retiree group.

Post-retirement mortality (service retirements)

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

- **Pension Plan:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020.
- **Health Plan:** Pub-2010 General Healthy Retiree Headcount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020.

The following table shows the observed benefit-weighted deaths for heathy retired members based on the actual experience during the sixteen 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 tables have an actual to expected ratio of 99% after adjustments for partial credibility. In future years the ratios should remain around 99% as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

As discussed, we continue to recommend the use of generational mortality tables, which incorporate a more explicit assumption for future mortality improvement. Accordingly, the goal is to start with mortality tables that closely match the current experience (without a margin for future mortality improvement), and then reflect mortality improvement by projecting lower mortality rates in future years.

[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	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	$1.95	$1.95	$1.94
Female	0.32	0.29	0.32
Total	**$2.27**	**$2.24**	**$2.26**
Actual / Expected	**99%**		**99%**[1]

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased members.
2. Expected amounts under the current and proposed generational mortality tables 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. Therefore, the proposed mortality tables reflect only a partial adjustment for actual EBMUDERS experience. In future experience studies, more data will be available which may further increase the credibility of the EBMUDERS experience.

For the purpose of setting the assumptions for the Health Plan, we have also provided in the table below the actual and expected deaths (without weighting by benefit amounts) using the headcount-weighted version of the Pub-2010 tables.

[1] If we use the benchmark Pub-2010 General table without any adjustment, the proposed actual to expected ratio would be 103%.

Healthy Retiree Mortality Experience – Headcount-Weighted

Gender	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	418	436	417
Female	93	85	93
Total	**511**	**521**	**510**
Actual / Expected	**102%**		**102%**

Notes:

1. Experience shown above is weighted by headcounts for deceased members instead of by benefit amounts.
2. Expected deaths 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.

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

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

Chart 3 compares the actual to expected deaths on an amount-weighted basis for service retirement members over the sixteen-year period for the current and proposed assumptions.

Chart 4 compares the number of actual to expected deaths on a headcount-weighted basis for service retirement members over the sixteen-year period for the current and proposed assumptions for the Health Plan.

Chart 5 shows the life expectancies (i.e., expected future lifetime) under the current and proposed tables for service retirement members on an amount-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2024. In practice, assumed life expectancies will increase in future years in accordance with the mortality improvement scale.

Beneficiary Mortality

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

- **Pension Plan, all beneficiaries:** Pub-2010 Contingent Survivor Amount-Weighted Above-Median Mortality Tables (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-2020.

- **Health Plan, all beneficiaries:** Pub-2010 Contingent Survivor Headcount-Weighted Above-Median Mortality Tables (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-2020.

In studying the mortality for the beneficiaries in our prior and the current studies, we reviewed the actual deaths compared to the expected deaths and recommended using the Pub-2010 Contingent Survivor mortality tables for all beneficiaries. 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 mortality experience that we have available for beneficiaries. The Pub-2010 Contingent Survivor mortality rates are comparable to EBMUDERS' actual mortality experience for beneficiaries.

The following table shows the observed benefit-weighted deaths for beneficiaries based on the actual experience during the sixteen 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 108% after adjustments for partial credibility. In future years the ratio should remain around 108% as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

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

Gender	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	$16.36	$22.99	$16.33
Female	505.75	541.10	504.55
Total	**$522.10**	**$564.09**	**$520.87**
Actual / Expected	**108%**		**108%[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 tables 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-2010 Contingent Survivor table without any adjustment, the proposed actual to expected ratio would be 114%.

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

For the purpose of setting the assumptions for the Health Plan, we have also provided in the table below the actual and expected deaths (without weighting by benefit amounts) using the headcount-weighted version of the Pub-2010 tables.

Beneficiary Mortality Experience – Headcount-Weighted

Gender	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	15	20	15
Female	205	220	205
Total	**221**	**240**	**220**
Actual / Expected	**109%**		**109%**

Notes:

1. Experience shown above is weighted by headcounts for deceased members instead of by benefit amounts.
2. Expected deaths 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.

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

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

- **Health Plan:**
  - **Not in pay status at the valuation:** Pub-2010 General Healthy Retiree Headcount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2021.
  - **In pay status at the valuation:** Pub-2010 Contingent Survivor Headcount-Weighted Above-Median Mortality Tables (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 have continued to recommend the Pub-2010 Contingent Survivor mortality tables (with higher mortality rates) for beneficiaries **after** the death of the member, but the General Healthy Retirees tables (with lower mortality rates) for beneficiaries **before** the death of the member.

For the purposes of the actuarial valuations (for funding and financial reporting), when calculating the liability for the continuance to a beneficiary of a surviving member, we recommend that the General Healthy Retiree mortality tables be used for beneficiary mortality both before and after the expected death of the member increased by 5% for males and unadjusted for females. Upon the actual death of the member (i.e., for all beneficiaries in pay status as of the valuation date), we recommend for the purposes of the actuarial valuations that we use the Contingent Survivor mortality tables increased by 5% for males and females. 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.[1]

Pre-retirement mortality

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

- **Pension Plan:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2020.
- **Health Plan:** Pub-2010 General Employee Headcount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2020.

The table below shows the observed salary-weighted deaths for active members based on the actual experience during the sixteen 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 64% after adjustments for partial credibility. In future years the ratios should remain around 64% as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

[1] Using the Contingent Survivor mortality tables both before and after the death of the member, as was recommended in the prior study, was also deemed reasonable by the RPEC.

Pre-Retirement Mortality Experience – Salary-Weighted
($ in thousands)

Gender	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	$286.76	$146.82	$286.61
Female	61.33	76.93	61.30
Total	**$348.10**	**$223.75**	**$347.90**
Actual / Expected	**64%**		**64%**

Notes:

1. Experience shown above is weighted by 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 EBMUDERS, there is less data available for actives (as the above experience was based on the salary of 24 actual versus 42 expected members who died during the past sixteen years), so it is given little credibility and the proposed tables are not adjusted.

For the purpose of setting the assumptions for the Health Plan, we have also provided in the table below the actual and expected deaths (without weighting by salary) using the headcount-weighted version of the Pub-2010 tables.

Pre-Retirement Mortality Experience – Headcount-Weighted

Gender	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	34	15	34
Female	8	9	8
Total	**42**	**24**	**42**
Actual / Expected	**57%**		**57%**

Notes:

1. Experience shown above is weighted by headcounts for deceased members instead of by salary.
2. Expected deaths under the current and proposed generational mortality tables 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.

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

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

Mortality table for optional forms of payment

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

Chart 3: Post-Retirement Benefit-Weighted Deaths ($ in millions)

Service Retired Members (July 1, 2008 through June 30, 2024)

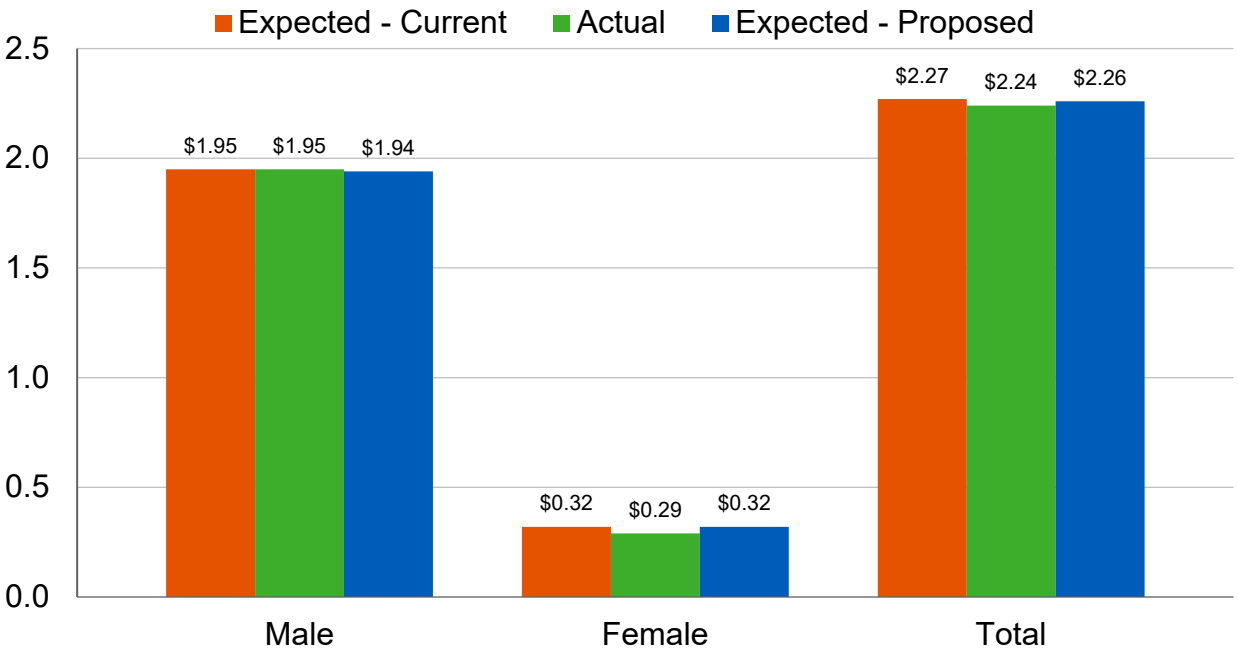


Chart 4: Post-Retirement Headcount-Weighted Deaths

Service Retired Members (July 1, 2008 through June 30, 2024)

For Health Plan

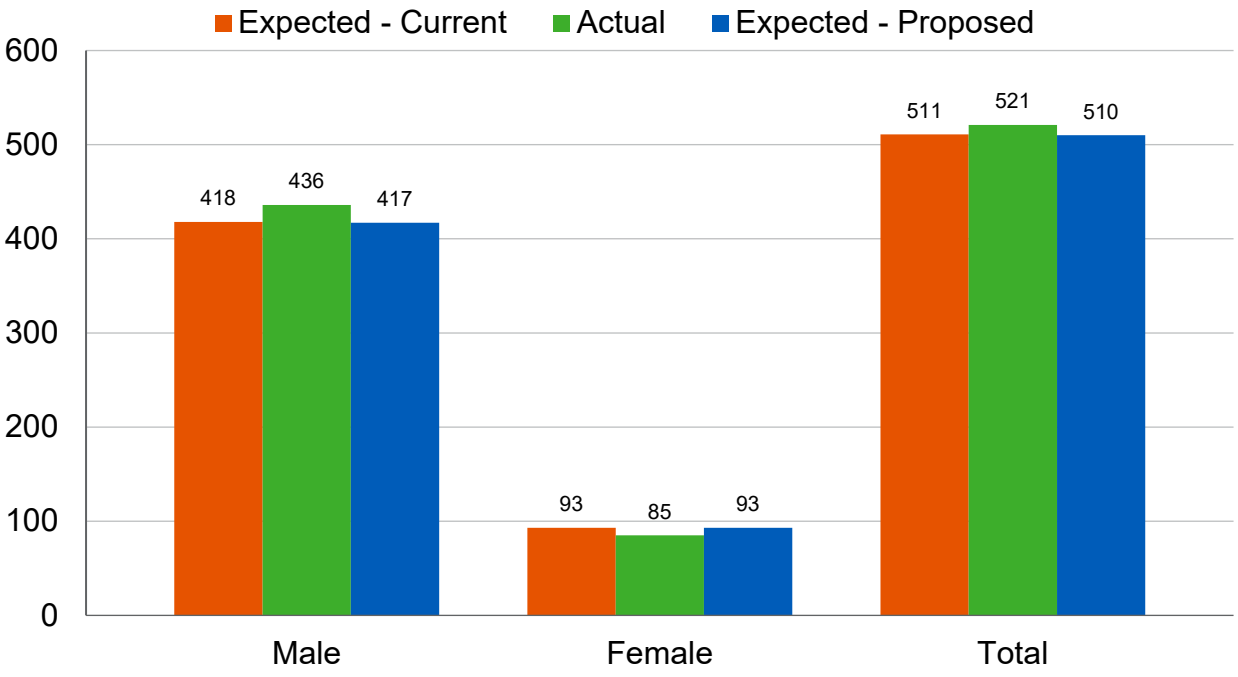
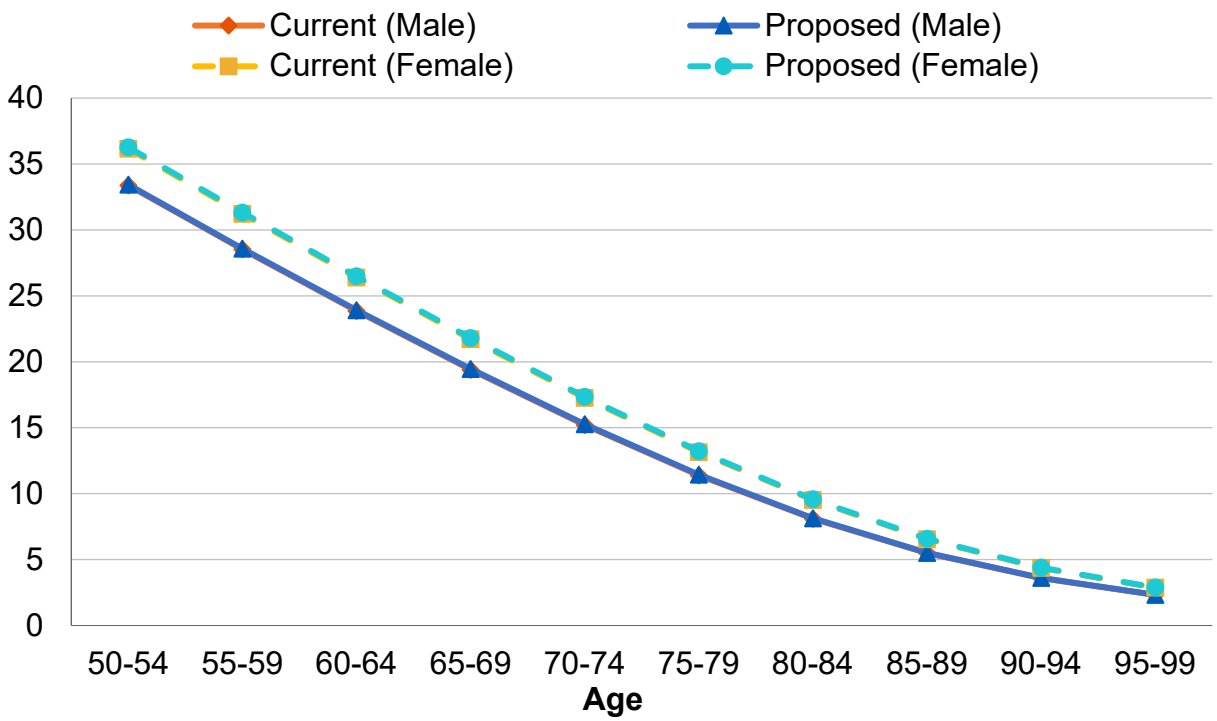


Chart 5: Benefit-Weighted Life Expectancies based on Age in 2024

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:

- **Pension Plan:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020.
- **Health Plan:** Pub-2010 Non-Safety Disabled Retiree Headcount-Weighted Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020.

The following table shows the observed benefit-weighted deaths for disabled retired members based on the actual experience during the sixteen 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 tables have an actual to expected ratio of 106% after adjustments for partial credibility. In future years the ratios should remain around 106% as long as actual mortality improves at the same rates as anticipated by the generational mortality tables.

Disabled Retiree Mortality Experience – Benefit-Weighted

($ in thousands)

Gender	Current Expected Weighted Deaths	Actual Weighted Deaths	Proposed Expected Weighted Deaths
Male	$49.30	$55.93	$49.23
Female	21.53	18.90	21.51
Total	**$70.84**	**$74.83**	**$70.74**
Actual / Expected	**106%**		**106%**[1]

Notes:

1. Experience shown above is weighted by annual benefit amounts for deceased members.
2. Expected amounts under the current and proposed generational mortality tables 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.

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 EBMUDERS, there is less data available for disabled retirees, so it is given little credibility and the proposed tables are only slightly adjusted.

[1] If we use the benchmark Pub-2010 Non-Safety Disabled table without any adjustment, the proposed actual to expected ratio would be 109%.

For the purpose of setting the assumptions for the Health Plan, we have also provided in the table below the actual and expected deaths (without weighting by benefit amounts) and using the headcount-weighted version of the Pub-2010 tables.

Disabled Retiree Mortality Experience – Headcount-Weighted

Gender	Current Expected Deaths	Actual Deaths	Proposed Expected Deaths
Male	27	28	27
Female	12	10	12
Total	**39**	**38**	**39**
Actual / Expected	**97%**		**97%**

Notes:

1. Experience shown above is weighted by headcounts for deceased members instead of by benefit amounts.
2. Expected deaths under the current and proposed generational mortality tables 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.

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

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

Chart 6 compares the actual to expected deaths on an amount-weighted basis for disabled members over the sixteen-year period for the current and proposed assumptions.

Chart 7 compares the number of actual to expected deaths on a headcount-weighted basis for disabled members over the sixteen-year period for the current and proposed assumptions for the Health Plan.

Chart 8 shows the life expectancies (i.e., expected future lifetime) under the current and proposed tables for disabled members on an amount-weighted basis. Life expectancies under the current and proposed generational mortality rates are based on age as of 2024. In practice, assumed life expectancies will increase in accordance with the mortality improvement scale.

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

Disabled Members (July 1, 2008 through June 30, 2024)

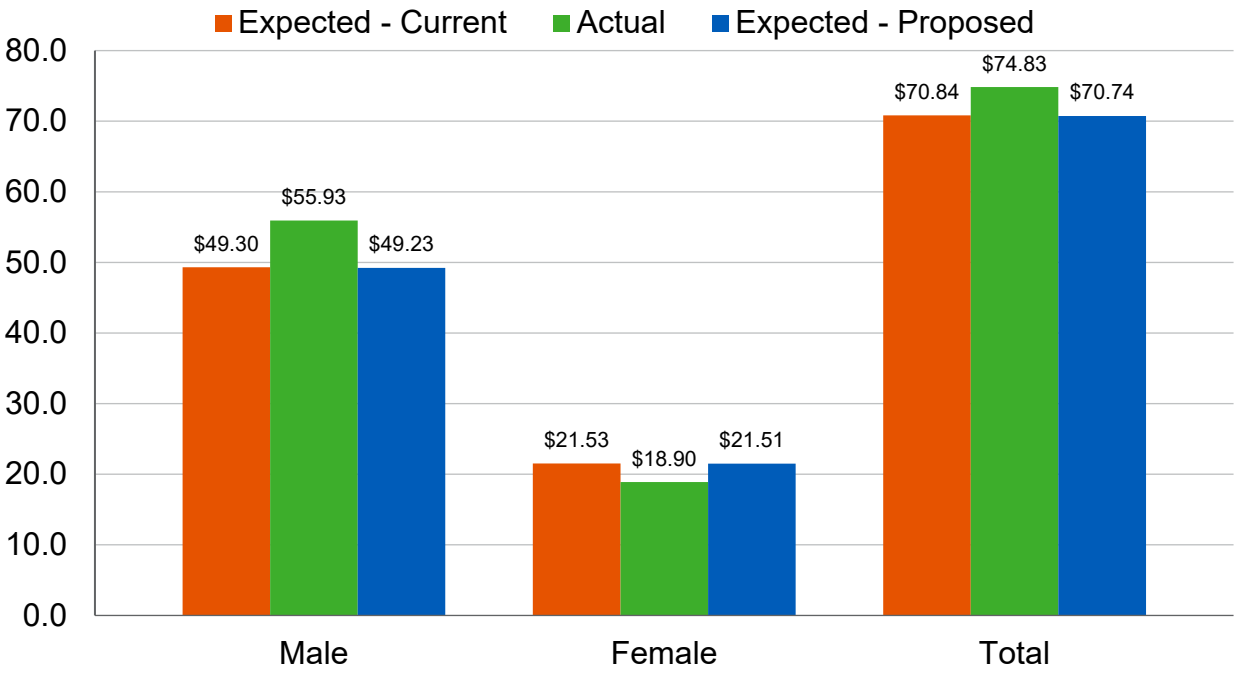


Chart 7: Post-Retirement Headcount-Weighted Deaths

Disabled Members (July 1, 2008 through June 30, 2024)

For Health Plan

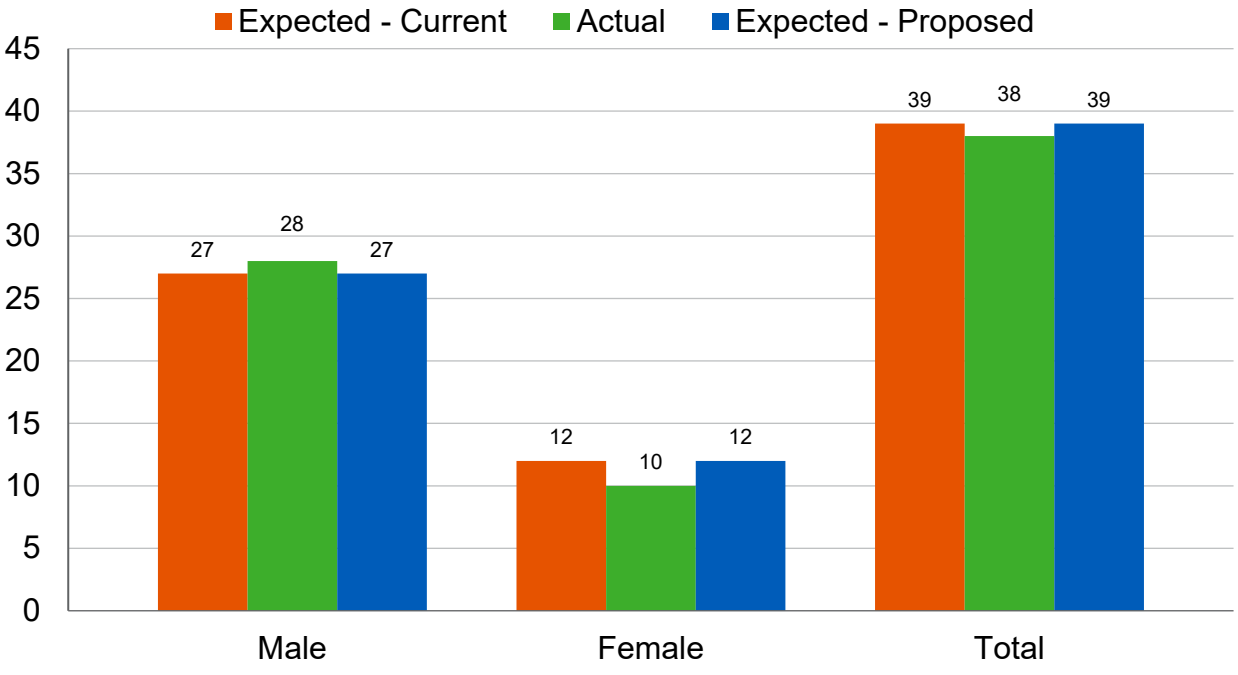
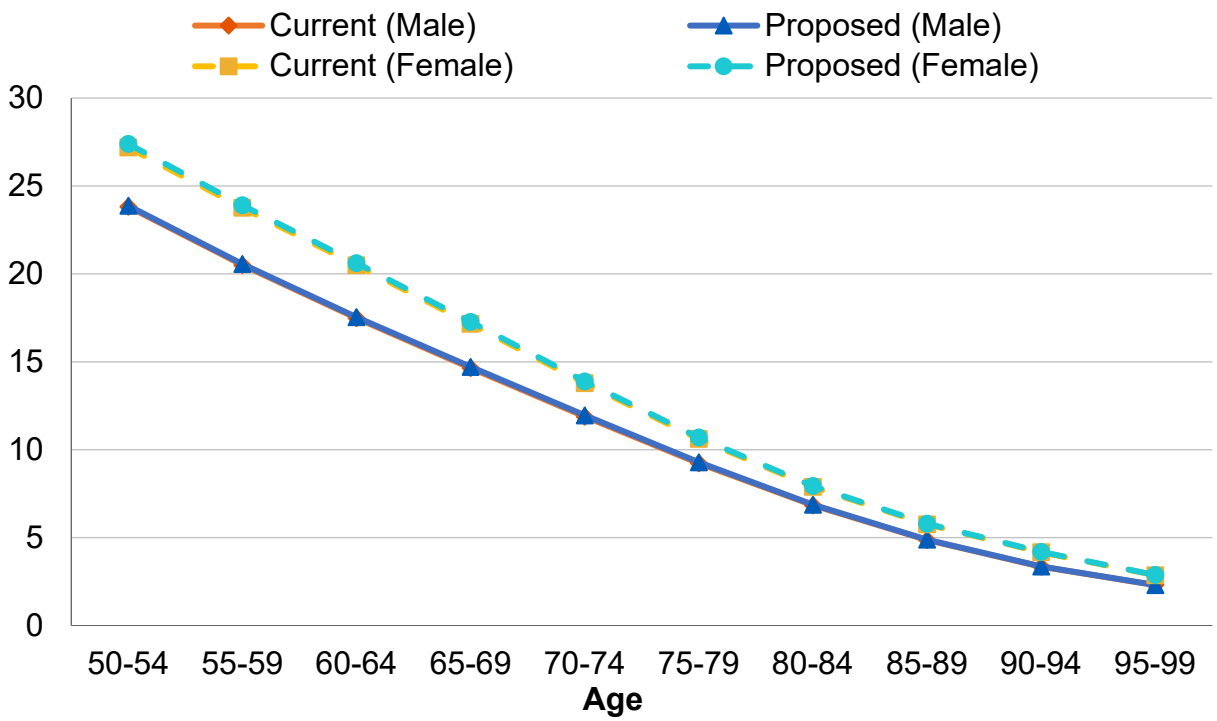


Chart 8: Benefit-Weighted Life Expectancies based on Age in 2024

Disabled Members



C. Disability incidence rates

When a member becomes disabled, he or she is generally entitled to a monthly benefit equal to 1/3 of their Final Compensation.

The following table shows the observed disability incidence rates based on the actual experience over the past four years. Also shown are the current assumed rates and the rates we propose.

Disability Incidence Rates (%)

Age	Current Rate[1]	Actual Rate	Proposed Rate[1]
20 – 24	0.000	0.000	0.000
25 – 29	0.000	0.000	0.000
30 – 34	0.010	0.000	0.010
35 – 39	0.030	0.000	0.020
40 – 44	0.120	0.213	0.120
45 – 49	0.170	0.175	0.130
50 – 54	0.170	0.000	0.140
55 – 59	0.190	0.000	0.150
60 – 64	0.240	0.000	0.160
65 – 69	0.320	0.000	0.170
70 – 74	N/A	0.000	0.170

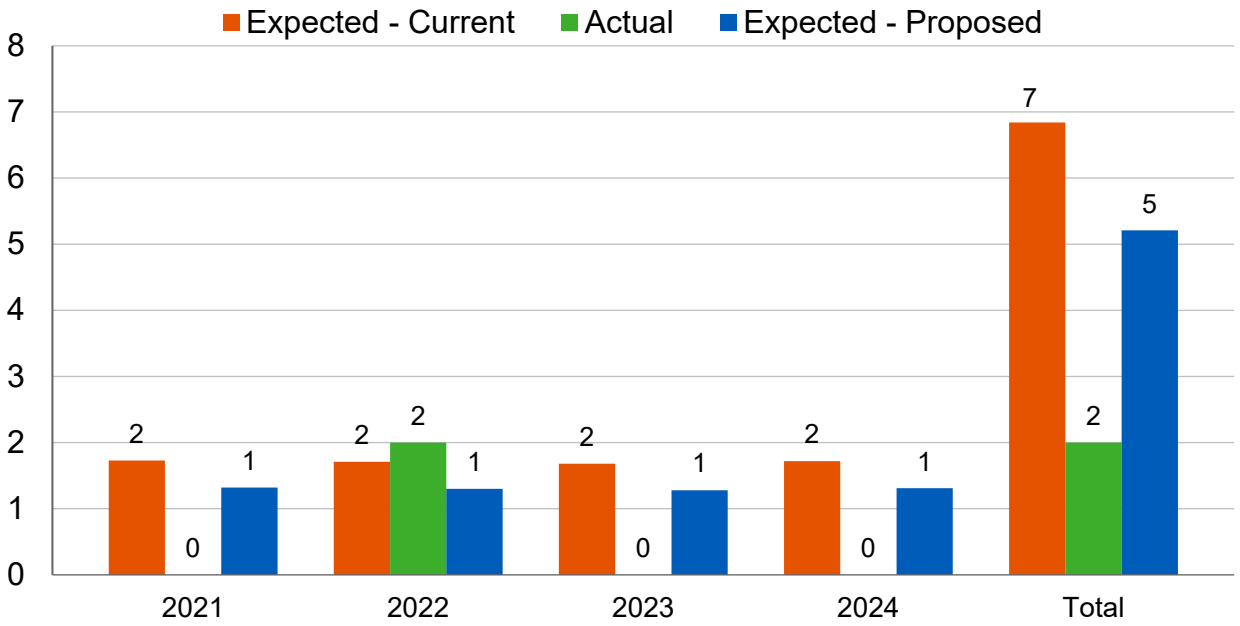
Based upon this experience and the overall low incidence of disability, we recommend slightly decreasing the disability incidence rate assumption overall.

Chart 9 compares the actual number of disabilities over the past four years to that expected under both the current and proposed assumptions.

Chart 10 compares the actual disability incidence rates with the current and proposed rates.

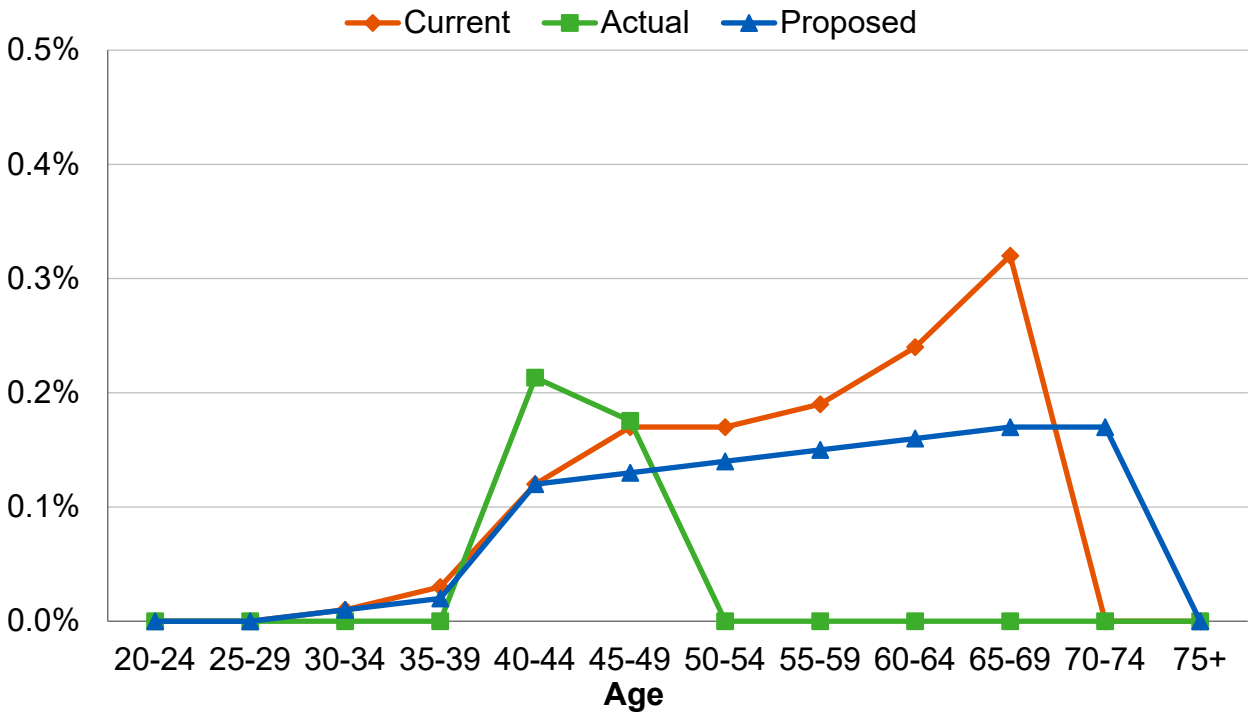
[1] At central age in the age range shown.

Chart 9: Actual Number of Disability Retirements Compared to Expected



Note: Results may not add due to rounding.

Chart 10: Disability Incidence Rates



D. Termination rates

Termination rates include all terminations for reasons other than death, disability, or retirement. Under the current assumptions, members with less than five years of service are assumed to terminate based on years of service (i.e., a service-based assumption), and members with five or more years of service are assumed to terminate based on age (i.e., an age-based assumption). With this experience study, we are recommending termination rates based only on a function of the member's years of service. Also, we are introducing separate rates for 1955/1980 Plan and 2013 Tier members.

The following table shows the observed termination rates based on the actual experience over the past four years. We have also included eight years of experience in order to improve the credibility of EBMUDERS' termination experience and to aid in our transition to a service-based assumption for both the 1955/1980 Plan and 2013 Tier for all service categories. Also shown are the current assumed rates and the rates we propose. Please note that we have excluded any members that were eligible for retirement unless the member actually terminated. In addition, termination liability continues to be based on the greater of a refund of member contributions and the present value of a deferred vested retirement benefit.

1955/1980 Plan—Termination Rates (%)

Years of Service	Current Rate[1]	Actual Rate (Last 4 Years)	Actual Rate from Current and Prior Studies (Last 8 Years)	Proposed Rate
Less than 1	6.75	16.00	6.82	11.30
1 – 2	4.25	7.69	5.56	6.00
2 – 3	4.00	8.82	4.76	6.00
3 – 4	3.50	2.56	4.23	3.00
4 – 5	2.50	0.00	0.51	3.00
5 – 6	1.88	6.25	2.79	2.50
6 – 7	1.92	3.92	2.16	2.50
7 – 8	1.93	2.99	2.75	2.50
8 – 9	1.93	3.92	2.95	2.50
9 – 10	1.90	1.79	2.67	1.80
10 – 11	1.88	1.80	1.75	1.80
11 – 12	1.90	2.65	1.04	1.80
12 – 13	1.90	0.92	1.08	1.80
13 – 14	1.85	1.83	1.63	1.80
14 – 15	1.82	0.00	1.27	1.60
15 – 16	1.78	1.52	1.75	1.60
16 – 17	1.76	3.64	2.62	1.60
17 – 18	1.74	1.10	1.71	1.60
18 – 19	1.72	2.50	1.23	1.60
19 – 20	1.70	0.00	0.70	1.60
20 and over	1.60	1.31	1.18	1.60

[1] The current rates shown for 5 or more years of service are based on our current age-based rates applied to the last four years of exposures.

2013 Tier—Termination Rates (%)

Years of Service	Current Rate[1]	Actual Rate (Last 4 Years)	Actual Rate from Current and Prior Studies (Last 8 Years)	Proposed Rate
Less than 1	6.75	9.27	8.74	8.00
1 – 2	4.25	3.64	3.65	4.00
2 – 3	4.00	3.54	3.70	3.75
3 – 4	3.50	2.92	2.72	3.25
4 – 5	2.50	3.32	2.87	3.00
5 – 6	2.02	2.48	2.11	2.70
6 – 7	2.00	4.10	3.64	2.60
7 – 8	1.98	3.23	3.23	2.50
8 – 9	1.96	1.22	1.22	2.30
9 – 10	1.95	3.74	3.74	2.20
10 – 11	1.90	2.78	2.78	2.10
11 – 12	1.75	0.00	0.00	2.00
12 – 13	0.00	0.00	0.00	1.90
13 – 14	0.00	0.00	0.00	1.80
14 – 15	0.00	0.00	0.00	1.70
15 – 16	0.00	0.00	0.00	1.60
16 – 17	0.00	0.00	0.00	1.60
17 – 18	0.00	0.00	0.00	1.60
18 – 19	0.00	0.00	0.00	1.60
19 – 20	0.00	0.00	0.00	1.60
20 and over	0.00	0.00	0.00	1.60

Based upon the recent experience, we recommend increasing the termination rates overall, in particular for the 2013 Tier, and separating termination assumptions for 1955/1980 Plan and 2013 Tier members.

We also continue to recommend that all termination rates are zero for all members eligible to retire, as long as a retirement rate is assumed. That is, it is assumed that members eligible to retire at termination will retire rather than defer their benefit or withdraw their contributions.

It is important to note that not every service category has enough exposures and/or decrements such that the results in that category are statistically credible even if we look at eight years' worth of experience. This is mainly the case at the highest service categories since most members in those categories are eligible to retire and so have been excluded from our review of this termination experience.

Chart 11 compares the number of actual to expected terminations over the past four years for the current and proposed assumptions for 1955/1980 Plan members.

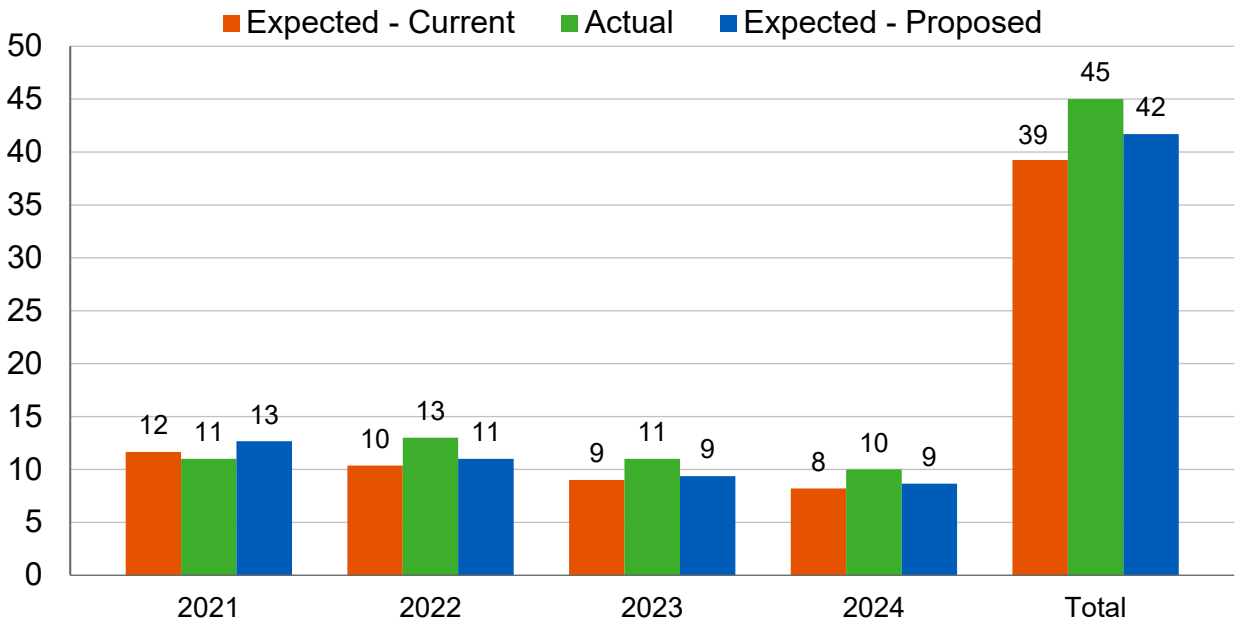
[1] The current rates shown for 5 or more years of service are based on our current age-based rates applied to the last four years of exposures.

Chart 12 compares the number of actual to expected terminations over the past four years for the current and proposed assumptions for 2013 Tier members.

Chart 13 compares the actual termination rates with the current and proposed rates for 1955/1980 Plan members.

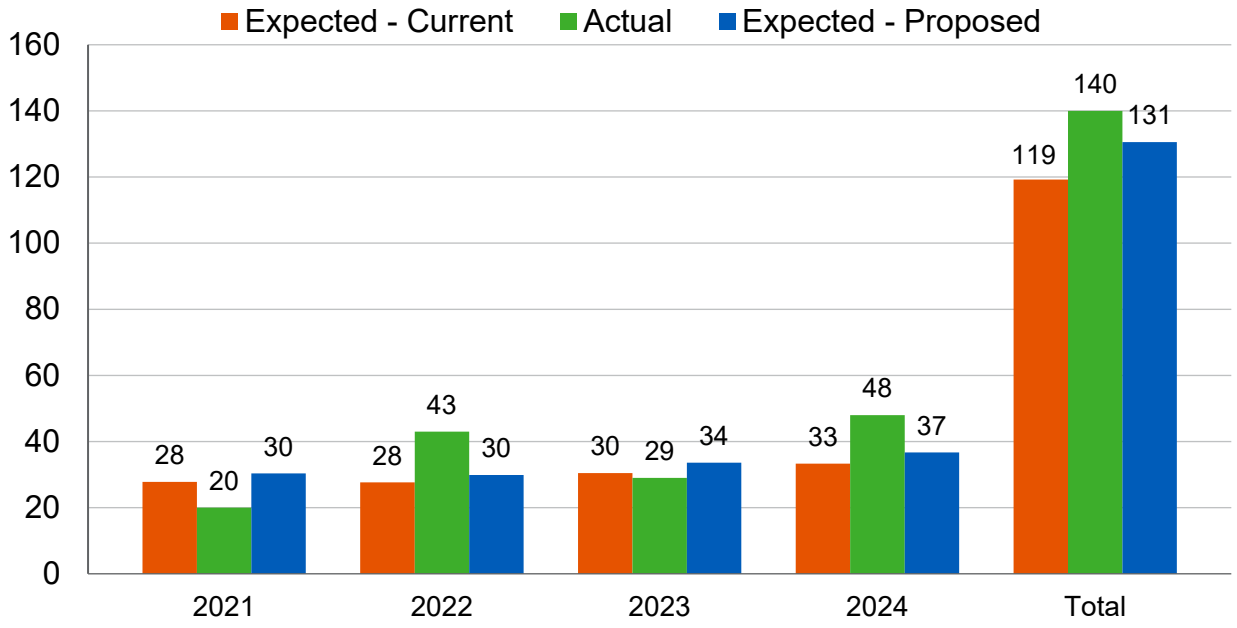
Chart 14 compares the actual termination rates with the current and proposed rates for 2013 Tier members.

Chart 11: Actual Number of Terminations Compared to Expected
1955/1980 Plan Members



Note: Results may not add due to rounding.

Chart 12: Actual Number of Terminations Compared to Expected
2013 Tier Members



Note: Results may not add due to rounding.

Chart 13: Termination Rates
1955/1980 Plan Members

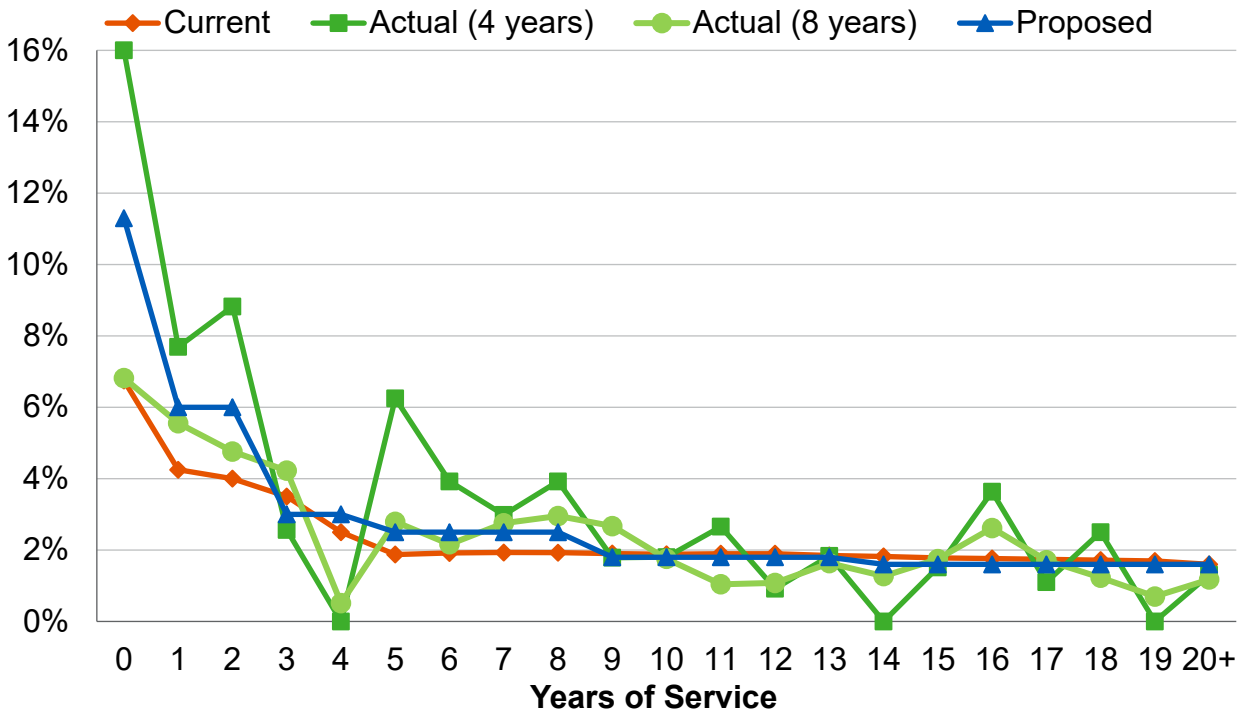
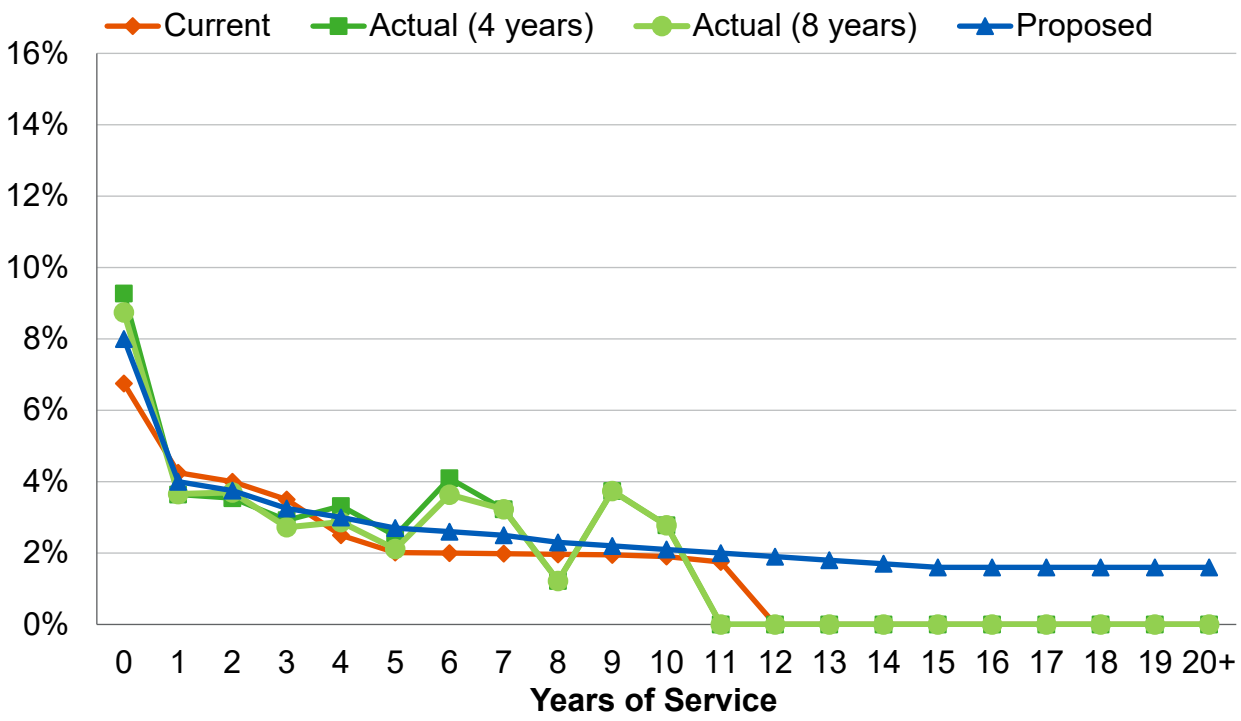


Chart 14: Termination Rates
2013 Tier Members



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.

The following two tables show the observed service retirement rates for the 1955/1980 Plan based on the actual experience over the past four years. Experience is separated for those members who are eligible for an unreduced benefit[1] and for other members who are not eligible for an unreduced benefit. The observed service retirement rates were determined by comparing those members who actually retired from service to those eligible to retire from service. Also shown are the current assumed rates and the rates we propose. With this experience study, we recommend increasing the age at which all members would be expected to retire from age 70 to age 75. This is based on the experience observed at EBMUDERS and the assumptions we use at a number of our other county employees retirement systems.

1955/1980 Plan

Retirement Rates (%) — 1955/1980 Plan: Eligible for an Unreduced Benefit

Age	Current Rate	Actual Rate	Proposed Rate
54	55.00	43.48	50.00
55	16.00	22.58	16.00
56	16.00	20.93	16.00
57	16.00	16.67	16.00
58	16.00	22.39	16.00
59	16.00	9.41	16.00
60	16.00	16.48	16.00
61	16.00	14.10	16.00
62	16.00	29.75	20.00
63	16.00	19.54	20.00
64	16.00	22.37	20.00
65	16.00	17.14	20.00
66	27.00	30.00	24.00
67	27.00	8.51	24.00
68	27.00	15.22	24.00
69	27.00	24.24	24.00
70	100.00	22.22	40.00
71	100.00	22.22	40.00
72	100.00	45.45	40.00
73	100.00	0.00	40.00
74	100.00	12.50	40.00
75 and over	100.00	31.58	100.00

[1] For example, a 1955/1980 Plan member who is 54 years old with 30 or more years of service would be eligible to receive the full ("unreduced") 2.60% per year of service accrual.

Based on this experience, we recommend decreases in the retirement rates at certain ages and recommend increases in the retirement rates at other ages, for 1955/1980 Plan members eligible for an unreduced benefit. Overall, the proposed rates represent a decrease in the retirement rates.

Chart 15 compares the number of actual to expected retirements over the past four years for the current and proposed assumptions, for 1955/1980 Plan members eligible for an unreduced benefit. Chart 18 compares the actual retirement rates for 1955/1980 Plan members eligible for an unreduced retirement with the current and proposed rates.

Retirement Rates (%) — 1955/1980 Plan: Not Eligible for an Unreduced Benefit

Age	Current Rate	Actual Rate	Proposed Rate
54	7.00	6.37	7.00
55	7.00	5.71	7.00
56	7.00	9.68	7.00
57	7.00	11.54	8.00
58	7.00	6.17	8.00
59	7.00	9.59	8.00
60	7.00	13.89	10.00
61	12.00	7.27	10.00

Based on this experience, we recommend a decrease in the retirement rates at age 61 and recommend increases in the retirement rates at other ages, for 1955/1980 Plan members not eligible for an unreduced benefit. Overall, the proposed rates represent an increase in the retirement rates.

Chart 16 compares the number of actual to expected retirements over the past four years for the current and proposed assumptions, for 1955/1980 Plan members not eligible for an unreduced benefit. Chart 19 compares the actual retirement rates for 1955/1980 Plan members not eligible for an unreduced retirement with the current and proposed rates.

2013 Tier

The following table shows the observed retirement rates for the 2013 Tier based on the actual experience over the past six years. (We used six years for the 2013 Tier to utilize the most experience available.) The observed service retirement rates were determined by comparing those members who actually retired from service to those eligible to retire from service. Also shown are the current assumed rates and the rates we propose. In setting our proposed assumptions, we have also looked at the assumptions from two of our other county employees retirement systems offering comparable benefits.

Retirement Rates (%) — 2013 Tier

Age	Current Rate	Actual Rate	Proposed Rate
52	1.75	0.00	2.00
53	1.75	0.00	2.00
54	2.75	0.00	2.00
55	4.75	0.00	3.00
56	5.75	0.00	3.00
57	5.75	0.00	4.00
58	5.75	0.00	4.00
59	7.75	7.14	6.00
60	7.75	4.55	6.00
61	10.25	0.00	6.00
62	18.00	0.00	10.00
63	15.00	5.56	10.00
64	9.00	7.14	10.00
65	23.75	0.00	20.00
66	23.75	16.67	20.00
67	32.50	11.11	20.00
68	35.00	0.00	20.00
69	38.75	0.00	20.00
70	100.00	50.00	35.00
71	100.00	100.00	35.00
72	100.00	0.00	35.00
73	100.00	0.00	35.00
74	100.00	0.00	35.00
75 and over	100.00	0.00	100.00

Based on this experience, we recommend decreases in the retirement rates at certain ages and recommend increases in the retirement rates at other ages, for 2013 Tier members. Overall, the proposed rates represent a decrease in the retirement rates.

Chart 17 compares the number of actual to expected retirements over the past six years for the current and proposed assumptions, for 2013 Tier members. Chart 20 compares the actual retirement rates for 2013 Tier members with the current and proposed rates.

Deferred vested members

Under the current assumptions, deferred vested members are assumed to retire at age 59, regardless if the member went on to work at a reciprocal retirement system or not. The following table shows the observed deferred vested retirement ages based on the actual experience over the past four 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.

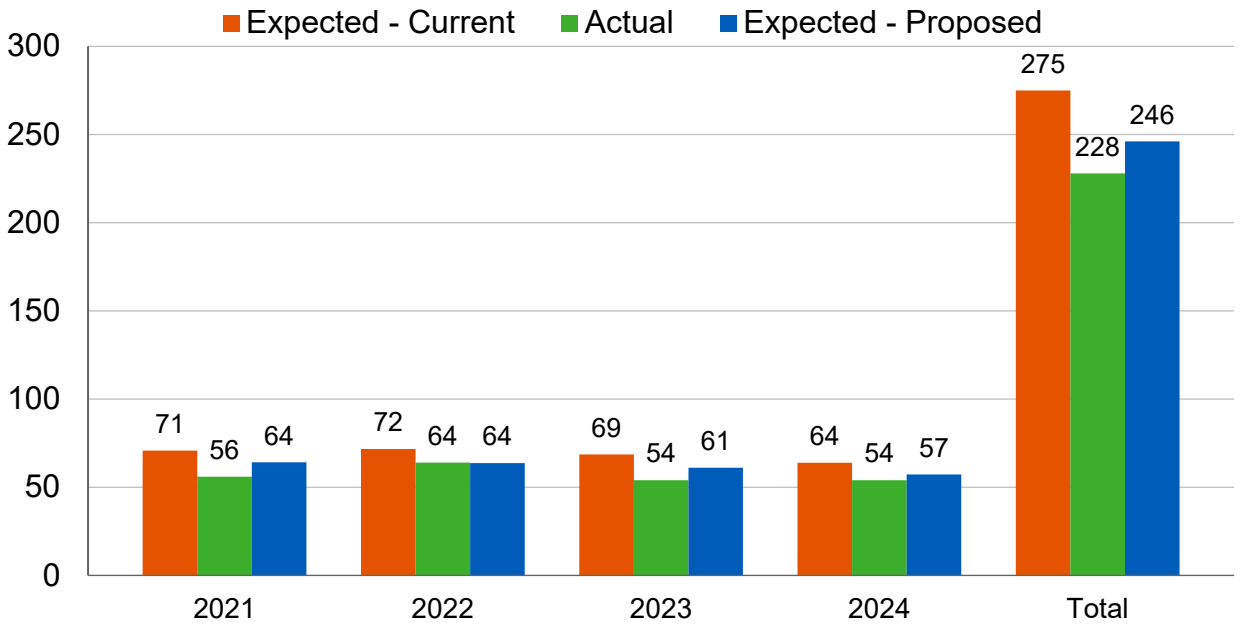
Deferred Vested Retirement Age

	Reciprocal Members	Non-Reciprocal Members
Current assumption	59.0	59.0
Actual average age	59.7	58.9
Proposed assumption	**59.0**	**59.0**

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

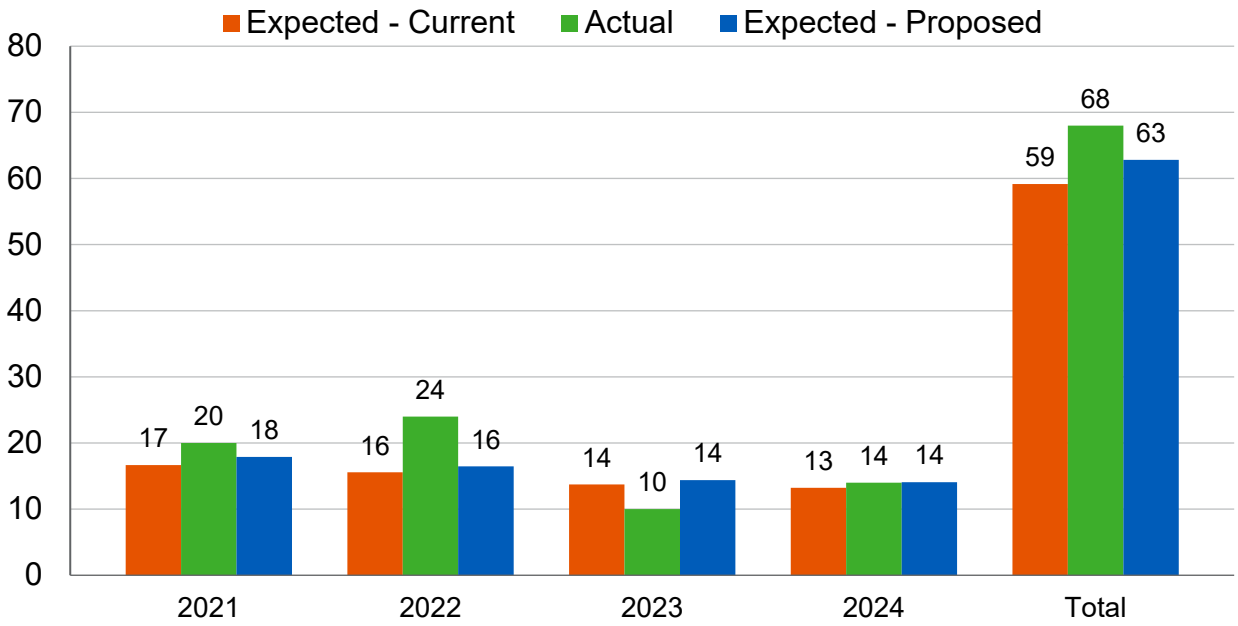
Chart 15: Actual Number of Retirements Compared to Expected

1955/1980 Plan – Eligible for an Unreduced Benefit



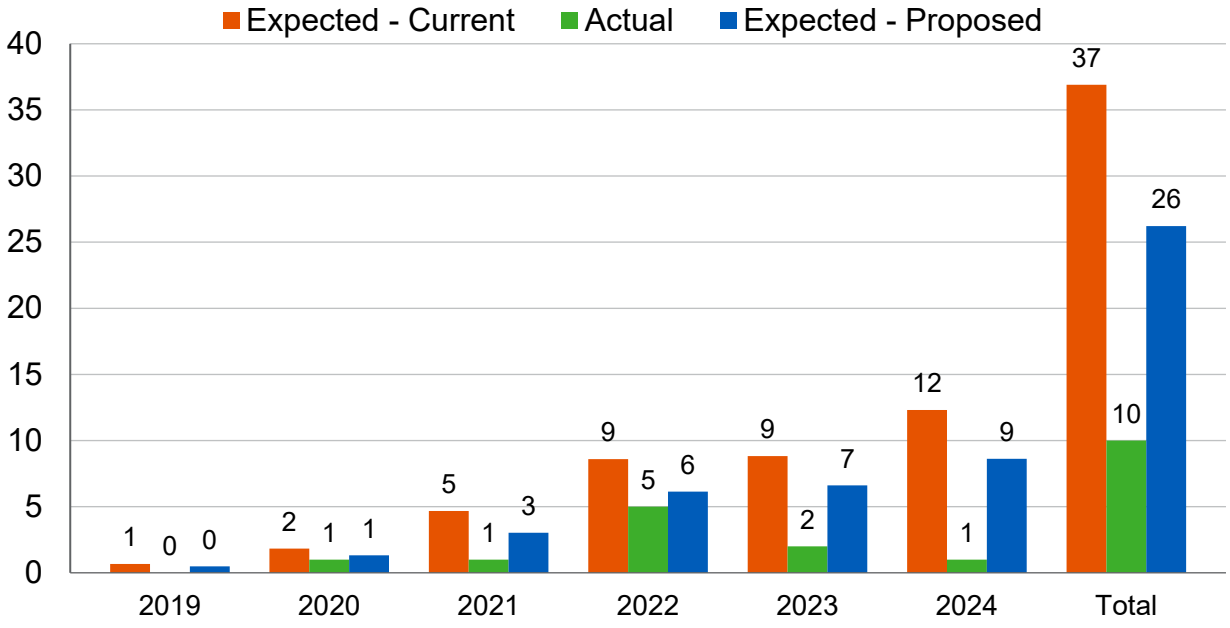
Note: Results may not add due to rounding.

Chart 16: Actual Number of Retirements Compared to Expected
1955/1980 Plan – Not Eligible for an Unreduced Benefit



Note: Results may not add due to rounding.

Chart 17: Actual Number of Retirements Compared to Expected
2013 Tier



Note: Results may not add due to rounding.

Chart 18: Retirement Rates

1955/1980 Plan – Eligible for an Unreduced Benefit

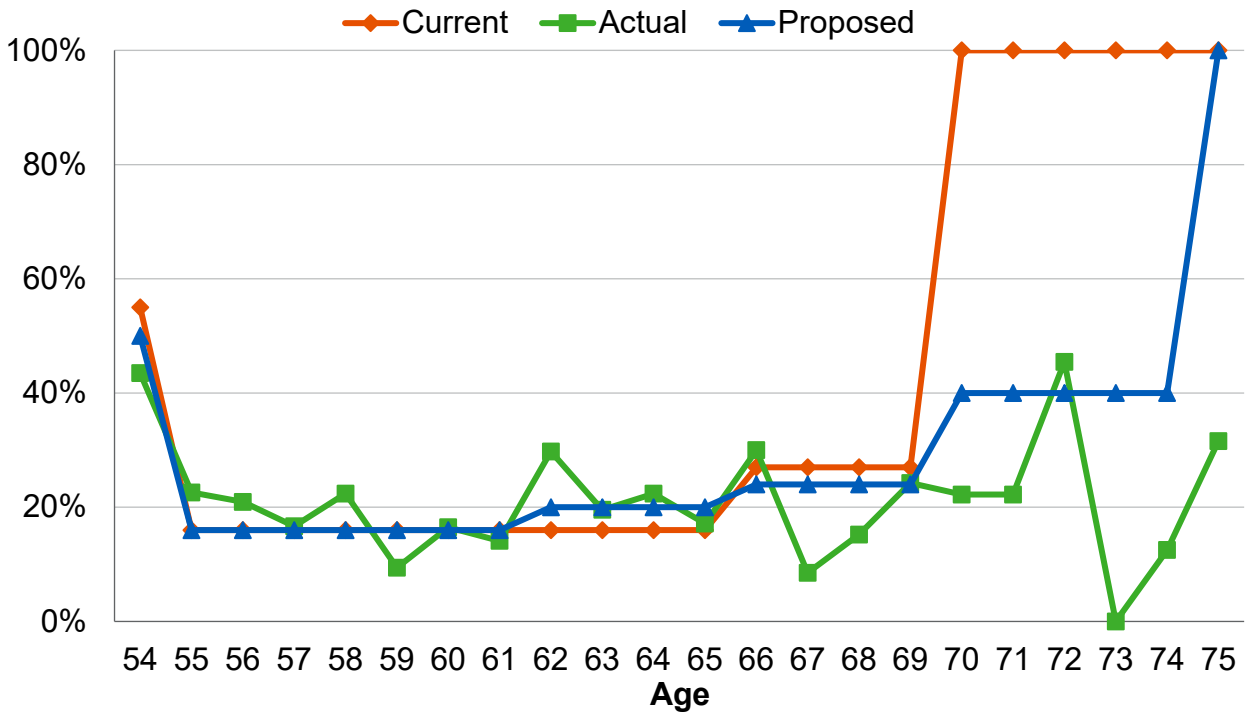


Chart 19: Retirement Rates

1955/1980 Plan – Not Eligible for an Unreduced Benefit

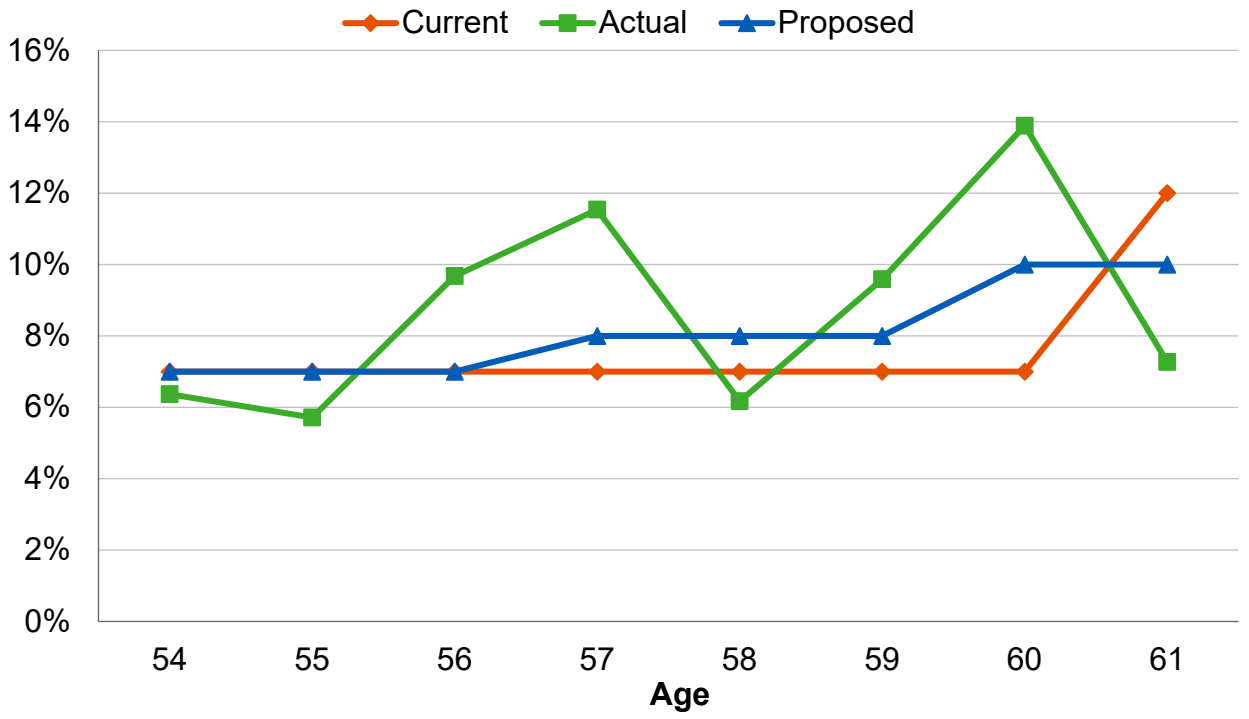
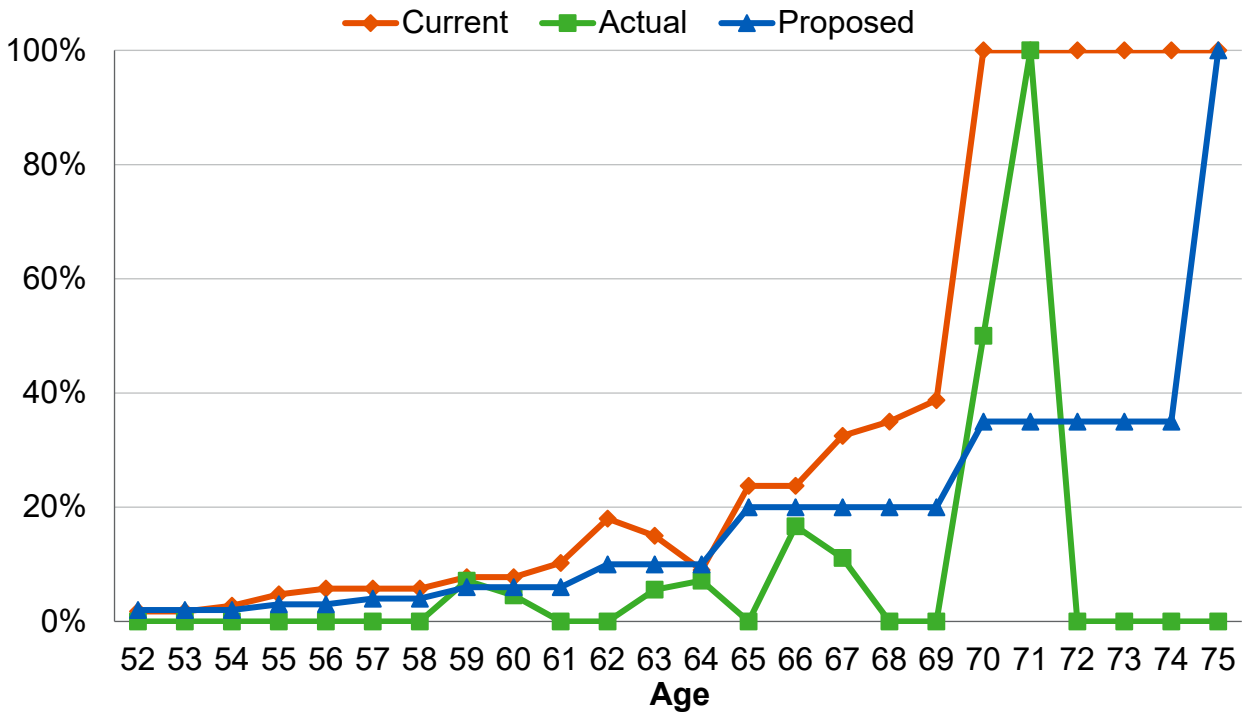


Chart 20: Retirement Rates

2013 Tier



F. Miscellaneous assumptions and change in method

Reciprocity

Under the current assumptions, a percentage of future deferred vested members are assumed to go on to work under a reciprocal retirement system. The following table shows the observed reciprocity percent based on the actual experience over the four-year and eight-year periods ending June 30, 2024. Also shown are the current and proposed assumptions.

Percent of Deferred Vested Members Covered under Reciprocal System

	Reciprocal Percent
Current assumption	15%
Actual percent (last four years)	16%
Actual percent (last eight years)	14%
Proposed assumption	**15%**

We recommend keeping the reciprocal assumption level at 15%. This recommendation takes into account the experience of only newly deferred vested members during the last eight valuations instead of all deferred vested members as of June 30, 2024 to better capture recent reciprocity trends. As noted in the last experience study report for the four-year period ending June 30, 2020, EBMUDERS made a refinement in the flagging of reciprocal members about eight years ago to only include outbound reciprocities (i.e., member who have left EBMUDERS to work for a reciprocal system), rather than capturing both outbound and inbound reciprocities. Accordingly, our experience lookback was limited to eight years in this case.

In addition, we recommend that a 3.75% annual salary increase assumption be utilized to anticipate salary increases from the date of termination from EBMUDERS (or from the date of the last reported salary, if provided for current deferred vested reciprocal members) to the expected date of retirement for deferred vested members covered by a reciprocal retirement system. This assumption is based on the ultimate 0.75% merit and promotion salary increase assumption for active members (for both the 1955/1980 Plan and 2013 Tier), together with the 2.50% inflation and 0.50% real "across-the-board" salary increase assumptions that are recommended earlier in *Section 3* of this report.

Sick leave conversion

Active members who accrue sick leave hours may convert their accumulated unused hours[1] at retirement into service credit for use in the calculation of their retirement benefit. Currently, unused sick leave hours are reported in the membership data provided for the actuarial valuation after the hours are earned by the members, and an actuarial liability is included in the annual valuation to anticipate the conversion of these unused sick leave hours at retirement.

[1] Pursuant to EBMUDERS' sick leave procedure, "when an employee's sick leave accumulation reaches the maximum of 1,040 hours, hours otherwise accrued thereafter shall be accumulated without limit in a Service Extension Credit account. For the purpose of calculating retirement benefits, an employee's period of service shall be supplemented at retirement by two hours for each hour of unused sick leave accumulated at date of retirement, PLUS two hours of each hour credited to the employee's Service Extension Credit account, with the total rounded to the nearest whole day."

In order to review the assumption for the amount of additional sick leave hours for each year of future employment that may be converted to service credit at retirement, we have observed over the four-year experience study period that the average active member with 11.2 years of service has accumulated 488 hours of unused sick leave. Based on EBMUDERS' sick leave conversion procedures, the 488 hours may be converted to about 0.47 years of service (based on 1,040 hours used for such conversion). When we divide the 0.47 years by the average active member's 11.2 years of service, sick leave is earned at the rate of about 0.042 (0.47 / 11.2) per year of service.

Based on this information, we recommend increasing the current assumption that future benefit accruals increase at 1.0 year of service per year of employment plus 0.040 years of additional service (previously 0.038) to anticipate conversion of unused sick leave for each year of employment. As previously directed by EBMUDERS, this assumption applies to active members in both the 1955/1980 Plan and the 2013 Tier.

Percent married/domestic partnership

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 members who retired during the four-year period ending June 30, 2024 who were reported with an eligible spouse or domestic partner at the time of retirement. 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

	Male Member	Female Member
Current assumption	85%	60%
Actual percent	83%	67%
Proposed assumption	**85%**	**65%**

Based on this experience, we recommend maintaining the assumption for male members and increasing the assumption from 60% to 65% for female members.

Age and gender of spouse/domestic partner

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 the age and gender of the survivor. Based on the experience for members who retired during the current four-year period (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, even with the inclusion of domestic partners.

2. **We recommend maintaining the spouse age difference assumption that male retirees are two years older than their spouses/domestic partners and female retirees are three years younger than their spouses/domestic partners.** These assumptions will continue to be monitored in future experience studies.

Member's Age as Compared to Spouse's/Domestic Partner's Age

	Male Retiree	Female Retiree
Current assumption	2 years older	3 years younger
Actual EBMUDERS' experience	1.8 years older	2.8 years younger
Proposed assumption	**2 years older**	**3 years younger**

Form of payment

Pursuant to Section 21 ("Optional Modification of Retirement Allowance") of the EBMUDERS Ordinance, a member may elect to receive an optional form of benefit at retirement that is the actuarial equivalence of his or her unmodified retirement allowance in the form of a lesser retirement allowance payable throughout life, with one of the four options stipulated in the Ordinance. It has been EBMUDERS' longstanding practice to use the current investment return and mortality assumptions in determining the actuarially equivalent optional forms of benefit.

Option 2 provides 100% continuance of the member's modified allowance under this option, payable to the designated beneficiary upon the member's death. Option 3 provides 50% continuance of the member's modified allowance under that option; and Option 4 provides 25% of the member's modified allowance under that option. Rather than a monthly benefit continuance option, Option 1 is a cash refund option that provides the balance of unused member contributions upon the member's death to his or her beneficiary or estate. However, under each option, the surviving spouse/registered domestic partner, if any, is also entitled to receive 50% of the member's unmodified allowance upon the member's death. We understand that for this reason, a higher proportion of members chose an optional form of benefit at retirement, in comparison to the election percentages we have observed at many of the county employees retirement systems that we serve which do not have this additional benefit feature.

Over the four-year period ending June 30, 2024, service retired members elected the following options at retirement:

Option Elected for New Service Retirements (July 1, 2020 – June 30, 2024)

Option Elected	Observed Election Percentage
Unmodified or Option 1	58%
Option 2 (100% continuance)	10%
Option 3 (50% continuance)	17%
Option 4 (25% continuance)	15%
Total	**100%**

In the prior four-year period ending June 30, 2020, service retired members elected the following options at retirement:

Option Elected for New Service Retirements (July 1, 2016 – June 30, 2020)

Option Elected	Observed Election Percentage
Unmodified or Option 1	52%
Option 2 (100% continuance)	11%
Option 3 (50% continuance)	22%
Option 4 (25% continuance)	15%
Total	**100%**

While more retirees are electing an Unmodified or Option 1 benefit and fewer are electing an Option 3 benefit recently, the percentages electing each benefit option are more stable when considered over all (not just new) service retirees. We looked at all service retirees in each of the past four valuations, for the years ending June 30, 2021 through June 30, 2024, and observed that they had elected the following options:

Option Elected for All Service Retirements (June 30, 2021 – June 30, 2024 Valuations)

Option Elected	Observed Election Percentage
Unmodified or Option 1	53%
Option 2 (100% continuance)	9%
Option 3 (50% continuance)	21%
Option 4 (25% continuance)	17%
Total	**100%**

Based on this observation, we recommend adopting the following optional form election percentages for use in the June 30, 2024 valuation. When compared to the current assumptions, we are recommending an increase in the percentage assumption for Unmodified or Option 1 and a reduction in the percentage assumption for Option 4.

Current and Recommended Option Election Percentages

Option Elected	Current Election Percentage	Recommended Election Percentage
Unmodified or Option 1	50%	55%
Option 2 (100% continuance)	10%	10%
Option 3 (50% continuance)	20%	20%
Option 4 (25% continuance)	20%	15%
Total	**100%**	**100%**

Change in methodology

With this experience study, we are recommending a technical change in the calculation of the total normal cost rate for the 2013 Tier. We note that this change does not impact the active member's total present value of benefits, only the allocation of that present value between prior service (actuarial accrued liability) and future service (normal costs).

As we pointed out in the last few valuations, the total normal cost rates for both the 1955/1980 Plan and the 2013 Tier have been developed assuming the normal cost dollar contribution amounts would increase at the rate of the total salary increase assumption. The dollar contribution amounts are then converted to a percent of payroll normal cost rate by dividing the dollar contribution amount by the payroll after limiting each individual employee's payroll by the appropriate compensation limit. There was an increase in the total normal cost rate for the 2013 Tier due to the changes in member demographics during two consecutive valuations as the average salary for continuing active 2013 Tier members increased by more than the increase in the CalPEPRA limit between those two valuations.

While this would have no impact on the calculation of the present value of future benefits, we recommend that starting with the June 30, 2024 valuation the normal cost rate for the 2013 Tier be calculated at the rate of the total salary increase assumption subject to the additional constraint that the resultant annual salary be no greater than the compensation limit for each year. This change would result in a more stable total normal cost rate in future valuations.

G. Retiree health assumptions

Retiree participation

The Health Insurance Benefit (HIB) is a reimbursement-based benefit that retirees can use towards coverage on an EBMUDERS-sponsored health plan, or other eligible expenses such as Medicare Part B premiums and premiums for other health plans. As a result, almost all retirees who are eligible for an HIB reimbursement participate in the program. Based on retirements during the most recent eight-year period from this year's data, **we propose to maintain the 95% participation assumption for retirees who are eligible for the HIB.**

In addition, based on the same eight-year period**, we propose to maintain the 70% assumption for participation in a non-Medicare health plan sponsored by EBMUDERS**. This additional 70% participation assumption is needed for the GASB 74 and 75 accounting valuations. For GASB accounting purposes, OPEB benefits are required to include the "implicit subsidy", which is the difference between the estimated age-adjusted costs of retiree coverage and the overall premium rate. Because the non-Medicare plans at EBMUDERS have blended rates based on the experience of active employees and retirees, there exists an age-related, implicit subsidy in the premium structure. Note, since the District only aims to pre-fund the explicit HIB reimbursements, the funding valuation, which develops the recommended employer contribution, does not incorporate the use of this additional 70% assumption.

Overall HIB Participation and EBMUDERS Non-Medicare Health Plan Participation

Retiree Participation	HIB	EBMUDERS Health Plan
Current assumption	95%	70%
Actual experience	95%	71%
Proposed assumption	**95%**	**70%**

For members who retire from vested terminated status, a separate participation assumption is used. Based on the same eight-year period**, we recommend an increase to the participation assumption for current vested terminated employees from 50% to 65% of the baseline assumptions shown above.** In other words, future participation by vested terminated members is assumed to be 65% of the participation by employees retiring directly from active service.

HIB Participation for Vested Terminated Participants

Vested Terminated Members	HIB Participation
Current assumption	50%
Actual experience	65%
Proposed assumption	**65%**

Spousal coverage

In the prior valuation, 70% of males and 35% of females were assumed to have a spouse or domestic partner participating in the retiree health plan. When analyzing this year's data, we noticed a significant difference between the percentage of retirees receiving a two-person HIB subsidy versus those with two-person coverage in an EBMUDERS-sponsored health plan. As noted on the prior page, the GASB valuations require us to measure the implicit subsidies received by retirees and spouses who have coverage in an EBMUDERS non-Medicare health plan. Because the difference was observed to be significant, we propose separate assumptions for the HIB spousal subsidy versus spousal coverage in an EBMUDERS non-Medicare health plan. **Based on retirements during the most recent four-year period, we propose an increase to the HIB spousal subsidy assumption from 70% of males and 35% of females to 75% for males and 50% for females. In addition, we propose a decrease to the EBMUDERS non-Medicare health plan spousal coverage assumption from 70% of males and 35% of females to 50% for males and 30% for females.**

The following tables provide the observed percentage of retirees with HIB spousal subsidies and those with a spouse covered in an EBMUDERS non-Medicare health plan.

HIB Spousal Subsidy

Spousal Subsidy	Male Member	Female Member
Current assumption	70%	35%
Actual experience	75%	56%
Proposed assumption	**75%**	**50%**

Spouse Coverage in EBMUDERS Non-Medicare Health Plan

Spouse Coverage	Male Member	Female Member
Current assumption	70%	35%
Actual experience	40%	34%
Proposed assumption	**50%**	**30%**

Covered spouse age difference

The following table shows the observed average spouse age difference for new retirees who receive a spousal HIB subsidy based on the actual experience over the past four years. Also shown are the current and proposed assumptions.

Covered Spouse's Age Compared to the Member's Age

Covered Spouse Age	Male Member	Female Member
Current assumption	3 years younger	2 years older
Actual experience	2 years younger	2 years older
Proposed assumption	**2 years younger**	**2 years older**

Based on plan experience over the most recent four-year period from this year's data, **we recommend decreasing the spouse age difference for a male retiree and maintaining the current assumption for a female retiree.**

Section 5: Cost Impact

The tables below show the changes in the total normal cost, actuarial accrued liability, funded ratios, and contribution rates (employer, employee, total normal cost, and UAAL) for the Pension and Health Plans (and both plans combined) due to the recommended assumption changes, as if they were applied in the June 30, 2023 actuarial valuation. As shorthand, we will refer to the pre-retirement assumption and the 2013 Tier normal cost rate calculation methodology changes as "pre-retirement changes" and the post-retirement assumption changes as "post-retirement changes" below.

Pension Plan

Change in Plan Liabilities, Contribution Rates and Funded Ratios Based on June 30, 2023 Actuarial Valuation

($ in thousands)

Component	Current Assumptions	Effect of Pre-Retirement Changes (a)	Effect of Post-Retirement Changes (b)	Total Increase/ (Decrease) (a) + (b)	Proposed Assumptions
Total employer and employee normal cost	$62,315	$940	$407	$1,347	$63,662
Total normal cost rate	23.76%	0.25%	0.15%	0.40%	24.16%
Actuarial accrued liability	$2,994,429	$2,817	$24,692	$27,509	$3,021,938
UAAL contribution rate	25.42%	(0.04%)	0.66%	0.62%	26.04%
Funded ratio on valuation value of assets basis	75.2%	(0.1%)	(0.6%)	(0.7%)	74.5%

Total Normal Cost Rates

Tier	Current Assumptions	Effect of Pre-Retirement Changes (a)	Effect of Post-Retirement Changes (b)	Total Increase/ (Decrease) (a) + (b)	Proposed Assumptions
1955/1980 Plan	27.83%	0.21%[1]	0.19%	0.40%	28.23%
2013 Tier	19.79%	0.29%[2]	0.12%	0.41%	20.20%
Combined	**23.76%**	**0.25%**	**0.15%**	**0.40%**	**24.16%**

Of the increase in the total normal cost rate for the 1955/1980 Plan, the primary cost drivers are higher salary increases, higher retirement rates, as well as the strengthening of the post-retirement mortality assumptions. Of the increase in the total normal cost rate for the 2013 Tier,

[1] The methodology change had no effect on the total normal cost for the 1955/1980 Plan, whose members are not PEPRA limited. The new assumptions increased the total normal cost for the 1955/1980 Plan overall.

[2] The methodology change increased the total normal cost for the 2013 Tier by 0.65%. The new assumptions decreased the total normal cost for the 2013 Tier overall.

the primary cost drivers are the change in methodology used to calculate the normal cost rate and the strengthening of the post-retirement mortality assumptions, offset somewhat by lowering the retirement rates.

Contribution Rate Impact (% of Payroll)
1955/1980 Plan members

Component	Current Assumptions	Total Pre-Retirement and Post-Retirement Changes	Proposed Assumptions
Total normal cost	**27.83%**	**+0.40%**	**28.23%**
• Employee normal cost	8.66%	+0.00%	8.66%
• Employer normal cost	19.17%	+0.40%	19.57%
UAAL rate	25.42%	+0.62%	26.04%
Total employer rate	44.59%	+1.02%	45.61%

Contribution Rate Impact (% of Payroll)
2013 Tier members

Component	Current Assumptions	Total Pre-Retirement and Post-Retirement Changes	Proposed Assumptions
Total normal cost	**19.79%**	**+0.41%**	**20.20%**
• Employee normal cost	9.41%	+0.69%	10.10%
• Employer normal cost	10.38%	-0.28%	10.10%
UAAL rate	25.42%	+0.62%	26.04%
Total employer rate	35.80%	+0.34%	36.14%

For the 2013 Tier, the 1% threshold required (see discussion below) before splitting the total normal cost rate on a 50/50 basis is reached using the changes recommended in this study.

Contribution Rate Impact (% of Payroll)
Combined

Component	Current Assumptions	Total Pre-Retirement and Post-Retirement Changes	Proposed Assumptions
Total normal cost	**23.76%**	**+0.40%**	**24.16%**
• Employee normal cost	9.04%	+0.35%	9.39%
• Employer normal cost	14.72%	+0.05%	14.77%
UAAL rate	25.42%	+0.62%	26.04%
Total employer rate	40.14%	+0.67%	40.81%

Of the various assumption changes, the most significant rate increase is due to the updated post-retirement assumption changes.

Discussion on 1955/1980 Plan Employee Contribution Rate and Development of Change in Employee and Employer Normal Cost Rates for the 2013 Tier for the Pension Plan

1955/1980 Plan

There would be no change in the total (Pension Plan plus HIB Plan) employee contribution rate for the 1955/1980 Plan members if the recommended assumption changes were implemented since the rate for these members has been set based on bargaining unit contract negotiations in 2013.

2013 Tier

On the other hand, pursuant to Section 7522.30(a) of the California Government Code, we understand that 2013 Tier members are required to contribute at least 50% of the total normal cost rate. Furthermore, Section 7522.30(d) states that the 2013 Tier employee contribution rate, "once established…shall not be adjusted on account of a change to the normal cost rate unless the normal cost rate increases or decreases by more than 1 percent of payroll above or below the normal cost rate in effect at the time the employee contribution rate is first established or, if later, the normal cost rate in effect at the time of the last adjustment to the employee contribution rate under this section."

Effective with the June 30, 2020 valuation, the total normal cost rate was determined to be 18.81%, which was a change of more than 1% of payroll compared to the rate of 17.56% that was determined in the initial CalPEPRA valuation for 2013. The June 30, 2020 valuation was the first time since the initial CalPEPRA valuation that the change in the total normal cost rate exceeded the 1% of payroll threshold. Consequently, the employee contribution rate for the 2013 Tier members was increased from 8.75% to 9.41%, which was at least 50% of the total normal cost rate.

For the June 30, 2023 valuation, the 2013 Tier employee contribution rate remained at 9.41% for the Pension Plan, because the total normal cost rate of 19.79% for this tier remained within 1% of payroll of the new 18.81% rate noted. However, in that valuation, we pointed out in our report that any further increase in the total normal cost rate would likely cause the total normal cost rate to exceed the 1% threshold. If that threshold is crossed, the total normal cost rate will again be reapportioned so that the employee contribution rate is at least 50% of the total normal cost rate. In this scenario, since the employee contribution rate calculated as of June 30, 2023 is less than 50% of the total normal cost rate, the increase in the employee contribution rate calculated in this study can be interpreted as including two components: (1) an increase in order to "catch up to" paying 50% of the total normal cost rate calculated as of June 30, 2023 (in the absence of the 1% threshold required for a reallocation of the total normal cost rate between the employer and the employee), and (2) another increase due to the higher total normal cost rate arising from the changes in assumptions and methodology recommended in this study.

Specifically, when we remeasured the total normal cost rate as of June 30, 2023 using the new assumptions and methodology recommended in this report, we observed that the resulting total normal cost rate of 20.20% is more than 1% above the 18.81% rate established in the June 30, 2020 valuation. The new employee contribution rate of 10.10%, which is an increase of 0.69%, includes an increase of 0.49% in order to catch up to paying at least 50% of the total

normal cost rate as of June 30, 2023 as well as an increase of 0.20% from all assumption and methodology changes. The new employer normal cost rate includes a corresponding decrease of 0.49% from this catch-up and an increase of 0.21% from all assumption and methodology changes.

However, we caution that if the changes recommended herein are adopted by the Board, they will first be applied in the June 30, 2024 valuation in combination with the membership data and other information supplied by EBMUDERS to perform that valuation; and the final total normal cost rate will again be compared to the 18.81% threshold to determine the actual increase in the employer and employee contribution rates for the 2013 Tier.

Health Plan

Change in Plan Liabilities and Funded Ratios Based on June 30, 2023 Actuarial Valuation

($ in thousands)

Component	Current Assumptions	Total Increase/ (Decrease)[1]	Proposed Assumptions
Total employer and employee normal cost	$2,214	$(2)	$2,212
Actuarial accrued liability	$131,627	$1,603	$133,230
Funded ratio on valuation value of assets basis	47.7%	(0.6%)	47.1%

Contribution Rate Impact (% of Payroll)

1955/1980 Plan members

Component	Current Assumptions	Total Pre-Retirement and Post-Retirement Changes	Proposed Assumptions
Total normal cost	**0.95%**	**+0.06%**	**1.01%**
• Employee normal cost	0.09%	+0.00%	0.09%
• Employer normal cost	0.86%	+0.06%	0.92%
UAAL rate	3.57%	+0.04%	3.61%
Total employer rate	4.43%	+0.10%	4.53%

Contribution Rate Impact (% of Payroll)

2013 Tier members

Component	Current Assumptions	Total Pre-Retirement and Post-Retirement Changes	Proposed Assumptions
Total normal cost	**0.79%**	**-0.06%**	**0.73%**
• Employee normal cost	0.09%	+0.00%	0.09%
• Employer normal cost	0.70%	-0.06%	0.64%
UAAL rate	3.57%	+0.04%	3.61%
Total employer rate	4.27%	-0.02%	4.25%

[1] The total includes the impact of pre-retirement and post-retirement changes.

Contribution Rate Impact (% of Payroll)
Combined

Component	Current Assumptions	Total Pre-Retirement and Post-Retirement Changes	Proposed Assumptions
Total normal cost	**0.87%**	**+0.00%**	**0.87%**
• Employee normal cost	0.09%	+0.00%	0.09%
• Employer normal cost	0.78%	+0.00%	0.78%
UAAL rate	3.57%	+0.04%	3.61%
Total employer rate	4.35%	+0.04%	4.39%

Pension Plan and Health Plan Combined

In total, for the two plans combined, the changes in this study would increase the employer contribution rate by 0.71% of payroll ($1,862,135 if applied to the 2023 valuation[1]).

Similarly, for the two plans combined, the changes in this study would increase the employee contribution rate by 0.35% of payroll ($917,954 if applied to the 2023 valuation[1]).

[1] Based on total payroll of $262,272,600 as of June 30, 2023.

Appendix A: Current Actuarial Assumptions

Economic Assumptions

Net Investment Return

6.75%, net of administrative and investment expenses. Expected administrative and investment expenses represent about 0.25% of the average Market Value of Assets.

Employee Contribution Crediting Rate

6.75%, compounded semi-annually.

Inflation

Increase of 2.50% per year.

Cost of Living Adjustments (COLA)

Retiree COLA increases of 2.75% per year. For members with a sufficient COLA bank, withdrawals from the bank can be made to increase the retiree COLA up to 3.00% per year.

Payroll Growth

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

Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit

Increase of 2.50% per year from the valuation date.

Increase in California Government Code Section 7522.10 Compensation Limit

Increase of 2.50% per year from the valuation date.

Salary Increases

The annual rate of compensation increase includes:

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

Merit and Promotion Increase Rates (%)

Time from Hire (Years)	Rate
Less than 1	6.25
1 – 2	6.00
2 – 3	5.00
3 – 4	3.75
4 – 5	2.50
5 – 6	1.50
6 – 7	1.25
7 – 8	1.25
8 – 9	1.00
9 – 10	1.00
10 and over	0.75

Demographic Assumptions

Post-Retirement Mortality Rates

Healthy

- **Pension Plan:** Pub-2010 General Healthy Retiree Amount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020
- **Health Plan:** Pub-2010 General Healthy Retiree Headcount-Weighted Above-Median Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two-dimensional mortality improvement scale MP-2020

Disabled

- **Pension Plan:** Pub-2010 Non-Safety Disabled Retiree Amount-Weighted Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two dimensional mortality improvement scale MP-2020
- **Health Plan:** Pub-2010 Non-Safety Disabled Retiree Headcount-Weighted Mortality Tables (separate tables for males and females) with rates increased by 5% for males, projected generationally with the two dimensional mortality improvement scale MP-2020

Beneficiary

- **Pension Plan, all beneficiaries:** Pub-2010 General Contingent Survivor Amount-Weighted Above-Median Mortality Tables (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-2020
- **Health Plan, all beneficiaries:** Pub-2010 General Contingent Survivor Headcount-Weighted Above-Median Mortality Tables (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-2020

Pre-Retirement Mortality Rates

- **Pension Plan:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2020

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

Age	Male	Female
20	0.04	0.01
25	0.02	0.01
30	0.03	0.01
35	0.04	0.02
40	0.06	0.03
45	0.09	0.05
50	0.13	0.08
55	0.19	0.11
60	0.28	0.17
65	0.41	0.27

- **Health Plan:** Pub-2010 General Employee Headcount-Weighted Above-Median Mortality Tables (separate tables for males and females), projected generationally with the two-dimensional mortality improvement scale MP-2020

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

Age	Male	Female
20	0.04	0.01
25	0.03	0.01
30	0.04	0.02
35	0.05	0.02
40	0.06	0.04
45	0.09	0.05
50	0.14	0.08
55	0.20	0.12
60	0.29	0.18
65	0.42	0.28

Disability Incidence Rates

Disability Incidence Rates (%)

Age	Rate
25	0.000
30	0.006
35	0.022
40	0.084
45	0.150
50	0.170
55	0.182
60	0.220
65	0.288

Disability rates are applicable after eight years of service.

Termination Rates

Termination Rates (%)

Less than Five Years of Service

Years of Service	Rate
Less than 1	6.75
1 – 2	4.25
2 – 3	4.00
3 – 4	3.50
4 – 5	2.50

Five or More Years of Service

Age	Rate
25	2.34
30	2.24
35	2.14
40	2.04
45	1.85
50	1.60
55	1.35
60	1.10

No termination is assumed after a member is eligible for retirement (as long as a retirement rate is assumed).

Retirement Rates

Retirement Rates (%)

Age	1955/1980 Plan Unreduced Pension[1]	1955/1980 Plan Reduced Pension	2013 Tier
52	0.00	0.00	1.75
53	0.00	0.00	1.75
54	55.00	7.00	2.75
55	16.00	7.00	4.75
56	16.00	7.00	5.75
57	16.00	7.00	5.75
58	16.00	7.00	5.75
59	16.00	7.00	7.75
60	16.00	7.00	7.75
61	16.00	12.00	10.25
62	16.00	N/A[2]	18.00
63	16.00	N/A	15.00
64	16.00	N/A	9.00
65	16.00	N/A	23.75
66	27.00	N/A	23.75
67	27.00	N/A	32.50
68	27.00	N/A	35.00
69	27.00	N/A	38.75
70 and over	100.00	N/A	100.00

Retirement Age for Inactive Vested Members

For current and future inactive vested members, the retirement age assumptions is 59.

1955/1980 Plan non-reciprocal members who are currently terminated with less than five years of service and are not vested are assumed to retire at age 65 if they decide to leave their contributions on deposit.

Reciprocity

15% of members who terminate with a vested benefit are assumed to enter a reciprocal system. For reciprocals, 3.75% compensation increases are assumed per annum.

[1] For example, a 1955/1980 Plan member age 54 with 30 or more years of service would receive the full 2.60% per year of service accrual.

[2] For ages 62 and over, all 1955/1980 Plan members who are eligible for retirement receive the full 2.60% per year of service accrual.

Future Benefit Accruals

1.0 year of service per year of employment, plus 0.038 years of additional service to anticipate conversion of unused sick leave for each year of employment. As directed by EBMUDERS, this assumption has been applied to active members in the 1955/1980 Plan and the 2013 Tier.

Unknown Data for Members

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

Percent Married/Domestic Partnership

For all active and inactive members, 85% of male members and 60% of female members are assumed to be married or in a domestic partnership at pre-retirement death or retirement.

Age and Gender of Spouse/Domestic Partner

For all active and inactive members, male members are assumed to have a female spouse who is 2 years younger than the member and female members are assumed to have a male spouse who is 3 years older than the member.

Since birth dates for non-spouse/non-domestic partner contingent beneficiaries are not provided by EBMUDERS, the age differences noted above also apply to assumed contingent beneficiaries of retired members who chose an optional form of payment at retirement.

Form of Payment

At retirement, members with spouses or domestic partners are assumed to elect the following form of payment (single members are assumed to elect the Unmodified option):

Election Percentage

Form of Payment	Election Percentage
Unmodified or Option 1	50%
Option 2 (100% continuance)	10%
Option 3 (50% continuance)	20%
Option 4 (25% continuance)	20%

Retiree Health Assumptions

Retiree Participation

Overall HIB Participation and EBMUDERS Non-Medicare Health Plan Participation

Retiree Participation	HIB	EBMUDERS Health Plan
Current assumption	95%	70%

The difference between the 95% of all future retirees expected to be provided with an HIB subsidy and the 70% (i.e. equals 25%) is what we used to anticipate future retirees who receive reimbursement for medical expenses through the HIB plan without being enrolled in an EBMUDERS medical insurance plan.

For deferred vested members, we assume an election equal to 50% of the future retiree election percent.

Spousal Coverage

For all active and inactive vested participants who elect to continue their health coverage at retirement, 70% males and 35% females are assumed to have an eligible spouse/domestic partner who also opts for coverage at that time.

Covered Spouse Age Difference

For all active and inactive vested participants, male participants are assumed to have a female spouse/domestic partner who is 3 years younger than the participant, while female participants are assumed to have a male spouse/domestic partner who is 2 years older than the participant.

Appendix B: Proposed Actuarial Assumptions

Economic Assumptions

Net Investment Return

6.75%, net of administrative and investment expenses. Expected administrative expenses and investment expenses represent about 0.15% of the beginning of year Actuarial Value of Assets.

Employee Contribution Crediting Rate

6.75%, compounded semi-annually.

Inflation

Increase of 2.50% per year.

Cost of Living Adjustments (COLA)

Retiree COLA increases of 2.75% per year. For members with a sufficient COLA bank, withdrawals from the bank can be made to increase the retiree COLA up to 3.00% per year.

Payroll Growth

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

Increases in Internal Revenue Code Section 401(a)(17) Compensation Limit

Increase of 2.50% per year from the valuation date.

Increase in California Government Code Section 7522.10 Compensation Limit

Increase of 2.50% per year from the valuation date.

Salary Increases

The annual rate of compensation increase includes:

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

Merit and Promotion Increase Rates (%)

Time from Hire (Years)	1955/1980 Plan	2013 Tier
Less than 1	6.25	6.50
1 – 2	6.00	6.25
2 – 3	5.00	5.25
3 – 4	3.75	4.25
4 – 5	2.50	2.75
5 – 6	1.50	1.75
6 – 7	1.25	1.25
7 – 8	1.25	1.25
8 – 9	1.25	1.25
9 – 10	1.25	1.25
10 – 11	1.00	1.00
11 – 12	1.00	1.00
12 – 13	0.75	0.75
13 – 14	0.75	0.75
14 – 15	0.75	0.75
15 and over	0.75	0.75

Demographic Assumptions

Post-Retirement Mortality Rates

Healthy

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

Disabled

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

Beneficiary

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

Pre-Retirement Mortality Rates

- **Pension Plan:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables (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	Male	Female
20	0.04	0.01
25	0.02	0.01
30	0.03	0.01
35	0.04	0.02
40	0.06	0.03
45	0.09	0.05
50	0.13	0.08
55	0.19	0.11
60	0.28	0.17
65	0.41	0.27

- **Health Plan:** Pub-2010 General Employee Amount-Weighted Above-Median Mortality Tables (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	Male	Female
20	0.04	0.01
25	0.03	0.01
30	0.04	0.02
35	0.05	0.02
40	0.06	0.04
45	0.09	0.05
50	0.14	0.08
55	0.20	0.12
60	0.29	0.18
65	0.42	0.28

Disability Incidence Rates

Disability Incidence Rates (%)

Age	Rate
25	0.000
30	0.006
35	0.016
40	0.080
45	0.126
50	0.136
55	0.146
60	0.156
65	0.166
70	0.170

Disability rates are applicable after eight years of service.

Termination Rates

Termination Rates (%)

Years of Service	1955/1980 Plan	2013 Tier
Less than 1	11.30	8.00
1 – 2	6.00	4.00
2 – 3	6.00	3.75
3 – 4	3.00	3.25
4 – 5	3.00	3.00
5 – 6	2.50	2.70
6 – 7	2.50	2.60
7 – 8	2.50	2.50
8 – 9	2.50	2.30
9 – 10	1.80	2.20
10 – 11	1.80	2.10
11 – 12	1.80	2.00
12 – 13	1.80	1.90
13 – 14	1.80	1.80
14 – 15	1.60	1.70
15 – 16	1.60	1.60
16 – 17	1.60	1.60
17 – 18	1.60	1.60
18 – 19	1.60	1.60
19 – 20	1.60	1.60
20 and over	1.60	1.60

No termination is assumed after a member is eligible for retirement (as long as a retirement rate is assumed).

Retirement Rates

Retirement Rates (%)

Age	1955/1980 Plan Unreduced Pension[1]	1955/1980 Plan Reduced Pension	2013 Tier
52	0.00	0.00	2.00
53	0.00	0.00	2.00
54	50.00	7.00	2.00
55	16.00	7.00	3.00
56	16.00	7.00	3.00
57	16.00	8.00	4.00
58	16.00	8.00	4.00
59	16.00	8.00	6.00
60	16.00	10.00	6.00
61	16.00	10.00	6.00
62	20.00	N/A[2]	10.00
63	20.00	N/A	10.00
64	20.00	N/A	10.00
65	20.00	N/A	20.00
66	24.00	N/A	20.00
67	24.00	N/A	20.00
68	24.00	N/A	20.00
69	24.00	N/A	20.00
70	40.00	N/A	35.00
71	40.00	N/A	35.00
72	40.00	N/A	35.00
73	40.00	N/A	35.00
74	40.00	N/A	35.00
75 and over	100.00	N/A	100.00

Retirement Age for Inactive Vested Members

For current and future inactive vested members, the retirement age assumption is 59.

1955/1980 Plan non-reciprocal members who are currently terminated with less than five years of service and are not vested are assumed to retire at age 65 if they decide to leave their contributions on deposit.

[1] For example, a 1955/1980 Plan member age 54 with 30 or more years of service would receive the full 2.60% per year of service accrual.

[2] For ages 62 and over, all 1955/1980 Plan members who are eligible for retirement receive the full 2.60% per year of service accrual.

Reciprocity

15% of members who terminate with a vested benefit are assumed to enter a reciprocal system. For reciprocals, 3.75% compensation increases are assumed per annum.

Future Benefit Accruals

1.0 year of service per year of employment, plus 0.040 years of additional service to anticipate conversion of unused sick leave for each year of employment. As directed by EBMUDERS, this assumption has been applied to active members in the 1955/1980 Plan and the 2013 Tier.

Unknown Data for Members

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

Percent Married/Domestic Partnership

For all active and inactive members, 85% of male members and 65% female members are assumed to be married or with domestic partner at pre-retirement death or retirement.

Age and Gender of Spouse/Domestic Partner

For all active and inactive members, male members are assumed to have a female spouse who is 2 years younger than the member and female members are assumed to have a male spouse who is 3 years older than the member.

Since birth dates for non-spouse/non-domestic partner contingent beneficiaries are not provided by EBMUDERS, the age differences noted above also apply to assumed contingent beneficiaries of retired members who chose an optional form of payment at retirement.

Form of Payment

At retirement, members with spouses or domestic partners are assumed to elect the following form of payment (single members are assumed to elect the Unmodified option):

Election Percentage

Form of Payment	Election Percentage
Unmodified or Option 1	55%
Option 2 (100% continuance)	10%
Option 3 (50% continuance)	20%
Option 4 (25% continuance)	15%

Retiree Health Assumptions

Retiree Participation

Overall HIB Participation and EBMUDERS Non-Medicare Health Plan Participation

Retiree Participation	HIB	EBMUDERS Health Plan
Proposed assumption	95%	70%

The difference between the 95% of all future retirees expected to be provided with an HIB subsidy and the 70% (i.e. equals 25%) is what we used to anticipate future retirees who receive reimbursement for medical expenses through the HIB plan without being enrolled in an EBMUD medical insurance plan.

For deferred vested members, we assume an election equal to 65% of the future retiree election percent.

Spousal Coverage

For all active and inactive vested participants who elect to participate in the HIB plan after retirement, 75% males and 50% females are assumed to have an eligible spouse/domestic partner who also receives HIB subsidy at that time.

For all active and inactive vested participants who receive coverage under an EBMUDERS non-Medicare health plan at retirement, 50% males and 30% females are assumed to have an eligible spouse/domestic partner who also opts for coverage at that time.

Covered Spouse Age Difference

For all active and inactive vested participants, male participants are assumed to have a female spouse/domestic partner who is 2 years younger than the participant, while female participants are assumed to have a male spouse/domestic partner who is 2 years older than the participant.

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